

METEOROLOGICAL
COMMITTEE MINUTES

1875

MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COMMITTEE,

1875.



LONDON:

PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1876.

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MINUTES OF THE PROCEEDINGS
OF THE
METEOROLOGICAL COMMITTEE.

116, Victoria Street, January 4, 1875.

PRESENT :

Mr. De La Rue in the Chair.

Mr. Galton.

Major-General Strachey.

Sir C. Wheatstone.

The Director was in attendance.

The Minutes of last meeting (December 7) were read and confirmed.

Reported—That the estimates had been sent to the Board of Trade on the 10th ult., as directed.

Reported—That certain Queries had been forwarded by the Exchequer and Audit Office, through the Treasury, relating to the accounts of the Office, which had all admitted of simple answers and explanations, which had been furnished.—Approved.

Submitted—The following correspondence with the Meteorological Society :—

DEAR SIR,

Meteorological Office, December 12, 1874

I HAVE to inform you that your letter of the 5th instant was laid before the Meteorological Committee on the 7th instant, and I was instructed to state for the information of the Meteorological Society that they are prepared to accept the several terms of agreement therein proposed.

I am, however, to say, with reference to paragraph 2, that this Office understands that the monthly means for each station will be supplied, with the copies of detailed observations therein referred to.

It also seems advisable to stipulate that the returns shall be furnished regularly within a definite time, for which this Office would name the end of three weeks from the date at which the return in question closes.

As soon as this arrangement is finally concluded, I shall notify the fact to those of the Society's observers who at present furnish returns to this Office.

G. J. Symons, Esq.,
Secretary, Meteorological Society.

I am, &c.
(Signed) ROBERT H. SCOTT,
Director.

Meteorological Society 30 Great George Street,
Westminster, S.W., December 23, 1874.

DEAR SIR,

I AM instructed by the Council of this Society to acknowledge receipt of your letter of the 12th instant, and to state that they concur in the expediency of the two proposals therein contained, and accordingly accept the terms of the agreement.

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

I am, &c.
(Signed) G. J. SYMONS,
Secretary.

Mr. Scott was instructed to prepare, for the consideration of the Committee, a draft letter to the Scottish Meteorological Society, informing it of the arrangement concluded with the Meteorological Society, and inviting the co-operation of the Scottish Society on similar terms.

SUBMITTED—The following STATEMENT respecting the RECORDS for November 1874, received from the SELF-RECORDING OBSERVATORIES, which have been examined at KEW OBSERVATORY (see Minutes 21st December 1868).

	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
ANEMOGRAPH:—		Good.		Good.		Good.		Good.		Good.		Good.		Good.
Action	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Records deficient, due to stoppage of clock	-	0	0	0	0	0	0	0	0	0	0	0	0	0
" other causes	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Orientation verified	-	-	28th	-	21st	-	2nd	-	11th	-	6th	-	1st	-
No. of errors discovered by subsidiaries	-	0	0	0	0	0	0	0	0	0	0	0	0	0
" irregular differences	-	0	0	1	0	0	0	0	0	0	0	0	9	0
Result of 40 Remasurements:—														
Greatest difference	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0
Mean difference irrespective of sign	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.3	0.3	0.3	0.3	0.4
Residual difference (—Kew)	-	0.0	+0.1	+0.1	+0.1	0.0	0.0	0.0	0.0	-0.1	-0.2	+0.1	+0.1	+0.2
Errors in dating curves	-	0	0	0	0	0	1	0	0	0	1	0	2	2
RAIN GAUGE.														
Action	-	Good.	Fair.	Good.	Good.	Fair.	Fair.	Good.	Good.	Fair.	Fair.	Fair.	Fair.	Fair.
Records deficient, due to stoppage of clock	-	0	0	0	0	0	0	0	0	0	0	0	9 hrs.	0
" other causes	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Errors in tabulation	-	0	1	2	2	4	4	0	0	3	3	0	0	0

Read—The following note :—

M. O. 2750.

MR. CURTIS has communicated to me an ingenious, and, I think, a valuable idea for the extension of our Anemometric records, and has asked me to bring it before the notice of the Committee, which I willingly do.

At present the records given by our Robinson's cups afford no information as to gusts or squalls, or as to the maximum force of the wind at any time: they tell no more than the mean force of the wind during some minutes, the time scale not admitting of more delicate appreciation. Yet the importance of knowing the maximum force of the wind is great, and is especially desirable for the information of underwriters, who consult our records when there has been a shipwreck to know whether the vessel was really subjected to great stress of weather.

Mr. Curtis' plan is to make the cups give additional results similar in general appearance to those afforded by a pressure Anemometer, which marks every gust and indicates the maximum force of the wind, very clearly, at every moment of time. He proposes to attach a "governor" to the revolving shaft, whose up-and-down movement shall communicate, by means of link-work, a lateral movement to a pen, that rests on a revolving cylinder.

The work to be performed is extremely light, and would not sensibly embarrass the freedom of movement of the cups. Mr. Curtis has drawn a plan, which no doubt would answer, but I think the details require consideration. They present no real difficulty; it is only a question to choose the best plan.

(Signed) FRANCIS GALTON.
December 29, 1874.

10/. was placed at Mr. Scott's disposal to enable Mr. Curtis to make a model.

Read—A letter from Captain Toynbee, submitting an excellent log by Captain T. W. Freeman, s.s. "Wisconsin." (Minutes 1874, p. 31.)

Mr. Scott was instructed to convey the thanks of the Committee to Captain Freeman.

Mr. Scott reported with reference to the subject of Sea Temperature on the coasts of the British Islands (Minutes 1874, p. 17), that he had supplied instruments, viz., two thermometers and one Sixe's deep sea thermometer to the following stations :—

Fern Islands lighthouse.	
Dudgeon	light ship.
Leman and Ower	"
Galloper	"
South Sand Head	"
Owers	"
Seven Stones	"
Morecambe Bay	"
Bahama Bank	"
<hr/>	
Kish	"
Arklow South	"
Coning Beg	"
Daunt's Rock	"

and that the instructions and forms for the observations were in the press.

The following resolution was adopted with reference to the Charts for Square III. (Minutes 1874, pp. 50 and 80) :—

"That the special thanks of the Committee be given to Captain Henry Toynbee, conveying to him their high appreciation of the value of these Charts, and the accompanying remarks, and also of the method devised by him for drawing the Charts, and furthermore that these thanks be accompanied by a present."

Reported—That experiments were being carried out to test the accuracy of the lenses of the Aberdeen thermograph, as directed at last meeting.

Submitted—An application for a Fishery Barometer for Buncrana.—Granted.

Reported—That the Daily Weather Charts had been supplied to—

A. E. Murray, Esq., Hastings, in exchange;

and that the supply had been cancelled in the following cases :—

G. C. Woollett, Acrise, Canterbury.

Prof. A. H. Curtis, Galway.

Reported—That 1,500/. had been transferred from the deposit account of the Committee to their current account on the 21st ult. on the signature of Major-General Strachey.

That the following cheques for December were drawn on the 26th December on the signature of Major-General Strachey :—

For Office :

		£	s.	d.
R. H. Scott	-	66	13	4
J. S. Harding, jun.	-	*20	13	4
J. S. Harding, sen.	-	†7	14	0
T. D. Bell	-	†5	12	0
Salaries and wages				

For Observatories :

R. H. Curtis	-	12	10	0
A. J. Rigby	-	†7	14	0
C. H. Thompson	-	†4	12	0
C. Stodart	-	†8	8	0
J. A. Curtis	-	8	6	8
Computations, &c.				

For Telegraphy :

F. Gaster	-	*15	5	4
W. L. Dallas	-	*9	8	4
F. Brodie	-	*7	19	2
Computations, &c.				

For Ocean Meteorology :

H. Toynbee, Marine Superintendent	-	33	6	8
R. Strachan	-	†20	0	0
C. Harding	-	†15	8	8
W. G. James	-	8	6	8
T. E. Allen	-	8	6	8
J. W. McVeagh	-	†4	12	0
Computations, &c.				

Total - - - - - £264 16 10

The following cheques for December were drawn on the 30th of that month on the signature of General Strachey :—

For Office :

	£	s.	d.
Cole and Leigh, Coals	7	10	0
C. W. Jacques, Rent	133	13	0
Wightman & Co., Printing, &c.	2	0	0

For Observatories : Quarterly Allowances, &c.—

D. Thomson, Aberdeen	-	62	10	0
Less Paper and Chemicals	-	11	4	2
		51	5	10
T. R. Robinson, Armagh	-	40	14	0
„ Expenses	-	9	11	2
		50	5	2
W. T. Dymond, Falmouth	-	\$65	12	6
R. Grant, Glasgow	-	\$61	17	6
H. Williams, Holyhead	-	2	17	8
S. Jeffery, Kew	-	62	10	0
„ Examination of Records	-	100	0	0
„ Waxed Paper	-	9	10	0
		172	0	0
C. Clouston, Orkney	-	2	16	8
E. J. Purbrick, Stonyhurst	-	\$49	7	6
Carried forward	-	£599	5	10

* Including allowance for extra attendance.

† Four weeks to the 26th.

‡ Including allowance for care of instruments.

§ 12s. 6d. deducted for Forms supplied.

				£	s.	d.
	Brought forward	-	-	599	5	10
For Observatories, &c.— <i>continued.</i>						
T. Kerr, Valencia, Salary	-	-	-	20	16	8
„ Expenses	-	-	-	52	14	10
G. T. Watson, Yarmouth	-	-	-		73	11 6
J. Driscoll, Rent at Valencia	-	-	-		4	14 0
R. J. Lecky, mounting Glass Ball	-	-	-		25	0 0
Malby and Sons, Printing, &c.	-	-	-		10	0 0
„ Anemo. Forms, Toronto	-	-	-	6	10	0
„ Printing R. Gauge Forms	-	-	-	3	0	0
				5	6	8
					14	16 8
For Telegraphy: Quarterly Allowances, &c.:						
N. J. Holmes, Scilly Co. October–November	-	-	-		6	1 3
H. Todd, Cambridge	-	-	-		3	19 0
J. Costello, Dover	-	-	-		3	5 10
J. Tilston, Holyhead	-	-	-		3	7 0
G. Mitchell, Kingstown	-	-	-		3	7 6
F. Gaster, London	-	-	-		3	5 0
W. D. Penny, Nairn	-	-	-		4	4 6
E. J. Lowe, Notts	-	-	-		3	18 0
J. Lucas, Oxford	-	-	-		3	6 0
J. Merrifield, Plymouth	-	-	-		3	5 0
W. Sandford, Portishead	-	-	-		3	19 6
W. Thomas, Scilly	-	-	-		4	10 10
W. Lawrence, Shetland	-	-	-		3	5 0
J. Smith, Stornoway	-	-	-		3	7 0
J. Trotter, Thurso	-	-	-		3	9 4
J. Sinclair, Wick	-	-	-		3	5 0
G. T. Watson, Yarmouth	-	-	-		3	6 7
C. Wakefield, York	-	-	-		3	5 0
Wightman & Co., Printing	-	-	-	1	10	0
„ „	-	-	-	1	7	6
					2	17 6
For Ocean Meteorology:						
J. J. Hicks, repairing "A" Barometers	-	-	-		15	12 0
F. Pastorelli, "A" Thermometers	-	-	-		22	0 0
J. H. Woodstock, Packing cases	-	-	-		4	6 6
H. J. Smart, Liverpool Agent	-	-	-		13	2 8
For Office Expenses:—						
J. S. Harding, jr., on account	-	-	-		120	0 0
Total	-	-	-		£971	14 0

The Committee then adjourned.

116, Victoria Street, January 18, 1875.

PRESENT:

Major-General Strachey in the Chair.

Mr. Galton.

The Director was in attendance.

The Minutes of last meeting (January 4) were read and confirmed.

Resolved—That the following letter be forwarded to Captain Toynbee:—

To Captain Henry Toynbee, F.R.A.S.,

Superintendent of the Marine Department of the Meteorological Committee.

SIR,

THE Meteorological Committee desire to express their appreciation of your labours, in successfully discussing the Meteorology of the ocean area that lies between the Equator and 10° North latitude, and between 20° and 30° West longitude.

That area, or "Square 3," as it is technically called, had been selected by them as the first of the ocean "squares" to be examined by you on account of the abundance of the data that exist concerning it, and of its paramount importance to navigators, since it is traversed by nearly every ship that crosses the Equator.

They, therefore, regard with peculiar satisfaction the thoroughness with which you have completed the first and most valuable portion of this class of work. You have discussed about 75,000 observations in a method devised by yourself, extracted from those logs alone whose good quality you had previously ascertained by careful examination. You have exhibited the results with much ingenuity in a graphical form, also devised by yourself, and have added abundant notes and tabular information. It appears to us that you have thereby expressed the meteorological conditions of the important area in question in a more compact and serviceable form than has hitherto been adopted for any other portion of the ocean.

The Committee deem it right to accompany their commendations with a substantial present, and they, therefore, beg your acceptance of a cheque of 50*l*.

A cheque for 50*l*. was drawn in favour of Captain Toynbee, on the signature of General Strachey.

Reported—That the following letter (which was approved) had been sent to the Meteorological Society:—

SIR,

January 11, 1875.

IN reply to yours of the 5th December I beg to say that the stations from which the Meteorological Office would wish returns on Form "A" are—

Aysgarth,

Buxton,

Strathfield Turgiss,

Calcethorpe,
Dartmoor.

It would also like, if possible, to obtain observations on the same Form and the same terms from a station in South Wales, if such a station is available.

I should be obliged if you would inform me what stations in connexion with the Meteorological Society could supply mean returns on the Form indicated as B.

I may say that this Office will not be ready to commence the publication of the Tables in question for some months to come.

I am, &c.

The Secretary, Meteorological Society.

(Signed) ROBERT H. SCOTT,
Director.

The following draft letter to the Scottish Meteorological Society was approved, and Mr. Scott was instructed to forward it:—

SIR,

I AM instructed by the Meteorological Committee to forward to you, for the information of the Council of the Scottish Meteorological Society, a copy of a correspondence which has recently passed between this Office and the Meteorological Society, and which has resulted in the conclusion of an arrangement, of which the particulars will be found in the correspondence, by which this Office will receive, for publication, returns of various kinds from certain stations organized by the Society.

I am to state that the Committee are desirous to learn whether or not the Council of the Scottish Meteorological Society are disposed to enter into an arrangement similar to that which has been established between this Office and the Meteorological Society.

Mr. Scott was instructed to forward the following letter to the Board of Trade, with reference to the correspondence, Minutes, 1874, p. 18:—

SIR,

Meteorological Office, January 19, 1875.

WITH reference to a letter from your Department (M. 2117, 1874), relating to a proposal for co-operation between this Office and the Meteorological Society, and to previous correspondence

between your Department and this Office relating to possible co-operation between this Office and the Scottish Meteorological Society, I am instructed by the Meteorological Committee to forward to you for the information of the Board of Trade a copy of a correspondence which has recently passed between this Office and the Meteorological Society, and which has resulted in the conclusion of an arrangement of which the particulars will be found in the correspondence, by which this Office will receive for publication returns of various kinds from certain stations organized by the Society.

I am further to state that the Committee have inquired whether or not the council of the Scottish Meteorological Society are disposed to enter into an arrangement similar to that which has been established between this Office and the Meteorological Society, and they will be happy to inform the Board of Trade of the result of this application.

Thomas Gray, Esq.,
Assistant Secretary, Marine Department,
Board of Trade.

I am, &c.
(Signed) ROBERT H. SCOTT,
Director.

Read—A letter from M. Le Verrier (M.O. 153) asking whether or not he could obtain for the Bulletin International a Sunday telegraphic report for either Valencia or Greencastle, and offering to pay the cost of transmission.

Mr. Scott was instructed to explain that the Office at Valencia was not open on Sundays, but that the Committee would be willing to use their best endeavours to procure the transmission of a Sunday Report from Greencastle to Paris, and that they would bear the expense of transmission.

Mr. Scott stated that the Permanent Committee of the Vienna Congress had recommended the adoption of an uniform code for Weather Telegraphy, and that this had already been adopted by several continental nations. He submitted a copy of the New Instructions for Weather Telegraphy, which he had prepared in accordance with this code, and reported that he proposed to introduce its use as soon as possible.—Approved.

Read—A letter (M.O. 757) from the Board of Trade authorizing the Committee to effect repairs to the Signal Station at Mount Batten, near Plymouth.

Mr. Scott was instructed to inform the Inspecting Command of Coast Guard for Plymouth that the repairs had been sanctioned. Cost not to exceed 3*l.* 10*s.* 0*d.*

Read—A letter from Captain Toynbee, submitting excellent logs by—

Captain W. Guise Comley, s.s. "Hong Kong" (Minutes, 1874, p. 80).

" J. Taylor Sutherland, "Glenesk" (Minutes, 1873, p. 61).

" C. E. Le Poer Trench, ship "Newcastle" (Minutes, 1871, p. 23).

Mr. Scott was instructed to convey the best thanks of the Committee to these gentlemen.

Submitted—Applications for Fishery Barometers for Abersoch.—Granted.

" " " Par.—Refused.

Reported—That the sheets of Hourly Values had been supplied to Trinity College Library, Cambridge.

The Committee then adjourned.

116, Victoria Street, February 1, 1875.

PRESENT :

Capt. Evans in the Chair.

Mr. De La Rue. | Mr. Galton.
Major-Gen. Strachey.

The Director was in attendance.

Read—The following letters :—

M. 1019.
M.O. 268.

SIR,

Board of Trade, January 26, 1875.

I AM directed by the Board of Trade to acknowledge the receipt of, and to thank you for, your letter of the 19th inst., enclosing a copy of a correspondence which has recently passed between the Meteorological Committee and the Meteorological Society, and which has resulted in certain arrangements for co-operation between those two bodies.

R. H. Scott, Esq.

I am, &c.
(Signed) THOMAS GRAY.

M.O. 254.

Meteorological Society, Westminster, S.W.,
January 23, 1875.

DEAR SIR,

IN reply to your letter of the 11th inst., I am happy to be able to offer you complete records from a good station at Carmarthen on Form A.

I find that your form B. requires 9 p.m. readings as well as 9 a.m., *i.e.*, the same observations as Form A. We receive such records, and shall be happy to furnish abstracts from the following inspected stations, *viz.* :—

Marlborough.

Cheadle.

Audley End.

Crowborough Observatory.

We are promised returns at those hours from the following non-inspected stations, *viz.* :—

Cardiff.

Abingdon.

Bodfaen, Pwllheli.

Hillington (9 a.m. and 10 p.m.).

Mansfield.

Ramsgate.

I believe that the foregoing statement will be substantiated by the returns which we shall receive, but at the same time it is obvious that I shall be in a position to speak more positively on receipt of the January returns early next month.

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

Yours, &c.
G. J. SYMONS, Secretary.

Mr. Scott stated that he would submit a reply to the latter at the next meeting.

Read—The following letter :—

GENTLEMEN,

Meteorological Office, January 20, 1875.

YOUR letter appreciating our work on Square 3, and the handsome present accompanying it, are a very great satisfaction to me, because they support my hope that the work will be of practical use to seamen, as well as help forward the science of Meteorology.

In thanking you, permit me to say that I have received great encouragement from Mr. Scott, who has always appreciated the method, and been ready with good advice on many points which were new to me.

I cannot close my letter without calling your special attention to the able assistance which I have received from the whole staff in the Marine Room. After a rather long experience in dealing with men, I am able to say with confidence that the office is fortunate in having such a staff of conscientious and able workers. I would especially mention Mr. C. Harding, now the senior clerk in charge of the room, who wrote the Appendix A., and has otherwise helped me much.

The Meteorological Committee
of the Royal Society.

I am, &c.
HENRY TOYNBEE.

Read—A letter from Capt. Toynbee submitting an excellent log by Capt. Gerard Gaye, ship "Eliza Shaw" (Minutes, 1874, p. 22).

Mr. Scott was instructed to convey the marked thanks of the Committee to that gentleman.

Submitted the following Abstract of Accounts from 1st April 1874 to 31st December 1874:—

Receipts.			Payments.		
—	Received.	Due.	—	Paid.	Estimated Liabilities.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Balance from 1873-4 -	2,290 12 2	—	OFFICE:		
Vote for 1874-5 -	10,000 0 0	—	Salaries -	989 4 6	—
Commissions for instruments, &c.	591 2 2	32 14 1	Rent, fuel, &c. -	443 14 1	5 0 0
Subscriptions for D.W. Charts	217 17 7	6 12 6	Contingencies -	141 8 7	10 0 0
Sundries -	54 3 7	2 11 0	LAND METEOROLOGY:		
Interest on deposit account -	104 16 5	—	Expenses at observatories -	2,021 9 8	18 0 0
			New instruments for ditto -	302 11 1	17 0 0
			Computations -	568 6 4	—
			Telegraphy -	1,316 12 10	613 0 0
			Inspections, D.W. Charts, &c.	477 2 2	80 0 0
			Computations -	494 6 7	—
			OCEAN METEOROLOGY:—		
			Marine Superintendent -	300 0 0	—
			Instruments, Admiralty -	190 13 4	71 0 0
			Ditto, Mercantile Marine, Agencies, &c.	388 7 5	123 0 0
			Computations and care of Instruments.	857 7 11	—
Totals -	£13,258 11 11	£41 17 7	Totals -	£8,491 4 6	£937 0 0

Probable net amount available on 1st January 1875 - - - £3,872 5 0

Reported—That the following cheques for January were drawn on the 25th of that month on the signature of General Strachey:—

For Office:

R. H. Scott	-	-	-	£	s.	d.
J. S. Harding, jun.	-	-	-	66	13	4
J. S. Harding, sen.	-	-	-	*20	3	4
T. D. Bell	-	-	-	† 9	12	6
Cole and Leigh, Coals	-	-	-	† 7	0	0
C. Gilman, Gas	-	-	-	7	10	0
W. G. Schoof, Repairing Clocks	-	-	-	4	13	3
				2	7	6

For Observatories:

R. & J. Beck, Zinc Plates	-	-	-	10	9	10
T. De La Rue, & Co., Paper	-	-	-	3	2	4
R. Grant, Glasgow Observatory	-	-	-	2	14	11
T. Kerr, Valencia	-	-	-	20	16	8
Allan, Brothers, Freight	-	-	-	2	16	5
R. H. Curtis	-	-	-	12	10	0
A. J. Rigby	-	-	-	† 9	12	6
C. H. Thompson	-	-	-	† 5	15	0
C. Stodart	-	-	-	†10	10	0
J. A. Curtis	-	-	-	8	6	8

For Telegraphy:

Postmaster General, September Quarter	-	-	-	269	11	11
S. M. Clare, Submarine Co., July to December	-	-	-	34	1	5
N. J. Holmes, Shetland Co., November to December	-	-	-	5	18	1
F. Dangerfield, D.W. Charts	-	-	-	12	13	11
B. Edgington, Signals	-	-	-	1	13	9
R. Strachan, Meteorological Registers	-	-	-	4	7	6
F. Gaster	-	-	-	*17	18	6
W. L. Dallas	-	-	-	*9	4	3
F. Brodie	-	-	-	*8	7	6

Carried forward - - - £568 10 2

* Including allowance for extra attendance.

† Five weeks to the 30th.

			£	s.	d.
Brought forward	-	-	568	10	2
For Ocean Meteorology:					
H. Toynbee, Marine Superintendent	-	-	33	6	8
Elliott, Brothers, Repairing Aneroids	-	-	4	9	0
J. J. Hicks, Thermometers	-	-	28	14	0
P. Adie, Repairing "A" Barometers	-	-	5	8	2
„ Repairing M.O. „	-	-	4	12	4
			10	0	6
V. Brooks, Day, & Co., Printing	-	-	8	14	6
D. MacGregor & Co., Glasgow Agents	-	-	6	0	9
R. Strachan	-	-	†20	0	0
C. Harding	-	-	*15	8	8
W. G. James	-	-	8	6	8
T. E. Allen	-	-	8	6	8
J. W. McVeagh	-	-	†5	15	0
Computations, &c.	-	-			
For Office Expenses:					
J. S. Harding, jun., on account	-	-	110	0	0
Total	-	-	£827	12	7

* Including allowance for extra attendance.

† Five weeks to the 30th.

‡ Including allowance for care of instruments.

The Committee then adjourned.

116, Victoria Street, February 22, 1875.

PRESENT:

Mr. De La Rue in the Chair.

Mr. Galton.

The Director was in attendance.

The Minutes of last meeting (Feb. 1) were read and confirmed.

Mr. Scott reported that he had forwarded the following reply (which was approved) to the Meteorological Society on the 10th inst. :—

SIR,

In reply to your letter of the 25th ultimo, I beg to inform you that this Office will be glad to receive observations on form "A" from Carmarthen, in addition to the stations already agreed upon.

Further, that the following stations for form "B" are selected :—

Pwllheli,
Hillington,
Bath,

Cheadle,
Audley End,
Marlborough,

Crowboro' Beacon,

and this Office will be glad to receive observations also on form "B" from Llandudno, if the Society has a station there.

If possible the returns should date from the 1st January last.

Yours faithfully,

(Signed) R. H. SCOTT,
Director.

To G. J. Symons, Esq.,
Secretary, Meteorological Society.

Read—The following letter :

SIR, Scottish Meteorological Society, Edinburgh,
February 15th, 1875.

YOUR letter of the 19th January has been submitted to the Council, and, with reference thereto, I am instructed to say that they hope soon to be able to publish daily observations from several of their Stations, and that copies of such publications will be forwarded gratuitously to the Meteorological Committee.

If it should happen that the Stations selected by the Council do not suit the purposes of the Committee, or supply them with the information they desire, the Council will be glad to give such further assistance as may be in their power.

Monthly resumés from nearly 90 of the Society's stations are at present and have long been published by the Registrar General for Scotland, or in the Society's Journal. Copies of these publications are sent herewith for the information of the Committee, and it is believed by the Council that they supply what is asked for under Class B in your letter to Mr. Symons of 18th November 1874.

Robert H. Scott, Esq.
Director, Meteorological Office.

I am, &c.
(Signed) THOMAS STEVENSON,
Hon. Sec.

