



## ROYAL COMMISSION

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# APPENDICES.

## APPENDIX I.

### The BOTANICAL COLLECTIONS at KEW and at the BRITISH MUSEUM.

COMMUNICATION from Mr. CARRUTHERS.

British Museum,  
29th March 1875.  
MY LORD DUKE,  
As Dr. Hooker and Messrs. Bentham and Ball were requested by the Commissioners to explain statements made in the communication I had the honour to submit, and as they apparently corrected or contradicted the said statements, I expected that I should also have been invited by the Commissioners for explanations of their statements.

I regret I had not such an opportunity before the Commissioners prepared their Report, as these explanations would have modified some of the statements, as of fact, contained therein; but, as I conceive, they ought to be in possession of those who will be called upon to take action on the Commissioners' Evidence and Reports, I communicate them in order that they may be included in the next publication of the Commission.

I am, &c.,  
To His Grace (Signed) Wm. CARRUTHERS.  
The Duke of Devonshire, K.G., F.R.S.  
&c. &c. &c.

Referring to the communications of Dr. Hooker and Messrs. Bentham and Ball printed on pages 26 to 29 of the *Fourth Report of the Royal Commission on Scientific Instruction and the Advancement of Science*, I beg to submit the following statements:—

I. As to Dr. Hooker's Statement regarding the Herbarium at Kew before the appointment of Sir W. J. Hooker, to the following effect:—"From what I recollect myself, and from what Sir W. J. Hooker told me, I believe that it was, for the period, extensive, that it was arranged chiefly according to countries, and was in part, at any rate, classified and well named," l. c. p. 26; I assert, from data which I shall adduce as I proceed, the following facts:—There were two Herbaria: 1, the private one of Mr. Aiton, which was kept at his own house; and, 2, the Herbarium collected by Bowie and Cunningham, which was accommodated in a room in the Gardens. 1. Mr. Aiton's Herbarium consisted of (a) garden specimens, (b) a small alpine collection made by Schleicher in Switzerland, and (c) a small series of British plants collected by Teesdale. This Herbarium was retained by Mr. Aiton when his connection with Kew Gardens ceased, and was sold by Foster and Son in 1851 with his other effects. I have the catalogue of this sale in my possession. 2. The Bowie and Cunningham Herbarium was collected by these botanists in their joint or separate expeditions as "Botanical Collectors to His Majesty." Some years after Sir W. J. Hooker became Director of Kew Gardens, this Herbarium was sent to the British Museum, and was placed in a cabinet, where it remained untouched until some time after I was appointed Keeper of the Botanical Department. I am, therefore, able, from my own knowledge, to speak of this Herbarium. It was arranged in three sections, South American, African, and Australian. I am intimately acquainted with the African portion, which is being incorporated with the general Herbarium, and I have carefully examined a large portion of the South American and Australian portions, and I am able to say that the whole was very imperfectly named and only approximately classified, and that it never could have been of any use in naming plants in the Gardens. But I have further the testimony of Mr. John Smith, who, according to the Report of Dr. Lindley, quoted in the *Fourth Report of the Commissioners*, was responsible for the names of the Garden plants, that he received no

assistance whatever in this work, either from the small Herbarium of Bowie and Cunningham in the gardens, or the private Herbarium of Mr. Aiton, kept in his own house. I regret that my suggestion that Mr. Smith should be examined was not adopted by the Commission, as his testimony would have been most important in regard to matters of fact, to which he alone can speak from personal knowledge.

From facts, which have come to my knowledge since I wrote the paper printed in the first volume of the Evidence taken before the Commissioners, I wish to modify the statement therein made that "no Herbarium of any kind, I believe, existed at the Gardens during their (the Aitons) time." (Appendix XV, Vol I., p. 45.) I was aware of the private Herbarium in Aiton's house when I wrote this, but not of the collections of Bowie and Cunningham accommodated in the Gardens. As they were, however, of no use for garden purposes, the argument of my paper is unaffected by this modification.

II. Mr. Bentham calls in question my personal experience of the Botanical Museum and Herbarium at Kew, because he has no recollection of seeing me there. If Mr. Jackson or Professor Oliver had borne this testimony, it would have been to the purpose. They are the officers in charge of these establishments, and their testimony, which would have been somewhat different from that of Mr. Bentham, would have been of value. I would, however, say further, that whether Mr. Bentham's memory or observation is at fault I cannot tell, but I have had the pleasure of seeing him at the Herbarium at Kew.

Mr Bentham ventures to correct my statement, made, as he thinks, from ignorance of the Kew Collections, that Sir W. J. Hooker had no "public Herbarium at Kew till 1855," by stating that he used "his own private Herbarium!" My statement was based on the Official Reports for 1853 and 1854 of Sir W. J. Hooker to the First Commissioner of Her Majesty's Works, in the former of which he says, "Kew had hitherto possessed no Herbarium or Hortus Siccus, the invariable accompaniment of every Botanic Garden abroad, and no Library save the small practical one for the use of the gardeners, but by gifts it is endowed by both," referring to the bequest of Dr. Broomfield's, and the gift of Mr. Bentham's Herbarium and Library. And in the latter he says, "till 1853 our Garden was utterly destitute of the two former appendages," viz., Herbarium and Library.

Mr. Bentham may have presented his Herbarium for the use of Scientific Botanists, but Sir W. J. Hooker, as the above extracts and other Reports testify, accepted it as an appendage to the National Botanic Gardens for "naming, arranging, and ticketing the specimens."

In reference to Mr. Bentham's correction of the date when his Herbarium and Library were presented, I have to say that the year given by me was obtained from the Official Report of the late Sir W. J. Hooker for the year 1855.

III. Mr. Ball calls in question my right, to state that "everything that became National property in 1827 is still in the Collection," unless I have verified, specimen by specimen, the tens of thousands of specimens in the Museum: Were this the only possible premise on which my assertion could be based, Mr. Ball would be justified; but I had other and more satisfactory data, which I am ready to state and substantiate at any time.

I venture to submit that Mr. Ball should not be allowed to print such charges as are contained in his letter of 28th November 1872, without being required to substantiate them. I deny that there is any foundation of truth for these statements; and until he specifies some of the "large accumulations of collections" that "were extensively

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Report,  
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‘attacked by insects,’ I have a right to believe that such assertions have no more foundation than the equally sweeping accusation against the Museum made in his Evidence in chief [Qu. 7229]. In that instance, when I demanded from him the case on which his assertion was founded, he informed me that “from inquiries made within the last two days, I am led to believe that the impression under which I spoke was incorrect.” Instead of withdrawing this admitted erroneous statement, he tries

to strengthen his position by making further equally objectionable and baseless assertions.

I venture to express the belief that whatever action is taken on the Evidence and Reports of the Commissioners will be based on the facts adduced in evidence, and not on the opinions of partisans whose strong assertions have not been and cannot be supported by facts.

WILLIAM CARRUTHERS.

29th March 1875.

## APPENDIX II.

CORRESPONDENCE between the TREASURY and the REGISTRAR GENERAL, relative to certain METEOROLOGICAL RETURNS furnished to him by MR. GLAISHER.

1543.

SIR, Whitehall, February 26, 1874.  
I AM directed by Mr. Secretary Cross to transmit to you, herewith, a copy of a letter received from the Treasury, with enclosed correspondence between that Department and the Registrar General, as to the employment of Mr. John [James] Glaisher in compiling certain Meteorological Returns; and I am to request that, in laying the same before the “Aid to Science Commissioners,” you will draw their special attention to the grant made to the Committee appointed by the Royal Society to conduct Meteorological Observations and Experiments on behalf of the Government. (See Civil Service Estimates, Class IV., Vote 6.)

I am, &c.

The Secretary to the Aid to Science Commission. A. F. O. LIDDELL.

1543/151.

Treasury Chambers,  
February 24, 1874.

SIR, I AM directed by the Lords Commissioners of Her Majesty's Treasury to transmit to you copies of the enclosed correspondence between this Board and the Registrar General, as to the employment of Mr. John [James] Glaisher in compiling certain Meteorological Returns, and I am to request that you will move the Secretary of State to cause them to be transmitted to the “Aid to Science Commission,” with a view of drawing their special attention to the grant made to the Committee appointed by the Royal Society to conduct Meteorological Observations and Experiments on behalf of the Government. (See Civil Service Estimates, Class IV., Vote 6.)

