

COLLEGE OF SCIENCE (DUBLIN), &c.

RETURN to an Order of the Honourable the House of Commons,
dated 26 March 1867 ;—for,

COPIES “ of the REPORT of the COMMISSION on the COLLEGE of SCIENCE,
DUBLIN, and of the Objections made to any of the Recommendations by
Members of the Commission :”

“ Of MINUTE of the Committee of the Privy Council for Education, directing
the Abolition of the Office of Director of the Museum of Irish Industry :”

“ And, of all CORRESPONDENCE that has taken place with different Depart-
ments of the Government with reference to the Abolition of that Office,
and to the new Arrangements proposed to be adopted for the Government of
the Museum.”

Mr. H. Cole to Sir Thomas Larcom.

South Kensington Museum,
11 October 1866.

Sir,

I AM directed by the Lords of the Committee of Council on Education to
transmit to you, for the information of the Lord Lieutenant of Ireland, the
accompanying Report on the proposed College of Science, and to request to be
favoured with any observations which his Excellency may desire to make on
the subject.

Sir Thomas Larcom, R.E., K.C.B.,
&c. &c., Dublin Castle.

I am, &c.
(signed) Henry Cole.

REPORT on the COLLEGE of SCIENCE for IRELAND.

To the Right Honourable the Lords of the Committee of Her Majesty's Most
Honourable Privy Council on Education.

My Lords,

IN accordance with the request contained in the letter of the Lord President,
dated the 17th February 1866, and with your Lordships' Minute of the 10th
March, we, the Commissioners thereby appointed, have carefully considered the
subject of the new College of Science referred to us, and have now the honour
to submit the following Report :

2. From the General Minute on Scientific Institutions and Instruction in
Dublin, that of the 21st September 1865, it appears that your Lordships con-
sider that, for the various reasons therein given, “ the Museum of Irish In-
dustry ” now existing in Dublin “ should,” on its re-organisation as contem-
plated by the Minute, “ have a wider scope given to it than that of a School of
Mines ; that it should become a College for affording a complete and thorough
course of instruction in those branches of science which are more immediately
connected with and applied to all descriptions of industry, including agri-
culture, mining, and manufactures ; that it should in this way supplement the
elementary scientific instruction already provided for by the Science Schools of
the Department, and that it should assist in the training of teachers for these
schools.”

3. At the same time Minute of 10th March 1866 states that “ as the
sphere of action sketched out in this (the preceding) Minute will be somewhat
new and beyond the limits hitherto placed on the action of the Science and Art
Department in respect of the encouragement of science, my Lords have appointed

a commission to advise them on the subject ;" and it proceeds, " My Lords consider that it is desirable that the college should, on its establishment, commence with a clear and defined object, a well considered course of study, and a proper staff of professors. They, therefore, request the Commission to consider these subjects and report generally on the scope of the instruction to be given, the examinations for testing it, and the certificates, &c. to be awarded to successful students.

4. Her Majesty's Government having thus decided generally on the necessity for the enlargement of the sphere of action of the existing Government Institution for Scientific Instruction in Dublin, it would appear that the matters on which your Lordships desired that we should advise may be most conveniently taken under the following heads :

- I. The precise sphere of action of the college, and the object at which it should aim.
- II. The scope and subjects of instruction.
- III. The staff of professors necessary.
- IV. The course of instruction and its duration.
- V. The examinations and granting of certificates.

I.—The precise Sphere of Action of the College, and the Object at which it should aim.

5. We think the object of the college should be to supply, as far as practicable, a complete course of instruction in science applicable to the Industrial Arts, especially those which may be classed broadly under mining, agriculture, engineering, and manufactures, and to aid in the instruction of teachers for the local schools of science.

6. We do not consider that the practical applications of science to industry, or the arts themselves, should be undertaken by the new College of Science as a special part of its teaching. Its aim should rather be to impart a sound and thorough knowledge of those branches of science which may be so applied, leaving it to the student subsequently to specialise his knowledge and turn his attention in the direction he may find most suitable ; but practical subjects when capable of being rendered illustrative of scientific principles should in all cases be introduced in the course of instruction.

7. Under existing circumstances, however, due to the division and redistribution of duties between the Royal Dublin Society and the College of Science, and in consequence of the representation made by the secretary, we think it may be advisable to attach a chair of Agricultural Science to the college. This should be looked upon as experimental, and its continuance be understood to be dependent on its success.

II.—The Scope and Subject of Instruction.