Mr. Scott was instructed to send the following reply :—

I AM instructed by the Committee in reply to your letter of the 15th inst., to express their thanks to the Council of the Scottish Meteorological Society for their readiness to allow them to reprint gratuitously any published information from the Society's Stations which they may wish to embody in the Tables to be published in future in the Quarterly Weather Report, in accordance with the recommendations of the Permanent Committee of the Vienna Congress now about to appear.

At the same time I am to point out to you that by my letter of December 12th to Mr. Symons it is provided "that the Returns shall be furnished regularly within a definite time, for which this Office would name the end of three weeks from the date at which the return in question closes."

The latest Return published in the Society's Journal for its own Stations is for December 1873, and although the Registrar General's Reports go down to a later date, and from them a portion of the returns on Form B may in all probability be extracted; those returns give only monthly means, not means for individual hours, which are required for Form B, and moreover it would not be advisable for this Office to be possibly compelled to wait until the original observations had already been published by the Society.

The Committee are fully prepared to defray the expenses of furnishing MS. copies of such information as they may require. They would therefore feel much obliged if your Council would state, at their early convenience, whether or not it would suit them to enter into such an arrangement as that proposed by my letter of January 19, and accepted by the Council of the Meteorological Society (London).

Reported—That a circular had been received from Capt. Hoffmeyer stating that he intended to continue the issue of his Synoptic Charts for the remainder of the year 1874, at the same rate of subscription as before (Minutes, 1874, p. 54). Mr. Scott stated that he had already received the names of 17 subscribers.

Read—A letter from Dr. G. Neumayer announcing that he had been appointed Director of the Deutsche Seewarte at Hamburg, and that Herr von Freeden had no longer any connexion with the establishment.

Submitted—Applications for Fishery Barometers for—

Dunbeath,	Caithness,
Teelin,	co. Donegal,

which were both granted.

Submitted—An application from Mr. G. H. Aird for an allowance for the care of the anemometer lent by Mr. Crossley and erected at Seaham at the expense of the Marquis of Londonderry, which had hitherto been attended to by him free of cost to the Committee.

Resolved—That an allowance be granted to Mr. Aird of 10% per annum, being at the same rate as is allowed at Holyhead (Minutes, 1869, p. 54).

Read—A letter from Captain Toynbee, submitting excellent logs kept by—

Captain G. S. Nares, R.N., H.M.S. "Challenger" (Minutes, 1874, p. 80).

„ A. Simpson, Schooner "Traveller" (Minutes, 1874, p. 4).

„ A. Becket, Ship "City of Perth,"

and recommending Captain Becket for the "Wind and Current Charts."

Mr. Scott was instructed to present the Charts to Captain Becket, and to convey to the other gentlemen the marked thanks of the Committee.

Submitted—The following letters :—

Christiania, January 25, 1875.

THE Square 3 is an excellent publication. Happily I got it just as I wanted data for some theoretical calculations. I have now computed by Lambert's formula and converted the mean wind force, Beaufort scale, into velocity of mètres per second, from your table, the resultant direction and mean velocity for each of the 25 2° Squares for August.

What a beautiful system there comes out! More beautiful than the prevailing winds on the right-hand corner of the Chart. There is a perfectly regular curving of the wind from the Equator to 10° north, and the path of the wind is almost the same in all longitudes.

The S.E. Trade crosses the line, and is gradually, as it reaches higher northern latitudes, turned by the earth's rotation to the right. Meanwhile this is opposed by the circumstance that the radius of curvature of the wind's path is directed towards the east, because this causes a centrifugal force tending to cause the wind to deviate towards the west, that is, to the left. The barometric observations laid down in the Charts of Square 3 are scarcely accurate enough to give the distribution of pressure so exactly that one can, without any modification, use them for calculating the true gradients. The barometers read exactly to 0.01, but the gradients are so small that a much greater accuracy of the barometric heights is required.

Meanwhile I have found by means of differences between the means of the horizontal and vertical columns of the Square a formula pretty well representing the barometer incline (so to say) of the Square.

The mean gradient is only 0.13 mm. per degree of latitude (60'), the isobars are inclined 15° towards the parallel, and the pressure is lowest on the western side.

In the same manner I have calculated the distribution of the vapour tension: the lines of equal vapour tension are almost parallel with the isobars. Angle of inclination 10°, vapour tension increasing towards the north, *i.e.*, towards the doldrums. Likewise I have calculated the amount of cloud: line of inclination of lines of equal cloudiness, 7°. Cloudiness increasing towards the north. The temperature has a maximum in the northern part of the Square. The velocity of the wind is decreasing towards the north. South of 4° if the wind runs to the *left* of the direction of the gradient, northward of 4° it turns more and more to the right.

The position of the calm belt I have calculated from the data given for the Square north of Square 3. Its inclination towards the parallel is about 12°. This coincidence of the lines for several elements is very striking. Professor Guldberg and I have calculated the whole motion of the winds, and the coefficient of friction has been found three times less than on coast stations with sea winds.

Professor Guldberg and I pursue our work very diligently. I now take up two other months, I think January and May (or December) in order to try other distributions of the elements in our formulæ. We sincerely hope to find something useful, and if so your publication of Square 3 has been our best means of carrying out our ideas. I have also used the Quarterly Weather Reports for determining the resistance of friction of the earth's surface against the wind on some of your stations, and shall use them hereafter when I come back to that subject.

Your comparison between the Beaufort scale and velocity seems to hold good for Square 3, as Professor Guldberg has determined the coefficient of friction by three different methods, which give nearly the same result, and one of them includes the velocity of the wind. It is an excellent thing that the winds in Square 3 are given in *single* points. For theoretical deductions we want the wind direction to a degree or so, so that 8 or 16 points is a very rough determination.

I am, &c.
(Signed) H. MOHN.

Christiania, February 1, 1875.

SQUARE 3 occupies me still very much. It is exceedingly interesting to see how in May the calm belt or the meeting of the Trades, the maximum of vapour tension, of cloudiness and of nimbus, the minimum of wind force, &c., do not coincide with the minimum of pressure. The situation is quite like that in our European atmospheric whirls, where the warmest and wettest air, the most cloud and rain, is lying, as a rule, on the one side of the barometrical minimum. Therefore this minimum is transported, and so also is the case with the lowest pressure in May in Square 3; it is travelling northwards, towards the region of the meeting of the Trades, &c.

Your publication of Square 3 will correct many of our traditional ideas of the Equatorial calms and doldrums. I shall be most happy to take my share in this work.

I am, &c.
(Signed) H. MOHN.

Reported—That the Daily Weather Charts had been presented in exchange for observations to—

W. J. Harris, F.M.S., Worthing.

Rev. W. Percy Robinson, Warden, Trinity College, Glenalmond.

Resolved—That the sum of 1,000*l.* be transferred from the deposit account of the Committee to their current account.

Reported—That a cheque for 20*l.* for petty cash had been drawn on the 15th inst. on the signature of Admiral Richards.

SUBMITTED—The following STATEMENT respecting the RECORDS for JANUARY 1875, received from the SELF-RECORDING OBSERVATORIES, which have been examined at KEW OBSERVATORY (see Minutes, 21st December 1868).

	Aberdeen.	Armagh.	Falmouth.	Glasgow.	Kew.	Stonyhurst.	Valencia.
	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.
	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.
ANEMOGRAPH :—							
Action - - - - -	0	25 hrs.	0	0	0	0	0
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
" " other causes - - -	0	0	0	0	0	0	0
Orientation verified - - -	30th	11th	16th	3rd	—	—	12 hrs.
No. of errors discovered by subsidiaries	0	0	0	2	0	0	1
" " irregular differences	0	0	0	0	0	0	0
Result of 40 Remeasurements :—							
Greatest difference - - -	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean difference irrespective of sign - - -	0.3	0.2	0.3	0.4	0.0	0.3	0.5
Residual difference (—Kew) - - -	0.0	—0.1	0.0	—0.1	0.0	—0.1	—0.2
RAIN GAUGE :—							
Action - - - - -	Fair.	Fair.	Fair.	Fair.	Fair.	Good.	Fair.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
" " other causes - - -	0	0	0	0	0	0	0
Errors in tabulation - - -	0	0	0	6	0	0	2

The following cheques for February were drawn:—

For Office:

				£	s.	d.
R. H. Scott	-			66	13	4
J. S. Harding, jun.	-			*20	3	4
J. S. Harding, sen.	-			†7	14	0
T. D. Bell	-			†5	12	0
Salaries and wages						

For Observatories:

T. Kerr (Valencia), Salary	-	-	-	-	20	16	8
Malby and Sons, plates, &c.	-	-	-	12	0	10	
„ anemo. forms	-	-	-	6	5	0	
					18	5	10
R. H. Curtis	-				12	10	0
A. J. Rigby	-				†7	14	0
C. H. Thompson	-				†4	12	0
C. Stodart	-				†8	8	0
J. A. Curtis	-				8	6	8
Computations							

For Telegraphy:

N. J. Holmes, Scilly Co., December	-	-	3	13	6		
„ „ January	-	-	3	7	3		
					7	0	9
F. Gaster	-				*17	14	10
W. L. Dallas	-				*8	11	4
F. Brodie	-				*8	5	0
Computations							

For Ocean Meteorology:

H. Toynbee, Marine Superintendent	-	-	-	-	33	6	8
Negretti and Zambra, repairing "A" aneroids	-	-	14	5	6		
„ "M.O." instruments	-	-	83	18	9		
					98	4	3
R. Rivière, binding Charts	-	-	-	-	8	8	0
J. Warley, freight, &c.	-	-	-	-	1	2	4
R. Strachan	-				*20	0	0
C. Harding	-				†15	8	8
W. G. James	-				8	6	8
T. E. Allen	-				8	6	8
J. W. McVeagh	-				†4	12	0
Computations, &c.							

For Office Expenses:

J. S. Harding, junior, on account	-	-	-	-	110	0	0
Total	-	-	-	-	£530	3	0

* Including allowance for care of instruments.

† Including allowance for extra attendance.

‡ Four weeks to the 27th.

The Committee then adjourned.

116, *Victoria Street*, March 8, 1875.

PRESENT :

Mr. De La Rue in the Chair

Captain Evans.

Mr. Galton.

The Director was in attendance.

The Minutes of last meeting (February 22) were read and confirmed.

Mr. Scott reported that he had been requested to act on the Committee for the Loan Exhibition of Scientific Apparatus to be held at the South Kensington Museum, and had consented.—Approved.

Mr. Scott reported that he had proposed, through Professor H. J. S. Smith, F.R.S., to furnish some evidence to the Science Commission supplementary to that already given by him (Minutes 1874, p. 39), and that he had received from the Secretary to the Commission (letter 535) a notification that such evidence might be submitted in writing.

He submitted a statement which he proposed to forward, which was approved.

Read—The following letter :

M.O. 505.

SIR,

Meteorological Society, London, February 23, 1875.

IN reply to your letter of the 16th inst., I have to inform you that this Society will be happy to supply returns on forms "A" and "B" for the several stations named therein, and also that we shall be able to supply returns from Llandudno from the 1st of January of the present year.

Yours, &c.

(Signed) G. J. SYMONS,
Secretary.

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

Submitted—An application for a fishery barometer for Inverallochy, Aberdeenshire.—Granted.

Read—A letter from Captain Toynbee submitting excellent logs from—

Captain C. W. Pearson, s.s. "Strathclyde" (Minutes 1874, p. 61.)

Captain C. Meadows Dobson, s.s. "Beta."

And recommending Captain Dobson for the Wind and Current Charts.

Mr. Scott was instructed to comply with this recommendation, and to express the thanks of the Committee to Captain Pearson.

Submitted—A circular from M. Le Verrier, stating that the Paris Observatory had commenced to issue telegraphic forecasts of weather to the coast twice daily. The service had commenced on the 1st inst.

Submitted—Monthly sheets of the readings from 10 Austrian stations in accordance with form A. (Minutes 1874, p. 85). Mr. Scott was instructed to publish Returns from the British stations on a similar form, as early as possible.

Mr. Scott drew attention to the forecasts of probable weather for the neighbourhood of London which had been issued privately to the Committee since November 25th, 1873 (Minutes 1873, p. 73), and he was instructed to report to the Committee on the desirability of publishing them.

Mr. Scott drew attention to Mr. De La Rue's signalling anemometer (Minutes 1873, p. 72), and stated that he saw no present prospect of having it erected at any of the stations in connexion with the Office. He was instructed to confer with the Postmaster-General on the subject with the view of having the system tested.

Reported—That Mr. Sandiford's health had failed, and that he had had to resign his clerkship (Minutes 1874, p. 54). Mr. Scott was instructed to accept his resignation, and to hand to him the sum of 12*l.* 10*s.* 0*d.*

Reported—That Mr. H. F. Green had been appointed a temporary clerk at a salary of 12*s.* per week.—Approved.

The Committee then adjourned.

116, Victoria Street, March 22, 1875.

PRESENT :

Mr. Galton in the Chair.

Admiral Richards.

Sir C. Wheatstone.

The Director was in attendance.

The Minutes of last meeting (March 8) were read and confirmed.

Read—The following letter :

M.O. 627.

Scottish Meteorological Society, Edinburgh,

March 9, 1875.

SIR,

I HAVE submitted to the Council of the Society your letter of the 23rd February in which you convey to them the thanks of the Meteorological Committee for permission, without charge, to re-publish in their Quarterly Weather Report, observations from the Scottish Meteorological Society's Stations which had been already published ; and I am directed to say that the Council, in according this permission, which they did readily, were acting on their rule to afford all the assistance in their power to persons, both in this country and abroad, who are engaged in prosecuting Meteorological investigations.

Hitherto such assistance, when applied for, has usually been of the nature of special information tending to the elucidation of some special inquiry, and permission to use continuously the observations collected by the Society had not previously been asked, except in the case of four foreign journals, but the Council willingly assented to the proposal of the Committee, assuming that they saw advantages likely to arise from the re-publication of observations, all of which had been once, and some twice published already.

The Monthly Means from 55 of the Society's stations are published by the Registrar General for Scotland in about six weeks from the date at which the returns close, and from about 40 other stations more irregularly in the Society's journal.

Among the 55 stations first alluded to, the Meteorological Committee may probably obtain all they require, and the observations are ready for use almost as soon after the close of the quarter to which they refer as you say is deemed desirable by the Committee.

The Council cannot undertake to supply the Committee sooner, nor are they able to alter the form which the Society has adopted, and which appears to them to be well suited for international purposes.

The Council are not aware that the Report of the Permanent Committee of the Vienna Congress is published, but they are of opinion that no form of monthly *resumés* can be said to have been resolved on, as the directors of central institutes have not yet been consulted by the Permanent Committee on the subject, in accordance with the remit to them by the delegates composing the Congress.

I am, &c.

R. H. Scott, Esq., Director,
Meteorological Office.

(Signed) THOMAS STEVENSON,
Hon. Sec.

Mr. Scott was instructed to send the following reply :

SIR,

I AM instructed by the Committee to inform you that they regret that the Council of the Scottish Meteorological Society are not prepared to enter into such an arrangement for the publication by the Committee of returns from certain of the Society's stations as that proposed in my letter of January 19.

At the same time I am to remark that neither the tables published by the Registrar General for Scotland, nor those published by the Society, afford all the details which are required for the form of monthly *resumés* which has been communicated to you, and which the Committee have decided to adopt in accordance with the recommendation of the Permanent Committee of the Vienna Congress.

The Report of that Permanent Committee is in print, but has not yet been published, and I have the honour to forward to you the portion of that Report which refers to the recommendation in question which was made unanimously by that Committee.

Mr. Scott was instructed to send a copy of the correspondence with the Scottish Meteorological Society to the Board of Trade with the following letter :—

SIR,

I AM instructed by the Committee to inform you, with reference to my letter to you of January 19th, that the Scottish Meteorological Society decline to enter into any such arrangement with the Committee as that which has been concluded between the Committee and the Meteorological Society (London), and I beg to enclose, for the information of the Board of Trade, a copy of the correspondence which has passed on the subject.

Submitted—The following Memorandum on obtaining Mean Values by the Planimeter (Minutes 1874, p. 19) :

A COMPARISON of the MEANS obtained by PLANIMETER with those obtained by the Ordinary Method gives the following Differences :—

				Mean Diff.	Extreme Differences.		Range.
				Irrespective of Sign.	Plan. Mean higher than Ord. Mean.	Plan. Mean lower than Ord. Mean.	
Barometer, Jan. /74.	Valencia	-	-	·0013	+·016	—·023	·039
Do.	Armagh	-	-	·0085	+·004	—·027	·031
Do.	Glasgow	-	-	·0112	+·030	—·003	·033
Do.	Aberdeen	-	-	·0001	+·017	—·014	·031
Do.	Falmouth	-	-	·0072	+·026	—·012	·038
Thermometers, Jan. /75.	Valencia, Dry	-	-	0°·27	+0°·2	—0°·7	0°·9
Do.	„ Wet	-	-	0°·34	+1°·5	—1°·0	2°·5
Do.	Armagh, Dry	-	-	0°·27	+0°·8	—0°·1	0°·9
Do.	„ Wet	-	-	0°·04	+0°·8	—4°·0	4°·8
Do.	Glasgow, Dry	-	-	0°·11	+0°·6	—0°·2	0°·8
Do.	„ Wet	-	-	0°·03	+0°·9	—1°·6	2°·5

Time.—Inasmuch as the hourly values of the several curves are kept at the Office, the means for the Bar. and dry and wet bulbs can be obtained by the ordinary method from the tabulations in two-thirds the time required to obtain them by Planimeter from the original curves, to the same degree of accuracy, while for any single mean required at some future time for checking, &c., the saving in time by the ordinary method would be much greater.

The total number of Planimeter means used above is 156 for Bar. and 178 for Thermometer.

R. H. Scott, Esq.

J. A. CURTIS.
10/3/75.

SUBMITTED—The following STATEMENT respecting the RECORDS for February 1875, received from the SELF-RECORDING OBSERVATORIES, which have been examined at KEW OBSERVATORY (see Minutes 21st December 1868).

		Aberdeen.	Armagh.	Falmouth.	Glasgow.	Kew.	Stonyhurst.	Valencia.
		Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.
		Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.
ANEMOGRAPH :—								
Action - - -	-	0	0	0	2 hrs.	0	0	0
Records deficient, due to stoppage of clock -	-	0	0	0	0	0	0	2
" " other causes -	-	27th	—	—	—	—	—	—
Orientation verified - - -	-	0	0	1	2	0	0	2
No. of errors discovered by subsidiaries -	-	0	0	0	1	0	0	0
" " irregular differences -	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Result of 40 Remasurements :—								
Greatest difference - - -	-	0.2	0.3	0.3	0.5	0.0	0.2	0.4
Mean difference irrespective of sign -	-	0.0	0.0	+0.1	+0.2	0.0	0.0	+0.2
Residual difference (— Kew) - - -	-							
RAIN GAUGE :—								
Action - - -	-	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.
Records deficient, due to stoppage of clock -	-	0	0	0	0	0	0	0
" " other causes -	-	0	0	0	0	0	0	0
Errors in tabulation - - -	-	0	0	0	0	0	0	0

Submitted—The following Return of the comparison between the Warnings issued and the Weather experienced in 1874 (Minutes, 1874, p. 49) :

Coasts.	Total No. of Orders to hoist and repetitions.	Warnings justified by subsequent Gales, Force 8 and upwards.	Warnings justified by subsequent strong Winds, Forces 6 and 7.	Warnings not justified by subsequent Weather.	Warnings late, Force 9, reached at Two Stations before issue.	Warnings partially late, Force 9, reached at One Station before issue.	Warnings late, owing to Sundays or Telegraphic Errors.	Storms for which no Warning was issued.
Ireland, south -	37	17	6	6	4	4	—	April 13th., Sept. 22nd, Oct. 21st.
„ east -	43	19	15	8	—	1	—	Jan. 18th., Sept. 22nd, Oct. 21st.
Scotland, east -	35	15	9	10	—	1	—	Jan. 11th., Jan. 18th., Jan. 26th., April 16th, Aug. 6th, Oct. 21st, Dec. 8th, Dec. 11th.
„ west (Clyde)	42	15	21	5	—	1	—	Jan. 18th., Mar. 27th, Oct. 21st.
England, north-west -	41	25	7	6	1	1	1	Oct. 21st.
„ west -	37	19	12	5	—	—	1	Oct. 21st.
„ south -	36	17	14	4	—	1	—	Oct. 21st, Nov. 29th. Sept. 21st., at entrance of channel.
„ south-east -	19	5	11	3	—	—	—	Dec. 11th., in eastern portion of channel.
„ east -	27	12	9	5	—	1	—	Oct. 21st, Nov. 29th. Jan. 18th., Oct. 21st, Nov. 29th.
Totals -	317	144	104	52	5	10	2	
Pe-centages -	—	45.4	32.8	16.4	1.6	3.1	—	

“p” in the last column indicates that the storm was only *partially* felt.

“s” “ ” “ ” “ ” the warning was not issued owing to Sundays or telegraphic errors.

If these figures be compared with those for the previous years in which the system has been checked we arrive at the following result in percentages :—

—	Warnings justified by subsequent Gales.	Warnings justified by subsequent Strong Winds.	Total Warnings justified.	Warnings not justified by subsequent Weather.
1870	46.7	21.7	68.4	22.4
1871	46	17.7	63.7	22.0
1872	61	19.5	80.5	11.9
1873	45.2	34.0	79.2	16.8
1874	45.4	32.8	78.2	16.4

Mr. Scott was instructed to forward the above Return to the Board of Trade for presentation to Parliament.

Read—A letter from Captain Toinbee submitting excellent logs by—

Capt. E. J. Blake, ship “Sydney Dacres,” (Minutes 1873, p. 61.)

„ T. M. Jones, R.N., H.M.S. “Glasgow.” Log kept by Nav. Lieut. R. Jackson, (Minutes 1874, p. 96.)

Mr. Scott was instructed to convey the thanks of the Committee to both gentlemen.

Submitted—Applications for Fishery Barometers for

Stonehaven, Aberdeenshire

Tribane, Co. Donegal.

—Granted.

Submitted—An application from Mr. Jeffery for an extra allowance of 6*l.* 15*s.* for time expended by Kew in retabulation of Thermograms, a step which had been rendered necessary during the period of change in the method of tabulating the Thermograms—Sanctioned.

Reported—That the following establishments have been added to the list for free distribution of hourly observations. (Minutes 1874, p. 89.)

University Library, Cambridge,
(in lieu of Fitzwilliam Library.)
Radcliffe Observatory, Oxford.

Observatory, Cambridge.

—Approved.

Resolved—That the sum of 1,500*l.* be transferred from the deposit account of the Committee to their current account.

The following cheques for March were drawn :—

For Office :

Office :					£	s.	d.	
R. H. Scott	} Salaries and wages	-	-	-	66	13	4	
J. S. Harding, jun.		-	-	-	*20	3	4	
J. S. Harding, sen.		-	-	-	+7	14	0	
T. D. Bell		-	-	-	+5	12	0	
Cole and Leigh, coals	-	-	-	-	7	5	0	
G. S. Freeman, fire insurance policy	124,817	-	1	6	0			
" "	133,438	-	1	2	0			
						2	8	0
C. W. Jacques, rent	-	-	-	-	133	13	0	

For Observatories, Quarterly Allowances, &c. :

D. Thomson, Aberdeen	-	-	-	†62	3	9
T. R. Robinson, Armagh	-	-	40	14	0	
"	expenses for quarter	-	8	15	0	
				49	9	0
W. P. Dymond, Falmouth	-	-	†65	12	6	
"	postage	-	1	6	7	
				66	19	1
R. Grant, Glasgow	-	-	-	*61	17	6
H. Williams, Holyhead	-	-	-	2	19	9
S. Jeffrey, Kew	-	-	62	10	0	
"	examination of records	-	100	0	0	
				162	10	0
C. Clouston, Orkney	-	-	-	2	17	2
G. H. Aird, Seaham	-	-	-	2	13	9
E. J. Purbrick, Stonyhurst	-	-	*49	7	6	
"	postage	-	1	0	3	
				50	7	9
T. Kerr, Valencia	-	-	49	15	1	
"	salary	-	20	16	8	
				70	11	9
G. T. Watson, Yarmouth	-	-	-	3	19	6
P. Adie, tabulating scales	-	-	3	10	6	
"	"	&c.	0	9	6	
				4	0	0
Hopkin and Williams, chemicals	-	-	-	1	5	8
R. and J. Beck, anemometer (Toronto)	-	-	-	69	10	6
R. W. Munro, instruments for Toronto	-	-	-	16	14	9
R. H. Curtis	Computations, &c.	-	-	12	10	0
A. J. Rigby		-	-	†7	14	0
C. H. Thompson		-	-	†4	12	0
C. Stodart		-	-	†8	8	0
J. A. Curtis		-	-	8	6	8
Carried forward	-	-	-	912	19	3

* Allowance for extra attendance.

† Four weeks to the 25th March.

‡ Deduction made for forms supplied.