I am, &c.

(Signed) WILLIAM LAW.

The Hon. A. F. O. Liddell.

SIR, December 28, 1867.  
UPON more than one occasion I have brought under the notice of the Lords Commissioners of Her Majesty's Treasury the advantage I derive from the labours of Mr. Glaisher in obtaining the results of Meteorological Observations from different parts of England and Wales.

They are published in my Weekly, Quarterly, and Annual Returns; 57 publications every year.

The interest of these returns in the eyes of many of the public is greatly increased by making known the results of these numerous observations, deduced by so scientific a man as Mr. Glaisher.

But his labour is enormous, as is evinced by the two specimens of my Weekly and Quarterly Returns, which I now enclose for their Lordships' inspection (see pages 402 and 403 and 408 of Weekly, and pages 6 and 18 to 26 of Quarterly).

I also now enclose a copy of a letter I have lately received from Mr. Glaisher, and I will thank you to ask their Lordships' sanction to my paying in future to Mr. Glaisher out of the funds voted by Parliament for the contingencies of this Office 200l. Os. 0d. per annum, instead of 100l. Os. 0d., the first of such payments to be made at the end of this current year.

I have, &c.

(Signed) GEORGE GRAHAM,  
Registrar General.

To the Secretary,  
Treasury, Whitehall.

MY DEAR SIR, Blackheath, August 15, 1867.

SINCE the year 1844 I have at the end of every quarter forwarded to you the results of carefully made Meteorological Observations collected from different parts of the country.

A sum of 50l. was allowed for several years towards the expense of reducing the observations and the deduction of results.

Two years since, on the addition of weekly returns for several large towns, the annual sum was increased to 100l., but these returns necessitate my employing a competent

computer to deduce the results, and to proceed with the work during my absence.

The work of necessity occupies a good deal of my time, for which I am not remunerated; may I ask you to increase, if you can, the annual allowance to 200l.

I am, &c.

The Registrar General. (Signed) JAMES GLAISHER.

20,391.

Treasury Chambers,

February 7, 1868.

SIR, WITH reference to your letter of the 28th of December last, I am directed by the Lords Commissioners of Her Majesty's Treasury to state that the subject of Meteorology generally, and Meteorological Observations, has been placed in the charge of a Committee of the Royal Society, and that a sum of 10,000l. is to be inserted in the Estimates, with the view of enabling them to carry out the objects assigned to them, in communication with the Board of Trade.

My Lords are inclined to think that the arrangements for reducing the Meteorological Observations for the purpose of publication in your Returns might be transferred to the Committee of the Royal Society, and form a part of their business, and my Lords suggest that you should place yourself in communication with the Committee, and make a further report to this Board.

In the meantime, however, my Lords would be sorry that the public should be deprived of your publications with the deductions of Mr. Glaisher, and they will not object to his remuneration being increased from the present rate of 100l. a year to the rate of 150l. a year, to be paid out of the contingencies of your Office, until it can be ascertained whether any arrangement can be made with the Meteorological Department.

I have, &c.

(Signed) GEO. A. HAMILTON.

The Registrar General. Exchequer and Audit Department,  
Somerset House, London, W.C.

1160.

August 30, 1872.

SIR, I AM directed by the Comptroller and Auditor General, with reference to the second paragraph of a letter addressed by the Lords Commissioners of Her Majesty's Treasury to the Registrar General, on the 7th February 1868, to transmit for their Lordship's consideration a copy of a letter dated 10th August 1872, sent by the Registrar General to this Department, relative to his continued employment of Mr. Glaisher upon Meteorological Observations.

I have, &c.

(Signed) C. MALLETT.

R. R. W. Lingen, Esq., C.B.

1092.

General Register Office, Somerset House.

SIR, As requested in your letter of 25th July, I now transmit copies of the correspondence between the Lords of the Treasury and myself respecting Meteorological Reports furnished to me by Mr. Glaisher.

I have had no correspondence on the subject with the Meteorological Society that I can recollect, nor have I acted upon the suggestion made by the Lords of the Treasury, on 7th February 1868, that I should communicate with the Royal Society, being unwilling that the public should be deprived of the deductions, of Mr. Glaisher to which they have been accustomed for many years in my Weekly, my Quarterly, my Annual Reports, 57 in number annually, and being certain that the Royal Society would not furnish me with Meteorological Observations so complete and so punctual as I invariably, without delay, receive from Mr. Glaisher.

I have, &c.

(Signed) GEORGE GRAHAM,  
Registrar General.

To the Secretary,  
Exchequer and Audit Department,  
Somerset House.

13,926. Treasury Chambers,  
September 16, 1872.  
SIR, IN forwarding to you the enclosed copies of correspondence for such further explanation as you may wish to offer, I am directed by the Lords Commissioners of Her Majesty's Treasury to express to you the surprise with which my Lords learn that you read their letter of February 7th, 1868, relative to the payment of Mr. Glaisher, for the preparation of Meteorological Records, as conveying more than a provisional and limited authority, and I am directed by their Lordships to acquaint you that the reasons which you have at present alleged appear to them to be insufficient to justify you in having continued to retain that gentleman's services without further express reference to this Board.

My Lords have not yet replied to the Comptroller and Auditor General as to the discharge of your account for these payments, and as the time is approaching at which the Estimates for 1873-4 have to be prepared, my Lords will be glad to receive also (as soon as possible) a statement of any fresh reasons you may wish to offer against the removal, after the end of the current financial year, of this charge from the votes in supply.

I am, &c.  
(Signed) CHAS. W. STRONGE,  
The Registrar General. pro Sec.

13,926. September 21, 1872.  
SIR, IN reply to your letter of 16th inst., I regret to own that inadvertently I have omitted to act upon the suggestion of the Lords Commissioners of Her Majesty's Treasury, conveyed to me in your letter of 7th February 1868.

I hasten to protest that I must not be considered guilty of anything so heinous as wilfully and designedly disobeying their Lordships instructions.

I did not, in written letters recorded in official ledgers at that time, communicate with the Royal Society, but from personal inquiries I satisfied myself that that learned body could not give the same particulars that I receive from the Royal Observatory at Greenwich, with the same regularity for immediate publication; and I am sorry to say I accidentally omitted to make that report to their Lordships. To me, personally, it was of course immaterial whether the particulars were furnished by the Royal Society or from the Royal Observatory at Greenwich.

I have now written to the Royal Society, and will inform their Lordships when I receive their reply.

I imagine that their Lordships do not wish to see the Meteorological Returns abridged, which for so many years I have been in the habit of publishing, the value of which was fully pointed out in my letter to you of 21st December 1864.

I have, &c.  
(Signed) GEORGE GRAHAM,  
To the Secretary, Treasury. Registrar General.

November 9, 1872.  
SIR, I WILL thank you to inform the Lords Commissioners of Her Majesty's Treasury that, in accordance with the wish I understood to be expressed by their Lordships, I have asked the Royal Society whether they could furnish me with the information and Reports on Meteorological subjects now supplied to me weekly, quarterly, and yearly, by Mr. Glaisher of the Royal Observatory at Greenwich, seeing that 10,000*l.* per annum is received from the public by the Meteorological Committee of the Royal Society.

I have received a reply, a copy of which I now enclose, and I shall be glad to receive instructions from their Lordships as to any further steps they desire me to take in this matter.

I have, &c.  
(Signed) GEORGE GRAHAM,  
To the Secretary, Registrar General.  
Treasury, Whitehall.

The Royal Society, Burlington House.  
November 6, 1872.  
SIR, IN reply to the inquiry contained in your letter of the 18th September 1872, I am directed by the President and Council of the Royal Society to explain that the weekly Meteorological Returns transmitted to your Office from the Royal Observatory, Greenwich, are supplied by the Astronomer Royal, and free of expense.

In case of any other information being desired from the Meteorological Committee, the President and Council suggest that application be made to the Board of Trade, under which Department the Committee acts.