8. The subjects of instruction should be the following :

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|---|---------------------------|
| 1. Applied Mathematics. | 8. Geology. |
| 2. Descriptive Geometry and Mechanical Drawing. | 9. Mineralogy. |
| 3. Mechanism. | 10. Agricultural Science. |
| 4. Physics. | 11. Mining. |
| 5. Chemistry. | 12. Metallurgy. |
| 6. Botany. | 13. Machinery. |
| 7. Zoology. | 14. Surveying. |

9. We propose, that under Applied Mathematics should be taken the application of mathematics to those sciences which are generally included under the head of mechanics, viz., statics, dynamics, hydrostatics, and hydrodynamics, as well as to some other branches of physics.

10. Under Mechanism should be treated only the relations of motion, or the study of machines merely as contrivances for changing one kind of motion into another, apart from any considerations of force, a science which has been termed Kinematics.

11. Under

11. Under Machinery, then, would be treated the application of mechanics and mechanism to machines used in the industrial arts.

12. As probably many students will enter at first without a sufficient knowledge of pure mathematics, the Professor of Applied Mathematics should give such preliminary instruction as may be necessary to students entering for the associateship (*see par. 18.*) He should not be called upon to give any such instruction to the occasional students, who can obtain it easily for themselves, and who should not be allowed to join the Applied Mathematics class without being thoroughly prepared in the elements of pure mathematics.

13. Chemistry should include both lectures and laboratory practice.

14. The requisite appliances and assistance for instructing the students practically in this and other branches of science should be provided.

III.—*The Staff of Professors.*

15. To teach the foregoing subjects professors will be required in—

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|---------------------------------------|--|
| 1. Applied Mathematics and Mechanism. | 7. Geology. |
| 2. Physics. | 8. Mineralogy and Mining. |
| 3. General Chemistry. | 9. Agriculture. |
| 4. Applied Chemistry. | 10. Descriptive Geometry, Mechanical Drawing, Machinery and Surveying. |
| 5. Botany. | |
| 6. Zoology. | |

Professorships of physics, general chemistry, applied chemistry, botany, zoology, geology, and agriculture already exist in connection with the Science and Art Department. This proposal, therefore, contemplates the addition of three new professorships.

16. It will be necessary for the Professor of Applied Mathematics and Mechanism, and the Professor of Descriptive Geometry, Machinery, and Surveying, to devote their whole time to the college; whilst from the other professors a minimum of three lectures a week during the session will be required. As the school develops, assistants or tutors, to teach under the professors, may be needed in many of the subjects.

IV. *The Course of Instruction.*

17. The course of instruction should extend over three years. There should be two terms in each year. In the first two years the instruction should be general. In the last year it should be specialised under the heads of Agriculture, Mining, Engineering, and Manufactures. The following is the scheme proposed:

FIRST YEAR.

First Term.
Applied Mathematics.
Physics.
Descriptive Geometry.

Second Term.
Applied Mathematics.
Physics.
Botany.
Descriptive Geometry.

SECOND YEAR.

Applied Mathematics.
Chemistry.
Laboratory Practice.
Mechanical Drawing.

Chemistry.
Laboratory Practice.
Zoology.
Mechanical Drawing.

THIRD YEAR.

Division A.—Mining.

Geology, with demonstrations in Palæontology, Mineralogy, Mining, and Assaying.

Division B.—Agriculture.

Geology, Agricultural Science, and Land Surveying.

Division C.—Engineering.

Mechanism, Machinery, Mechanical Drawing, and Surveying.

Division D.

Mechanism, Applied Physics, and Applied Chemistry.

V. *Examinations and Certificates.*

18. A diploma of associateship of the college should be given to students who pass in all the subjects of the first two years, and take a first class in all the subjects in one division of the third year.

19. Persons should also be permitted to enter for the separate courses, and to receive certificates after examination.

20. The examinations should be conducted by officers appointed by the Science and Art Department conjointly with the professors of the college.

21. In conclusion, we would beg leave strongly to urge that it is important and advisable to have instruction given in Political Economy. Probably the best way of promoting a knowledge of this important science would be to establish evening lectures, to be attended by the students, but open to all other persons. Any objection that might be taken to a Government Department dealing with this subject might, we would suggest, be met by requesting one or other of the Universities to appoint the lecturer for the time being.

We have, &c.

(signed)

Rosse.

Talbot de Malahide.

W. B. Carpenter.

B. M. Cowie.

John Fowler.

E. Frankland.

W. H. Gregory (with the exception of paragraph 21, to which I object).

H. D. Harness, Col. R. E.

A. W. Hofmann.

Thomas H. Huxley.

J. Beete Jukes.

Robert Kane.