				£	s.	d.
Brought forward				912	19	3
For Telegraphy, Quarterly Allowances, &c. :						
Postmaster-General, private wire	-	-	22	0	0	
„ telegrams, &c. December quarter	424	8	2			
				446	8	2
H. Todd, Cambridge	-	-	-	3	19	0
J. Costello, Dover	-	-	-	3	5	10
J. Tilston, Holyhead	-	-	-	3	6	6
G. Mitchell, Kingstown	-	-	-	3	6	5
F. Gaster, London	-	-	-	3	5	0
W. D. Penny, Nairn	-	-	-	4	4	6
E. J. Lowe, Notts	-	-	-	3	18	0
J. Lucas, Oxford	-	-	-	3	6	0
J. Merrifield, Plymouth	-	-	-	3	5	0
W. Sandford, Portishead	-	-	-	3	19	6
W. Thomas, Scilly	-	-	-	4	6	4
W. Lawrence, Shetland	-	-	-	3	5	0
J. Smith, Stornoway	-	-	-	3	6	0
J. Trotter, Thurso	-	-	-	3	6	0
J. Sinclair, Wick	-	-	-	3	5	0
G. T. Watson, Yarmouth	-	-	-	3	6	6
C. Wakefield, York	-	-	-	3	5	0
Wightman & Co., B.P. wrappers	-	-	-	7	0	0
F. Gaster	-	Computations, &c.	-	†17	16	8
W. L. Dallas	-		-	†8	15	4
F. Brodie	-		-	†8	5	10
For Ocean Meteorology :—						
H. Toynbee, Marine Superintendent	-	-	-	33	6	8
Cashiers, Bank of England, Bermuda	-	-	1	12	6	
„ „ ladders for anemometer			0	11	3	
				2	3	9
Negretti and Zambra, repairing instruments	-	-	-	3	2	0
J. H. Woodstock, packing cases	-	-	-	3	4	0
P. Adie, repairing “A” barometers	-	-	5	14	6	
„ „ “M.O.” „	-	-	6	15	0	
				12	9	6
L. P. Casella, “A” thermometers	-	-	6	18	0	
„ „ “M.O.” „	-	-	14	17	0	
				21	15	0
J. J. Hicks, instruments	-	-	-	8	14	6
F. Pastorelli, thermometers	-	-	-	11	8	0
Pewtress & Co., circulars to captains	-	-	-	9	15	0
Street Brothers, „	-	-	-	1	2	6
J. R. Jones, Aberdeen agent	-	-	-	5	18	4
D. McGregor & Co., Glasgow agents	-	-	-	2	5	2
J. Gill, Liverpool agent	-	-	-	7	4	8
R. Strachan	-	Computations, &c.	-	\$20	0	0
C. Harding	-		-	*15	8	8
W. G. James	-		-	8	6	8
T. E. Allen	-		-	8	6	8
J. W. McVeagh	-		-	†4	12	0
For Office Expenses :						
J. S. Harding, jun., on account	-	-	-	100	0	0
Total	-	-	-	£1,740	3	11

* Allowance for extra attendance.

† Four weeks to 27th March.

‡ Allowance for extra attendance.

§ Allowance for care of instruments.

The Committee then adjourned.

116, Victoria Street, April 5, 1875.

PRESENT :

General Strachey in the Chair.

Mr. Galton.

The Director was in attendance.

The Minutes of last meeting (March 22) were read and confirmed.

Reported—That the correspondence with the Scottish Meteorological Society had been sent to the Board of Trade as directed.

Mr. Scott was instructed to apply to the Treasury for an imprest of 2,000*l.* to meet the current expenses of the Office.

Submitted—The following letter :—

DEAR SIR,

Meteorological Office, 116, Victoria Street,
March 24, 1875.

It will soon be requisite to decide on what our next marine work shall be, and I shall be glad to have the Committee's decision on the subject.

After careful consideration I would suggest that we deal with the six 10° squares off the Cape of Good Hope, using the method adopted for the nine 10° squares now in hand.

We have a large number of observations for these squares, and they are of very great importance to the navigator. I have considered what the Dutch have already done in that part of the sea, and think that quotations from their work may render ours more complete, but in no way does it carry out the object we have in view.

R. H. Scott, Esq., F.R.S.,
Director, Meteorological Office.

I remain, &c.
(Signed) HENRY TOYNBEE.

Mr. Scott was instructed to request Capt. Toynbee to explain to the Committee in more detail the advantages which he expected to derive from the investigation proposed by him.

Reported—That the Daily Weather Charts (Minutes, 1872, pp. 21 and 37) had appeared in *The Times* since the 1st instant.

Mr. Scott reported that having been requested to act on the Arctic Committee of the Royal Society, he had been entrusted with the preparation of the Instructions for Meteorological Observations during the expedition, and he had drawn up such instructions and forwarded them to the Royal Society, having previously submitted them to Admiral Richards.

Reported—That the Meteorological Office of the Dominion of Canada had been put on the free list for the hourly values.

Reported—That the following names had been struck off the list for the free supply of the Daily Weather Charts :—

R. H. Barnes, Esq.
The Imperial Beacon.
G. J. Jones, Esq., Lymington.
Rev. F. Malleson, Broughton-in-Furness.
E. E. Morris, Esq., Middle Class School, Bedford.
The Mechanics' Magazine.
The Press Association.

The Committee then adjourned.

116, Victoria Street, April 19, 1875.

PRESENT:

Major-General Smythe in the Chair.

Mr. Galton.

Sir C. Wheatstone.

The Director was in attendance.

The Minutes of last meeting, April 5, were read and confirmed.

Submitted—The following letters:—

DEAR SIR,

April 7, 1875.

WITH reference to my letter of March 24th asking for the Committee's instructions as to the next maritime work to be taken up by this Office, I beg to hand you a letter from Professor Buys Ballot, to whom I wrote on the subject. Besides the great advantage of knowing the monthly changes in direction and force of wind and current for small spaces, in a part of the sea where those changes are very sudden, the proposed work would most probably show whether there is not a fine-weather route to the westward, during the southern winter, in higher latitudes than those now frequented by homeward-bound ships. All who have experienced a series of westerly gales on the edge of the Aguthas Bank would appreciate such a discovery.

I am, &c.

R. H. Scott, Esq., F.R.S.,
Director, Meteorological Office.

(Signed) HENRY TOYNBEE.

Utrecht, April 5, 1875.

No doubt it will be of great interest if you give your results of the observations in the squares indicated; they may be combined with our results as far as we have them. Everyone can easily compare our results with yours and combine them with their due weights, because we have given them for each single degree square. They have only to multiply the mean by the number of the observations and to add the products to your sums for the same degrees.

It would perhaps be better that both these inquiries should be given separately. Where they give the same result there would be great probability of correctness, otherwise a more thorough scrutiny is wanted, which would not be apparent if the results were combined, the differences then being effaced.

Resolved—That Capt. Toynbee's suggested investigation of the district embracing the Cape of Good Hope be approved.

Submitted—The following letter:—

The Imperial Academy of Science, Vienna,

January 30, 1875.

IN consideration of the general interest excited by the question respecting the decrease of the amount of water in springs and rivers which has already been raised in many quarters, and of the importance of the phenomena connected with this decrease to the social conditions of civilized nations, and with regard to the unusual height which the flood level has attained in recent times in consequence of such phenomena, and, lastly, with regard to the high scientific importance of this question, the Section for Mathematics and Natural Science of the Imperial Academy has received with great pleasure an invitation to undertake a more minute investigation of this subject so intimately related to social economy.

One of our most distinguished hydraulic engineers, M. G. Wex, K.K. Ministerial-rath, and Chief Director of the great works for the Improvement of the Danube at Vienna, which were begun in 1869 and are now nearly completed, has presented to the Academy the accompanying work, "On the Decrease of Water in Springs, Streams, and Rivers, in connection with the simultaneous Rise of the Flood Level in Cultivated Countries," with the request that the conclusions drawn by him from the facts therein stated should be thoroughly investigated by a committee of experts.

The Academy has readily complied with this request, and the committee appointed for the above purpose has, with the assistance of M. Wex, subjected the facts in question to a thorough discussion, and has communicated the results to the Academy in the accompanying Report.

The Section has declared that it fully concurs in the conclusions drawn from the data submitted to the Committee, and has also approved the proposals made by the Committee.

The Imperial Academy has therefore the honour to request the Meteorological Office to turn its attention to this subject, and to contribute, in so far as may at present be possible, towards the discovery of a remedy for, or at least towards a more minute investigation of the means of, in some measure, checking calamities so serious in their consequences to future generations as are set forth in the accompanying papers as arising from the continual decrease of water in springs, streams, and rivers.

The Academy has the honour to request the Meteorological Office to procure for it any observations of the water level in flowing streams during a series of years, if such are already in existence, and in the case of no such observations being taken at present to institute them should circumstances admit.

It is desirable that these measures should be taken on a uniform plan, for which the Tables and Diagrams contained in the accompanying work may serve as a basis.

The Academy will not fail, when it has sufficient material at its disposal, to invite to a consultation those institutions which may interest themselves in the matter, in order to determine in what way the facts may best be utilized.

(Signed) C. FREIHERR V. ROKITANSKY, President.
A. RITTER V. SCHRÖTTER, General Secretary.

To the Meteorological Office.

Mr. Scott was instructed to ascertain whether or not such records of the level of rivers exist in this country, and also to apply to the India Office for similar information (as had been suggested to him by General Strachey).

Read—A letter from Captain Toynbee, submitting an excellent log by Capt. J. A. Martyn, R.M.S. "Cuba" (Minutes 1874, p. 80).

Mr. Scott was directed to convey the marked thanks of the Committee to Capt. Martyn.

Mr. Scott reported that he had procured through the Stationery Office one of Zuccato's patent papyrographs for the use of the Office.

Reported—That the Daily Weather Charts had been supplied free of charge to—
The Capt.-Superintendent, Pembroke Dockyard.
The Capt. H.M.S. "Nankin," Milford Haven.

And that the following names had been taken off the free list:—

W. J. Harris, Esq., Worthing.
C. L. Prince, Esq., Tunbridge Wells.
W. O. Whitehouse, Esq., Hampstead.

Submitted—The following publications:—

Report of Proceedings of the Conference on Maritime Meteorology. O. No. 23.
Report of the Permanent Committee of the Vienna Congress for 1874. N.O. No. 9.

Submitted—The following Abstract of Accounts from 1st April 1874 to 31st March 1875:—

Receipts.			Payments.		
—	Received.	Due.	—	Paid.	Estimated Liabilities.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Balance from 1873-4 -	2,290 12 2	—	OFFICE:		
Vote for 1874-5 -	10,000 0 0	—	Salaries -	1,314 19 0	—
Commissions for instruments, &c.	725 1 7	226 5 0	Rent, fuel, &c. -	603 2 8	16 0 0
Subscriptions for D.W. Charts	297 2 11	7 0 0	Contingencies -	195 17 0	9 0 0
Interest on deposit account -	129 10 10	—	LAND METEOROLOGY:		
Sundries -	69 18 5	8 11 0	Expenses at observatories -	2,644 3 11	54 0 0
			New instruments for ditto -	391 12 9	—
			Computations -	763 11 2	—
			Telegraphy -	2,139 8 9	403 0 0
			Inspections, D.W. Charts, &c.	583 2 3	114 0 0
			Computations -	665 6 8	3 10 0
			OCEAN METEOROLOGY:—		
			Marine Superintendent -	450 0 0	—
			Instruments, Admiralty -	265 15 0	140 0 0
			Ditto, Mercantile Marine, Agencies, &c.	575 4 11	276 0 0
			Computations and care of Instruments.	1,093 6 5	—
Totals -	£13,512 5 11	£241 16 0	Totals -	£11,685 10 6	£1,015 10 0

Probable net amount available on 1st April 1875 - - - £1,053 1 5

Reported—That an imprest for 2,000*l.* had been received from the Treasury and lodged to the credit of the Committee at the Bank of England.

A provisional scheme for re-appointment of the staff was adopted, subject to the approval of other members of the Committee.

Submitted—The following STATEMENT respecting the RECORDS for March 1875, received from the SELF-RECORDING OBSERVATORIES, which have been examined at KEW OBSERVATORY (see Minutes 21st December 1868).

	Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.	Good.
ANEMOGRAPH:—														
Action - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " other causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orientation verified - - -	27th	-	30th	-	15th	-	1st	-	25th	-	-	-	31st	-
No. of errors discovered by subsidiaries	0	0	0	0	0	0	1	0	0	0	0	0	0	0
" " irregular differences	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Result of 40 Remeasurements:—														
Greatest difference - - -	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0	2.0
Mean difference irrespective of sign - - -	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.0	0.1	0.2	0.4	0.3	0.6
Residual difference (-Kew) - - -	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1
RAIN GAUGE.														
Action - - -	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Good.	Good.	Fair.	Fair.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " other causes - - -	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Errors in tabulation - - -	0	0	0	0	0	0	2	0	0	0	0	0	0	0

BAROGRAPH:—

Action	-	-	-	-	-	-	Good. Do.	Good. Do.	Good. Do.	Good. Do.
Photography	-	-	-	-	-	-	0	0	0	0
Records deficient, due to stoppage of clock	-	-	-	-	-	-	0	0	0	0
" " failure of light	-	-	-	-	-	-	0	0	0	0
" " other causes	-	-	-	-	-	-	0	0	0	0
No. of errors discovered—	-	-	-	-	-	-	1	0	0	4
In entry of standard	-	-	-	-	-	-	0	0	0	3
" calculating residual correction	-	-	-	-	-	-	0	0	0	5
" applying residual correction	-	-	-	-	-	-	0	0	0	0
" subtraction in subsidiary tables	-	-	-	-	-	-	0	0	0	0
" tabulation by subsidiaries	-	-	-	-	-	-	0	0	0	0
" " irregular differences	-	-	-	-	-	-	0	0	0	2
<i>Result of 40 Remeasurements:—</i>	-	-	-	-	-	-				
Greatest difference	-	-	-	-	-	-	·0050	·0020	·0040	·0050
Mean difference irrespective of sign	-	-	-	-	-	-	·0017	·0009	·0016	·0025
Residual difference (— Kew)	-	-	-	-	-	-	— ·0010	— ·0003	— ·0005	+ ·0006
Mean monthly difference between simultaneous barograph and barometer readings	-	-	-	-	-	-	·0014	·0017	·0011	·0028

THERMOGRAPH:—

Action	Good.		Good.		Good.		Good.		Good.		Good.*		Good.†	
	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Photography	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Records deficient, due to stoppage of clock	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" failure of light	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" imperfectly moistened bulbs	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" partially frozen	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" other causes	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. of errors discovered in entry of standard	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" by subsidiary measurements	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" of subtraction in do. tables	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" detected under glass scale	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Result of 40 Remeasurements:—														
Greatest difference	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean difference irrespective of sign	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Residual difference (— Kew)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean monthly difference between simultaneous thermograph and thermometer readings	-	-	-	-	-	-	-	-	-	-	-	-	-	-
No. of errors in maxima and minima	-	-	-	-	-	-	-	-	-	-	-	-	-	-
" in entry of tabulated readings into tabulation sheets	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* 6½ days both dry and wet have been re-tabulated at Kew.

† 8 days wet bulb have been re-tabulated at Kew.

‡ Through testing scale.

The Committee then adjourned.

116, Victoria Street, April 26, 1875.

PRESENT :

Mr. De La Rue in the Chair.

Mr. Galton.

Major-General Smythe.

The Director was in attendance.

The Minutes of last meeting (April 19) were read and confirmed.

Submitted—Minutes from the Board of Trade (M, 5173, and M, 6201, 1875), relating respectively to a memorial from the Scottish Meteorological Society, for a subsidy, and to the motions of Mr. Malcolm to reduce the vote to the Office by 500*l.*, and of Mr. M'Lagan to reduce it by 1,000*l.*

It was resolved to reply,—In reference to the proposed reduction of the Annual Grant, the Committee, after the experience of eight years, with the most rigid management of their finances, can see no means of reducing the annual expenditure, without materially impairing the efficiency of the Office.

Mr. Scott was instructed to forward the above resolution to the Board of Trade.

Reported—That the Meteorological Society had appointed a Committee to confer with Mr. Scott as to obtaining records of the level of rivers, &c.

The officers and clerks were re-appointed for the ensuing financial year at the following salaries (see Minutes, 1874, pp. 36–38) :—

						£	s.	d.
R. H. Scott, Director	-	-	-	-	-	800	0	0
Capt. H. Toynbee, Marine Superintendent	-	-	-	-	-	400	0	0
J. S. Harding, jun., Chief Clerk	-	-	-	-	-	*240	0	0
R. Strachan, 1st Senior	-	-	-	-	-	*200	0	0
(with 50 <i>l.</i> additional for instruments).								
F. Gaster, 2nd Senior Clerk	-	-	-	-	-	*180	0	0
C. Harding, 3rd	-	-	-	-	-	*170	0	0
R. H. Curtis, 4th	-	-	-	-	-	*160	0	0
J. A. Curtis, 1st Junior Clerk	-	-	-	-	-	*110	0	0
T. E. Allen, 2nd	-	-	-	-	-	*110	0	0
Increase.								
W. L. Dallas, 3rd	-	-	-	8	0	0	100	0
F. Brodie, 4th	-	-	-	8	0	0	86	0
G. G. Francis, 5th	-	-	-	7	4	0	80	0
T. D. Bell, 6th	-	-	-	7	4	0	80	0

The following scale of weekly salaries was approved :—

J. S. Harding, sen., Office Keeper	-	-	-	-	1	18	6
J. W. McVeagh, Temporary Clerk	-	-	0	3	0	1	6
A. J. Rigby,	-	-	-	-	1	18	6
A Vacancy	-	-	-	-	1	15	0
C. H. Thompson,	-	-	0	3	0	1	6
H. N. Copley,	-	-	0	3	0	1	3
R. Sargeant,	-	-	0	3	0	1	3
H. Chivers,	-	-	0	2	0	0	14
H. J. Green,	-	-	-	-	0	12	0
C. Stodart, Engraver	-	-	-	-	2	2	0

The Rev. Thos. Kerr was re-appointed Director of Valencia Observatory at a salary of 250*l.* per annum.

Resolved—That the question of the maximum salaries of clerks which was deferred last year (see Minutes, 1874, p. 38) should be definitely settled as follows (see Minutes, 1867, p. 16) :—

* Increase of 10*l.* since last year.

Old Staff:

	£	s.	d.
Chief Clerk - - - - -	250	0	0
1st Senior Clerk (with 50% additional for instruments)	200	0	0
2nd " - - - - -	190	0	0
3rd " - - - - -	180	0	0
4th " - - - - -	170	0	0

Junior Staff:

1st and 2nd Junior Clerks - - - - -	140	0	0
3rd and 4th " - - - - -	130	0	0
5th and 6th " - - - - -	120	0	0

Temporary Clerks:

Maximum salary to remain as already fixed (see Minutes, 1873, p. 24), viz.—	100	0	0
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It was resolved that Mr. R. H. Curtis be promoted to the rank of a senior clerk, and Messrs. Francis and Bell to the Junior Staff; and further, that any future additions to the *Annual List* be made only in case of vacancies arising.

Read—A letter from Captain Toynbee, submitting an excellent Log by Captain T. L. Wadham, ship "The Murray" (Minutes 1874, p. 43).

Mr. Scott was instructed to convey to Captain Wadham the marked thanks of the Committee.

Reported—That Mr. W. G. James had resigned his clerkship.

Mr. De La Rue and Major-General Smythe were requested to act as auditors of the accounts.

The following cheques for April were drawn:—

For Office:

	£	s.	d.
R. H. Scott - - - - -	66	13	4
J. S. Harding, jun. - - - - -	20	0	0
T. D. Bell - - - - -	6	13	4
J. S. Harding, sen. - - - - -	*7	14	0
E. Higgs, Repairs in Office - - - - -	12	13	6
Williams and Norgate, Books - - - - -	7	2	8

For Observatories:

Thos. Kerr, Valencia, Salary - - - - -	20	16	8
F. Dangerfield, Printing - - - - -	2	10	0
Maltby and Sons, " - - - - -	4	2	0
R. H. Curtis - - - - -	13	6	8
A. J. Rigby - - - - -	*7	14	0
C. H. Thompson - - - - -	*5	4	0
C. Stodart - - - - -	*8	8	0
J. A. Curtis - - - - -	9	3	4

For Telegraphy:

N. J. Holmes, Scilly telegrams, February—March - - - - -	5	18	9
J. Bennett, Covering for signals - - - - -	3	10	0
F. Dangerfield, Delivery of D. W. Charts - - - - -	12	3	7
F. Gaster - - - - -	†18	15	2
W. L. Dallas - - - - -	†9	19	8
F. Brodie - - - - -	†9	5	6

For Ocean Meteorology:

H. Toynbee, Marine Superintendent - - - - -	33	6	8
Elliott Bros., repairing "A" aneroids - - - - -	4	0	0
R. Strachan, "A" aneroids - - - - -	33	18	0

Carried forward - - - - - 322 18 10

* Four weeks to the 24th.

† Including allowance for extra attendance.

	£	s.	d.
Brought forward - - -	322	18	10
V. Brooks, Day and Son, Printing - - -	8	8	0
Steel and Jones, "Shipping Gazette" - - -	3	5	5
R. Strachan - - -	20	16	8
C. Harding - - -	16	10	7
W. G. James - - -	9	3	4
T. E. Allen - - -	9	3	4
J. W. McVeagh - - -	5	4	0
Computations and care of instruments			
For Office Expenses:			
J. S. Harding, jun., on account - - -	109	7	5
Total - - -	£504	17	7

* Four weeks to the 24th.

† Including allowance for extra attendance.

‡ Including allowance for care of instruments.

The Committee then adjourned.

116, Victoria Street, May 3, 1875.

PRESENT:

Mr. Gassiot in the Chair.

Mr. De La Rue | Lord Rosse.
Major-General Smythe.

The Director was in attendance.

The Minutes of last meeting (April 26) were read and confirmed.

A draft reply to the Board of Trade, prepared at last meeting, having been modified into the form in which it is now printed on those Minutes was adopted.

Reported—That information had been received through Mr. Sclater, F.R.S., of the Local Government Board (Letter 1040), that the Registrar-General did not at present require information from the Office for his tables (Minutes, 1874, p. 85.)

Submitted—A critique on the Quarterly Weather Report, which had been supplied to Mr. De La Rue by Mr. Lockyer.

Mr. Scott submitted a counter-statement: the Committee decided not to enter into a paper controversy, but Mr. Scott was directed to thank Mr. Lockyer for his courtesy in sending the intended critique before publication. Mr. Scott to be at liberty, if he think fit to do so, to send Mr. Lockyer his counter-statement, on the understanding it is not to be published.

Mr. Scott was instructed to have the critique and his statement printed on the Minutes in parallel columns.

Submitted—A letter from Mr. Kerr (Letter 1074), applying for two months' leave, and asking that a substitute should be sent to take his place.

Mr. Scott was instructed to see if any arrangement could possibly be made.

Read—A letter from Captain Toynbee, submitting "excellent logs" from—

Captain T. M. Almond, ship "Decapolis" (Minutes, 1873, p. 28).

„ J. M'Donald Gray, barque "Speranza" (Minutes, 1874, p. 61).

„ W. H. Smith, R.N.R., s.s. "Scandinavian" (Minutes, 1874, p. 8).

Reported—That Mr. H. Harries had been appointed a temporary clerk at the salary of 17. 15s. 0d. a week in the room of Mr. James.

The Committee then adjourned.

116, Victoria Street, May 17, 1875.

PRESENT :

The Earl of Rosse in the Chair.

Major-General Smythe.

Sir C. Wheatstone.

The Director was in attendance.

The Minutes of last meeting (May 3) were read and confirmed.

Reported—That a copy of the Minute relating to the vote for the Office, as finally adopted, had been forwarded to the Board of Trade on the 4th inst., as directed at last meeting.

Submitted—Certain correspondence (Letters 1137, 1147, and 1154) respecting the proposed Exhibition in connexion with Fisheries at Paris in July, and requesting that the Office would co-operate therewith by exhibiting a set of instruments, &c.

Mr. Scott was instructed to make further inquiry on the subject, and report to the Committee.

Mr. Scott stated that he had had some communications with Mr. H. M. Jenkins, F.G.S., Secretary of the Royal Agricultural Society, with reference to the possibility of obtaining statistics on the growth of crops and on the progress of the harvest, &c. for occasional embodiment in the Daily Weather Reports, and he was instructed to write to the Society in question on the subject.

Mr. Scott stated that he had learnt that the Post Office might probably be disposed to extend telegraphic communication in Ireland so as to allow of the establishment of a reporting station at Mullaghmore in the county Sligo, (Minutes 1873, p. 54,) if applied to by a Government office. He was instructed to request the Board of Trade to back the application of the Committee for this extension of the telegraphic system.

The draft reply to the critique mentioned at last meeting was submitted. Mr. Scott was instructed to insert it on the Minutes as follows:—

REPLY.

1. The table referred to (p. 39, Report 1868) gives the *mean* results of certain comparisons to hundredths of a degree, the actual measurements to which the table refers were only to tenths. It will be seen from sections 20 and 21 of the thermograph regulations, (p. 66 of same report), that the degree of absolute accuracy there aimed at was *half a degree*.

It is doubted by those who have more experience in dealing with our thermograms, whether they *can* be tabulated to a tenth of a degree, considering the frequent want of definition in the photographic impression, and the uncertainty in the time scale when there is unsteadiness of temperature, causing vertical oscillations in the curve.

It seems fair to assume that about two-tenths of a degree is a fair limit of accuracy for the tabulations at present.

2. With reference to the improvements introduced into the methods of measurement and reproduction of the curves, it should be stated that after several years' experience of the thermograms, whereby a far more

THE METEOROLOGICAL OFFICE.*

1. The self-recording instruments which have been in operation at the seven observatories of the Meteorological Office since January 1869, may be regarded as the best and most complete anywhere existing for recording continuously the atmospheric pressure, temperature, humidity, and rainfall, and the velocity and direction of the wind. To ensure correctness in the work done, and accurate tabulation of the results, minute regulations with respect to the officials at the outlying observatories, the assistant at the Central Observatory, and the director of the Central Observatory, were laid down in the Report for 1868, p. 62. Thus, as regards the thermograph, 37 regulations were laid down, one of the most important of these being the 25th, by which it was provided that 40 remeasurements from each month's curves were to be made at Kew, the central observatory; and a table is given (page 39) of the results of measurements which were specially designed for the detection of *small errors*, from which it appears that refinements as delicate as the one-hundredth of a degree of temperature were taken cognisance of.

2. Tracings of the curves, and five-day and monthly results of the tabulations, though not the tabulations themselves, have been published, beginning with 1st January 1869; and since then many and great im-

* "Quarterly Weather Reports of the Meteorological Office." Published by the authority of the Meteorological Committee, January 1869 to September 1873. "Hourly Readings from the self-recording Instruments at the seven Observatories in connection with the Meteorological Office, January to September 1874."

extensive range of readings was obtained than existed for the preliminary determinations of the scales at Kew, it has been found that in several instances the scales originally furnished were not sufficiently exact, and new ones were engraved and supplied.