I have, &c.  
(Signed) W. SHARPEY, M.D.,  
G. Graham, Esq., Secretary R.S.  
Registrar General.

17,087. Treasury Chambers.  
November 19, 1872.  
SIR, I AM directed by the Lords Commissioners of Her Majesty's Treasury to acquaint you, for the information of the Lords of the Committee of Council for Trade, that for some years past an annual payment has been made through the Registrar General to Mr. Glaisher, one of the Assistants to the Astronomer Royal, on account of the preparation, by him, of certain tables of Meteorological Observations, which are published by the Registrar General with his Reports.

My Lords have received from the Registrar General a copy of a letter from the Royal Society (a copy of which is herewith enclosed), dated 6th November 1872, from which it appears that some misapprehension exists as to the terms on which these Returns are supplied, and bearing in mind the arrangement made in 1866, by which the sum of 10,000*l.* was placed on the Estimates in order to provide for Scientific Meteorological Observations, &c., to be undertaken by a Committee appointed by the Royal Society at the request of the Government, my Lords would be glad if their Lordships of the Committee of Council for Trade would cause a communication to be addressed to the Committee of the Royal Society with a view to ascertain whether the tables now furnished by Mr. Glaisher might not be supplied to the Registrar General by that Committee without incurring any charge beyond the 10,000*l.* a year they now receive.

I am to transmit copies of the Registrar General's Returns with Mr. Glaisher's tables appended.

I am, &c.  
T. H. Farrer, Esq. (Signed) WM. LAW.

## METEOROLOGY.

Board of Trade, Whitehall Gardens.

November 29, 1872.  
SIR, I AM directed by the Board of Trade to acknowledge the receipt of your letter of the 19th instant (17,087) inquiring whether certain tables of Meteorological Observations, now furnished by Mr. Glaisher, might not be supplied to the Registrar General of Births, Deaths, and Marriages by the Meteorological Committee of the Royal Society, without incurring any charge beyond the 10,000*l.* a year they now receive.

Before taking the matter into further consideration, this Board would be glad if the Lords Commissioners of Her Majesty's Treasury would cause them to be informed specifically what particulars the Registrar General would require, also in what forms and at what periods these particulars would have to be furnished.

The Meteorological Committee have certain stations, observatories, telegraphic and others, from which they obtain reports, and it would be of importance to know whether the Registrar General would be satisfied with these, or if he thinks it necessary that reports should still be obtained from Mr. Glaisher's present stations, whether he can guarantee that the Committee would in future be able to obtain information from Mr. Glaisher's present stations.

Having regard to them, I am to suggest that it might be desirable that the Registrar General of Births, Deaths, and Marriages should be instructed to place himself in direct communication with the Meteorological Committee, who are ready to render all the help in their power.

I have, &c.  
(Signed) W. R. MALCOLM.  
The Secretary, Treasury.

18,248. Treasury Chambers.  
December 7, 1872.  
SIR, WITH reference to the correspondence which has taken place on the subject of the tables of Meteorological Observations supplied to you hitherto by Mr. Glaisher, one of the Assistants to the Astronomer Royal, for publication with your Reports, I am desired by the Lords Commissioners of Her Majesty's Treasury to transmit to you the enclosed copy of a letter which their Lordships have received from the Board of Trade on the subject, and I am to request that you will place yourself in communication with the Meteorological Committee of the Royal Society, in accordance with the suggestion contained in the last paragraph of that letter, and report the result to this Board.

I am, &c.  
(Signed) WILLIAM LAW.  
The Registrar General.

February 6, 1873.  
SIR, I WILL thank you to lay before the Lords Commissioners of Her Majesty's Treasury the copies and extracts of a letter dated 7th January 1873, addressed to me by the Meteorological Committee of the Royal Society, and of a letter, dated 3rd February, which I have received from Mr. Glaisher, to whom I showed the first-named letter.



I think, beyond all doubt, the Committee would not be able to furnish with necessary regularity the observations for publication on specified days in the same fulness as they have for many years been received by me here without fail.

This would be so painful to Mr. Glaisher that, as their Lordships dislike giving him 150*l.* per annum, he offers to continue furnishing these Returns *gratuitously*.

I think their Lordships will hardly consent to such an arrangement proposed by this gentleman, so zealous in his calling.

I take the liberty of suggesting that their Lordships should recommend the Committee to give to Mr. Glaisher annually 150*l.* out of the immense sum placed every year at their disposal for like purposes.

I have, &c.

(Signed) GEORGE GRAHAM,  
Registrar General.

To the Secretary,  
Treasury, Whitehall.

Meteorological Office,  
116, Victoria Street, London, S.W.  
January 7, 1873.

SIR,

I AM instructed by the Meteorological Committee to inform you, in reply to your letter of the 17th ultimo, that having examined the list of stations from whence Meteorological Reports are printed in your various Returns, they are of opinion that there would be no difficulty in their supplying you with information of a similar character to that now published by you, without any additional charge to the Government beyond their annual grant.

Several private observers whose names appear in the Returns, already supply observations to this Office, and the Committee think it probable that a larger proportion of the remainder would do so if requested.

In order that you may be acquainted with the amount of information the Committee are now in a position to supply, I am instructed to send you the map herewith enclosed, on which I have marked in red the stations from which the Committee receive reliable daily observations. The number of these stations could be increased.

The Committee having a staff competent to discuss the Returns, would be most happy to meet the wishes of the Treasury by supplying such Returns free of charge.

I am instructed to point out to you, that they could not undertake to pay any sum of money out of the grant, with the management of which they are intrusted, for work to be carried on by any gentleman not under the entire control of, and in direct communication with the Committee.

I have, &c.

(Signed) ROBERT H. SCOTT,  
Director.

G. Graham, Esq.,  
Registrar General,  
Somerset House, W.C.

MY DEAR SIR, Blackheath, February 3, 1873.

I THANK you for affording me an opportunity of perusing the correspondence that has taken place with reference to the meteorological matter supplied by me to you for publication in your Quarterly Reports, and for which in recent years I have received the sum of 150*l.* per annum.

I have supplied this information for the last 28 years, and in relation to the discussion that has occurred, I desire to place on record the history of the matter as far as I am concerned.

Previously to the year 1844, you published the results of a few observations, the accuracy of which you stated you had no means of determining, and you added that you had no one in your Office who could assist you in the reduction of the observations to useful and practical results.

I travelled at my own expense over the country, and induced 40 to 50 gentlemen of education to incur the expense of instruments, and to supply themselves with new ones where broken, also at their own expense, as well as to devote their time to taking the observations. Every attempt to collect a corps of observers previously had failed.

From the year 1844 I supplied the information to you adapted to your wants, at first without receiving any grant, then 50*l.* was granted, afterwards 100*l.*, and lately 150*l.* annually towards the expenses. It seems to be considered that 10,000*l.* paid for the Meteorological Office ought to cover all meteorological expenses, and in this I entirely agree. I go further and say that 10,000*l.* appears to me an extravagant sum to spend annually on Meteorology, even if it were properly devoted to the advance of the science. When the Royal Observatory at Greenwich, an institution

that is charged with duties of a far higher scientific and national importance, and undertakes far more laborious work, is maintained at much less cost. I think advisedly and as an old meteorologist who has devoted more than 40 years of his life to the advance of the science, when I say that I can see no results that are obtained by the Meteorological Office that in any way represent the value of the money expended on them, and I am so clearly convinced of the inability of the Office to collect and properly reduce the information that it has been a pleasure to me to undertake and build up in accordance with the varied needs of your Office, and the advance of Science, for more than a quarter of a century, that rather than the work should be continued under the direction of others not competent to carry it on, I would willingly supply the matter to you, as for some years I did, free of expense.

The original foundation of the meteorological stations and the continued supply of observations I have received, together with the confidence and goodwill the observers have invariably shown towards me, have been a great source of pride to me, and I have never regarded the preparation of the matter I have forwarded to you for so many years in the light of work done for money.

I bore, as I have stated, the expense of the reduction of the observations, the labour and expense of correspondence, travelling expenses in visiting the stations, for a long time myself, and if necessary I am prepared to do so again.