Myles O'Reilly (with the exception of paragraph 21, to which I object).

Lyon Playfair.

E. Sabine, Lieut.-General, R. A.

Warrington W. Smyth.

William K. Sullivan.*

John Tyndall.

J. F. D. Donnelly, Capt. R. E., and Secretary of Commission.

South Kensington, 9 July 1866.

Sir *Thomas Larcom* to Mr. *H. Cole*.

Sir,

Dublin Castle, 13 October 1866.

I AM directed by the Lord Lieutenant to acknowledge the receipt of your letter of the 11th instant, and to acquaint you, for the information of the Lords of the Committee of Council on Education, that his Excellency concurs in the Report on the College of Science in Ireland therein transmitted, and trusts it will be carried into effect with all convenient speed.

I am, &c.

Henry Cole, Esq., C.B.,
South Kensington Museum.

(signed) *Thomas Larcom.*

* Professor Sullivan signs with the following reservation, "with the exception of paragraph 13, which does not express the decision of the Commission; the first part of paragraph 16 so far as relates to the words 'devote their whole time;' and the last sentence of paragraph 21, to which I strongly object."

The Right Hon. *H. Corry* to the Secretary to the Treasury.

College of Science, Dublin.

South Kensington Museum,
26 November 1866.

Sir,

REFERRING to your letter of the 20th January 1866, in which you state that the Lords Commissioners of Her Majesty's Treasury concur in the arrangements proposed in the Minute of the 21st September 1866, by the Lords of the Committee of Council on Education, to be adopted for the Royal Dublin Society and the Museum of Irish Industry, my Lords transmit herewith an estimate for placing and maintaining the College of Science in Dublin, which it was thereby determined to create, in a thorough state of efficiency.

A Commission was, by Minute of the 10th March 1866, appointed to advise my Lords on the constitution and staff of the proposed college, and on the general scope of instruction to be given in it.

The Commission reported on the 9th July 1866. The Irish Government were communicated with, and Sir Thomas Larcom, in a letter dated 13th October, stated that his Excellency the Lord Lieutenant concurred in the report, and trusted it would be carried into effect with all convenient speed.

A copy of the report of the Commission, of which my Lords fully approve, is transmitted herewith.

The estimate is framed on it, except as regards administration, buildings, &c., matters which were not referred to the Commission, and therefore not considered in the report. With regard to the staff of professors, the Commission recommends (page 4) that there should be ten (10) professorships. Seven of these already exist in some form in connection with the Department. Two of the professors, viz., the professor of Applied Mathematics and Mechanism, and the professor of Descriptive Geometry, Machinery, and Surveying, will have to devote their whole time to the College; their salaries should, therefore, be 400 *l.* rising to 500 *l.* per annum. These professorships are new.

The professor of Applied Chemistry will be charged with the laboratory and laboratory instruction, which will require his constant attendance, and he will perform analyses when called upon by the Department. Taking into consideration the private work he is enabled to undertake, together with the fees of students, and, on the other hand, that he will have to instruct the Royal exhibitors free of charge, 300 *l.* per annum would seem to be a fair salary. The present chemist will be the future professor of Applied Chemistry. As chemist he receives 200 *l.* per annum.

The other professors are put in the estimate at 200 *l.* a year each. This amount most of them now receive, and it is the same as is paid to the professors in the Royal School of Mines. All the professors will be required to instruct the Royal exhibitors free of charge.

The report contemplates assistants or tutors as the school develops. The only assistant immediately needed is one in the chemical laboratory. The present assistant receives 100 *l.* per annum out of "incidents." He should be put on a fixed salary of 100 *l.*, rising to 150 *l.* by 10 *l.* per annum.

With regard to administration, hitherto the Museum of Irish Industry and the School of Science applied to Industry and the Arts have been under a director. The Minute of the 21st September lays it down, that for the future "a clear line of demarcation between the functions of the Museum of Irish Industry and the Royal Dublin Society should be strictly maintained, so as to avoid future complication." Under that arrangement the Museum of Irish Industry, converted into a College of Science, was to be strictly instructional, as distinct from the Royal Dublin Society, which was to be exhibitional as far as Government grants were concerned. The Museum of the College then was to "be entirely subordinate to and contain only such objects as are essential to the instruction in the College."

Under the new and altered position of the institution as a pure college, a director would appear to be unnecessary. It is impossible that any one man can really supervise or direct instruction in the whole range of science to be taught in it.