Moreover, it was found, in the process of producing the plates for the Quarterly Weather Report, that the mode of tabulation by means of standard readings originally devised at Kew, was defective, as giving no possibility of testing the degree of distortion of the base-line (termed technically "bagging"). Accordingly the instruments have been altered, fiducial lines are now traced photographically, and the tabulations effected from these lines. By this arrangement a far higher degree of accuracy has been rendered possible in the tabulation and reproduction of the curves than was attainable during the first four years of the issue of the Quarterly Weather Report.

The actual tabulating scales, newly supplied, have been engraved in the office, greater accuracy being secured in this way than by employing an optician.

It is perfectly true that the observations of "clouds" and "weather" at the observatories would be a valuable addition to the work done, but these observations have not as yet been specially taken up by the Committee as not admitting of automatic registration. The pecuniary allowance to each observatory is not sufficient to ensure such assistance as would permit of many eye observations. The photographic manipulation and the tabulations at the observatories take up a very large proportion of the daily working time of a skilled assistant.

It may be remarked that there are other *desiderata* of even higher importance than those mentioned, especially the determination of the direction of the different strata of wind, which are known by balloon experience to differ greatly, also the determination of the vertical movements of the air, either in ascent or descent.

4 and 5. The reviewer assumes "that the curves are correctly traced from the photographs." The degree of correctness claimed for the present copper-plate impressions is half a degree for the thermometer. In the first volume executed by lithography this accuracy was not attained, owing partly to the inexperience of the serious influence of "bagging," which was discovered by the great difficulty found in making the early curves to coincide with the tabulations, and partly that the curves were drawn "on the stone" by the ordinary pantagraph, which is far less accurate than the exceedingly delicate instrument, "Wagner's pantagraph," since used for tracing the curves on to the copper plates.

The table selected for examination is the very first that was ever prepared. It is stated that there are 12 errors in it.

Of these 12 errors cited by the reviewer, three are due to the incorrectness of the lithographic plate, viz., the maximum and minimum at Armagh, and the maximum at Glasgow, all of which correspond with the values given by the tabulation of the original photographic curves (except Glasgow maximum, which is 0.1 wrong, being 50.2 by tabulation, 50.1 as printed, and 50.9 as given by the lithographic curve).

It may here be stated that all the reviewer's measurements have been checked and found to agree with those made in the office to the extent of ± 0.2 .

The other nine errors, although great, have arisen

improvements have been made in representing the curves on the plates, all in the direction of greater clearness and precision, for which the committee deserve our best thanks. Among the many valuable results of these curves we may point to the high temperature at Glasgow on the 21st April 1873, in connexion with the remarkable changes in the direction and force of the wind which occurred at the time; to the heavy rain at Valencia on the 2nd July 1873, in connexion with the changes of wind, temperature, and pressure; and to the minute oscillations of pressure at almost all the observatories on the 3rd and 4th July 1873, in connexion with the changeable weather at the time. In these connexions the absence of any observations of clouds is, however, a serious defect.

3. One of the principal objects for which the seven observatories were established was to furnish the data of observations for the determination of the meteorological "constants" for pressure, temperature, rainfall, &c., for different parts of the British isles. This being now the seventh year in which this expensive system of observation is going forward, it may be well to inquire how far the information, as published by the Meteorological Office, meets the requirements of the problems to be solved.

4. Assuming that the curves are correctly traced from the photographs, we may inquire whether the figures tabulated from these, under the regulations referred to above, be satisfactorily accurate. No hourly values having been printed before January, 1874, the question can only be answered by an examination of the printed monthly maxima and minima, with the days and hours of their occurrence, as compared with the curves. The following table, giving the extreme readings of the thermometer for each of the observatories for January 1869, is here reprinted verbatim from the Quarterly Weather Report, p. 34:—

	Maximum.	Day and Hour.	Minimum.	Day and Hour.
Valencia	53°·7	4th, 4 A.M.	37°·0	22nd, 3 A.M.
Armagh	53°·1	16th, 2 P.M.	31°·9	26th, 2 A.M.
Glasgow	50°·1	5th, 10 A.M.	29°·5	26th, 7 A.M.
Aberdeen	48°·8	31st, 6 P.M.	30°·6	26th, 8 A.M.
Falmouth	54°·0	30th, noon.	36°·0	24th, 9 A.M.
Stonyhurst	51°·8	31st, noon.	28°·4	25th, 2 A.M.
Kew	55°·3	30th, 6 P.M.	27°·6	25th, 7 A.M.

Each datum of this table we have compared with the temperature curves for the month, measuring each observation four times, viz., by the side scales of each curve from below upwards, and from above downwards. Setting aside every reading which does not differ from the measured reading so much as 0.4 of a degree, and the discrepancies which appear to arise

from causes which it is hoped have been removed in the later months and years. They are attributable to various causes:—

a. Confusion between Astronomical and Civil Time for the Month.—The three minimum temperatures for Glasgow, Aberdeen, and Stonyhurst, correctly cited by the reviewer, occurred during the first 12 hours of the civil month, and were therefore excluded from the astronomical month, to which the tables at pp. 37–40 (from which the table examined by the reviewer was compiled) refer. In the early months of the Quarterly Weather Report, the possibility of the extreme readings for civil and astronomical months not coinciding was not sufficiently kept in view.

b. Error in Conversion of Astronomical to Civil Time for the Day.—The first error cited, at Valencia, arose from entering 4d. 16h., as 4 a.m. on the 4th, instead of on the 5th.

c. Extraction of wrong readings,—from the idea that as the extremes were to be given to the nearest hour, the actual extreme readings at an exact hour were extracted and printed, instead of the true extremes, which might fall at another epoch.

d. Misprints.—39°·9 for Glasgow in October should be 29°·9 at same day and hour.

The reference to the minimum temperature at Aberdeen in August 1873, is in error, the mark (†) drawing attention to the note has been printed on the wrong line. It should refer to Falmouth, as will be seen by reference to the published curve for the day in question.

The means now taken being for civil time, the two first causes of error are removed, and care is taken to examine and re-examine the tables printed.

6. Of the three errors stated to exist in the last published table of *errata*. Two, viz., 1874 for 1873, are evident and could not mislead anyone, as no parts of the Quarterly Weather Report for 1874 have been published, so that no correction to it was possible. Oh. 2 is intended for Oh. 2 minutes as Oh. does not belong to the day beginning at midnight. The table of *errata* in question is being reprinted to bind up with the complete volume, and the errors pointed out in the critique were detected and corrected for this issue as soon as the erroneous table appeared.

7. The degree of attainable accuracy of the tabulations has already been mentioned under No. 1, as about 0°·2. Readings are not attempted to the hundredth of a degree.

from the unequal shrinkage of the paper as indicated by the results of the four measurements, there are in the above table 12 errors, the maxima at Falmouth and Kew being doubly wrong, the amount at the given hours being wrong, and the date of occurrence being also wrong. The following is the table as corrected, the corrected readings being shown by asterisks:—

	Maximum.	Day and Hour.	Minimum.	Day and Hour.
Valencia	53°·7	*5th, 4 A.M.	37°·0	22nd, 3 A.M.
Armagh	*53°·8	16th, 2 P.M.	*32°·3	26th, 2 A.M.
Glasgow	*50°·9	5th, 10 A.M.	27°·0	*1st, 2 A.M.
Aberdeen	48°·8	31st, 6 P.M.	*28°·7	*1st, 4 A.M.
Falmouth	54°·9	*31st, 11 P.M.	36°·0	24th, 9 A.M.
Stonyhurst	51°·8	31st, noon.	*22°·8	*1st, 8 A.M.
Kew	*55°·8	*31st, 1 P.M.	27°·6	25th, *5 A.M.

5. It will be observed that the errors are of three sorts—(1) errors of temperature and errors of the date of occurrence of the maxima and minima, including (2) errors of the day of the month, and (3) errors of the hour of the day. Similarly the other months of 1869 have been examined, from which it is seen that there are—

	Number of Errors.
Errors of temperature varying from 0°·4 to 9°·6*	41
Day of month wrong	22
Temperature and day of month correct, } but hour of day wrong	9
Total	72

The tables and curves for 10 months, taken indiscriminately from the other years, have also been examined.

In the tables for April and June 1870 (p. 37 of the Quarterly Weather Report of that year) there occur six errors in each of these months, and in the table for March 1871 (p. 26 of Quarterly Weather Report for 1871) there occur seven errors. In none of the 22 months examined are there fewer than two errors. This is the number of errors in the table for August 1873 (p. 42 of Quarterly Weather Report for 1873) being the last month for which the whole of the curves have been published. One of these two errors has reference to the minimum temperature for Aberdeen (39°·2) which occurred at 4 a.m. of the 11th August, and regarding which the following remark is made in a foot note:—"Doubtful; instrument out of action immediately after 6 a.m." If we turn to the Aberdeen temperature curve of the 11th, we see that the instrument was not out of order during the whole of that day; and by examining the curve for the whole month, we see further that the instrument went out of action on no day at 6 a.m., and that on the six occasions on which it went out of order during the month, it is highly probable that in none of the cases did the temperature fall so low as 39°·2.

6. Tables of *errata* for 1869 have been published by the Office from time to time, the last one appearing in November 1874. Not one of the numerous *errata* referring to 1869, which have been detected in this examination, has yet appeared in the tables of *errata* published by the Office. Furthermore, these tables of *errata* are themselves repeatedly in error; thus, the last one published in the Quarterly Weather Report for July–Sept. 1873 contains in the five lines which compose it no fewer than three mistakes, viz., 1874 being twice printed for 1873, and the hour of occurrence of the minimum temperature at Glasgow being curiously printed as Oh. 2 a.m. instead of Oh. a.m., the month having begun with the minimum temperature.

7. As the curves for 1874 are not yet published, there are no means of checking the hourly tabulated readings from the curves. Referring, however, to the regulations laid down for the detection and correction of *small errors*, and to the minute refinement to which

* The minimum temperature at Glasgow for October is given as 39°·9 at p. 109 of the Quarterly Weather Report instead of 30°·3 as by the cause of temperature.

8. The reason of the preponderance of whole degrees is that the lines on the tabulating scales occupy a larger space than a tenth of a degree, and the tabulator has a tendency to set down the exact degree instead of estimating the tenth.

That this is the correct interpretation for Kew is shown by the fact that for the month cited, January 1874, the following were the proportions for the three consecutive digits:—

Dry bulb.		Wet bulb.	
•1	48	•1	42
0	171	0	134
•9	85	•9	70

The personal tendencies of the different tabulators come out in these figures.

Their most serious attention is continually drawn to such facts as those pointed out by this critique.

At all events a single month is rather a short period for the determination of the hourly range of temperature at any station.

It may be observed that continuous records, or even observations, during the night hours, correct to whole degrees, could hardly be obtained from even second-rate, much less third-rate observers.

9. It will nevertheless be found that these records do afford every means within their scope for scientific use.

10. The rate of publication of the Quarterly Weather Report has been governed by that of the plates. No additional assistance from other departments of the Office could accelerate this. The original delay arose from the necessity of discovering methods for producing a continuous graphical record for publication, a problem, the solution of which was previously unattempted.

the results were carried, viz., to the hundredth of a degree, we were led to expect that the tabulated readings would be taken from the curves with an approach to accuracy of at least the tenth of a degree. A slight inspection of the figures of the tabulated readings shows at once that this is not the case, with the single exception of the observatory at Stonyhurst.

8. A word will explain our meaning. There being no reason why any one of the 10 decimal figures, viz., •1, •2, •3, . . . •8, •9, •0 should occur oftener than another, it is evident that on the mean of, say, a month's observations, the number of times on which a reading of a whole degree occurred would be, approximately, a tenth of the whole number of readings. At Kew, however, out of the whole 744 readings for January 1874, 172 whole degrees were read off from the curves and have been printed in the tables; in other words, nearly 100 in excess of a due proportion. Next month matters improved at Kew, and only 82 whole-degree readings are given; in March they rose to 127, and fell again in April to 94. In this respect Kew shows the greatest irregularity of all the observatories, but more especially as regards the tabulations from day to day, being very different from the business-like tabulations printed for Stonyhurst. Summing up all the whole degree readings at each of the observatories for the nine months, and comparing the results with a tenth part of all the readings tabulated, we obtain the following results: At Stonyhurst the number of whole-degrees read off were 16 per cent., less than a tenth part of the whole; at the other observatories the numbers are greater than a tenth part of the whole, in the following order: Kew, 50 per cent.; Aberdeen, 95 per cent.; Armagh, 112 per cent.; Falmouth, 137 per cent.; Valencia, 147 per cent.; and Glasgow, 148 per cent. Every statistician will know the meaning of these figures, and how completely they destroy the scientific character of the work. It should moreover be kept in mind that 1874 was the fifth year of the tabulation by the observatories of the readings taken from the curves. The method of tabulation as carried out is too rough for even the determination of the temperature daily "constants," a statement which will be self-evident from the following hourly mean values for Valencia for July 1874, beginning with 1 a.m.: $57^{\circ}\cdot7$, $57^{\circ}\cdot5$, $57^{\circ}\cdot3$, $57^{\circ}\cdot2$, $57^{\circ}\cdot1$, $57^{\circ}\cdot6$, $58^{\circ}\cdot7$, &c.; the curve for the time from 2 to 5 a.m. cannot be determined from observations in which whole degrees so largely preponderate. Though the instrumental arrangements for the continuous registration of the temperature may well be regarded as a triumph in science, yet the results, as tabulated and published, can scarcely lay claim to a higher value than eye-observations of third-rate observers.

9. In view of the results of this examination, it is not easy to see how one can make a scientific use of the tabulations, and the results deducted therefrom, as made by this department of the Office, until (1) the tracings of the curves from the photographs, (2) the tabulations of the hourly values from the curves, and (3) the monthly and five-day means have been carefully revised.

10. It cannot be said that the publications have been issued under a press of work in the Office, seeing that the Quarterly Weather Reports have been published just when the Office has been ready to do it. The last published Report is for the quarter ending September 1873, and the last quarter of 1871 only appeared in November last. Further, at page 66 of the report for 1873, giving a list of persons in the employment of the Meteorological Committee, we learn that at the time of going to press the number so employed was 24, and the sum expended in the year for salaries amounted to about 3,727*l.*, to which if we add 2,722*l.* for expenses at observatories, it is evident that there can be no reasonable doubt that the staff available for this work is amply sufficient.

11. The exposure of the thermographs at the observatories is admittedly defective in some respects, as compared with that possible for smaller stations, where the observations are taken by the eye.

The circumstances which have led to the deviations from uniformity which exist have been of various characters; one of the most important being the extra cost which would have been entailed by erecting special buildings for the thermographs at each station, even if such a measure had been possible in all cases; which there is some reason to doubt.

It should however be remarked that the situation of the observatory at Valencia is not in any way "confined," and that the thermograph stand at Aberdeen is not surrounded with buildings, but is on the north side of a line of buildings.

11. There is a question yet remaining to be considered, viz., are the thermometers at these observatories in positions which will fairly indicate the march of the temperature of each place through the hours of the day; and, above all, are they so placed as to be comparable with each other? In the introduction to the Quarterly Weather Report for 1870, woodcut illustrations are given of the thermometer screens, with their positions and surroundings. No two of these are alike, the only approach to uniformity being Stonyhurst and Glasgow. Two of the observatories, viz., Valencia and Falmouth, occupy important positions near the sea, and might have yielded valuable results with regard to the influence of the sea on climate, but they have been placed in situations so confined that their temperature observations are of little value considered as contributions to a scientific inquiry into the climate of these islands.

12. The Council of the Scottish Meteorological Society, in a report dated 3rd July, 1872, drew attention to the position of the thermometers, particularly those at Aberdeen, which are 41 feet above the ground and surrounded with buildings, giving it as their opinion that "observations so made were not comparable with each other, nor with other observations."* The publication since, by the Committee, of the hourly readings, enables us to examine the point from the observations themselves. One of the best marked phases of the daily temperature, as well as one of the most important, both for scientific and practical purposes, is the increase which takes place from 9 a.m. to 3 p.m. At Kew the mean increase between these two hours for January and February 1874 was $4^{\circ}8$, and for July and August $6^{\circ}7$, the greater increase in the summer months being in accordance with the climatic facts. But at Aberdeen the thermometers indicated between the same hours a mean increase of $3^{\circ}7$ for January and February, and $1^{\circ}8$ for July and August; thus, instead of being larger in summer, the recorded difference was only half that recorded in winter. It is needless to remark that these results for Aberdeen in no sense represent the temperature of this part of Her Majesty's dominions, and that for the supplying of data for temperature "constants" for that part of North Britain, the observations made there are worse than useless. The arrangements for the thermometers at the seven observatories, both as regards height above the ground, and exposure, call for reorganisation.

13. The reviewer is evidently of opinion that telegraphic reporting stations should afford the same facilities for climatic observations as are demanded from stations of the second order.

This is not the case. One most important condition for a satisfactory telegraphic station is its proximity to a postal telegraph station.

This condition in many cases renders it impossible to procure satisfactory and uniform exposures for thermometers and rain gauges, e.g. at North Shields, Dover, and Plymouth.

14. It is not intended that mean temperatures shall be calculated for any but a very few telegraphic stations.

Many of the defects pointed out $5\frac{1}{2}$ years ago by Mr. Symons have been corrected, but, as just stated, telegraphic stations are not to be judged in the same way as ordinary observing stations.

The reviewer is unaware that the office has other stations besides the observatories and telegraphic stations, and that, if required, information can be supplied to the Registrar-General from a number of these extra stations.

In connection with the subject of the relative perfection of our telegraphic system, it is fair to remark that this office is the only one in existence which regularly issues monthly tables of errata for its Weather Reports.

13. In Part I. of the Quarterly Weather Report for 1870 appears a valuable table of the mean monthly readings of the barometer at the committee's telegraphic stations. If we were sure that the method of annual inspection of these stations is a sound one, the results for Holyhead might suggest an inquiry into the influence of the sea on the state of the barometer. The position of the rain-gauges above the ground at these stations, which varies from 5 inches to 23 feet, calls also for revision.

14. In all the reports issued by the Office it will be observed that no monthly mean temperatures for the telegraphic stations have yet been published by the Committee. With reference to these stations, Mr. Symons, in December 1869, remarked: "Various facts brought under our notice convince us that more remains to be done than has yet been effected, and that 'in many respects these stations (telegraphic) are unworthy of the nation of which they are to a certain extent representative.'† We have no means of knowing how far matters have been rectified. It may therefore be doubted, if the office were asked to furnish meteorological information for the use of the Registrar-General, whether they possess in their own stations the means of supplying it.

* "Journal Scottish Meteorological Society," vol. iii. p. 290

† "Meteorological Magazine," vol. iv. p. 177.

15. The department reviewed is only one branch of the Office. A great amount of valuable work is therein accomplished at a cost by no means out of proportion to the sum annually expended. If the grant were increased more could be accomplished.

A recapitulation may be permitted of what has been so frequently stated, but which appears still to be occasionally misunderstood, that the 10,000*l.* has to pay for three distinct departments:—1. Ocean Meteorology. 2. Weather Telegraphy. 3. Land Meteorology of the British Islands.

Mr. Scott submitted the following Report:

I have to report that I visited the Reporting Station of *Yarmouth* on the 23d ult., and found everything in very good order, including the self-reporting anemometer erected on the roof of the Sailor's Home.

Cambridge was visited on the 24th. With reference to this station all that I have to remark is that the change in the exposure of the thermometer screen has not yet been made as was hoped at the date of my last visit, (*Minutes* 1873, p. 53,) but I am given to understand that a *Stevenson's* screen will soon be erected. In all other respects the station seems thoroughly satisfactory.

Reported—That a cheque for 50*l.* had been drawn on the 10th inst., for petty cash, in favour of *J. S. Harding, jun.*, on the signature of Major-General Smythe.

The Committee then adjourned.

13. In Part I. of the Quarterly Weather Report for 1870 appears a valuable table of the mean monthly readings of the barometer at the committee's telegraphic stations. It was very kind that the method of annual inspection of these stations is a sound one, the results for the year might suggest an inquiry into the influence of the sea on the state of the barometer. The position of the telegraphic stations above the ground at these stations, which range from 5 inches to 23 feet, calls also for revision.

14. In all the reports issued by the Office it will be observed that no monthly mean temperature for the telegraphic stations have yet been published by the Committee. With reference to these stations, Mr. Symonds, in December 1869, remarked: "Various facts would rather lead me to believe that the mean temperature of the stations (telegraphic) are not 'worthy of the nation of which they are to a certain extent representative.' I have no means of knowing how far matters have been rectified. It may therefore be doubted if the office were asked to furnish meteorological information for the use of the Registrar-General, whether they possess in their own stations the means of supplying it."

15. The reviewer is evidently of opinion that telegraphic reporting stations should afford the same facilities for climatic observations as are demanded from stations of the second order. One more important condition for a satisfactory telegraphic station is its proximity to a postal telegraph station. This condition in many cases renders it impossible to procure satisfactory and uniform exposures for thermometers and rain gauges, as at *North Shields*, *Dover*, and *Yarmouth*.

16. It is not intended that mean temperatures shall be calculated for any but a very few telegraphic stations. Many of the defects pointed out 3½ years ago by Mr. Symonds have been corrected, but, as just stated, telegraphic stations are not to be judged in the same way as ordinary observing stations. The reviewer is aware that the office has other stations besides the telegraphic and telegraphic stations, and that it reports information from a number of stations to the Registrar-General from a number of these extra stations. It is not intended to be understood that this office is the only one in which mean temperatures are reported. It is not intended to be understood that this office is the only one in which mean temperatures are reported. It is not intended to be understood that this office is the only one in which mean temperatures are reported.

116, Victoria Street, June 7, 1875.

PRESENT :

The Earl of Rosse in the Chair.

Mr. De La Rue.

Major-General Smythe

Major-General Strachey.

The Director was in attendance.

The Minutes of last meeting (May 17) were read and confirmed.

Submitted—The Auditors' Report as follows :—

METEOROLOGICAL OFFICE : ACCOUNT OF RECEIPTS AND PAYMENTS for the year ending the 31st March 1875.

RECEIPTS.				PAYMENTS.			
		£	s. d.			£	s. d.
Balance from year 1873-4	-	2,290	12 2	<i>Office.</i>			
Parliamentary vote	-	10,000	0 0	Salary of Director	-	800	0 0
Commissions for instruments	- 725 1 7			Do. two Clerks	-	339	15 0
Subscriptions for D.W. Charts	- 297 2 11			Office Keeper and Messenger	-	175	4 0
Do. hourly observations	- 14 0 0						1,314 19 0
Do. Danish Synoptic Charts	- 17 1 6			Rent of office, &c.	-	534	12 0
Do. M. S. Weather Reports	- 15 0 0			Fuel and gas	-	41	18 5
Supply of Meteorological Data, &c.	- 23 16 11			Furniture and fittings	-	26	12 3
		1,092	2 11				603 2 8
Interest on deposit account	-	129	10 10	Postage	-	79	18 4
				Printing and books	-	21	14 7
				Attendance and other contingencies	-	94	4 1
							195 17 0
				<i>Land Meteorology.</i>			
				Expenses at observatories	-	2,644	3 11
				New instruments (colonies, &c.)	-	391	12 9
				Computations	-	763	11 2
							3,799 7 10
				Telegraphy	-	2,139	8 9
				Inspections, issue of D. W. Charts, &c.	-	583	2 3
				Computations	-	665	6 8
							3,387 17 8
				<i>Ocean Meteorology.</i>			
				Marine Superintendent	450	0	0
				Supply and return of instruments, &c.:			
				Admiralty	-	265	15 0
				Mercantile Marine	575	4	11
				Computations and care of instruments	-	1,093	6 5
							2,384 6 4
							11,685 10 6
				Cash in hand	-	60	12 7
				Advance to Valencia Observatory	-	50	0 0
				Bank of England account	-	545	10 8
				London and Westminster Bank	-	1,170	12 2
							1,826 15 5
							£13,512 5 11
							£13,512 5 11

Examined and compared with the vouchers and found correct.

(Signed)

W. J. SMYTHE, Major-General, } Auditors.
WARREN DE LA RUE,

4 June 1865.

BALANCE SHEET, 31 March 1875.

	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.
To sundry creditors	-	1,015	10 0				By cash (as above)	-	1,826	15 5			
„ probable net surplus	-	1,053	1 5				„ sundry debtors	-	241	16 0			
				2,068	11 5						2,068	11 5	

BAROGRAPH:—

BAROGRAPH :—					
	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.
Action - - -	-	-	-	-	-
Photography - -	-	-	-	-	-
Records deficient, due to stoppage of clock failure of light	0	0	0	0	0
" " "	0	0	0	0	0
" " other causes -	0	0	0	0	10 hrs.
No. of errors discovered—					
In entry of standard	0	0	2	0	12
" calculating residual correction	0	1	0	0	0
" applying residual correction	1	0	0	1	1
" subtraction in subsidiary tables	0	0	1	0	1
" tabulation by subsidiaries	1	0	0	0	1
" irregular differences	1	0	0	0	1
" entry of tabulated readings into subsidiary sheets - -	0	0	1	0	0
<i>Result of 40 Remeasurements :—</i>					
Greatest difference	.0040	.0050	.0050	.0020	.0050
Mean difference irrespective of sign	.0014	.0018	.0020	.0008	.0021
Residual difference (—Kew)	+ .0007	+ .0011	— .0004	.0005	— .0007
Mean monthly difference between simultaneous Barograph and Barometer readings	.0013	.0027	.0021	.0020	.0026

THERMOGRAPH:—

THERMOGRAPH :—					
	-	-	-	-	-
Action - Photography	-	-	-	-	-
Records deficient, due to stoppage of clock failure of light imperfectly moistened bulbs partially frozen other causes No. of errors discovered in entry of Standard by subsidiary measurements of subtraction in do. tables detected under glass scale	-	-	-	-	-
No.	"	"	"	"	"
"	"	"	"	"	"
"	"	"	"	"	"
"	"	"	"	"	"
<i>Result of 40 Remeasurements :—</i>					
Greatest difference	-	-	-	-	-
Mean difference irrespective of sign	-	-	-	-	-
Residual difference (-Kew)	-	-	-	-	-
Mean monthly difference between simultaneous Thermograph and Thermometer readings	-	-	-	-	-
No. of errors in maxima and minima	-	-	-	-	-
Entry of tabulated readings into tabulation sheets	-	-	-	-	-

† 14 hrs. dry bulb on the 10th have been re-tabulated at Kew.