The amount I received was devoted to paying expenses, and I have always considered, even in recent years when I have received 150*l.*, that my own services were given almost gratuitously.

With regard to the Meteorological Office supplying the information hitherto collected by myself, it could of course be done if the Office had as many stations with careful observers, as well scattered over the country as mine are, but in point of fact nothing of the kind is the case: the Office, at great cost, maintains six elaborate meteorological stations in England, Ireland, and Scotland, situated almost in a straight line (as near as possible), furnished with self-registering instruments, but placed differently in each. Now for the purpose for which the Meteorological matter is printed in your Returns, six stations would be useless, and the self-registration would give no additional value.

Mr. Scott, the Director of the Meteorological Office, states that a good many observers who now forward reports to me would do so to that Office if requested, and it is not unlikely that a considerable number of the gentlemen who contribute information to me might, if asked to do so, send copies also to any Government Department; but setting aside the question of how far Mr. Scott, as the head of a Government Office, is morally justified in tampering with my corps of observers, the majority of whom were induced to take observations at my personal request, I do not believe any Government Department could afford to perform the work under a very considerable expense, and for this reason: I have been repeatedly asked by my observers whether I supplied the instruments, or whether any public body could supply them, and have invariably replied that I had no fund for such a purpose, and that they must bear the expenses themselves. Some would-be observers have then declined, but others I have induced to undertake the expense. Now I am certain that observers would not bear the cost of their own instruments; not to mention the devotion of their own time to supply information gratuitously to any Government office, particularly when that office had a very large sum of money at its disposal.

With regard to the great waste of public money, which I in common with most meteorologists, consider takes place by the Meteorological Office, I trust that if the Lords of the Treasury see fit to withhold the grant I have received, they may also consider whether it is not desirable that a considerable reduction may also be made in the amount annually devoted to Meteorology, which not only seems to me excessive, but likewise calculated to bring the science into disrepute, from the small return that is received for the money, due, as I consider, to its misapplication. I wish to except Sea Meteorology, the results from which I am of opinion are valuable, and for which *alone* the Office was founded.

I should not have felt called upon to express an opinion on the management of the Meteorological Office, only as its Director states that he can perform the work that I have hitherto done, I feel it due to myself to distinctly state why I desire the work begun by me, and continued during a great part of my life, should not be handed over to those in whom I could place no confidence, and, so long as I am able, I desire to continue, with or without a grant, the series of reports of which I was the founder, and in which I have reason to know every member of the medical profession places confidence.

I have not entered into more detail with regard to my objection to entrust work to the Meteorological Office, though I am ready to do so if required.

But I cannot close without expressing my opinion that no head of a Meteorological Office will inspire confidence who is not an observer himself, and contrasting the amount of information I have collected and afforded, for a sum never exceeding 150*l.*, with the work performed by the Office for a grant of 10,000*l.*

I am, &c.  
(Signed) JAMES GLAISHER.

The Registrar General.

2200.

Treasury Chambers,  
April 2, 1873.

SIR, THE Lords Commissioners of Her Majesty's Treasury have had before them your letter of the 6th ultimo

[February], and its enclosures, with respect to the supply to you by Mr. Glaisher, of the Royal Observatory, of Meteorological matter for the purpose of printing with your Reports.

I am to acquaint you that their Lordships are pleased to sanction the employment of Mr. Glaisher up to the present time at the salary, viz, 150*l.* per annum, but this sanction is limited to the year ending 31st March 1874.

A copy of this letter has been sent to the Comptroller and Auditor General with reference to his letter of the 30th August last, calling their Lordships' attention to Mr. Glaisher's continued employment, copy of which was sent you with the letter of this Board of the 14th [16] September last.

I am, &c.  
(Signed) WILLIAM LAW.

The Registrar General.

### APPENDIX III.

#### THE METEOROLOGICAL OFFICE.

##### COMMUNICATION FROM THE DIRECTOR.

Royal Commission on Scientific Instruction and the Advancement of Science,  
6, Old Palace Yard, S.W.,  
Feby. 27, 1875.

SIR,

WITH reference to your letter to Professor Smith, proposing to give further Evidence respecting additional work carried on by the Meteorological Office, I am directed by His Grace, the Chairman of this Commission, to say that any further information which you wish to place before the Commissioners may be conveyed in the form of a written communication.

I have, &c.,  
J. NORMAN LOCKYER,  
Secretary

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

Meteorological Office,  
116, Victoria Street, London, S.W.,  
27 February 1875.

SIR,

I HAVE the honour to acknowledge the receipt of your letter of this day, and to inform you, in reply, that I shall submit a brief statement to you, in accordance with the kind permission of His Grace the Chairman of the Commission.

This statement will not have reference so much to "additional work carried on at the Meteorological Office," as to the action of the Permanent Committee of the Vienna Congress in the development of uniformity of operations in the different European countries.

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

Norman Lockyer, Esq., F.R.S., Secretary,  
Royal Commission on Scientific  
Instruction, &c.

Meteorological Office,  
116, Victoria Street, London, S.W.,  
March 11, 1875.

SIR,

IN accordance with the kind permission from His Grace the Chairman of the Science Commission, conveyed to me in your letter of the 27th ult., I beg to enclose a memorandum containing some evidence supplementary to that already tendered by me to the Commission.

I have the honour to be  
Your obedient servant,  
ROBERT H. SCOTT,  
Director.

J. N. Lockyer, Esq., F.R.S.

##### SUPPLEMENTARY EVIDENCE FOR THE ROYAL COMMISSION ON SCIENTIFIC INSTRUCTION AND THE ADVANCEMENT OF SCIENCE.

Qu. 13,925. Arrangements have been concluded between the Meteorological Society and the Meteorological Office, and have come into effect on the 1st January 1875. The principal features of these arrangements are that the Observers belonging to these two organizations are supplied with an uniform schedule for recording their observations, and that the Society undertakes to furnish to the Office monthly returns from certain selected stations for publication with the returns from its own stations, in con-

sideration of a certain payment, which will probably average about 50*l.* per annum.

An invitation has been issued to the Scottish Meteorological Society to co-operate with the Office on similar terms, and the Meteorological Committee are not without some hope that this proposal may be accepted.

Qu. 13,933. The Trinity House and the Commissioners of Irish Lights have undertaken to have observations of sea temperature taken at certain lightships and at one lighthouse. The Commissioners of Northern Lights have declined to co-operate on the ground of having no lightships.

The Committee have been requested by the "Commission Zur Wissenschaftlichen Untersuchung der Deutschen Meere" to organize a series of observations on the Western Coasts of the North Sea, similar to that organized under its own auspices on the German shores.

The Committee have not felt themselves in a position to undertake so complete an investigation, as much of the enquiry would be of a biological character, and, therefore, foreign to their own sphere of operations.

Qu. 13,939. In virtue of the arrangements mentioned under Qu. 13,925, the Office is prepared, if necessary, to supply returns of trustworthy character from January 1st, 1875, from at least 36 stations distributed over Great Britain and Ireland, and there is no doubt that this list could be largely increased to meet the requirements of the Registrar-General, if such stations as the Royal Observatory, Greenwich, the Radcliffe Observatory, Oxford, the Bidston Observatory, Birkenhead, were requested to continue to send to the Meteorological Office their returns as soon as the Registrar-General ceased to receive them directly.

Qu. 13,961. The Permanent Committee of the Vienna Congress held a meeting at Utrecht this year, and adopted certain measures tending towards the attainment of greater uniformity in climatological enquiry than has hitherto obtained.

The chief of these measures has been the recommendation that at a certain number of stations in each country observations of a similar nature should be taken and should be published on an uniform system, so as to be capable of being bound up together. These observations are to be published in full, and a form has also been devised for the publication of yearly *résumés* from all stations.