The professors will or should be among the most eminent men in their several branches. So vast has the field of each branch of science now become,

that no one, however eminent, can be considered an authority in any but that which he has chosen for his special study. It follows, if this position be correct, that some layman of administrative capacity, and of sufficient distinction to carry weight, but unbiassed by any special scientific predilections would, if one were required, be a proper head of an institution of this nature. At present, however, we consider a council of professors, with a dean of faculty, to be an organization more adapted to the requirements of a College of Science. The dean would be the organ of the professors in all communications with the Science and Art Department. He would preside at all meetings, where he should have a casting vote, and generally represent the professorial body. The office should be annual and filled by rotation, according to seniority of appointment. Such an arrangement would appear best adapted to induce general co-operation and harmony with energetic action. An honorarium of 100 *l.* should be attached to the office of dean of faculty.

The executive and secretarial business would then devolve on a permanent secretary who should attend all meetings of the council of professors. As this officer would, however, be more especially the agent and representative of the Department in all business, whether immediately connected with instruction or not, it would be advisable that he should not vote at the council. The salary put down is 400 *l.* The gentleman who is now secretary of the committee of lectures might well undertake this office. The curator of the Museum should also act as librarian (for which post he is excellently qualified) as recommended by the House of Commons' Committee. This will give him increased duties, especially as the library will require enlarging. His present salary, which is only 200 *l.* per annum, should be increased to 300 *l.* as recommended. It will be seen that no vote is taken for provincial lectures, which will cause a saving of 500 *l.* per annum. The general science system of the Department has made, and promises to make, such great progress in Ireland that my Lords see no reason for continuing these exceptional grants to that country.

Last year a vote was taken for exhibitions. It is proposed that there should be nine Royal exhibitions of 50 *l.* a-piece tenable for three years, three becoming vacant every year. These would be given in competition at the May examinations of Science Schools and Classes in the same way as the Royal exhibitions to the Royal School of Mines. In addition to these there should be four scholarships of 50 *l.* each, tenable for two years; two to become vacant each year. These should be given in competition to the students who have been a year in the College, if sufficiently deserving to be recommended for them. The 500 *l.* per annum saved by discontinuing the provincial lectures will nearly cover this expenditure.

The Commission on the college recommend lectures on political economy. My Lords do not think it desirable that these should be commenced, or any arrangements made for them till the college has been in action for some time.

A new laboratory, class lecture rooms, and class rooms, will be required for the college. This increased accommodation can be only obtained in two ways.

Either by obtaining some land at the back of the Museum on which to build; this is the property of minors, but it is believed the trustees would be willing to sell or lease it, if power were obtained for them to do so; or by removing the offices of the Geological Survey elsewhere, the collections of the Survey remaining in the College Museum, but under the charge of the officers of the Survey.

The former course cannot be recommended.

The latter course would provide class rooms and lecture rooms at once, sufficient at all events for the wants of the college for many years to come, and it does not appear that it would put the Geological Survey to any serious inconvenience. There is no connection between the College of Science and the Geological Survey.

The most feasible and least expensive plan for providing accommodation for the laboratories and class rooms, is to clear one of the side galleries for them, and to glaze over the court to receive the collections removed from the gallery. The expense of covering in the court, fitting up laboratory, &c., it is estimated would be 3,000 *l.*

The fees should be about 2 *l.* per course of lectures, or 10 *l.* a year, or 25 *l.* for the whole studentship of three years. For laboratory practice about 2 *l.* per month, or 12 *l.* for the full course of nine months. The holders of Royal exhibitions

exhibitions and Royal scholarships will pay no fees. It would be advisable that the fees, until they amounted in the gross to the total amount of the salaries of the professors from Government, should, with only one slight deduction, be apportioned among them. My Lords would propose to fix the deduction till then at 10 per cent., when the question should be re-considered, of the total fees, the Science and Art Department having power to employ the sum thus received in any way that appeared most desirable in the college. The apportionment of the fees among the professors, after the deduction of 10 per cent., might with advantage be made in the following manner: as respects the fees paid for the separate courses, half to go to the professor who gives the course, the other half to go to a common fund, to be shared among all the professors, the secretary and curator of the Museum. As respects the lump sums paid for the year, or the full course, half to go to the professors whose courses are attended, and the other half to go into the common fund, to be distributed among all the professors, the secretary, and the curator. This scheme may require some modification as respects the fees for the laboratory. But these and other details may be arranged afterwards, in consultation with the council of professors.

It will be seen from the estimate, that independent of the cost of preparing the building as a college, and providing rooms for the Geological Survey office, the annual expenditure will be a little over 7,000 *l.* per annum, or about the same as the expenditure in each of the Queen's Colleges, and an increase of less than 2,500 *l.* on the present cost of the Museum of Irish Industry and School of Science applied to the arts.