* April 4th, 1 p.m. to wind velocity re-tabulated at Kew.

Reported—That the accounts of the Office for the year 1874–5 had been forwarded to the Treasury, with the Auditors' Report, on the 5th inst.

Reported—That the Board of Trade had determined to exhibit at the Paris Fishery Exhibition in July their Rocket Apparatus, &c.

Mr. Scott was instructed to inform the London Committee that the Meteorological Committee would be ready to furnish for Exhibition a set of their instruments, &c., as supplied to ships and to fishing stations.

Submitted—The following letter which had been sent on the 28th ult. as directed :—

DEAR SIR,

May 28, 1875.

THE idea has been frequently entertained by members of the Meteorological Committee that it might be well to embody in the weekly summaries of the weather issued by this Office some notice of the progress and growth of crops, &c.

I am instructed to inquire from you, whether in the opinion of your Council it would be expedient or possible to attempt the organization of such a service of reports, inasmuch as unless the information were reasonably complete and trustworthy its publication would be worse than useless; or whether your Council deem that the information on these points at present published unofficially in the newspapers meets the requirements of the subject.

I need not say that the Committee will be most grateful for any assistance or suggestions which may be tendered to them by your Council.

H. M. Jenkins, Esq., F.G.S., Secretary,
Royal Agricultural Society of England.

I am, &c.,
(Signed) R. H. SCOTT,
Director.

Submitted—The following letter which had been sent on the 28th ult. as directed :—

SIR,

May 28, 1875.

I AM instructed by the Meteorological Committee to draw the attention of the Board of Trade to the following matter connected with the extension of the telegraphic system of the country, and thereby with the possible improvement of their system of Telegraphic Weather Reports.

The present want of information from the north-west coast of Ireland is a most serious defect in their system of reporting, no station being available for the purpose between Valentia and Greencastle, while the latter station is so sheltered from the west winds that it frequently does not feel the force of the gales.

The points at which the telegraphic wires are extended to the coast, along the district mentioned, are the seaport towns, which are all in sheltered situations, and therefore unsuited for the purposes of reporting weather.

The attention of the Committee has long been directed to the desirability of obtaining reports from Mullaghmore, in the county Sligo, a low lying point very well exposed to wind and sea.

In order for this to be possible it would be necessary that the telegraphic wires should be extended at least to Cliffony, a Money Order Office, situated within a short distance of Mullaghmore.

On the 16th June 1874, I, in the company of the Earl of Enniskillen, had the honour of an interview with H.M. Postmaster General on the subject, and I was informed by his Lordship that the question of the required extension of the wire might perhaps be entertained in the course of the present year 1875.

I am informed by the Earl of Enniskillen, that recently the Postmaster General informed him that if the Committee's application were supported by a Government Department it might possibly receive favourable consideration.

I have, therefore, to request that you will move the Board of Trade to apply to the Post Office for the extension of telegraphic communication to the town of Cliffony, if not actually to the village of Mullaghmore; and I have no hesitation in saying that such a measure would be a most important improvement as regards information obtainable of approaching storms, and would thereby tend to increase the accuracy and consequent usefulness of storm warnings.

I am, &c.,
(Signed) ROBERT H. SCOTT,
Director.

Submitted—The following letter :—

DEAR SIR,

The Patent Type Founding Company,
31 Red Lion Square, June 3, 1875.

HAVING now had over two months' working experience in producing stereotypes of Daily Weather Charts for the morning newspapers, we have the pleasure to inform you that we have now organized our machinery, and made arrangements which enable us to undertake to execute the stereotypes conveniently in time for insertion in the afternoon papers—this being the requirement originally proposed to us by Mr. Francis Galton—and further that we have heard from reliable sources that the general public take great interest in the Meteorological information as now supplied by the Chart.

Before offering it to the evening papers we beg your consideration of the possibility of obtaining later information, so that stereotypes of the morning observations might be supplied to evening papers, and evening observations for following morning papers.

We may also mention that it has been intimated to us that the morning papers would abandon its

insertion if the same information had already appeared in any newspapers of prior issue—and any such abandonment, you would readily agree with us, would be very prejudicial to the success of the Chart. Waiting the favour of your reply

We are, &c.
(Signed) SHANKS, REVELL & Co.

Mr. Scott was instructed to reply as follows:—

GENTLEMEN,

June 7, 1875.

I BEG to inform you that I have laid your letter of the 3rd instant before the Committee of this Office, and I am instructed to reply that, whereas they would be very glad that the information supplied by them should appear in the afternoon papers, they regret that the amount of funds at present at their disposal would be quite insufficient to meet the increased expenditure which would be caused by supplying for the morning issues data, sufficient for the construction of a special Chart, later than have appeared in the afternoon papers, nor do they at present see any prospect of raising the amount by public subscription.

I am, &c.,
(Signed) ROBERT H. SCOTT.
Director.

Messrs. Shanks, Revell & Co.

Submitted—An application for a Fishery Barometer for Portscath, Cornwall.—
Granted.

Read.—The letter from Capt. Toynbee, submitting Excellent Logs kept by the following gentlemen:—

Commodore J. G. Goodenough, C.B., H.M.S. "Pearl" (Minutes, 1874, p. 61).

Captain E. C. Bennett, Ship "Thessalus."

" D. F. McKechnie, Barque "Cottica," (Minutes, 1874, p. 96).

" R. D. Lunham, s.s. "Charles Howard," (Minutes 1874, p. 61).

" C. C. Prehn, Barque, "Eleanor."

" J. E. Moulard, s.s. "Batavia," s.s. "Calabria," (Minutes 1874, p. 80).

" J. J. Price, Barque, "Sorata," (Minutes 1874, p. 80).

Mr. Scott was instructed to present the Wind and Current Charts to Capts. Bennett and Prehn, and to express to the other gentlemen the marked thanks of the Committee.

Reported—That the Daily Weather Charts had been supplied to Gen. Farre, Algiers, in exchange.

Reported—That the following cheques for May had been drawn on the 31st of that month, on the signature of Capt. Evans, who, with Sir C. Wheatstone, had attended.

For Office :

						£	s.	d.
R. H. Scott	-					66	13	4
J. S. Harding, jun.	} Salaries and Wages	-	-	-	-	20	0	0
J. S. Harding, sen.		-	-	-	-	*9	12	6
T. D. Bell		-	-	-	-	6	13	4
C. Gilman, Gas Co.		-	-	-	-	2	16	-

For Observatories :

A. Burgess, Woodcuts	-	-	-	-	-	7	0	0
T. Kerr, Valencia, Salary	-	-	-	-	-	20	16	8
P. Adie, Barometers for Toronto	-	-	-	42	0	0		
" " Christiania	-	-	-	55	10	0		
						97	10	0
Allan, Brothers, Freight	-	-	-	-	-	5	9	6
J. J. Hicks, "Stevenson's" Screen	-	-	-	-	-	1	15	0
R. H. Curtis	} Computations, &c.	-	-	-	-	13	6	8
A. J. Rigby		-	-	-	-	*9	12	6
C. H. Thompson		-	-	-	-	*6	10	0
C. Stodart		-	-	-	-	*10	10	0
J. A. Curtis		-	-	-	-	9	3	4
Carried forward	-	-	-	-	-	£287	9	5

* Five weeks to the 30th.

116, Victoria Street, June 21, 1875.

PRESENT :

The Earl of Rosse in the Chair.

Captain Evans.

Rear-Admiral Richards.

Major-General Strachey.

The Director was in attendance.

The Minutes of last meeting (June 7) were read and confirmed.

Mr. Scott stated that he had already sent to the several observatories a copy of the Minutes for May 17, containing the critique which appeared in "Nature," on the 10th inst., with his reply to it, and he submitted the following circular to the observatories which was approved, and he was instructed to issue it.

DRAFT CIRCULAR TO OBSERVATORIES.

DEAR SIR,

I have to draw your special attention to the fact which has been noticed from the first in this Office, and has lately been brought prominently forward by a critique in "Nature," of the 10th instant, that the tabulation, especially of the thermograms, made at the observatories, is hardly effected with the requisite minuteness and accuracy.

The Office is fully aware of the difficulty of this operation, but, nevertheless, a very slight amount of reflection will show that the preponderance of whole degree readings, which appears in the case of almost all the observations, cannot have any foundation in fact, and is, moreover, not entirely to be attributed to the coarseness of certain of the ruled lines on the tabulating scales supplied.

That this preponderance exists you can easily satisfy yourself by examining the tabulations from such of your own records as you may have by you on receipt of this letter.

You have already received a copy of the reply to the critique in question, which I have submitted to the Committee, from which you will have seen that several of the statements therein contained are not in accordance with facts; but, nevertheless, it is the more incumbent on all in connexion with the Office to do their best to obviate the possibility of such remarks being made in future.

It appears to this Office that if the regulations as to the subsidiary measurements, &c., as prescribed in the Report of the Committee for 1868 had been rigidly carried out, many errors which have been discovered to exist in the tabulations would have been *detected and corrected*.

Submitted—The following Report :

I have to report that I visited *Oxford* on the 8th inst., and had the pleasure of finding Mr. Main at home. The instruments at the Radcliffe Observatory, which are used for our telegraphic reports are in very good order, except the rain gauge, which is of a faulty construction. I hope that Professor Main will have this instrument replaced by a new one.

Portishead, visited June 9.—The instruments at this station have been removed, as the observer has changed his residence. The alteration has been an improvement. Everything was in good order.

Plymouth, visited June 10.—At this station there is nothing calling for remark, except that the prospect of obtaining a good exposure for the thermometers and rain gauge seems very poor.

Scilly, visited June 11.—This station was as usual in very good order. A Stevenson's screen has now been erected, so that the thermometer exposure is very good.

Hurst Castle, visited June 14.—This station continues very satisfactory, and the addition of a Stevenson's thermometer screen on the top of the casemates has been very beneficial.

I visited the observatory at Falmouth on the 12th, and have nothing to remark about it.

ROBERT H. SCOTT.

Read—A letter from Captain Toynbee submitting an excellent log kept by Captain F. Wherland, ship "Galatea" (Minutes 1874, p. 22).

Mr. Scott was instructed to convey the marked thanks of the Committee to Captain Wherland.

Submitted—An application for a fishery barometer for the Haslar Hospital.—Granted.

Mr. Scott was instructed to make arrangements for Mr. Beckley to inspect the instruments at the observatories as soon as possible.

SUBMITTED—The following STATEMENT respecting the RECORDS for May 1875, received from the SELF-RECORDING OBSERVATORIES, which have been examined at KEW OBSERVATORY (see Minutes 21st December 1868).

	Aberdeen.	Armagh.	Falmouth.	Glasgow.	Kew.	Stonyhurst.	Valencia.
	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.	Direction. Good.
	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.	Velocity. Good.
ANEMOGRAPH :—							
Action - - -	0	0	0	0	0	0	0
Records deficient, due to stoppage of clock	-	-	-	-	-	-	-
" " other causes -	0	0	0	0	0	0	0
Orientation verified -	29th	31st	-	-	5th	-	2nd
No. of errors discovered by subsidiaries	0	0	0	0	0	0	6
" " irregular differences	0	0	0	0	0	0	0
Result of 40 Remasurements :—							
Greatest difference -	1.0	1.0	1.0	1.0	1.0	1.0	2.0
Mean difference irrespective of sign	0.4	0.3	0.2	0.3	0.0	0.2	0.6
Residual difference (— Kew) -	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.1
RAIN GAUGE :—							
Action - - -	Fair.	Fair.	Fair.	Fair.	Good.	Good.	Fair.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
" " other causes -	0	0	0	0	0	0	0
Errors in tabulation -	0	2	0	0	0	0	0

BAROGRAPH :—

Action	-	-	-	-	-
Photography -	-	-	-	-	-
Records deficient, due to stoppage of clock failure of light other causes -	-	-	-	-	-
No. of errors discovered—	-	-	-	-	-
In entry of standard	-	-	-	-	-
" calculating residual correction	-	-	-	-	-
" applying residual correction	-	-	-	-	-
" subtraction in subsidiary tables	-	-	-	-	-
" tabulation by subsidiaries	-	-	-	-	-
" irregular differences	-	-	-	-	-
Result of 40 Remeasurements :—					
Greatest difference	-	-	-	-	-
Mean difference irrespective of sign	-	-	-	-	-
Residual difference (— Kew)	-	-	-	-	-
Mean monthly difference between simultaneous barograph and barometer readings	-	-	-	-	-
In entry of tabulated readings into tabulation sheets	-	-	-	-	-

THERMOGRAPH:—

[illegible]

*Two days wet bulb have been retabulated at Kew.

116, Victoria Street, July 5, 1875.

PRESENT :

Major-General Strachey in the Chair.

Captain Evans.

The Earl of Rosse.

Sir C. Wheatstone.

The Director was in attendance.

The Minutes of last meeting (June 21) were read and confirmed.

The Draft Report for 1874 was submitted and approved, with certain alterations. Mr. Scott was instructed to forward it to the Board of Trade for presentation to Parliament.

Submitted—The following correspondence :

M. 9163.

M. O. 1499.

SIR,

Board of Trade, June 28, 1875.

WITH reference to the question of the extension of telegraphic communication to Cliffony or Mullaghmore, I am directed by the Board of Trade to transmit to you, to be laid before the Meteorological Committee, the enclosed copy of a letter received from Her Majesty's Postmaster-General on the subject, I am to state that this Board have every disposition to assist the Committee in prosecuting their inquiries.

Before, however, they can arrive at an opinion as to the advantage which the public may be expected to derive from the proposed outlay, which would form in effect an additional grant of public money for Meteorological purposes, this Board would be glad to receive such further observations, if any, as the Meteorological Committee may desire to offer in explanation of the necessity for the outlay and for its being made a charge upon the public taxpayer rather than upon the Meteorological vote.

R. H. Scott, Esq.

I am, &c.
(Signed) THOMAS GRAY.

C. 77362.

SIR,

General Post Office, London, June 18, 1875.

I AM directed by the Postmaster-General to acknowledge the receipt of your letter of the 10th instant (No. 8215) in which you enclose a copy of a letter from the director of the Meteorological Office in regard to the extension of the Postal Telegraph System to Cliffony, and His Lordship desires me to inform you that the question has on former occasions received the consideration of the Department, and that as it is not thought that the revenue which would be derived from messages sent on behalf of the Meteorological Office and from public telegraph business, which would be transacted at Cliffony, would cover the cost of maintaining a postal telegraph office there; taking into account the heavy outlay involved in making extension, estimated at 500*l*., Lord John Manners has not felt himself warranted in acceding to the applications which have been made to him on the subject.

I am directed, however, to inform you that His Lordship is willing to represent the matter to the Treasury if the Board of Trade are prepared to recommend that the request of the Director of the Meteorological Office shall be granted in the interest of the public service, and if such be the opinion of the Board the Postmaster-General will be glad to be furnished with an official statement to this effect.

The Assistant Secretary,
Marine Department, Board of Trade.

I am, &c.
(Signed) F. I. SCUDAMORE.

Mr. Scott stated that he had sent the following reply, which was approved:

July 1, 1875.

IN reply to your letter of the 28th ult. (M. 9163) enclosing a copy of a communication from the General Post Office respecting the proposal of this Office that the telegraph wires should be extended to Cliffony, I beg to state that, notwithstanding the great gain which would be thereby derived for the purposes of Weather Telegraphy, the Committee would be unwilling that a special application on the subject should be made to the Treasury on their account solely, if the cost would be so great as that stated.

We were under the impression that the Post Office had intended ultimately to extend the wires to all money order offices, as has repeatedly been said, and that for this reason they might be disposed to do so at once, in the case of Cliffony, if this Office established a reporting station there.

Thanking you for the trouble you have taken in the matter,

I am, &c.
(Signed) R. H. SCOTT.

Read—A letter from Captain Toynbee submitting an excellent log by Captain W. Cruickshank, ship "Richard Wright." Mr. Scott was instructed to present to Captain Cruickshank a copy of the Wind and Current Charts.

Mr. Scott stated that additional shelving was required for the library and the store of documents, &c. in the Marine Room, and he was instructed to procure estimates.

Submitted—The following Abstract of Accounts from 1st April 1875 to 30th June 1875:—

Receipts.			Payments.		
—	Received.	Due.	—	Paid.	Estimated Liabilities.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Balance from 1874-5 -	1,826 15 5	—	OFFICE:		
Vote for year (imprest) -	2,000 0 0	8,000 0 0	Salaries -	338 16 0	—
Commissions for instruments, &c.	234 2 8	85 7 0	Rent, fuel, &c. -	154 4 10	—
Subscriptions for D.W. Charts	72 19 9	8 16 8	Contingencies -	61 2 6	12 0 0
Interest on deposit account -	7 17 0	—	LAND METEOROLOGY:		
Sundries -	32 8 10	20 2 6	Expenses at observatories -	645 18 7	26 0 0
			New instruments for ditto -	156 12 7	97 0 0
			Computations -	223 1 6	—
			Telegraphy -	441 13 11	845 0 0
			Inspections, D.W. Charts, &c.	128 8 2	108 0 0
			Computations -	180 2 4	—
			OCEAN METEOROLOGY:—		
			Marine Superintendent -	100 0 0	—
			Instruments, Admiralty -	202 14 9	67 0 0
			Ditto, Mercantile Marine, Agencies, &c.	100 13 10	73 0 0
			Computations and care of Instruments.	233 7 10	—
Totals -	£4,174 3 8	£8,114 6 2	Totals -	£2,966 16 10	£728 0 0

Probable net amount available on 1st July 1875 -

£8,593 13 0

Reported—That the sum of 1,000*l.* had been transferred, on the 28th ult., from the deposit account of the Committee to their current account on the signature of the Earl of Rosse.

Reported—That the following cheques for June were drawn on the 28th of that month on the signature of the Earl of Rosse:—

For Office:

R. H. Scott	} Salaries and wages	
J. S. Harding, jun.		
J. S. Harding, sen.		
T. D. Bell		
H. Bond, repairs		
C. W. Jacques, rent		

£	s.	d.
66	13	4
20	0	0
*7	14	0
6	13	4
4	16	9
133	13	0

For Observatories:

D. Thomson, Aberdeen	
Less chemicals supplied	
T. R. Robinson, Armagh	
„ expenses for quarter	
W. P. Dymond, Falmouth	
R. Grant, Glasgow	
H. Williams, Holyhead	

+61 17 6
4 17 2
57 0 4
40 14 0
8 5 5
48 19 5
66 5 0
+61 17 6
2 13 8

Carried forward - 476 6 4

* Four weeks to 26th June.

† 12*s.* 6*d.* deducted for forms supplied.

				£	s.	d.	
Brought forward	-	-	-	476	6	4	
S. Jeffery, Kew	-	-	-	62	10	0	
„ examination of records	-	-	-	100	0	0	
„ verifications	-	-	-	29	11	0	
				192	1	0	
C. Clouston, Orkney	-	-	-	-	2	10	0
G. H. Aird, Seaham	-	-	-	-	2	13	9
E. J. Purbrick, Stonyhurst	-	-	-	*49	7	6	
„ postage	-	-	-	0	6	2	
				49	13	8	
T. Kerr, Valencia	-	-	-	49	11	6	
„ salary	-	-	-	20	16	8	
				70	8	2	
G. T. Watson, Yarmouth	-	-	-	-	3	19	6
J. Driscoll, rent at Valencia	-	-	-	-	25	0	0
Hopkin and Williams, chemicals	-	-	-	-	4	17	2
Malby and Sons, printing	-	-	-	9	12	6	
„ „	-	-	-	2	15	0	
				12	7	6	
W. Marriott, Meteorological returns	-	-	-	-	15	0	0
R. W. Munro, copper chimneys	-	-	-	2	13	3	
„ tools for Mauritius	-	-	-	2	14	6	
				5	7	9	
P. Adie, tabulating scales, &c.	-	-	-	-	1	12	9
J. J. Hicks, thermometers	-	-	-	-	10	2	0
Postmaster-General (on account of Ertel and Son)	-	-	-	-	3	4	6
R. H. Curtis	} Computations	-	-	-	13	6	8
A. J. Rigby		-	-	-	7	14	0
C. H. Thompson		-	-	-	5	4	0
C. Stodart		-	-	-	8	8	0
J. A. Curtis		-	-	-	9	3	4

For Telegraphy, Quarterly Allowances, &c.:

Postmaster-General, January to March	-	-	379	1	11
H. Todd, Cambridge	-	-	3	19	0
J. Costello, Dover	-	-	3	5	10
J. Tilston, Holyhead	-	-	3	6	6
G. Mitchell, Kingstown	-	-	3	6	2
F. Gaster, London	-	-	3	5	0
W. D. Penny, Nairn	-	-	4	4	6
E. J. Lowe, Notts	-	-	3	18	0
J. Lucas, Oxford	-	-	3	6	0
J. Merrifield, Plymouth	-	-	3	5	0
W. Sandford, Portishead	-	-	3	18	0
W. Thomas, Scilly	-	-	4	5	1
J. Smith, Stornoway	-	-	3	7	0
J. Trotter, Thurso	-	-	3	6	8
J. Sinclair, Wick	-	-	3	5	0
G. T. Watson, Yarmouth	-	-	3	6	6
C. Wakefield, York	-	-	3	9	0
Wightman & Co., B.P. wrappers	-	-	7	0	0
F. Gaster	} Computations, &c.	-	+18	16	8
W. L. Dallas		-	+8	18	7
F. Brodie		-	+9	7	4

For Ocean Meteorology:—

H. Toynbee, Marine Superintendent	-	-	33	6	8
F. Pastorelli, "A" thermometers	-	-	37	9	2

Carried forward - - - £1,469 13 8

* Four weeks to the 26th June.
† Including allowance for extra attendance.

			£	s.	d.
Brought forward	-	-	1,469	13	8
P. Adie, repairing "A" barometers	-	-	4	0	0
" " " " "B.T." "	-	-	12	12	6
J. J. Hicks, repairing "A" thermometers	-	-	2	17	6
" " " " "M.O." "	-	-	1	2	0
S. Jeffery, "A" verifications	-	-	37	8	0
" " " " "M.O." "	-	-	5	10	0
J. Gill, Liverpool agent	-	-	42	18	0
J. R. Jones, Aberdeen agent	-	-	11	18	3
D. McGregor & Co., Glasgow agents	-	-	2	6	6
Street Brothers, advertisements	-	-	4	0	0
R. Strachan	-	-	1	2	6
C. Harding	-	-	\$20	16	8
T. E. Allen	-	-	16	5	6
J. W. McVeagh	-	-	9	3	4
Computations and care of instruments	-	-	*5	4	0
For Office Expenses:					
J. S. Harding, jun., on account	-	-	100	0	0
" " " " " " " "	-	-	50	0	0
R. H. Scott, on account	-	-	150	0	0
	-	-	40	0	0
Total			£1,794	0	5

* Four weeks to the 26th June.

† Including allowance for extra attendance.

§ Including allowance for care of instruments.

The Committee then adjourned.

116, Victoria Street, October 11, 1875.

PRESENT:

Admiral Richards in the Chair.

Captain Evans.

The Director was in attendance.

The Minutes of last meeting (July 5) were read and confirmed.

Reported—That Lord Rosse having been the only member present on the 19th of July there had not been a quorum on that day.

Reported—That the vote had been passed on the 30th of July, and that on that occasion Mr. W. H. Smith, on the part of the Treasury, had stated, in reply to the Scotch members who had proposed to diminish the vote by 1,000*l.*, that "It was the intention of the Treasury in the course of the autumn to conduct an inquiry, and ascertain for themselves what appeared to be the best method of conducting observations for meteorological purposes."

Mr. Scott drew the attention of the Committee to the portion of the Eighth Report of the Royal Commission on Scientific Instruction, &c. (p. 25), which referred to the management of the Office by the Committee, and conveyed the approval of the Commission of such management.

Submitted—The following correspondence (*vide* Minutes 1868, p. 54 ; 1870, p. 76) :—

M.O. 1552.

H. 4699.

Board of Trade (Harbour Department),
July 5, 1875.

SIR,

WITH reference to previous correspondence relative to the supply of meteorological instruments for the lighthouse service in the Bahamas, I am directed by the Board of Trade to state that they have now received from the inspector of lighthouses in that colony a requisition for six barometers and six thermometers, and I am to request that you will be good enough to state whether the Meteorological Department will be willing to supply the same.

In that event, the Board presume that the Committee would consider it the safer and better course to themselves to forward the instruments to the colony. If so preferred, however, the Board of Trade will cause their shipping agent (Mr. Tallack, Windsor Chambers, Great St. Helen's, E.C.) to obtain freight, and the cases may be sent to this Office to be delivered to him.

The information requested in your letter of the 19th August last relative to the disposition, &c. of the instruments now in the Bahamas, has not yet been received from the colony, but a further communication on the subject has now been addressed to the Governor.

The Director, Meteorological Office.

I am, &c,
(Signed) C. CECIL TREVOR.

SIR,

WITH reference to the application from the Inspector of Lighthouses in the Bahamas, communicated to this Office in your letter (H. 4699) of the 5th inst., I would venture to point out to the Board of Trade that this Office cannot be expected to supply instruments unless for the purpose of procuring observations for discussion.

In the year 1871 certain instruments were supplied by the Meteorological Committee to four stations in the Bahamas, on the express understanding that filled registers were to be returned regularly from each lighthouse supplied, but since that date registers have only been received

from Abaco	-	-	-	for 18 months
" Cay Sul	-	-	-	" 30 "
" Inagua	-	-	-	" 12 "

And in no case is the period which has elapsed completely represented.

It should, however, be said that Captain Stuart himself has sent in first-class logs from his own vessel the "Richmond."