The number of stations suggested for each country is as follows:—

Norway	-	-	-	-	10
Sweden	-	-	-	-	10
Denmark, with Iceland and Færoe	-	-	-	-	6
Great Britain and Ireland	-	-	-	-	15
Russia in Europe	-	-	-	-	50
Russia in Asia	-	-	-	-	100
Netherlands	-	-	-	-	2
Belgium	-	-	-	-	2
Germany	-	-	-	-	12
France	-	-	-	-	12
Austria and Hungary	-	-	-	-	15
Turkey	-	-	-	-	10
Switzerland	-	-	-	-	5
Italy	-	-	-	-	12
Spain, Portugal (and Azores)	-	-	-	-	12
Greece	-	-	-	-	3

The Permanent Committee have reason to hope that this proposal will be accepted by all the nations of Europe with one or two exceptions, among which France should be mentioned, inasmuch as she was not represented at the Congress of Vienna.

Qu. 13,962. I have been elected Secretary to the Permanent Committee.

Qu. 14,402. The Maritime Conference mentioned was held in September 1874 at the Meteorological Office. It was of a private, i.e. non-official, character, and was attended by the following gentlemen:—

Austria	- R. Muller	- Director of the Imperial Royal Hydrographic Office at Pola.
Belgium	- F. van Rysselberghe	- Navigation School, Ostend.
Bengal	- H. F. Blanford	- Secretary Meteorological Committee, Calcutta.
China	- J. D. Campbell	- Inspectorate General of Chinese Maritime Customs, London.
Denmark	- Capt. N. Hoffmeyer	- Director of the Royal Danish Meteorological Institute, Copenhagen.
France	- A. Delamarche	- Ingénieur Hydrographe, Ministry of Marine, Paris.
"	- C. Sainte Claire Deville	- Inspector of French Meteorological Stations, Paris.
Germany	- W. H. v. Freedgen	- Director of the "Deutsche Seewarte" at Hamburg.
"	- H. A. Meyer	- Commissioner for Investigating the German Seas, Kiel.
"	- G. Neumayer	- Hydrographer, Berlin.
"	- Capt. Stempel	- Imperial Navy.
Great Britain	- R. J. Mann, M.D.	- President of the Meteorological Society, London.
"	- Rear-Adm. M. F. Nolloth	- Representative of the Admiralty.
"	- R. H. Scott, F.R.S.	- Director of the Meteorological Office, London. Hon. Secretary to the Sub-Committee.
"	- Capt. H. Toynbee	- Marine Superintendent, Meteorological Office. (Representative of the Board of Trade.)
Holland	- H. Buys Ballot	- Director of the Royal Meteorological Institute of the Netherlands, Utrecht.
"	- Lieut. J. E. Cornclissen	- Marine Superintendent, Utrecht (Royal Dutch Navy).
Italy	- Capt. N. Canevaro	- Naval Attaché to the Royal Italian Legation, London (Royal Italian Navy).
Norway	- H. Mohn	- Director of the Royal Norwegian Meteorological Institute at Christiania.
Portugal	- J. C. de Brito Capello	- Director of Nautical and Meteorological Observations, Observatory of the Polytechnic School, Lisbon.
Russia	- A. Moritz	- Director of the Observatory at Tiflis.
"	- Capt. M. Rikatcheff	- Central Physical Observatory, St. Petersburg (Imperial Navy).
Spain	- Capt. H. Montojo	- Spanish Navy.
"	- Capt. C. Pujazon	- Director of the Marine Observatory, San Fernando (Spanish Navy).

Every nation in Europe, except Greece, Sweden, and Turkey, was represented. The United States, however, took no part in the Conference.

The Report of the Conference has now appeared, and contains the replies from the various nations respecting the working of the Brussels Conference referred to by me under Qu. 14,401.

The result of the deliberations was to approve, on the whole, of the Brussels Resolutions, and to recommend for

general adoption a plan of observation and record almost identical with that in use in our own Office.

Qu. 14,432. The Permanent Committee have supported the request for copies of the Hourly Tabulations from our automatic records, and the Committee have undertaken to issue them for the year 1875 as well as for 1874, but the subscribers have been extremely few.

ROBERT H. SCOTT.

## APPENDIX IV.

### RESOLUTIONS passed at the LAST MEETING of the COMMISSION.

[Extracted from the Minutes.]

" At this, the final meeting of the Royal Commission on Scientific Instruction and the Advancement of Science, the following Resolutions were carried unanimously:

" I. That the Commissioners desire, before separating, to place on record their high sense of the value of Mr. J. Norman Lockyer's services as Secretary to the Commission.

" The labours of the Commission have extended over a period of more than five years, during which Mr. Lockyer has been constantly engaged in procuring and arranging for the Commissioners information upon various and important subjects connected with Science.

" The Commissioners would refer more especially to Mr. Lockyer's exertions as Assistant-Commissioner for enquiring into Scientific Teaching in Public Schools.

" The Commissioners consider that they have been very fortunate in obtaining the services of a Secretary who combined eminence in scientific enquiry with experience of the business of the Public Departments.

" The Commissioners desire, in conclusion, to express a hope that, on the termination of the Commission, some arrangement may be made by which the services of Mr. Lockyer, in the promotion of Science, may be secured to the country.

" II. That the above Resolution be printed in the Appendix, and that His Grace the Chairman of the Commission be requested to lay it before the Prime Minister and the Lord President of the Council."

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**ANALYSES.**  
**OF THE**  
**EVIDENCE CONTAINED IN THIS VOLUME.**

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# ANALYSES OF THE EVIDENCE

RESPECTING

## METEOROLOGY.

- SCOTT, ROBERT H., Esq., M.A., F.R.S.** (*Index of his Evidence.*)
- Accommodation for Science Purposes.*  
Meteorological Office is not located in a public building; it utilizes existing buildings for observational purposes, 13,886, 14,011-14,014, 14,393-14,398, 14,483.
- Admiralty.*  
Meteorological Office is constantly consulted by Admiralty Court, 13,948.
- Army Medical Department.*  
Army Medical Department is being organized in conjunction with Meteorological Office, 13,950.
- Austria.*  
Meteorological Congress at Vienna; permanent committee appointed, 13,958-13,963.  
Allowance in Austria for meteorological observations, 14,020 (App. B.)
- Board of Trade.*  
Meteorological Office was originally under Board of Trade; it should be so again, 13,861-13,874, 13,904, 13,978.
- British Association.*  
Grants given by British Association for rainfall observations, 13,940-13,947.
- Brussels.*  
Brussels Conference proposed a uniform system for ocean observations; English only adhere to it, 14,400, 14,401.
- Colonies.*  
Meteorological organizations exist in India, New South Wales, New Zealand, &c., 13,952-13,955.
- France.*  
French Meteorological Department; no proper organization; connexion with London Meteorological Office, 13,957, 14,449, 14,454-14,456.
- FitzRoy, Admiral.*  
Admiral FitzRoy; formerly head of Meteorological Department; his publication of fragmentary notices; his signals still used, 13,863, 13,864, 13,906, 13,932, 14,386, 14,387, 14,420, 14,454, 14,458, 14,465, 14,467.
- Government.*  
Relation of Government to Meteorological Office; disclaims connexion; gives an annual vote, 13,861-13,874, 13,904-13,906.
- Grants for Science Purposes.* See *Income and Expenditure.*
- Greenwich.*  
Correspondence with Astronomer Royal respecting Greenwich Observatory as a centre for meteorological purposes, 13,912-13,915.
- Income and Expenditure.*  
Meteorological Office; its Government vote of 10,000*l.* a year; serious want of funds; payments to observers; smallness of salaries, &c., 13,871, 13,872, 13,890-13,895, 13,900-13,902, 13,918, 13,932, 13,964-14,019, 14,438-14,447, 14,490-14,493.  
Scottish Meteorological Society's proposal for a grant not acceded to, 13,929-13,932.
- Kew.*  
Kew Observatory the central one for Meteorological Office; scientific instruments are verified there, 13,907-13,915, 14,388, 14,424-14,426, 14,483-14,487.
- Merchant Service.*  
Meteorological Office lends instruments to captains in merchant service, and receives observations, 13,896-13,903.
- SCOTT, ROBERT H., Esq.—cont.**
- Meteorological Office (London).*  
Meteorological Office; its history, organization, staff, anomalous position, want of funds, &c., 13,861-14,020, 14,381-14,496.
- Meteorological Offices (Foreign).*  
London Meteorological Office has relations with foreign offices; these have smaller grants than England, 13,956-13,958, 13,968, 13,969, 14,020 (App.)
- Meteorological Society (London).*  
Meteorological Office would accept proposed co-operation of Meteorological Society if funds were sufficient, 13,925-13,928.
- Meteorological Society (Scotland).* See *Scottish Meteorological Society.*
- Meteorology.*  
Meteorological observations; an experimental observatory is much wanted, 13,861-14,020, 14,381-14,496.  
Importance of centralization for meteorological observations, 13,951.  
Metric system not desirable for meteorological observations, 13,963.
- Metric System.*  
Objection to adoption of metric system for meteorological observations, 13,963.
- Observatories.*  
Meteorological Office has seven observatories; continuous records taken photographically, and mechanically in case of winds, 13,907-13,915, 13,995, 14,423-14,426, 14,483-14,489.  
Serious want of an experimental observatory for meteorology; it should deal with nothing but mean results, 14,483-14,489.
- Rainfall.*  
Meteorological Office should determine rainfall for general, not local, meteorological purposes, 13,940-13,947.  
British rainfall organization is private; originated with Mr. Symons, aided by British Association, &c., 13,940-13,947.
- Registrar-General.*  
Registrar-General's returns; Meteorological Office desirous not to publish similar information, 13,934-13,939, 14,020 (App. A.)
- Royal Navy.*  
Meteorological Office supplies Royal Navy with instruments, and receives observations, 13,891-13,903, 14,490.
- Royal Society.*  
Royal Society's connexion with Meteorological Office; has no control, but nominates committee of management, 13,864-14,020.
- Russia.*  
Allowance in Russia for meteorological observations, 14,020 (App. B.)
- Science.*  
Importance to Meteorological Office of having scientific supervision, 13,873.
- Scientific Instruments.*  
Meteorological Office furnishes Royal Navy, merchant service, agents at ports, &c. with recording instruments, 13,891-13,903, 14,381-14,393, 14,399-14,422, 14,423-14,430, 14,471, 14,476-14,478.  
Use of Galton's pantagraph, Amsler's planimeter, and De la Rue's anemometers with bells, by Meteorological Office, 14,427-14,430, 14,471.