The Secretary of Her Majesty's Treasury.

I am, &c.
(signed) *H. Corry.*

The Secretary to the Treasury to the Right Hon. *H. Corry.*

Sir,

Treasury Chambers, 11 January 1867.

THE Lords Commissioners of Her Majesty's Treasury have had before them your letter of the 26th November last, and its enclosures.

Their Lordships desire me to state in reply, and for the information of the Lords of the Committee of Council on Education, that they concur generally in the arrangements proposed in your letter, for placing and maintaining the College of Science in Dublin in a state of efficiency, and they agree to an estimate being submitted to Parliament for the amount, and in the form of that transmitted by you.

At the same time my Lords desire to point out that, as the new system is more or less tentative, it becomes necessary to stipulate that the new professors to be appointed shall not be entitled to claim compensation in the event of their offices being abolished within a period of seven years, and they request that the necessary intimation may be made to those gentlemen in writing.

I am, &c.
(signed) *George Ward Hunt.*

The Right Hon. *H. Corry.*

Mr. *H. Cole* to Sir *Robert Kane.*

Science and Art Department, London, W.,
21 February 1867.

Sir,

I AM directed by the Lords of the Committee of Council on Education to inform you that the Lords Commissioners of Her Majesty's Treasury have approved of the scheme for the New College of Science for Ireland, based on the Report of the Commission of which you were a member.

The Estimates for next year have been framed in accordance therewith, and will, with the report and correspondence, shortly be laid on the Table of the
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House of Commons. In anticipation of its publication, that you should be made acquainted with that portion of the scheme which, dealing with the administration, affects yourself personally, the extract from the Vice President's letter to the Treasury, is as follows :--

" With regard to administration, hitherto the Museum of Irish Industry and the School of Science applied to industry and the arts, have been under a director. The Minute of the 21st September lays it down, that for the future ' a clear line of demarcation between the functions of the Museum of Irish Industry and the Royal Dublin Society should be strictly maintained, so as to avoid future complication.' Under that arrangement, the Museum of Irish Industry converted into a College of Science, was to be strictly instructional, as distinct from the Royal Dublin Society, which was to be exhibitional as far as Government grants were concerned. The museum of the college then was to ' be entirely subordinate to and contain only such objects as are essential to the instruction in the college.'

" Under the new and altered position of the institution as a pure college, a director would appear to be unnecessary. It is impossible that any one man can really supervise or direct instruction in the whole range of science to be taught in it.

" The professors will or should be among the most eminent men in their several branches. So vast has the field of each branch of science now become, that no one, however eminent, can be considered an authority in any but that which he has chosen for his special study. It follows, if this position be correct, that some layman of administrative capacity, and of sufficient distinction to carry weight, but unbiassed by any special scientific predilections, would, if one were required, be a proper head of an institution of this nature. At present, however, we consider a council of professors, with a dean of faculty, to be an organization more adapted to the requirements of a College of Science. The dean would be the organ of the professors in all communications with the Science and Art Department. He would preside at all meetings, where he should have a casting vote, and generally represent the professorial body. The office should be annual, and filled by rotation, according to seniority of appointment. Such an arrangement would appear best adapted to induce general co-operation and harmony with energetic action. An honorarium of 100 £. should be attached to the office of dean of faculty."

Your present office, as you will perceive, ceases under the altered system to be established for the Museum of Irish Industry; and their Lordships regret that there is no one of the new appointments on the staff of the new college of science which they could offer to one of your eminence. They are glad to think, however, that your leaving the Museum of Irish Industry, of which you have been so long the head, will not entirely deprive the country of your able and valuable services in the furtherance and direction of education in Ireland.

It is to these zealous services that the Museum of Irish Industry owes in so great a degree its present position.

Sir Robert Kane, F.R.S.,
Museum of Irish Industry.

I have, &c.
(signed) *Henry Cole.*

COLLEGE OF SCIENCE (DUBLIN), &c.

COPIES of the REPORT of the COMMISSION on the COLLEGE of SCIENCE, DUBLIN; of MINUTE of the Committee of Privy Council for Education directing the Abolition of the Office of Director of the Museum of Irish Industry; and, of CORRESPONDENCE with different Departments of the Government with reference to the Abolition of that Office, and to the new Arrangements proposed to be adopted for the Government of the Museum.

(*Mr. Monsell.*)

*Ordered, by The House of Commons, to be Printed,
9 April 1867.*

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Under 2 oz.