It appears from the experience gained by this Office that there is not much prospect of any equivalent return in a scientific way being obtained by it for the instruments now demanded, and I would therefore submit to the Board of Trade that this Office should not be called upon to supply them, and more particularly so as the information as to the disposal of the existing instruments applied for in August last has not, as you inform me, yet been received.

I ought, however, to point out that the value of regular and good observations from such a district, if at all obtainable, would be very great, and that, therefore, it is hoped that instruments of good quality may be supplied from some source other than this Office, in order that at least the means of taking observations might be provided. This Office is ready to furnish such at cost price.

Submitted—The following correspondence:—

SIR, India Office, September 8, 1875.
I AM directed by the Secretary of State for India in Council to transmit to you herewith copy of correspondence* which has taken place between his Lordship and the Government of India, on the subject of the tabulation of the meteorological observations contained in the ships' logs relating to Indian seas, which are at present in the office of the Meteorological Society, and I am desired by Lord Salisbury to request that you will be good enough to favour him with the opinion of the Meteorological Committee on the advisability of proceeding tentatively at the outset, and collating the logs for a limited area in the manner suggested in his Lordship's despatch of the 25th February last.

The Director,
Meteorological Office, Victoria Street.

I am, &c.
(Signed) LOUIS MALLET.

SIR, Meteorological Office, September 23, 1875.
IN reply to your letter of the 8th instant, respecting the supply of certain meteorological observations contained in the registers of this Office, relating to Indian seas, for the use of Mr. Blanford, I beg to state that I have referred the matter to Captain Toynbee, marine superintendent of this Office, and now beg to submit the following mode of procedure for the consideration of Lord Salisbury:—

That this Office should extract into data-books the data of one month, say January, or any other month preferred by Mr. Blanford, for the whole district, viz., the Bay of Bengal and Arabian Sea. This would make it possible to test the value of the work before proceeding with the other months, and the books for one month would be complete in themselves, and therefore need not be returned to this Office if it is thought right to continue the extraction.

Sir Louis Mallet, C.B., (Signed) ROBERT H. SCOTT,
Under Secretary of State, India Office. Director.

SIR, India Office, October 5, 1875.
WITH reference to your letter dated the 23rd ultimo, I am directed by the Secretary of State for India to request that you will be so good as to furnish me with an estimate of the cost of making the extracts for one month, as suggested in your letter.

Robert H. Scott, Esq. (Signed) LOUIS MALLET.

SIR, Meteorological Office, October 11, 1875.
IN reply to your letter of the 5th instant, asking for an estimate of the cost of extracting the meteorological data for the district required by Mr. Blanford for the period of one month, I beg to state that the cost, including preliminary examination and preparation, together with the value of the books used in the extraction, would be about 100l. This estimate is framed upon the work done by our own clerks, who have had special training in this branch, and is limited to the logs now in this Office.

Sir Louis Mallet, C.B., (Signed) ROBERT H. SCOTT,
Under Secretary of State, India Office. Director.

Mr. Scott submitted the following report:—

I HAVE to report that I have completed my inspection of the stations in the north of England and in Ireland and Scotland.

York, visited July 26.—This station was found in good order, excepting that the ill health of the observer has caused some irregularity in the reports. The observer referred to has died since my visit.

Scarbro', visited July 26.—This station was in very good order; I have hopes of ere long obtaining a site for a Stevenson's thermometer screen, to be used instead of the wall screen now in use.

North Shields, visited July 27.—This station was satisfactory. I set up the thermometers in the new Stevenson's screen and the rain gauge in Dockwray Square, the site recently granted to us through the exertions of Mr. J. R. Procter. This change will be a very marked improvement as regards the value of the Shields reports.

Leith, visited July 28.

Aberdeen, visited July 30.

Sumburgh Head, visited August 2.—There has been a great change at this station during this year, Mr. Lawrence the former observer having gone to Fair Isle. The instruments have consequently been removed from Vatchly school-house to Dunrossness Manse, at a distance of half a mile, the Rev. W. Brand, the Minister, having undertaken the duty of reporting.

The manse is not so well placed as the school-house for observations of wind and sea disturbances, as it is on a lower level than the school-house, but in other respects the exposure leaves nothing to be wished, while as regards the wind there is not much in the way of shelter to break its force.

* Letter M.O. 1869/75 not printed here.

I have every hope that Mr. Brand will make a good observer. I have arranged with him that, as long as the cable is not in action, the allowance for the duty of reporting shall be only 2s. 6d. per week instead of 5s., the regular allowance.

Thurso and Wick, visited August 4.—These stations are in fairly good order.

Nairn, visited August 5.—This station has been removed from the town to a distance of about two miles, owing to a change in the locality selected for the school. The new site is on the edge of a wood, and affords a fairly free exposure for the thermometers and rain gauge, but is not so satisfactory for the estimation of wind force, at least from the side on which the wood lies. This is, however, of minor importance, as the wind at Nairn is very local in its character. The instruments were in good order.

Stornoway, visited August 7.—In a very satisfactory state.

St. Ann's Head, visited September 13.—This station continues to be one of the best we have.

Valencia, visited September 16.—This station is in a satisfactory state, Stevenson's screen has just been erected, and I transferred the thermometers to it, so that I expect an improvement in the reports of temperature.

Roche's Point, visited September 18, and found in very good order.

Kingstown, visited September 20.—Instruments found in good order, but observer was discovered to read the barometer vernier wrongly. An error in the Kingstown readings had long been suspected, but the detection of the cause was not easy, and had baffled our efforts. It is now set to rights.

Donaghadee, visited September 22.—Found in a fairly satisfactory condition.

Malville (Greencastle), visited September 23.—At this station the observer Mr. M'Gladery, has been dismissed by the post office authorities without consultation with this Office, and so I propose to appoint Mr. Lowry, the petty sessions clerk and schoolmaster, to act in his place, as soon as he shall have learnt the duties. He is a well educated man, and can provide a far better exposure for the instruments than is possible on the post office premises.

Holyhead, visited October 8.—This station continues in good order, but the observer is not of so high a class as I could wish. However, in such a place as Holyhead, it is not possible to secure the services of a thoroughly qualified observer, and at the same time of a station affording good opportunities of taking observations of wind and sea.

The stations of *Androssan*, *Bidston Observatory* (Liverpool), and *Nottingham* have not been inspected this year.

I have further to report that I have inspected all the observatories during the year, and that Mr. Beckley has also visited them, and examined into the condition of their respective instruments.

The question of the thermograph scales at Aberdeen observatory, already mentioned on the Minutes (Minutes 1874, p. 95), has given much trouble, and I have to ask your permission to supply a new thermometer to replace the dry bulb.

The most serious matter to which I have to draw your attention is the loss which we have sustained in the death of the Rev. T. Kerr (which occurred on the 22nd August) of typhus fever, caught in visiting the poor at Valencia.

As soon as the Office was informed of the illness of Mr. Kerr, Kew Observatory was requested to send Mr. Cullum to take temporary charge of the observatory, which Mr. Jeffery most kindly consented to do. Mr. Cullum remains at Valencia for the present, and I have ventured to allow him temporarily the same scale of pay as Mr. Kerr.

I have to submit to you the names of several gentlemen who are candidates for the vacant appointment.

I have further to report that I have visited the following extra stations, *Sandwich*, *Seaham Harbour*, *Glenalmond*, *Durham Observatory*, which I found in a satisfactory condition.

Oct. 11, 1875.

I am, &c.
(Signed) ROBERT H. SCOTT.

Mr. Scott was instructed to send a list of all the candidates for the vacant post with their qualifications to each member of the Committee, and to announce the election for the 25th instant.

Submitted—The following correspondence:—

Ministry of Public Instruction, Rome, July 16, 1875.

THE congress or meeting of Italian scientific men will be held at Palermo on the 29th of August next.

The Government is anxious to take advantage of this opportunity, when many distinguished men of Science will be assembled, to have a question discussed which appears to it of extreme importance, viz., that of the organization of the Italian Meteorological Service, a subject which has already been debated upon several times, but which has never yet been settled in a satisfactory manner.

From the accompanying programme you will perceive which are the principal points on which the undersigned considers it desirable to draw the attention of the meeting. He appeals to you as an European celebrity, and would be much gratified by your conferring the honour of your presence at the meeting, and contributing to the happy solution of the numerous and important questions relating to the solid foundation of our meteorological organization.

With much esteem,

The Director,

Meteorological Office, London.

For the Minister,

(Signed) BETTI.

21st June 1875.

I HAVE the honour to acknowledge the receipt of your very flattering invitation to attend the Scientific Congress at Palermo at the end of August and of the programme of meteorological questions to be discussed at that meeting.

I regret most sincerely that it will not be possible for me to leave England this autumn, so that I should not be able to take part in the important deliberations which will be held.

I can only express the hope that among the results of the meeting will be a further development of our science in Italy, a country to which we already owe so much.

ROBERT H. SCOTT.

The following cheques were drawn for July, on the 19th of that month, on the signature of the Earl of Rosse.

		£	s.	d.	£	s.	d.
For Office :							
R. H. Scott	-	66	13	4			
J. S. Harding, jun.	} Salaries and wages	20	0	0			
J. S. Harding, sen.		*7	14	0			
T. D. Bell		6	13	4			
					101	0	8
For Observatories :							
Thos. Kerr, Valencia, Salary	-				20	16	8
R. H. Curtis	} Computations	13	6	8			
A. J. Rigby		*7	14	0			
C. H. Thompson		*5	4	0			
C. Stodart		*8	8	0			
J. A. Curtis		9	3	4			
					43	16	0
For Telegraphy :							
F. Gaster	} Computations	†17	10	9			
W. L. Dallas		†10	6	9			
F. Brodie		†8	17	3			
					36	14	9
For Ocean Meteorology :							
H. Toynbee, Marine Superintendent	-				33	6	8
R. Strachan	} Computations and Care of Instruments	20	16	8			
C. Harding		†15	16	4			
T. E. Allen		9	3	4			
J. W. McVeagh		*5	4	0			
					51	0	4
For Offices Expenses :							
J. S. Harding, jun., on account	-				100	0	0
					£386	15	1

On the 16th August :

J. S. Harding, jun., Office Expenses, on the signature of				
Admiral Richards	-	-	-	50 0 0

A cheque for 20*l.* on account, was drawn for Mr. R. Beckley on the 24th July, on the signature of Mr. De La Rue.

The following cheques for August were drawn on the 30th of that month, on the signature of Admiral Richards :—

		£	s.	d.
For Office :				
R. H. Scott	} Salaries and wages	66	13	4
J. S. Harding, jun.		20	0	0
J. S. Harding, sen.		†9	12	6
T. D. Bell		6	13	4
Carried forward	-	£102	19	2

* Four weeks to July 24th.

† Including allowance for extra attendance.

‡ Five weeks to the 28th August.

	£	s.	d.
Brought forward	102	19	2
Cole and Leigh, coals	10	8	0
Wightman and Co., printing	1	2	0
" " "	2	8	6
Williams and Norgate, books	3	10	6
For Observatories:			
R. & J. Beck, repairing pantograph	1	7	6
" zinc plates	10	9	10
	11	17	4
Hopkin and Williams, chemicals	6	9	3
S. Jeffery, waxed paper	9	10	0
D. Thomson, Aberdeen, postages	2	19	9
L. P. Casella, new instruments	26	2	6
R. H. Curtis	13	6	8
A. J. Rigby	*9	12	6
C. H. Thompson	*6	10	0
C. Stodart	*10	10	0
J. A. Curtis	9	3	4
For Telegraphy:			
N. J. Holmes, Scilly Co.	9	3	9
V. Brooks, Day and Son, printing	2	8	0
F. Dangerfield, D.W. Charts	12	14	3
F. Gaster	†17	4	3
W. L. Dallas	†10	17	7
F. Brodie	†8	7	2
For Ocean Meteorology:			
Captain H. Toynbee, Marine Superintendent	33	6	8
J. H. Woodstock, packing cases	3	11	0
L. P. Casella, "A" thermometer	32	5	0
" rain gauges	20	0	0
	52	5	0
Elliott Brothers, aneroid	2	19	0
P. A. Feathers, Dundee agent	1	13	4
R. Strachan	†20	16	8
C. Harding	†16	18	4
T. E. Allen	9	3	4
J. W. McVeagh	*6	10	0
On Account:			
R. H. Scott, inspections	40	0	0
J. S. Harding, jun., Office expenses	90	0	0
"	40	0	0
Total	£604	14	8

On the 7th September:

J. E. Cullum, Valencia, on account, on the signature of General Strachey	50	0	0
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The following cheques for September were drawn on the 27th September on the signature of Captain Evans:

For Office:

R. H. Scott	66	13	4
J. S. Harding, jun.	20	0	0
J. S. Harding, sen.	§7	14	0
T. D. Bell	6	13	4

Carried forward - - - £101 0 8

* Five weeks to the 28th August.

† Allowance for extra attendance to 21st August.

‡ Including allowance for care of instruments.

§ Four weeks to the 25th.

	£	s.	d.
Brought forward	101	0	8
H. Bond, fittings, &c.	38	6	0
C. W. Jacques, rent	133	13	0
Wightman and Co., printing	2	4	0
For Observatories :			
D. Thomson, Aberdeen	†61	17	6
T. R. Robinson, Armagh	40	14	0
„ expenses for quarter	11	16	6
	52	10	6
W. P. Dymond, Falmouth	†65	12	6
R. Grant, Glasgow	†61	17	6
H. Williams, Holyhead	2	13	5
S. Jeffery, Kew	62	10	0
„ Examiner of Records	100	0	0
	162	10	0
C. Clouston, Orkney	2	10	0
G. H. Aird, Seaham	2	10	0
S. J. Perry, Stonyhurst	†49	7	6
J. E. Cullum, Valencia	61	11	6
G. T. Watson, Yarmouth	4	0	6
T. Culleton, Stencils	2	2	0
Malby and Sons, anemograph forms	7	10	0
„ rain gauge	5	10	0
	13	0	0
P. Adie, barometers, &c.	8	16	0
Allan, Brothers, freight	1	13	0
H. Taylor and Son, freight and charges	3	7	7
R. H. Curtis	13	6	8
C. H. Thompson	*5	4	0
C. Stodart	*8	8	0
J. A. Curtis	9	3	4
For Telegraphy: Quarterly Allowances, &c.:			
H. Todd, Cambridge	4	0	0
J. Costello, Dover	3	5	10
J. Tilston, Holyhead	3	6	6
G. Mitchell, Kingstown	3	6	4
F. Gaster, London	3	5	0
W. D. Penny, Nairn	4	4	6
E. J. Lowe, Notts	3	18	0
J. Lucas, Oxford	3	6	0
J. Merrifield, Plymouth	3	5	0
W. Sandford, Portishead	4	1	6
W. Thomas, Scilly	4	8	9
J. Smith, Stornoway	3	5	0
J. Trotter, Thurso	3	5	0
J. Sinclair, Wick	3	5	0
G. T. Watson, Yarmouth	3	6	6
C. Wakefield, York	3	5	0
Wightman & Co., B.P. wrappers	7	0	0
F. Gaster	†20	9	3
W. L. Dallas	†9	14	10
F. Brodie	†9	15	7
For Ocean Meteorology :			
H. Toynbee, Marine Superintendent	33	6	8
P. Adie, repairing "A" Barometers	19	1	0
„ „ B.T. „	20	16	0
	39	17	0
Carried forward	£1,044	2	5

* Four weeks to the 25th.

† 12s. 6d. deducted for forms supplied.

‡ Including allowance for extra attendance.

	£	s.	d.
Brought forward - - -	1,044	2	5
J. Gill, Liverpool agent - - -	114	15	2
J. R. Jones, Aberdeen agent - - -	2	2	10
Street Bros., advertisements - - -	1	2	6
R. Strachan - - -	*20	16	8
C. Harding - - -			
T. E. Allen - - -			
J. W. McVeagh - - -			
Computations - - -	†15	12	8
	9	3	4
	‡5	4	0
For Office Expenses:—			
J. S. Harding, jr., on account - - -	80	0	0
" " " " - - -	40	0	0
Total - - -	£1,232	19	7

Submitted—The following Abstract of Accounts from 1st April 1875 to 30th September 1875:—

Receipts.			Payments.		
	Received.	Due.		Paid.	Estimated Liabilities.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.
Balance from 1874-5 - - -	1,826	15 5	OFFICE:		
Vote for year - - -	10,000	0 0	Salaries - - -	675	0 0
Commissions for instruments, &c. - - -	330	16 1	Rent, fuel, &c. - - -	336	11 10
Subscriptions for D.W. Charts - - -	119	7 0	Contingencies - - -	128	8 2
Interest on deposit account - - -	7	17 0	LAND METEOROLOGY:		
Sundries - - -	43	15 8	Expenses at observatories - - -	1,287	19 0
			New instruments for ditto - - -	198	5 5
			Computations - - -	430	18 11
			Telegraphy - - -	507	11 7
			Inspections, D.W. Charts, &c. - - -	251	13 6
			Computations - - -	352	12 1
			OCEAN METEOROLOGY:		
			Marine superintendent - - -	200	0 0
			Instruments, Admiralty - - -	257	11 9
			Ditto, Mercantile Marine, Agencies, &c. - - -	165	2 11
			Computations and care of Instruments. - - -	460	3 7
Totals - - -	£12,328	11 2	Totals - - -	£5,251	18 9
		84 6 5			1,040 0 0

Probable net amount available on 1st October 1875 - - - £6,120 18 10

Read—A letter from Captain Toynbee submitting excellent Logs kept by

Captain J. Blair, barque "Arouca."

" H. Campbell, ship "Burdwan."

" A. J. Miller, ship "Camperdown."

" G. Shaw, s.s. "Beta."

" W. Warden, s.s. "Alpha."

" R. J. Balderston, ship "Rajmahal" (Minutes 1873, p. 79).

" W. Ellery, ship "Bowfell" (Minutes 1874, p. 80).

" F. J. Gray, R.N., H.M.S. "Nassau."

(Log kept by Lieutenants S. A. Holt, and G. N. A. Pollard).

" E. Carl V. Heggum, ship "Rozelle" (Minutes 1874, p. 80).

" J. P. Holdich, barque "Agra" (Minutes 1874, p. 50).

" C. Johnson, ship "St. Lawrence" (Minutes 1874, p. 36).

" G. H. Jones, s.s. "Dwina" (Minutes 1874, p. 61).

" T. M. Jones, R. N., H.M.S. "Glasgow" (Minutes 1875, p. 24).

(Log kept by Staff Commander R. Jackson).

" A. Kerr, ship "Ardgowan" (Minutes 1874, p. 80).

" H. Longley, s.s. "Yorkshire" (Minutes 1874, p. 80).

" C. Maples, ship "Riversdale" (Minutes 1875, p. 80).

* Including allowance for care of instruments.

† Including allowance for extra attendance.

‡ Four weeks to the 25th.

- Captain C. W. Pearson, s.s. "Strathclyde" (Minutes 1875, p. 19).
 „ T. C. Potts, ship "Tenasserim" (Minutes 1874, p. 80).
 „ C. H. Renaut, ship "Crusader" (Minutes 1874, p. 80).
 „ G. R. Stuart, ship "Oamaru" (Minutes 1874, p. 38).
 „ W. Symington, s.s. "Hankow" (Minutes 1874, p. 61).
 „ C. E. le Poer Trench, ship "Newcastle" (Minutes 1875, p. 8).
 „ H. P. Wight, ship "Dunalistair" (Minutes 1871, p. 27).
 „ H. G. Wilcox, R.N.R., s.s. "Glenfinlas" (Minutes 1871, p. 40).

Mr. Scott was instructed to present the Wind and Current Charts to the five first-named gentlemen and to express to the others the marked thanks of the Committee.

Reported—That estimates amounting to 24*l.* 8*s.* 6*d.* and 10*l.* 15*s.* respectively had been accepted for extra bookshelves, and for whitening ceilings in the Office, and that the work had been executed (Minutes p. 51).

Reported—That Mr. McVeagh had resigned his appointment as temporary clerk on the 24th ult. Mr. Scott was instructed to procure a successor to him.

Submitted—The following publications:—

Q. W. R., 1873, Pt. 4	-	-	-	-	27 July.
Instructions in the Use of the Meteorological Instruments	-	-	-	-	3 August.
Report, 1874 -	-	-	-	-	10 "
Q. W. R., 1874, Pt. I	-	-	-	-	16 "
Hourly Observations to April 1875.	-	-	-	-	

A cheque was drawn transferring 5,000*l.* from the current account of the Committee to their deposit account at the London and Westminster Bank.

SUBMITTED—The following STATEMENT respecting the RECORDS for June 1875, received from the SELF-RECORDING OBSERVATORIES, which have been examined at KEW OBSERVATORY (see Minutes 21st December 1868).

	Aberdeen.	Armagh.	Falmouth.	Glasgow.	Kew.	Stonyhurst.	Valencia.
	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.
ANEMOGRAPH :—							
Action - - - - -	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Records deficient, due to stoppage of clock	0 0	0 0	0 0	0 0	0 0	0 0	0 0
" " other causes - - -	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Orientation verified - - -	0 0	0 0	0 0	0 0	0 0	0 0	0 0
No. of errors discovered by subsidiaries	0 0	0 0	0 0	0 0	0 0	0 0	0 0
" " irregular differences	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Result of 40 Remasurements :—							
Greatest difference - - -	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0
Mean difference irrespective of sign - - -	0.1 0.4	0.3 0.4	0.2 0.4	0.3 0.4	0.1 0.1	0.2 0.2	0.6 0.6
Residual difference (— Kew) - - -	0.0 +0.1	0.0 0.0	-0.1 +0.1	0.0 0.0	0.0 0.0	-0.1 +0.1	0.1 0.1
RAIN GAUGE :—							
Action - - - - -	Good.	Fair.	Fair.	Fair.	Good.	Good.	Fair.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
" " other causes - - -	0	0	0	0	0	0	0
Errors in tabulation - - -	0	1	0	0	0	2	2

BAROGRAPH :—

Action - - -	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.
Photography - - -	0	0	0	0	0	0
Records deficient, due to stoppage of clock	3 hrs.	0	0	0	0	0
failure of light	0	0	0	0	0	0
other causes -	0	0	0	0	0	0
No. of errors discovered—						
In entry of standard	1	4	0	0	7	0
calculating residual correction	1	0	0	0	0	0
applying residual correction	0	1	0	0	1	0
subtraction in subsidiary tables	0	0	0	0	0	0
tabulation by subsidiaries	0	0	0	0	0	0
irregular differences	1	0	0	0	0	0

Result of 40 Remeasurements :—

Greatest difference - - -	0.0040	0.0050	0.0050	0.0030	0.0040	0.0050
Mean difference irrespective of sign	0.0018	0.0019	0.0017	0.0009	0.0016	0.0023
Residual difference (—Kew)	—0.0001	—0.0009	—0.0010	—0.0004	—0.0009	+0.0012
Mean monthly difference between simultaneous						
Barograph and Barometer readings	0.0016	0.0026	0.0020	0.0015	0.0018	0.0026

THERMOGRAPH :—

Action - - -	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.
Photography - - -	Dry. 0	Wet. 0	Dry. 0	Wet. 0	Dry. 0	Wet. 0
Records deficient, due to stoppage of clock	0	0	0	0	0	0
failure of light	0	13	0	0	0	0
imperfectly moistened	—	0	—	0	—	0
bulbs -	—	0	—	0	—	0
partially frozen	—	0	—	0	—	0
other causes -	0	0	0	0	0	1
No. of errors discovered in entry of Standard	0	1	0	0	0	3
by subsidiary measurements	0	0	0	0	0	0
of subtraction in do. tables	0	0	0	0	0	0
detected under glass scale	0	0	0	0	0	0

Result of 40 Remeasurements :—

Greatest difference - - -	0.20	0.20	0.2	0.10	0.10	0.20
Mean difference irrespective of sign	0.08	0.10	0.07	0.06	0.07	0.06
Residual difference (—Kew)	+0.08	+0.09	—0.01	—0.02	—0.06	0.00
Mean monthly difference between simultaneous						
Thermograph and Thermometer readings	0.14	0.23	0.08	0.12	0.15	0.13
No. of errors in maxima and minima	0	0	1	0	2	5

* 3 hrs. lost whilst clock was cleaned.

have been examined at Kew Observatory (see Minutes, 21st December 1868).

Points noticed at Kew.		Aberdeen.		Armagh.		Falmouth.		Glasgow.		Kew.		Stonyhurst.		Valencia.	
Action	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.	Direction.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " other causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orientation verified	31st	31st	31st	31st	31st	31st	31st	31st	31st	31st	31st	31st	31st	31st	31st
No. of errors discovered by subsidiaries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " irregular differences	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Result of 40 Remasurements :—															
Greatest difference	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean difference irrespective of sign	0.3	0.5	0.3	0.6	0.3	0.2	0.3	0.1	0.2	0.1	0.2	0.3	0.4	0.2	0.4
Residual difference (— Kew)	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1	—0.1
RAIN GAUGE :—															
Action	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " other causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Errors in tabulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " other causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Errors in tabulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
" " other causes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Errors in tabulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BAROGRAPH :—

Action	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.
Photography	0	0	0	0	0	0
Records deficient, due to stoppage of clock	0	0	0	0	0	0
failure of light	0	0	0	0	0	0
other causes	0	0	0	0	0	0
No. of errors discovered—	5	5	0	0	1	1
In entry of standard	1	1	0	0	0	0
calculating residual correction	3	4	0	0	2	2
applying residual correction	0	4	0	0	0	0
subtraction in subsidiary tables	0	0	0	0	0	0
tabulation by subsidiaries	0	0	0	0	0	0
irregular differences	0	0	0	0	0	0
Result of 40 Remeasurements :—						
Greatest difference	·0040	·0050	·0030	·0050	·0050	·0040
Mean difference irrespective of sign	·0016	·0018	·0012	·0018	·0019	·0020
Residual difference (— Kew)	+ ·0003	+ ·0010	— ·0003	+ ·0011	— ·0010	— ·0004
Mean monthly difference between simultaneous barograph and barometer readings	·0016	·0029	·0021	·0017	·0015	·0025
Errors in dating curves	0	0	0	2	0	0

THERMOGRAPH :—

Action	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.	Good. Do.
Photography	0	0	0	0	0	0
Records deficient, due to stoppage of clock	0	0	0	0	0	0
failure of light	0	0	0	0	0	0
imperfectly moistened bulbs	0	0	0	0	0	0
partially frozen	0	0	0	0	0	0
other causes	0	0	0	0	0	0
No. of errors discovered in entry of standard	1	1	15 hrs.	0	0	0
by subsidiary measurements	0	0	0	0	0	0
of subtraction in do. tables	0	0	0	0	0	0
detected under glass scale	0	0	0	0	0	0
Result of 40 Remeasurements :—						
Greatest difference	0·10	0·20	0·10	0·20	0·20	0·20
Mean difference irrespective of sign	0·06	0·07	0·04	0·04	0·04	0·06
Residual difference (— Kew)	+ 0·06	+ 0·05	+ 0·04	+ 0·04	+ 0·05	+ 0·03
Mean monthly difference between simultaneous thermograph and thermometer readings	0·12	0·17	0·10	0·13	0·18	0·14
No. of errors in maxima and minima	0	0	0	0	0	3
in entry of tabulated readings into tabulation sheets	0	0	0	0	1	0
Errors in dating curves	0	0	0	0	2	0

The Committee then adjourned.