SCOTT, ROBERT, H., Esq.—cont.

*Scientific Publications.*

Charts of ocean currents, surface temperature, &c. issued by Meteorological Office; difficult to prepare charts of large areas; 530 reports issued daily, 14,408–14,418, 14,457, 14,479, 14,480.

Continuance of "Fragmentary Papers" by Meteorological Office desirable, 14,419–14,423.

"Atlas des Mouvements généraux de l'Atmosphère," formerly published in France; now suspended, 14,454.

*Scotland.*

Expenses of meteorological establishments in Scotland, 13,932.

*Scottish Meteorological Society.*

Meteorological Office desired to co-operate with Scottish Meteorological Society; failure of negotiations, 13,929–13,932.

*Sundays.*

Meteorological Office does not receive or issue reports on Sundays, 14,469.

*Telegraphy.*

Meteorological Office telegraph system; 29 stations for morning reports, 7 for afternoon; freer use of telegraphs desirable, 13,917–13,921, 13,998–14,003, 14,441–14,448, 14,471–14,475, 14,494, 14,495.

United States telegraphs are stopped at certain times for transmission of meteorological reports, 14,444.

Foreign systems of telegraphy are various, but uniformity is hoped for, 14,475.

*United States.*

Great scale of Meteorological Department in United States; system of synchronous observations established with England, 14,444–14,447, 14,450, 14,470.

STEWART, BALFOUR, Esq., LL.D., F.R.S. (Index of his Evidence.)

*Board of Trade.*

When, under Board of Trade, as now, Meteorological Office observations related to physical meteorology, 14,067–14,072.

*British Association.*

Great value of rainfall observations carried on by British Association, 14,059, 14,060.

*Committees.*

Objection to unpaid committees like Meteorological Committee, 14,061.

*Electricity.*

No records of atmospheric electricity except at Greenwich and Oxford; Meteorological Office will probably commence observations soon, 14,021, 14,051, 14,097.

Observations on atmospheric electricity should be taken by meteorological observatories generally, 14,055, 14,056.

*FitzRoy, Admiral.*

Admiral FitzRoy's observations related to physical meteorology, 14,068, 14,072.

*Glaisher, Mr.*

Valuable meteorological work done by Mr. Glaisher; distinct from that of Meteorological Office, 14,075–14,090.

*Government.*

Physical meteorology is a proper subject for Government support; climatic meteorology might have some aid, 14,031–14,047, 14,051, 14,057, 14,067–14,101.

Special meteorological expeditions should be undertaken by Government, 14,048, 14,049.

*Grants for Science Purposes.*

Government grant for climatic meteorology should be given through scientific societies, 14,047, 14,052.

*Greenwich.*

Photographic observations of the sun's disc are regularly taken at Greenwich, 14,023.

Observations on atmospheric electricity are taken only at Greenwich and Oxford, 14,021, 14,051, 14,097.

*Meteorological Committee.*

Objections to Meteorological Committee; a Meteorologist Royal should be appointed, 14,035, 14,036, 14,061, 14,102–14,109.

*Meteorological Office (London).*

Meteorological Office; objection to its committee of management; general approval of its work, 14,021–14,114.

*Meteorological Offices (Foreign).*

Foreign Government Meteorological Departments are chiefly for physical meteorology, 14,091, 14,092.

STEWART, BALFOUR, Esq.—cont.

*Meteorological Society (England).*

Meteorological Society might be employed to render aid in regard to climatic meteorology, 14,053.

*Meteorologist Royal.*

Desirable that a Meteorologist Royal, responsible to Government, should be appointed, 14,035, 14,036, 14,061, 14,102–14,109.

*Meteorology.*

Meteorological science; recent advances, &c., 14,021–14,023.

Meteorology, physical and climatic; former should be aided by Government, 14,031–14,047, 14,057, 14,067–14,101.

Government should undertake special expeditions for meteorological purposes, 14,048, 14,049.

Meteorological observations should be taken at a number of stations, which should be visited and inspected, 14,062–14,066.

*Observatories.*

Solar observations require a special observatory; it need not be costly, 14,024–14,030.

Observations on atmospheric electricity might be undertaken by meteorological observatories generally, 14,055, 14,056.

*Ocean.*

Oceanic meteorology; knowledge imperfect; Government expeditions desirable, 14,048, 14,049, 14,111, 14,112.

*Oxford.*

No records of atmospheric electricity except at Oxford and Greenwich, 14,021, 14,051, 14,097.

*Photography.*

Photographic observations of the sun's disc are taken at Greenwich; will probably be undertaken in India, Mauritius, &c., 14,023.

*Rainfall.*

Rainfall observations are of great value; better carried on voluntarily than by Meteorological Office, 14,059, 14,060.

*Registrar-General.*

Meteorological Office should not have to furnish observations to Registrar-General's Department, 14,038–14,044, 14,075–14,090, 14,098–14,101.

*Royal Society.*

Royal Society's Meteorological Committee might be dispensed with, 14,035, 14,036, 14,061, 14,102–14,109.

*Science.*

Progress of meteorological science, 14,021–14,114.

*Scientific Instruments.*

Use of self-recording instruments in Meteorological Office, 14,021, 14,022.

*Scientific Societies.*

If Government aid be given to climatic meteorology, it should be through scientific societies, 14,046, 14,052.

*Scottish Meteorological Society.*

Scottish Meteorological Society is doing great good; encouragement desirable, 14,046, 14,052, 14,058.

*Sun.*

Photographic observations of the sun are taken at Greenwich, &c., 14,023.

Special observatory desirable for solar observations, 14,024–14,030, 14,055, 14,113, 14,114.

*Telegraphy.*

Weather telegraphy should continue to be taken by Meteorological Office, 14,041.

MAIN, THE REV. ROBERT, M.A., F.R.S. (Index of his Evidence.)

*Colonies.*

Photographic meteorological observations are carried on at Toronto, 14,161.

*Denmark.*

English Government should co-operate with Denmark for meteorological purposes, 14,148, 14,149.