116, Victoria Street, October 25, 1875.

PRESENT:

Mr. Galton in the Chair.

Captain Evans. | Rear-Admiral Richards. | Major-General Strachey.

The Director was in attendance.

The Minutes of last meeting (October 11) were read and confirmed.

Mr. Scott reported the death of Sir Charles Wheatstone, which had occurred in Paris on the 20th inst.

Read—A letter (No. 2,121) from Mr. Gassiot, tendering his resignation of his seat on the Committee, owing to the state of his health.

The consideration of this letter was postponed for the present, and Mr. Scott was instructed to send the following reply:—

DEAR SIR,

THE Committee have requested me, in acknowledging your letter of the 10th inst., to express their very sincere regret at your wish to give up your place in their body, inasmuch as they feel that the success of the Office has been in great measure due to the valuable advice you have from time to time afforded them, and to the very active part you have for so many years taken in their proceedings. They will take a suitable opportunity of giving effect to your wishes that your resignation should be communicated to the Council of the Royal Society, and they will address you further on the subject.

Submitted—The following letters:—

M.O. 2112.

SIR,

Hamburg, 7 October 1875.

THE Resolutions adopted by the International Meteorological Congress of Vienna, recommended, among other important matters, as necessary for the advancement of Maritime Meteorological inquiry, that the *division of labour* with regard to the eligible areas should be carried through on an international basis. In consequence of this, and with the object to instate the principle involved in the named Resolutions, the Meteorological Institutes of the Netherlands and Germany ("Seewarte") have come to a mutual agreement tending, as they believe, to further the objects in view very materially. According to which the former will work out and publish the Meteorological Observations for the China Sea (between 0° and 30° N. lat., the coast, and 150° E. long.), while to the latter was allotted the area of the North Atlantic between 30° and 50° N. lat., and from coast to coast. The Institutes will supply each other with the entire respective material in such a form that it is already arranged in squares of one degree. The direction of the "Deutsche Seewarte," bringing this fact to the knowledge of the Director of the Meteorological Institute of Great Britain, solicits his kind assistance, and begs he may be pleased to furnish the "Seewarte" with the Meteorological data over the area of the North Atlantic above named.

In return the Direction declares to be most willing to send to the Meteorological Institute of London any Maritime Meteorological material in its possession, provided the area is named and defined, and has no doubt that the Institute of Utrecht will most readily enter into a similar arrangement of reciprocity, as soon as a desire to that effect is made known.

The labours in connexion with this agreement have already been commenced by the "Deutsche Seewarte," and the Direction should therefore feel greatly obliged by an early and favourable answer from the Director of the Meteorological Institute.

By order,

W. WAGNER,

The Direction of the Deutsche Seewarte.

R. H. Scott, Esq.

M.O. 2075.

SIR,

Utrecht, October 2, 1875.

I AM so happy to communicate to you that the German Meteorological Institute has accepted my proposition for distributing the areas among us, according to what I said in my sequels to the "Suggestions on a Uniform System of Meteorological Observations," pp. 48, 49, and that it is agreed that the German Institute should send to us all materials relating to the China Sea north of the equator to 36° N. lat., and from the coast to 150° E. long., while I have bonded myself to give in return our observations in the Atlantic, between 30° and 50° N. lat., and from coast to coast.

We would both be very much pleased, if you should think it desirable to supply us with your

materials, and we offer to send into your Institute the materials relating to another area you may choose, of course in such a form that it is already arranged in squares of one degree.

The publications themselves should be as much as possible in the same form and on the same scale, in order that the different tables may be easily joined and juxtaposed.

R. H. Scott, Esq.

BUYS BALLOT,
Director of the Dutch Meteorological Institute.

Mr. Scott was instructed to send the following reply :—

SIR,

IN reply to your letter of the — inst., I am instructed by the Committee to inform you that they have received with great interest the intelligence that the Deutsche Seewarte had arranged with the Royal Meteorological Institute of the Netherlands for a mutual interchange of the observations in the respective offices relating to the districts of the ocean which you have severally undertaken to investigate.

With reference to your request for an interchange of observations with this Office, I am to assure you that it will give the Committee sincere gratification to supply you with any information in this Office which can be of use to you, on the condition that you defray the expense of copying the observations for areas of one degree, this being the invariable practice of this Office in the supply of materials, as has been fully explained at Leipzig and Vienna, and more recently at the Conference for Maritime Meteorology in London.

The observations in this Office are kept in the original logs, unreduced, unless they have been used for investigations prosecuted by this Office. No original logs are allowed to leave the Office, and the process of reduction and copying into any forms which you may prefer, of the mass of material in our possession for the district you have named, will be proportionate to its amount. The Committee desire me to express their regret that there are no funds at their disposal which would enable them to supply the information on any other basis than that above named.

If we should find that any materials in your Office are likely to be of utility to this Office for its investigations, we should be most happy to defray the cost of copying them.

The consideration of the candidates for the post of Superintendent of the Observatory at Valencia was taken up, and the names of Messrs.

J. E. Cullum,

John Dallas,

Lovel Squire,

were selected for reconsideration on Monday, Nov. 1st.

Submitted—The following Report :—

ON THE VARIATIONS IN THE CORRECTIONS OF HYDROMETERS.

Let K represent the correction given for a hydrometer at the Kew Observatory, and M that found at the Meteorological Office after an interval Y, of years. Then $M - K = \pm V$, is the variation of the correction, which, if +, is due to a deposit of salt or dirt on the instrument, or to contraction of its volume, or to both causes combined; and, if —, is due to the wear of the instruments, or its enlargement of volume, or to both causes combined. The hydrometers under consideration were all of them made of glass, and no symptoms of wear were discernible, and they were always cleaned for comparison with the standard; consequently this investigation has merely to decide whether they undergo enlargement or shrinkage by use and age, assuming that the corrections have been carefully ascertained. There is, however, the liability of the scale slipping; but, unless this has been evident, it must somewhat affect the result. Those only of which the scales had undoubtedly shifted have been rejected. The scale, if it shifts at all, generally slips down the stem, but instances sometimes occur of it having slipped up the stem.

The detailed results are given on the next page. The mean variation is only + 0.2, indicating slight shrinkage, but practically it tends to show that these instruments undergo no material change in weight or volume. The extreme variations range from + 2.0 to — 2.5, or an extreme error of 4.5 divisions. These extremes may sometimes be due to mistakes in comparisons, but are more probably owing to shifting of the scales, which cannot always be detected by simple inspection, and hence the necessity for trying these instruments after they return from a voyage.

I have thought these results of sufficient interest to bring under your notice.

To the Director,
Meteorological Office.

R. STRACHAN,
1875, Oct. 23rd.

The following are the results obtained :—

Part of Scale compared.	Variation.			Interval of Years.	Number of Instruments tried.
	Mean.	Max.	Min.		
0	-0.2	+1.6	-1.2	2	11
"	-0.1	+2.0	-0.9	4	104
"	+0.3	+1.7	-1.0	6	27
"	-0.5	+0.7	-2.5	12	10
"	-0.2	-0.1	-0.3	14	3
"	+0.6	+1.6	-1.0	16	17
"	0.0	+0.9	-1.1	18	26
"	+0.1	+1.3	-1.5	20	18
15	+0.2	+0.5	-0.1	1	2
"	+0.3	+0.4	0.0	4	5
"	+1.1	+1.1	—	13	1
"	+0.5	+0.5	—	17	1
24	+0.1	+0.8	-0.4	1	11
"	0.0	+1.7	-0.6	4	9
"	-0.1	+1.4	-1.4	5	7
"	-0.4	-0.2	-0.7	13	2
"	+0.2	+0.5	-0.2	15	4
"	+0.4	+0.4	—	20	1
27	-0.4	-0.1	-0.8	2	2
"	+0.8	+0.8	—	15	1
35	+0.2	+1.2	-0.6	2	36
"	-0.3	+0.8	-1.0	3	9
"	+0.7	+1.2	+0.3	13	5
"	+0.2	+0.7	-0.1	16	6
"	+0.3	+2.0	-1.1	17	4
40	+0.2	+0.7	-0.3	2	2
"	+0.8	+1.3	-0.1	14	3
"	+0.6	+0.8	+0.4	16	2
Mean and extremes }	+0.2	+2.0	-2.5	Of all —	
"	+0.3	+2.0	-2.5	12 and over.	
"	0.0	+2.0	-1.4	6 and under.	

Mr. Scott drew the attention of the Committee to certain inaccuracies in the barogram tabulations for Glasgow and Aberdeen for 1874, which had not been detected by the preliminary examination at Kew, and he was instructed to communicate with the respective directors on the subject.

Reported—That the Hydrographic Office of the Imperial Russian Navy had requested an exchange of publications with the Office.—Accepted.

Mr. Scott reported that he had arranged with Professor Wild for a mutual interchange of a complete set of meteorological instruments for stations of the second order.

The Russian instruments had arrived, and were as follows :—

Syphon barometer.	1 hair hygrometer.
2 ordinary thermometers.	1 rain gauge.
1 minimum thermometer.	1 wind pressure gauge.
1 thermometer screen.	

He had sent off by steamer on the 21st inst. the following instruments in return :—

1 Kew barometer	Set as supplied for use on board ship.
1 set thermometers (6)	
1 set hygrometers (4)	
1 thermometer screen	
1 maximum thermometer	Extra supply for land stations.
1 minimum thermometer	
1 rain gauge	
1 Stevenson's thermometer screen	

Approved.

Read—A letter from the coast-guard officer at Ryde, requesting that the fishery barometer formerly supplied to St. Helen's, but no longer in use there, might be erected at the coast-guard station at Ryde.—Approved.

Reported.—That Mr. W. Allingham, formerly 3rd officer, ship "Grace Darling," of Boston, U.S., had been appointed a temporary clerk in the place of Mr. M'Veagh, at the salary of 1*l*. 18*s*. 6*d*. per week, commencing from the 18th inst.

The following cheques for the month of October were drawn:—

For Office :		£	s.	d.
R. H. Scott,	Salaries and Wages	-	-	66 13 4
J. S. Harding, jun.,	"	-	-	20 0 0
J. S. Harding, sen.,	"	-	-	* 7 14 0
T. D. Bell,	"	-	-	6 13 4
Reeves and Turner, Books	-	-	-	4 10 0
For Observatories :				
S. Jeffery, Sundry Expenses	-	-	-	40 13 1
" Verifications	-	-	-	16 0 0
Negretti and Zambra, Thermometers	-	-	-	61 16 0
R. H. Curtis, Computations	-	-	-	13 6 8
C. H. Thompson,	"	-	-	* 5 4 0
C. Stodart,	"	-	-	* 8 8 0
J. A. Curtis,	"	-	-	9 3 4
For Telegraphy :				
W. Brand, Shetland Reporter	-	-	-	1 12 0
S. M. Clare, Submarine Telegraph Company	-	-	-	32 4 5
Postmaster General, Telegrams, June Quarter	-	-	-	267 13 0
F. Dangerfield, Delivery of Daily Weather Charts	-	-	-	12 19 4
F. Gaster, Computations	-	-	-	† 18 13 8
W. L. Dallas,	"	-	-	† 10 4 0
F. Brodie,	"	-	-	† 9 0 11
For Ocean Meteorology :				
H. Toynbee, Marine Superintendent	-	-	-	33 6 8
S. Jeffery, "A" Verifications	-	-	27 14 0	
" "B.T." "	-	-	13 16 0	
				41 10 0
Negretti and Zambra, "A" Instruments	-	-	27 3 3	
" " "B.T." "	-	-	23 0 0	
				50 3 3
D. McGregor & Co., Glasgow Agent	-	-	-	8 2 2
Steel and Jones, "Shipping Gazette"	-	-	-	3 5 5
R. Strachan, Computations	-	-	-	† 20 16 8
C. Harding,	"	-	-	† 16 7 4
T. E. Allen,	"	-	-	9 3 4
For Office Expenses :				
J. S. Harding, jun., on account	-	-	-	100 0 0
				<u>£895 3 11</u>

* Four weeks to the 23rd.

† Including extra attendance to the 23rd.

‡ Including allowance for care of instruments.

The Committee then adjourned.

116, Victoria Street, November 1, 1875.

PRESENT :

Mr. De La Rue in the Chair.

Captain Evans.

Rear-Admiral Richards.

Mr. Galton.

Major-General Strachey.

The Director was in attendance.

The Minutes of last meeting (October 25) were read and confirmed.

Submitted—The following letter :—

M.O. 2230.

SIR,

WITH reference to your letter of the 11th instant, to the effect that the cost of extracting the Meteorological data for the district of the Bay of Bengal and the Arabian Sea for one month would probably cost 100*l.*, I am directed by Lord Salisbury to request you to be good enough to cause the work referred to to be set in hand in the manner suggested, the cost being chargeable to this Office.

R. H. Scott, Esq.

I am, &c.
(Signed) LOUIS MALLET.

Mr. Scott was instructed to inform the India Office that the work would be at once taken in hand.

Mr. Scott reported that the Daily Chart was now supplied by Messrs Shanks, Revell, & Co. to the following papers :—

The "Times."

The "Sheffield Independent."

„ "Standard."

„ "Newcastle Daily News."

„ "Daily News."

„ "Bradford Observer."

„ "Hour."

„ "Leeds Mercury."

„ "Manchester Evening News."

„ "Liverpool Mercury."

„ "Sussex Daily News."

And that on a recent occasion he had had an interview with Mr. J. C. MacDonald of the "Times" office, regarding the possibility of a special supply by the Office of reports taken in the evening, say at 6 p.m., to the "Times" exclusively, and at the expense of that journal. He submitted the following letter :—

M.O. 2238.

MY DEAR SIR,

The "Times," Printing House Square,
October 28, 1875.

I SHALL be quite prepared, as soon as you are ready for it, to enter into the arrangement with you which we discussed on Monday; the basis of it being an understanding on our side that the "Times" is to pay the cost of daily evening telegrams from ten additional stations, so as to complete the materials for a chart ten hours later than that now issued; also to defray any other incidental expenses connected therewith. On your side, as far as other newspapers are concerned, you will, while we thus share in the cost of its production, supply this evening chart to us exclusively. But of course for your public and scientific objects you are left entirely unfettered.

That was the nature of the arrangement as we discussed it, and on the part of the "Times" I am quite willing to give it early effect.

R. H. Scott, Esq.

Yours truly
(Signed) JOHN C. MACDONALD.

After careful consideration of the question the following resolution was adopted :—

Considering the importance to this Office of obtaining evening reports in order to give a greater continuity to their knowledge of weather changes, and the "Times" being willing to contribute largely to the expense of procuring them, Mr. Scott is instructed to explain to the "Times" the willingness of the Committee to comply with their wishes, as far as this can be done without behaving unfairly to other papers, and to ascertain if the "Times" would be satisfied with a tentative experiment, without the clause of exclusiveness.

The consideration of the candidates for the superintendentship of Valencia Observatory was taken up, and Mr. J. E. Cullum was appointed, subject to the approval of the Kew Committee.

Read—A letter from Captain Toynbee submitting excellent logs by—

Captain David Gray, S.S. "Eclipse." (Minutes, 1874, p. 80.)

„ John Gray, S.S. "Hope." (Minutes, 1874, p. 80.)

„ John Owen, ship "W. G. Russell." (Minutes 1874, p. 37.)

Mr. Scott was instructed to convey the marked thanks of the Committee to these gentlemen.

The Committee then adjourned.

116, Victoria Street, November 8, 1875.

PRESENT :

Major-General Strachey in the Chair.

Mr. De La Rue.

The Director was in attendance.

The Minutes of last meeting (November 1) were read and confirmed.

Mr. Scott stated that he had been informed by Mr. Galton and General Strachey that the Committee of Inquiry announced by the Treasury (Minutes, p. 54) had been appointed.

Mr. Scott was instructed to prepare a précis of the action of the Meteorological Committee in relation to the programme proposed in the original report of the "Committee of Three," 1866.

Read—The following letter :

M. O. 2343.

DEAR SIR,

"The Times," November 11, 1875.

THE "Times" does not ask for anything unfair to other papers, and is quite willing that they also should have the afternoon Charts when they have entitled themselves to the privilege by sharing in the expense.

We are also satisfied to treat these Charts as a tentative experiment, which the Committee are free to abandon at any time on giving reasonable notice.

Believe me, &c.

R. H. Scott, Esq.

(Signed) JOHN C. MACDONALD.

Mr. Scott was instructed to forward the following letter to the Board of Trade :

SIR,

November 16, 1875.

I AM instructed by the Committee to inform you that this Office has received an application from "The Times" for a number of special reports of the weather taken at the Office stations at 6h. p.m. daily, to be collated at and transmitted through the Office for publication next morning, the editor of "The Times" undertaking to reimburse the Office for all expenses connected therewith without laying claim to any exclusive right of receiving the reports to the detriment of other papers.

The Committee consider that the proposal in question would, if carried out, place information at their disposal for storm warning and other purposes which would be of great public advantage, but before acceding to the request made they would be glad to receive the approval of the Board of Trade to the arrangement proposed.

You will perceive that this matter raises the question of this Office making a charge for information supplied to newspapers.

I am, &c.

Thomas Gray, Esq.,
Board of Trade.

(Signed) R. H. SCOTT.

He was further instructed to communicate with the Postmaster-General with a view of organizing the transmission of Weather Reports by telegraph every evening, including Sundays, to meet a demand for such information from the public.

Read—An application from Mr. Cullum for temporary leave of absence from Valencia in order to take over his family to that place, and asking if the Committee would grant him any assistance towards the move.

Mr. Scott was instructed to inform him that the leave would be given, and an advance of half a year's salary authorised.

Read—A letter (No. 2292) from Professor Grant offering to retabulate the Glasgow records at his own cost, for the period for which the discrepancies exist, which were referred to Minutes October 25.

Mr. Scott was instructed to inform him that the Committee will not require him to retabulate the curves.

BAROGRAPH:—

Action	-	-	-	-	-
Photography	-	-	-	-	-
Records deficient, due to stoppage of clock	-	-	-	-	-
" " failure of light	-	-	-	-	-
" " other causes	-	-	-	-	-
No. of errors discovered—					
In entry of standard	-	-	-	-	-
" calculating residual correction	-	-	-	-	-
" applying residual correction	-	-	-	-	-
" subtraction in subsidiary tables	-	-	-	-	-
" tabulation by subsidiaries	-	-	-	-	-
" irregular differences	-	-	-	-	-
<i>Result of 40 Remasurements :—</i>					
Greatest difference	-	-	-	-	-
Mean difference irrespective of sign	-	-	-	-	-
Residual difference (— Kew)	-	-	-	-	-
Mean monthly difference between simultaneous barograph and barometer readings	-	-	-	-	-
Errors in dating curves	-	-	-	-	-

THERMOGRAPH:—

Action -	+Good. Do.	Dry.	Wet.
Photography -	-	-	-
Records deficient, due to stoppage of clock failure of light -	-	-	-
" " imperfectly moistened bulbs -	-	-	-
" " partially frozen -	-	-	-
" " other causes -	-	-	-
No. of errors discovered in entry of standard by subsidiary measurements -	*2 hrs.	0	0
" " by subtraction in do. tables -	0	0	0
" " detected under glass scale -	0	0	0
<i>Result of 40 Remasurements :</i>			
Greatest difference -	0·20	0·20	0·20
Mean difference irrespective of sign -	0·13	0·11	0·11
Residual difference (— Kew) -	-0·12	-0·10	-0·10
Mean monthly difference between simultaneous thermograph and thermometer readings -	0·17	0·20	0·20
No. of errors in maxima and minima -	0	0	0
In entry of tabulated readings into tabulation sheets -	0	0	0

* Mr. Beckley examining instrument.

† Curves throughout the month.

+ Curves throughout the month have been remeasured at Kew and necessary corrections applied, have been tabulated at Kew.

Read—A letter from Captain Toynbee, submitting excellent Logs from—

Captain W. Watson, s.s. "Parthia" (Minutes, 1874, p. 92).

„ J. E. Mouland, s.s. "Batavia" (Minutes, 1875, p. 45).

And recommending that Captain Watson's diagrams of his voyages be lithographed and published.

Mr. Scott was instructed to convey the marked thanks of the Committee to both gentlemen, and to request Captain Toynbee to make a specific proposal as to the number of plates, quantity of letterpress, and nature of the explanations to be given.

Submitted—The monthly diagrams for the 9 squares of the equatorial region of the Atlantic which had been prepared, and on which Captain Toynbee had read a paper at the British Association at Bristol.

Resolved—That Captain Toynbee be requested to publish his paper, with extra copies of the diagrams.

Submitted—The following Report—

SIR,

November 15th, 1875.

I BEG to inform you that on Saturday, the 23rd of October last, I inspected the instruments, &c. at the *Dover* Telegraphic Reporting Station. With the exception of the few defects mentioned below everything was satisfactory.

I am, &c.

R. H. Scott, Esq.,
Director, Meteorological Office.

(Signed) FREDC. GASTER.

DEFECTS OBSERVED.

Check Bar.—No. 157. Attached thermometer defective. In endeavouring to rectify it I broke the bulb off.

Thermometer Screen.—That for maximum and minimum thermometers is *very* rotten, and needs replacing.

Wet Bulb.—Was not so clean as could be wished. I cleaned up all the instruments and had the wet bulb remounted. The positions of the thermometers and raingauge are not so good as could be wished, but I could get no better place.

Read—A letter from Mr. Jeffery (No. 2273) stating that the estimate for the cost of the Pagoda observations had been exceeded by 5*l.* 13*s.* 0*d.* and applying for that sum. The request was acceded to.

Mr. Scott reported that during the illness of Mr. Kerr, Mr. C. O'Sullivan, formerly assistant at Valencia, had kindly taken charge of the observatory for a week. Furthermore that Honoria Guare, the housekeeper, had left the observatory after seven year's service, in order to emigrate, and he requested permission to give a gratuity in each case.

He was authorised to grant the following gratuities—

2*l.* 2*s.* 0*d.* to Mr. C. O'Sullivan.

2*l.* 10*s.* 0*d.* to Honoria Guare.

The Mersey Docks and Harbour Board, at their own suggestion, were taken off the list for the free receipt of the Daily Weather Charts.

The Committee then adjourned.

116, Victoria Street, November 29, 1875.

PRESENT:

Major-General Strachey in the Chair.

Mr. De La Rue.

Mr. Galton.

Major-General Smythe.

The Director was in attendance.

The Minutes of last meeting (November 15) were read and confirmed.

Submitted—The following letter:

M. 17217.

M. O. 2470.

SIR,

Board of Trade, November 26, 1875.

I AM directed by the Board of Trade to acknowledge the receipt of your letter of the 16th inst., submitting an application from the "Times" newspaper for the transmission of special Daily Weather Reports to that newspaper on payment of the expenses connected therewith.

In reply I am to inform you that this Board see no objection to such Reports being furnished by the Meteorological Office to the "Times" or other newspapers, so long as the vote for Meteorological purposes is not exceeded, and the other work of the Office in no way neglected.

R. H. Scott, Esq.

I am, &c.

(Signed) THOMAS GRAY.

Mr. Scott was instructed to write to the Secretary of the Post Office as follows:—

SIR,

Meteorological Office, November 29, 1875.

A PUBLIC demand having been made that later information as to weather, &c. should be published in the "Times," the Committee of this Office have taken the matter into consideration and have consented to the request.

I am accordingly about to give directions for reports, made at 6 p.m. daily, Sundays included, to be sent to this Office for immediate utilization from the following stations:—

Stornoway	Aberdeen
North Shields	Ardrossan
Moville	Valencia
Holyhead	Penzance (for Scilly)
Hurst Castle	Yarmouth

and I have to request therefore that you will be good enough to inform me what would be the extra expense (if any) incurred thereby, on account of opening the offices which would otherwise be closed at that hour on Sundays, and transmitting the reports to this Office.

I may mention that this is simply a question of transmission, not of taking the observations.

I have, &c.

John Tilley, Esq., Secretary, General Post Office.

ROBERT H. SCOTT,

Director.

Mr. Scott reported that further correspondence had taken place between himself and the Harbour Department of the Board of Trade, relative to the requisition for instruments for the lighthouses in the Bahamas (Minutes, p. 54), which was contained in letters 2285 and 2293 from the Board of Trade, and replies 2225, 2300 from the Meteorological Office, and that the Board of Trade having finally agreed to purchase the instruments from the Office, the same had been forwarded for shipment as requested.—Approved.

Submitted—The following correspondence:—

SIR,

Deutsche Seewarte, Hamburg, November 15, 1875.

THE Weather Telegraphy of North-west Europe has hitherto exhibited a gap which has been seriously felt, inasmuch as the telegraphic communications respecting atmospheric conditions in Germany, both in the interior of the country and on the coast, which have reached the neighbouring states have been incomplete. Owing to this want, weather forecasting on the one hand has been rendered much more difficult, while, on the other, an accurate study of the individual phenomena, by means of bulletins and synchronous charts, was scarcely possible. By the establishment of the Deutsche Seewarte, the 3rd Division of which devotes itself exclusively to Weather Telegraphy and storm-warnings; and by the grant to it of suitable means and powers, this circumstance, which caused obstruction in every direction, has been effectively remedied, so that henceforth Germany also will be able to take part in the branch of inquiry in question. Accordingly the time appears to have come for organizing, on some common plan, the telegraphic interchange referred to, by considering the possible co-operation of the individual countries and introducing the same into the system for North-west Europe, by an agreement between the directors of the different central offices for Weather Telegraphy and Storm Warnings. It is certainly unnecessary that I should here state in detail the advantages of such an understanding, since it is self-evident to anyone whose duty it is to undertake weather studies.

I therefore venture to propose to you a Conference with the special object of a discussion relating solely to the subject mentioned, and I have the honour of requesting you to attend here on the 11th, 12th, and 13th of next month, as it seems very desirable that the new arrangement of the matter in question should take place with the beginning of the next year.

For the purpose of general guidance, with respect to the questions to be dealt with, I have ventured to set forth in the enclosure the points which in my humble opinion it is important to settle, and I earnestly request you to have the goodness to favour me with your views in reply, as soon as possible, as well with regard to any changes or additions, so that an *ad hoc* suitable basis for the proposed discussion may be arrived at from the various proposals that may be received.

The following gentlemen have been invited, in an identical circular, to take part in these discussions which will be of a strictly private character:—Buys Ballot, Hoffmeyer, Mohn, Rubenson, and Scott. Each of these gentlemen, as especially in your case, has been urgently requested to comply with the invitation, and I hope it will be possible for each of the Directors to be present on this occasion, in order to bring that conformity into the mutual work, which alone can ensure the progress of our science.

Requesting you to honour me soon with a favourable reply,

R. H. Scott, Esq., F.R.S., Director,
Meteorological Office, London.

I remain, &c.
G. NEUMAYER.

ENCLOSED MEMORANDUM.

Some points, the discussion and ultimate settlement of which is of the greatest importance in carrying on an International exchange of Weather Reports:—

I.—1. Can the wish expressed at the Meteorological Congress of Vienna in favour of a bi-daily exchange of Telegrams be generally carried out for the district represented by the Directors of the Meteorological Institutes of Denmark, Germany, England, Holland, Norway, and Sweden?

2. If so, suitable principles must be defined, as to time, extent and arrangement, so that uniformity and certainty may be brought into the Weather-Report service for the district of North-west Europe.

3. In the event of individual countries not being able to undertake the obligation of such an extended service; this is to be stated, and the method indicated how their participation in the general and more perfect system may be effected.

4. Plans are to be discussed as to how the co-operation in Weather Telegraphy of the other European countries, with the system of the countries of North-west Europe, which should form the nucleus for a more comprehensive system, should be organized.

5. The bearings of the system of the United States of America to that of North-west Europe is to be made the subject of special discussion and consideration.

6. What should be the nature of the systematic publications, and how can the individual central offices most effectively aid in this respect? Can a method of international division of labour be brought about in the publication of synoptic charts and bulletins specially devoted to the subject?

7. What method of carrying on the publications of the individual central offices is specially recommended so that the object sought, viz., the facilitating of the study and general understanding of Weather Telegraphy may be most surely attained.

II.—8. What rules should be established for the extraordinary Weather-Report service, so that the final result “to be able to communicate trustworthy Storm Warnings” may be, as far as possible, reached.

9. Are any improvements or extensions of FitzRoy's apparatus to be introduced as recommended by the Meteorological Congress at Vienna, with the view of effecting an International value in signals used for Storm Warning purposes, and how are the Meteorological notices (placards) in connexion with the signals to be managed?

10. The results of the Storm Warnings in the N.-W. European system are to be published with explanatory remarks, in a suitable organ, which is to be specified, at short intervals, and as quickly as possible.

In all these arrangements the resolutions of the Vienna Congress, and the agreements arrived at by the Permanent Committee appointed by it, must serve as a basis and standpoint.

Mr. Scott reported that he had sent the following reply, which was approved:—

DEAR SIR,

November 22, 1875.

IN reply to your letter of the 15th instant, which only reached me this day, I regret to say that it will be quite impossible for me to be absent from my office in London at present, and that therefore I cannot hope to be at Hamburg on the 11th prox., so as to take part in the proposed private Conference on the subject of Storm Warnings for North-west Europe.

If, however, I should hear from you that the Conference will take place, I shall be happy to furnish you with some remarks on the various points enumerated in the memorandum appended to your letter.

I cannot but express my regret that no mention has been made of France or Russia in that memorandum, and more particularly so as the relations in regard to Storm Warnings between the former country and England have existed for many years.

G. Neumayer,
Deutsche Seewarte, Hamburg.

I am, &c.
ROBERT H. SCOTT,
Director.

Submitted—The following letter :—

CHER MONSIEUR,

Direction Générale du Dépôt des Cartes et Plans,
Paris le 27 Novembre 1875.

NOUS pensons sérieusement à nous occuper de météorologie nautique et nous ne pouvons mieux faire, avant de prendre un parti sur les points essentiels, que de chercher à profiter de l'expérience de ceux qui, comme vous, nous ont précédés avec succès dans ces travaux importants.

M. l'Ingr. Ch. Ploix, l'auteur de la Météorologie nautique dont nous vous avons envoyé un exemplaire au commencement de cette année, sera probablement chargé de la météorologie nautique en ce qui concerne l'entente avec les établissements étrangers,—dès qu'il sera officiellement nommé il s'empressera de se mettre en relations avec vous.

En attendant je vous serais reconnaissant de vouloir bien m'envoyer un de vos journaux météorologiques pour la mer—en blanc bien entendu.

Recevez, &c.

A. DELAMARCHE,
Ingénieur hydrographe en Chef.

Mr Scott was instructed to reply as follows :—

MY DEAR SIR,

November 20, 1875.

I AM instructed by the Meteorological Committee to assure you of the very great interest with which they have received the intimation of the proposed organization of an office for the study of Maritime Meteorology in Paris, and that it will probably be placed under a gentleman so well known in the science as M. Ploix.

I have great pleasure in forwarding to you a copy of our Log, and of all the other books and forms which are used in the ocean branch of our Office.

We shall be most happy to give any further explanations which may be required, and shall gladly welcome any gentleman you may send over to see our mode of working.

Yours, &c.,

ROBERT H. SCOTT.

Monsieur A. Delamarche.

Submitted—The following letter :—

SIR,

Stockholm, November 25, 1875.

As member of a Committee deputed by our Government to organize meteorological observations at sea, I take the liberty to request you to send me a copy of the Abstract Log and rough book used in England.

Hoping that my request will in nowise inconvenience you.

I have, &c.

R. RUBENSON.

Mr. Scott was instructed to reply in similar terms to the preceding letter.

Reported—That Captain Schück, of Hamburg, had applied for and received permission to repair to London to extract from the Logs in the Office information relating to Typhoons in the China Seas, and that he had already arrived.—Approved.

Mr. Scott reported that the précis of the action of the Committee since 1866 ordered at last meeting was not yet complete, but that he hoped to have it ready by next meeting. He was instructed to have it set up in type for the consideration of the Committee.

Read—A letter from Captain Toynbee, submitting an excellent Log by Captain C. Meadows Dobson, S.S. "Beta" (Minutes, p. 19), assisted by his first and second officers, Messrs. Harvey and Webster.

Mr. Scott was instructed to convey the best thanks of the Committee to Captain Dobson.

Read—A letter from Captain Toynbee (No. 2494) proposing that 81 diagrams of voyages across the Atlantic by Captains Watson and Martyn should be lithographed.

Mr. Scott was instructed to procure an estimate of the cost.

Reported—That the Kew Committee had signified their approval of Mr. Cullum's resignation of his post at Kew, and that he had been accordingly appointed to the superintendentship of Valencia Observatory by the following letter :—

DEAR SIR,

November 25, 1875.

I BEG to inform you that the Committee, at their meeting of the 1st instant, appointed you Superintendent of Valencia Observatory, at a salary of 150*l.* per annum, increasing by 10*l.* yearly, to a maximum of 200*l.*

It must be clearly understood that you hold the appointment direct from this Office, and that the engagement may be terminated on either side giving three months' notice.

Allowances for assistance, &c. (forage excepted), to be the same as those specified in your account for September quarter.

Please to notify your acceptance of these terms.

Yours faithfully,

ROBERT H. SCOTT,
Director.

J. E. Cullum, Esq.

Reported—That Mr. Cullum's acceptance had been received on the 27th instant.

Mr. Scott drew the attention of the Committee to the question of the errata alleged to exist in the Quarterly Weather Reports, and he was instructed to have the tables of maximum and minimum readings for the year 1871 re-examined by comparison with the original records.

Mr. Scott reported that he had been invited to lecture at Hull on "Storm Warnings," on the 1st proximo.

Reported—The following cheques were drawn on the 23rd instant on the signature of Captain Evans :—

	£	s.	d.
J. E. Cullum, Valencia, salary, October	-	20	16 8
" salary, November–March	-	62	10 0
			83 6 8
J. S. Harding, junior, office expenses	-	-	10 0 0

The following cheques for November were drawn :—

For Office:		£	s.	d.
R. H. Scott	Salaries and wages	-	66	13 4
J. S. Harding, jun.		-	20	0 0
J. S. Harding, sen.		-	*9	12 6
T. D. Bell		-	6	13 4
Cashiers, Bank of England, for Stationery Office		-	5	12 10
P. S. King, books		-	4	10 7
For Observatories:				
Hopkin and Williams, chemicals		-	8	15 9
S. Jeffery, Pagoda observations		-	5	13 0
C. O'Sullivan, Valencia Observatory		-	2	2 0
J. J. Hicks, thermometer screens		-	8	17 0
R. H. Curtis	Computations, &c.	-	13	6 8
C. H. Thompson		-	6	10 0
C. Stodart		-	10	10 0
J. A. Curtis		-	9	3 4
For Telegraphy:				
N. J. Holmes, Scilly Co., July–October		-	11	16 0
J. J. Hicks, thermometer screens		-	3	10 0
Postmaster-General for N. Hoffmeyer		-	12	9 5
Wightman & Co., wrappers		-	6	13 0
F. Gaster	Computations, &c.	-	+17	17 6
W. L. Dallas		-	+11	4 1
F. Brodie		-	+9	9 2
For Ocean Meteorology:				
H. Toynbee, Marine Superintendent		-	33	6 8
Cashiers, Bank of England, for account of Navy		-	4	17 6
" " "		-	0	3 2
			5	0 8
J. J. Hicks, instruments		-	4	19 0
J. D. Potter, Admiralty Charts		-	12	16 6
" "		-	1	11 6
			14	8 0
G. H. Simmonds, Ascension observations		-	3	11 0
R. Strachan	Computations	-	+20	16 8
C. Harding		-	+16	18 4
T. E. Allen		-	9	3 4
For Office Expenses:				
J. S. Harding, jun., on account		-	100	0 0
" "		-	50	0 0
			150	0 0
Total			£509	3 2

* Five weeks to the 27th.

† Including allowance for extra attendance to the 27th.

‡ Including allowance for care of instruments.

The Committee then adjourned.

116, Victoria Street, December 6, 1875.

PRESENT:

Major-General Smythe in the Chair.

Mr. Galton.

The Director was in attendance.

The Minutes of last meeting (Nov. 29) were read and confirmed.

Submitted—The following correspondence:—

No. 163,917.

M.O. 2,525.

SIR,

General Post Office, December 2, 1875.

I BEG leave to acknowledge the receipt of your letter of the 29th ultimo with reference to the transmission of Meteorological Observations by telegraph from certain offices in the United Kingdom on Sunday evenings.

With the exception of the Hurst Castle and Aberdeen Post Offices, none of the post offices in the towns named in your letter are open for the transaction of telegraph business between the hours of 6 p.m. and 7 p.m. on Sunday evenings, consequently if it is imperative that the observation in every case be taken at 6 p.m. precisely, the fees specified in the accompanying circular* will have to be paid to the postmaster and telegraph clerk at each of the remaining offices, and in the case of Stornoway, Moville, and Valencia, to the postmasters and clerks of the intermediate offices in addition. I enclose a list* giving the names of the intermediate offices, and also showing how, if the transmission of the messages between 6 p.m. and 7 p.m. is not imperative, the amount of extra fees payable may be reduced.

The fees must be paid direct to the postmasters entitled to them, as they are not accounted for to this department. In the ordinary course they are paid at the time the message is handed in, but I have no doubt that, as the messages will be sent regularly, you will be able to make some arrangement for their periodical payment, if that course is more convenient to you; and possibly some of the postmasters may be willing to accept a less payment than the usual rate.

I am, &c.,

(Signed) C. H. B. PATEY.

R. H. Scott, Esq.

DEAR SIR,

Meteorological Office, December 3, 1875.

WITH reference to my letter of the 27th ult. I beg to inform you that I have received a reply from the Post Office about the *Sunday Evening* Report.

It appears that the only question is that of expense. I estimate that the expense of transmission per week alone will be as follows:—

	s.	d.
10 messages - - - - -	10	0
Extra fees to clerks and postmasters - - - - -	22	0
Scilly Telegraph Company - - - - -	2	6
	34	6

Extra charge at Scilly not yet known.

Will you please say if you approve of this expenditure.

Yours faithfully,

ROBERT H. SCOTT,

Director.

J. C. MacDonald, Esq.

M.O. 2,544.

DEAR SIR,

"The Times," 4 December, 1875.

There will be no objection raised by "The Times" to the extra expense for Sunday Messages, and as far as we are concerned you may proceed without further delay to carry out the new arrangements.

Yours, &c.

(Signed) JOHN C. MACDONALD.

R. H. Scott, Esq.

Mr. Scott was instructed to proceed to make the necessary arrangements for a daily Evening Service, and to report to the Committee.

* Not printed here.

Submitted—A letter, No. 2,526, from the Board of Trade, applying for the Estimate for the Office for the financial year, 1876-7.

Mr. Scott was instructed to inform the Board of Trade that the sum required by the Committee for the ensuing financial year would be 10,000*l.*, being the same sum as was voted during the current year.

The following detailed estimate was ordered to be printed on the Minutes :—

METEOROLOGICAL OFFICE ESTIMATES for the Years 1876-77.

Particulars.	Proposed for 1876-7.	Voted for 1875-6.	1876-77.	
			Increase.	Decrease.
Office—	£	£	£	£
Salaries and Wages	1,370	1,320	50	—
Rent, Fuel, Fittings, &c.	650	600	50	—
Office Expenses	250	180	70	—
Land Meteorology—				
Expenses at Observatories	2,400	2,600	—	200
Computations	900	800	100	—
Telegraphy	1,680	1,600	80	—
D.W. Charts, Inspections, &c.	450	500	—	50
Computations	650	650	—	—
Ocean Meteorology—				
Marine Superintendent	400	400	—	—
Admiralty Instruments	250	150	100	—
Mercantile Marine	200	250	—	50
Computations	800	950	—	150
	10,000	10,000	—	—

The Committee then adjourned.

116, *Victoria Street*, December 20, 1875.

PRESENT :

Mr. De La Rue in the Chair.

Captain Evans.

Mr. Galton.

Major-General Smythe.

Major-General Strachey.

The Director was in attendance.

The Minutes of last meeting (December 6) were read and confirmed.

Read—The following letter :

M. O. 2633.

The Royal Society, Burlington House,

December 17, 1875.

SIR,

I AM directed by the President and Council of the Royal Society to transmit to you, for the information of the Meteorological Committee, the enclosed copy of Treasury Minute, dated November 3, 1875, which was communicated to them by the Lords of the Treasury.

I am further to say that the President and Council would be happy to receive any information the Committee may wish to communicate relative to their past proceedings.

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

I am, &c.
(Signed) G. G. STOKES,
Secretary.

COPY of TREASURY MINUTE, dated November 3, 1875.

MY LORDS read a letter, dated 21st April 1874, from the Marquis of Tweeddale, President of the Scottish Meteorological Society, submitting the claims of the Society for aid from the State; also previous applications of similar purport from the same Society, and the several replies thereto from this Board, which have been to the effect that My Lords were unwilling to propose to Parliament any grant in aid of Meteorological Science beyond that made to the Committee of the Royal Society, but that, recognizing the value of the labours of the Scottish Society, they should be glad if an arrangement could be made by which it should participate in the parliamentary grant, in proportion to the services rendered by it in furtherance of the objects of that grant.

To this decision My Lords would under present circumstances be disposed to adhere, seeing that the grant of 10,000*l.* is made not to a kindred English society, but to a scientific committee, which undertakes in return to conduct for the Government business formerly entrusted to a public department.

But their attention having thus been drawn to the subject, My Lords are led to think that a general inquiry into the working of the present arrangements might with advantage be instituted, nine years having elapsed since they were entered into.

It was in the year 1856 that the Government first began to give direct assistance to the study of Meteorology. In that year the Meteorological Department of the Board of Trade was constituted, with the primary object of collecting and subsequently discussing facts and observations too numerous to be collected and discussed by private persons. It continued in existence for 10 years, under the direction of Admiral FitzRoy. On the death of that gentleman in 1866, a committee, consisting of Mr. Galton, Commander Evans, and Mr. Farrer, was appointed to review the results of the labours of the Department, and to make such a report as would enable the Government to decide on the policy to be adopted in the future.

In consequence of their recommendations the control of the Department was transferred to the Royal Society, who, in return for an annual grant of 10,000*l.*, agreed to appoint a Committee to carry out the duties connected with the Office. They were to be left perfectly free in their method and in their choice of labour, and the only condition attached to the grant was that an annual account should be rendered to Parliament of the expenditure and of the results obtained in each year.

This is the arrangement now in force, and into the working of which My Lords think that the time has arrived for an inquiry. Judging by the annual reports of the Committee, they feel sure that the Society has spared no pains to carry out effectively the duties with which it was entrusted, and it is from no want of confidence in their method of proceeding that their Lordships have decided on this step. But the grant is so considerable that they do not think they would be justified in continuing it for any lengthened period without satisfying themselves that the results obtained are such as to warrant the application of so large a sum of public money.

The inquiry should, they consider, be directed to the following points:—

1. How far have the statistics hitherto collected led to the discovery or confirmation of any Meteorological laws.

2. How far have the principles on which storm warnings are given been justified by results.

The second of these questions is practically included in the first, but on the answers to the two will depend the further question of,—

3. How far the appropriation of a large sum of public money in aid of Meteorology is justified, bearing in mind the fact that it is not the policy of Government in this country to give direct

assistance to the study of any science, except with a view to the more immediate application of scientific theories to practical purposes, in which the public rather than individuals have a direct interest.

4. Should the Committee decide to recommend that public expenditure for meteorological purposes be continued, they should proceed further to consider upon what system it may be best administered. With this object, full information should be obtained with regard to the mode in which the present grant is applied; and in connexion with this part of the inquiry, My Lords would wish that the representations of the Scottish Meteorological Society should receive the consideration of the Committee.

They propose that the Committee should consist of the following gentlemen:—

Sir W. Stirling Maxwell, Bart., M.P.

T. Brassey, Esq., M.P.

R. R. W. Lingen, Esq., C.B. (their permanent secretary).

T. H. Farrer, Esq.

J. D. Hooker, Esq., M.D., C.B.

F. Galton, Esq.

Lieut.-General R. Strachey, C.S.I.

It was further stated that the name of Mr. D. Milne Home had been subsequently added to the Committee.

Mr. Scott called the attention of the Committee to certain errors in the Treasury Minutes, and was requested to point them out to the Royal Society, and also was requested to draw up and submit to the Committee the information asked for by the Royal Society.

Mr. Scott submitted a summary of the work done in the Office, 1867–75 inclusive, which was considered and handed back to him for revision.

Submitted—The following reply to the circular memorandum inclosed in Dr. Neumayer's letter of November 15 (Minutes, November 29); which was approved.

REMARKS on the MEMORANDUM enclosed in DR. NEUMAYER'S LETTER of November 15, (Minutes, November 29th.)

I. 1.–5. I am unable to find any expression of a "wish" on the part of the Vienna Congress for a bi-daily exchange of telegrams.

All that is stated in that report of that Congress on this subject is:

1. That "communications on the state of the weather are to be given by the central office to the "public daily, and wherever possible twice a day."
2. That the establishment of a central International Office for the receipt of evening telegrams is desirable.

I would only remark that the subject of the international exchange of weather telegrams is purely a financial matter, and while it is not to be expected that this exchange can be arranged on terms of perfect equality as regards all concerned, it on the other hand cannot be contended that all reports are of equal value.

It must rest with the directors of the different central institutes to make such demands for regular information on their colleagues, as their experience may lead them to deem requisite for their own service, and to negotiate these arrangements on terms as advantageous to themselves as is possible in each case.

As regards the United Kingdom, its readiness to supply regular information to the continent is well known, and is only limited by the necessity incumbent on the Meteorological Office to confine its expenditure to the funds provided for the service.

6–7. I am unable to understand the exact meaning of the first question in No. 6. In my opinion each country requires a published Daily Weather Report, of a character somewhat similar to our own, referring more especially to its own area.

A method of international division of labour, if it can be called into existence, is very desirable. By this is meant a publication of charts for different, but adjacent districts by the several institutes, on the same scale and same projection, so as to be capable of being placed together to form a connected whole. At the same time it appears to this Committee that it would be very desirable, if feasible, to organise some method of co-operative action in the bringing out of synoptic charts analogous to those of Captain Hoffmeyer.

II. 8. The system of extraordinary warnings at present in operation between this Office and Holland, Hamburg, and the Scandinavian countries appears to be satisfactory and to meet the requirements of the case.

9. I am not disposed to recommend any alteration in the FitzRoy signal apparatus, excepting in so far as it is used by this office in a signification somewhat modified from that attached to it by its original inventor.

I am not disposed to recommend the employment of any complicated system of signalling or even of the Aeroklinoscope.

10. I do not think that the publication of the results of storm warnings in north-west Europe, would have a value at all commensurate with its cost.

Read—A letter from Captain Toynbee submitting excellent Logs by—

The late Commodore Goodenough, H.M.S. "Pearl" (Minutes, p. 45), kept by Navigating Lieutenant H. Hosken.

Capt. H. Simpson, schooner "Traveller" (Minutes, p. 4).

„ W. Symington, ss. "Hankow" (Minutes, p. 61).

Mr. Scott was instructed to convey the marked thanks of the Committee to these gentlemen.

Mr. Scott reported that arrangements were in progress for commencing the evening reports to the "Times" on the 31st inst., and submitted the following memorandum as to the extra cost of Office work entailed by the proposed arrangements.

This proposal was accepted by the Committee for three months, on the understanding that extra work in connexion with weather telegraphy should be curtailed to the amount indicated in the memorandum.

The proposed arrangement for preparing a daily weather chart for the "Times," from special 6 p.m. observations can be carried into effect by the clerks in the telegraph room, should Mr. Sargeant be added to the force.

The work would be done in "shifts," some of the clerks attending from 8.30 a.m. to 4.30 p.m. and the remainder from 1 p.m. to 9 p.m. daily.

Should the *evening work* (i.e., after 5 p.m.) be paid for at the rate of "time and a half" pay, and Sunday evening work (three hours for two clerks) at the rate of double pay; then the total *excess* of cost, over what is now actually paid would be about 250*l.* per annum.

Of this sum this Office should bear 90*l.*, as it will be a great gainer in time available for other official duty, and will almost entirely obviate the necessity of "*extra work*" done at home, the cost of which is already about 80*l.* per annum.

F. GASTER.

The name of F. E. Sawyer, of Brighton, was removed from the list for gratuitous reception of the Daily Weather Reports.

Resolved—That the sum of 1,500*l.* be transferred from the deposit account of the Committee to their current account.

The following cheques for Salaries, &c. for December were drawn:—

For Office :

R. H. Scott	-					£	s.	d.
J. S. Harding, jun.	-					66	13	4
J. S. Harding, sen.	-					20	0	0
T. D. Bell	-					*7	14	0
						6	13	4

Salaries and wages

For Observatories :

R. H. Curtis	-					13	6	8
C. H. Thompson	-					*5	4	0
C. Stodart	-					*8	8	0
J. A. Curtis	-					9	3	4

Computations, &c.

For Telegraphy :

F. Gaster	-					†17	0	4
W. L. Dallas	-					†10	5	8
F. Brodie	-					†8	13	7

Computations, &c.

For Ocean Meteorology :

H. Toynbee, Marine Superintendent	-					33	6	8
R. Strachan	-					†20	16	8
C. Harding	-					†15	12	8
T. E. Allen	-					9	3	4

252 1 7

* Four weeks to the 25th.

† Extra attendance to the 18th.

‡ Including allowance for care of instruments.

Submitted—The following STATEMENT respecting the RECORDS for September 1875, received from the SELF-RECORDING OBSERVATORIES, which have been examined at Kew OBSERVATORY (see Minutes 21st December 1868).

	Aberdeen.	Armagh.	Falmouth.	Glasgow.	Kew.	Stonyhurst.	Valencia.
	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.	Direction. Velocity. Good. Good.
ANEMOGRAPH:—							
Action -	0	0	0	0	0	0	0
Records deficient, due to stoppage of clock	0	37 hrs.*	0	0	2 hrs.†	0	0
" other causes	—	—	—	—	—	—	—
Orientation verified -	30th	30th	13th	—	18th	—	—
No. of errors discovered by subsidiaries	0	0	0	1	0	1	0
" irregular differences	0	0	0	0	0	0	0
Result of 40 Remasurements:—							
Greatest difference -	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean difference irrespective of sign -	0.4	0.1	0.1	0.1	0.2	0.1	0.6
Residual difference (—Kew) -	+0.1	+0.3	0.0	-0.1	+0.1	0.0	0.0
RAIN GAUGE.							
Action -	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.	Fair.
Records deficient, due to stoppage of clock	0	0	0	0	0	0	0
" other causes -	0	0	41 hrs.	3	0	0	0
Errors in tabulation -	0	0	2	—	—	—	—