*Glaisher, Mr.*

Value of Mr. Glaisher's work; to stop it would increase expense without gain to science, 14,173–14,197.

*Government.*

Government should promote international meteorology, 14,130–14,140, 14,147, 14,169, 14,170.

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- Prælector of Physiology.**  
 At Cambridge; position of, *Rep. III.*, p. xxii., xxviii.
- Price, Professor.**  
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- Fritchard, Rev. C.**  
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- Prizes for Science.**  
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- Professors.**  
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- Provostship.**  
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 Foundation, colleges, studies, scholarships, &c. at, *Rep. VII.*, p. 35; *App.* p. 73.
- R.**
- Radcliffe Library.**  
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- Radcliffe Observatory.**  
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- Ramsay, Professor.**  
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- Rankine, Professor.**  
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- Rawlinson, Sir Henry.**  
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- ASTRONOMICAL PHYSICS.**  
 An observatory, specially devoted to, should be founded, *Rep. VIII.*, p. 41.
- BOARD OF TRADE.**  
 Mining Record Office to be lodged with Statistical Department of, *Rep. I.*, p. vii.
- BRITISH MUSEUM.**  
 1. Change in administration of natural history collections.  
 2. Director to be appointed by the Crown; keeper, &c. by minister.  
 3. Present superintendent to be first director.  
 4. Board of visitors to be constituted.  
 5. Botanical collection to be arranged with reference to geographical distribution and palæontology.  
 6. To distribute duplicate specimens, *Rep. IV.*, p. 3, 17, 23.

**Recommendations and Conclusions—cont.****CATHOLIC UNIVERSITY OF IRELAND.**

Grant not recommended for. *Rep. V.*, p. 28.

**CHILDREN.**

In schools, to receive instruction in science, *Rep. II.*, p. xvi., xix.

**COUNCIL OF SCIENCE.**

For Oxford and Cambridge Universities, *Rep. III.*, p. xxv.—xxxvii.

**COUNCIL OF SCIENTIFIC ADVICE FOR GOVERNMENT.**

To be appointed; functions of Government Grant Committee to be transferred to it; not to initiate investigations, *Rep. VIII.*, p. 46, 47.

**DEAN.**

For new South Kensington Science School, *Rep. I.*, p. vii., and *Rep. I. Supp.*, p. ix.

**DOCTORATE IN SCIENCE.**

To be given only on proof of research, *Rep. VII.*, p. 3.

**DUBLIN UNIVERSITY.**

1. Original research to be essential for fellowships.
2. Scholarships to be awarded for science. *Rep. VII.*, p. 34.

**EDINBURGH UNIVERSITY.**

1. Has a claim to increased State aid.
2. Should receive a capital sum and an annual grant.
3. Capital sum to be dependent on private contributions.
4. Expenditure to be subject to parliamentary control. *Rep. VII.*, p. 14, 28.

**EDUCATION DEPARTMENT.**

Co-ordination with Science and Art Department to continue, *Rep. II.*, p. xxviii.

**EXAMINATIONS.**

"Leaving" preferable to matriculation examination for Oxford and Cambridge, *Rep. III.*, p. ix.

**FELLOWSHIPS.**

To be re-modelled, freed from celibacy restriction, and given for original research, *Rep. III.*, p. xlv.—lvii.

**GEOLOGICAL SURVEY OFFICE.**

To remain in Jermyn Street, *Rep. I.*, p. vii.

**GLASGOW UNIVERSITY.**

1. Natural history chair to be divided, and provision made for a new professorship.
2. Increased payments to be made for assistants.
3. Scientific professors' salaries to be revised.
4. State grant to be increased, and under parliamentary control. *Rep. VII.*, p. 20, 28.

**GOVERNMENT AID TO SCIENCE.**

1. Present aid is inadequate.
2. To be given in aid of laboratories, &c., for scientific investigations.
3. To be given in aid of physical meteorology, terrestrial and astronomical physics, and tidal phenomena.
4. To be given in aid of private investigators.
5. By increase of Royal Society's grant.
6. By institution of a ministry and council of science. *Rep. VIII.*, p. 46, 47.

**GOVERNMENT GRANT FUND.**

May be considerably increased, with advantage, *Rep. VIII.*, p. 47.

**INVESTIGATORS.**

Should be remunerated for their time and labour, *Rep. VIII.*, p. 47.

**KEW GARDENS.**

1. Collections to be arranged with reference to systematic botany.
2. To receive recent plants from Government expeditions.
3. To aid investigations in physiological botany. *Rep. IV.*, p. 23.

**KING'S COLLEGE, LONDON.**

1. To have State aid; grants to depend on subscriptions.
2. Hospital, Medical Department, and Day School finances to be kept distinct.
3. Grant to be conditional on a new charter abolishing religious restrictions, &c. *Rep. V.*, p. 12.

**Recommendations and Conclusions—cont.****LABORATORIES.**

Ought to be provided by the Government, *Rep. VIII.*, p. 47.

To be added to new Science School at South Kensington, *Rep. I.*, p. vii.

**HYDE INSTITUTE, OXFORD.**

Physical apparatus imperfect, *Rep. III.*, p. xxxix.

**LECTURES, PUBLIC.**

To artizans; to be given on applications of science, *Rep. I.*, p. vii.; *Rep. IV.*, p. 24.

To be given on general principles of science, *Rep. IV.*, p. 24.

**LITERATURE.**

Not antagonistic to science in education, *Rep. III.*, p. vii.

**MATHEMATICS.**

To be added to Royal School of Mines' instruction, *Rep. I.*, p. vii.

**MINING RECORD OFFICE.**

To be lodged with Statistical Department, or in College of Chemistry premises, *Rep. I.*, p. vii.

**MUSEUM OF PRACTICAL GEOLOGY.**

To be kept for Museum and Geological Survey purposes only. Working men's lectures to continue, *Rep. I.*, p. vii.

**MUSEUMS, PROVINCIAL.**

To be connected with Science and Art Department, *Rep. IV.*, p. 23.

**NEWCASTLE COLLEGE OF PHYSICAL SCIENCE.**

May soon establish a claim to Government aid, *Rep. V.*, p. 24.

**OBSERVATORIES.**

Should be established and maintained by the Government, *Rep. VIII.*, p. 47.

**ORIGINAL RESEARCH.**

To be promoted in universities by—(1) a scientific professoriate; (2) fellowships; (3) special laboratories; (4) increased museums; (5) doctorate in science, *Rep. III.*, p. lvii.

To be promoted by State aid to laboratories, private investigators, &c., *Rep. VIII.*, p. 46, 47.

**OWENS COLLEGE.**

To receive Government aid, *Rep. V.*, p. 21.

**PENSIONS.**

To be instituted for University Professors, *Rep. III.*, p. xxxiv.

**PROFESSORS.**

Plurality of, indispensable, *Rep. III.*, p. xxvi.

To be elected by small boards, *Rep. III.*, p. xxxiii.

**PROFESSORSHIPS.**

Additional, for Oxford and Cambridge, *Rep. III.*, p. xxvi.—xxx.

**QUEEN'S UNIVERSITY, IRELAND.**

1. Colleges to have increased grant for assistants, &c.
2. Geology to be separated from natural history chair at Belfast. *Rep. VII.*, p. 40.

**RELIGION.**

Restrictions of, should be abolished at King's College, *Rep. IV.*, p. 12.

**RESEARCH (ENDOWMENT OF).**

Aid may properly be given for the, by the State, *Rep. VIII.*, p. 47.

**REVISED CODE.**

Gives insufficient encouragement to science, *Rep. II.*, p. xix.

**ROYAL COLLEGE OF CHEMISTRY.**

1. To vacate premises in Oxford Street, *Rep. I.*, p. vii.
2. Teaching in, to be rendered more efficient, *Rep. I.*, p. vii.
3. To be consolidated with Royal School of Mines, *Rep. I.*, p. vii.

**ROYAL COLLEGE OF SURGEONS' MUSEUM.**

To be added by the State, and not removed to South Kensington, *Rep. IV.*, p. 4, 23.



**Recommendations and Conclusions—cont.****ROYAL SCHOOL OF MINES.**

1. Teaching in, to be rendered more efficient, *Rep. I.*, p. vii.
2. To be consolidated with College of Chemistry, *Rep. I.*, p. vii.

**ROYAL SCHOOL OF NAVAL ARCHITECTURE.**

1. Instruction of, to be given in new Science School at South Kensington, *Rep. I.*, p. vii.

**SAINT ANDREW'S UNIVERSITY.**

1. Staff and appliances to be sufficient for proper teaching of science.
2. Classes at Dundee not to be affiliated.
3. Scientific chairs not to be transferred to Dundee.
4. Government grant to be increased; expenditure being submitted to Parliament.
5. Salaries of scientific professors to be revised. *Rep. VII.*, p. 25, 26.

**SCHOLARSHIPS IN NATURAL SCIENCE.**

1. To be founded at Oxford and Cambridge, *Rep. III.*, p. xiii.

**SCHOOLS, ELEMENTARY.**

1. Science to be taught to children and pupil-teachers, *Rep. II.*, p. xvi., xix.

**SCHOOLS, PUBLIC AND ENDOWED.**

1. To devote not less than six hours a week to science.
2. One sixth of examination marked to be allotted to science.
3. Same proportion for leaving examinations. *Rep. VI.*, p. 10.

**SCIENCE AND ART DEPARTMENT.**

1. To work in harmony with general elementary education.
2. To continue co-ordinate with Education Department.
3. To have a more efficient system of inspection.
4. Teachers to be recognized as Elementary Science Teacher, Second Grade Science Master, and First Grade Science Master.
5. Payments for results to be rated according to certificate held by teacher.
6. Practical instruction and practical examination for teachers.
7. Examinations for teachers to be conducted by Department examiners.
8. To give training-college students the opportunity of remaining a third year.
9. To encourage employment of assistant teachers.
10. Exhibitions to be offered to encourage first-grade science teachers.
11. Extended grants to be given for buildings, laboratories, apparatus, &c.
12. To encourage formation of science schools, and scientific instruction in grammar schools, &c.
13. To organize typical museums, and aid and inspect provincial museums. *Rep. II.*, p. xxviii.-xxx.; *Rep. IV.*, p. 23.

**SCIENCE SCHOOL AT SOUTH KENSINGTON.**

1. To be formed out of Royal School of Mines and College of Chemistry.
2. Science teachers to be instructed therein.
3. Respecting organization of, and accommodation in, *Rep. I.*, p. vii., viii.; *Rep. I. Supp.*, p. ix.

**SCIENCE TEACHERS.**

1. To receive instruction in new Science School at South Kensington, *Rep. I.*, p. viii.

**SCOTLAND.**

1. Number of degree-giving bodies not to be increased, *Rep. VII.*, p. 22.

**SCOTTISH UNIVERSITIES.**

1. Two classes to be recognized in natural science honors' list, *Rep. VII.*, p. 5, 28.
2. Grants to be accounted for to Government, *Rep. VII.*, p. 28.

**SOUTH KENSINGTON MUSEUM.**

1. To form a collection of physical and mechanical instruments.
2. Its scientific collections to be placed under a minister. *Rep. IV.*, p. 23.

**TIDAL PHENOMENA.**

1. An organization should be established for the observation of, and for the reduction of the observations, *Rep. VIII.*, p. 47.

**TRAINING COLLEGES.**

1. System to be modified for scientific instruction, *Rep. II.*, p. xix.

**Recommendations and Conclusions—cont.****UNIVERSITY COLLEGE, LONDON.**

1. To receive State aid; grants to depend on subscriptions.
2. Finances of hospital, medical department, and day school to be kept distinct. *Rep. V.*, p. 12.

**UNIVERSITIES.**

1. Much still to be done for science in, *Rep. III.*, p. ix.

**Reed, Mr. E. J.**

1. On scientific investigation relating to ships, *Rep. VIII.*, p. 4.
2. On a council of science, *Rep. VIII.*, p. 41.

**Reeks, Trenham, Esq.**

1. On professors' salaries at Royal School of Mines, *Rep. V. App.*, p. 38.

**Register Office.**

1. Estimate for reports for, in 1874-5, *Rep. VIII. App.*, p. 49.

**Registrar-General.**

1. Meteorological observations supplied to, *Rep. VIII.*, p. 20, 26.

**Religion.**

1. As affecting King's College and Catholic University of Ireland, *Rep. V.*, p. 8, 25, 26.
2. Not recognized for degrees, &c. at Queen's University, Ireland, *Rep. VII.*, p. 35.

**Revised Code.**

1. Codes of 1861 and 1871, as affecting scientific instruction, *Rep. II.*, p. xi.-xix.

**Richards, Admiral.**

1. On scientific advice for Government, *Rep. VIII.*, p. 3.
2. On physical observatories, *Rep. VIII.*, p. 14.
3. On a minister and council of science, *Rep. VIII.*, p. 31.
4. On a council of science as affecting Admiralty, *Rep. VIII.*, p. 31.

**Rigg, Rev. Dr.**

1. On scientific instruction in colleges and schools, *Rep. II.*, p. xii.-xiv.

**Robson, Mr.**

1. On University College and Hospital, *Rep. V.*, p. 4, 6, 7, 11; *App.* p. 29.

**Rolleston, Dr.**

1. On an electing board for professors, *Rep. III.*, p. xxxii.
2. On biology at Oxford, *Rep. III. App.*, p. lxi.
3. On early instruction in science, *Rep. VI.*, p. 7.

**Roscoe, Professor.**

1. On science in German universities, *Rep. III.*, p. xxvi.
2. On study at Owens College, *Rep. V.*, p. 18, 19.
3. On a council of science, *Rep. VIII.*, p. 32, 40.

**Rossall School.**

1. Scientific instruction in, *Rep. VI. App.*, p. 17, 61, 97, 134.

**Rosse, Lord.**

1. On Royal Society Government Grant, *Rep. VIII.*, p. 6.

**Royal College of Chemistry.**

1. Organization, instruction, &c. in, *Rep. I.*, p. vii.; *Rep. II.*, p. xxi.

**Royal College of Science, Dublin.**

1. Exhibitions to, collections of, &c., *Rep. II.*, p. xxiii.; *Rep. IV.*, p. 15.

**Royal College of Surgeons.**

1. Hunterian Museum of, &c., *Rep. IV.*, p. 4, 23.

**Royal Dublin Society.**

1. Museums administered by, *Rep. IV.*, p. 15.
2. Estimates for, in 1873-4, *Rep. IV. App.*, p. 26.

**Royal Geographical Society.**

1. Government grant to, *Rep. VIII.*, p. 6.

**Royal Irish Academy.**

1. Estimates for, in 1873-4, *Rep. IV. App.*, p. 26.

**Royal School of Mines.**

1. Relation of, to Geological Survey, *Rep. I.*, p. vii.
2. Want of a chair of mathematics, laboratories, &c. in, *Rep. I.*, p. vii.
3. Want of accommodation in, *Rep. I.*, p. vii.
4. Exhibitions to, *Rep. II.*, p. xxiii.
5. Professors' stipends at, *Rep. V.*, p. 11; *App.* p. 38.

**Royal School of Naval Architecture.**

In relation to new Science School at South Kensington, *Rep. I.*, p. viii.

**Royal Society.**

Government Grant administered by, *Rep. VIII.*, p. 6, 21.  
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**Royal Society of Edinburgh.**

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**Rugby School.**

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**Russell, Earl.**

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**Saint Paul's School.**

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**Saint Peter's College, Westminster.**

Scientific instruction in, *Rep. VI. App.*, p. 16-54, 94, 130.

**Salaries.**

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**Sabine, Sir Edward.**

On Royal Society Government Grant, *Rep. VIII.*, p. 7.  
On a council of science, *Rep. VIII.*, p. 29.  
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**Salisbury, The Most Hon. E. A., Marquess of.**

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**Scholarships and Exhibitions.**

To Royal School of Mines, and College of Science, Dublin, *Rep. II.*, p. xxiii.  
At Oxford and Cambridge, *Rep. III.*, p. xiii, xhii.  
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**School Scientific Societies.**

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**Science School at South Kensington.**

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