Miscellaneous

A PLAN

FOR THE

FURTHER DEVELOPMENT

OF THE

POLYTECHNIC SCHOOL.

April, 1886

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On the 24th of February last, Chancellor Eliot addressed the following letter:—

To Professors Woodward, Potter, Nipher and Johnson:

GENTLEMEN: It seems to me that some special plan or outline of a plan for the development of the Polytechnic work of the University should be matured, with a view to growth and increased efficiency, particularly as a fifth year is now to be added to the course of study. After some consultation, therefore, I venture to ask you to act as a committee to prepare such an outline, specifying *first*, the essential, and *second*, the desirable steps of progress, with the most practicable methods of procedure, and to report the same to the Faculty of the Undergraduate Department at an early day, so that the attention of the Board of Directors can be definitely called to its consideration, if thought expedient.

I can not help thinking that good results would follow such action, and I am sure that the effort should be made. Hoping that you will agree with me, I remain,

Very respectfully yours,

W. G. ELIOT,

Chancellor.

On the 8th of April the committee presented their report to the Faculty of the Undergraduate Department.

REPORT.

The undersigned, a committee appointed by the Chancellor to report a plan for the development of the Polytechnic School, beg leave to submit the following report: —

1. The absolute necessity of the early appointment of a Professor of Dynamic Engineering must be admitted. There is no probability that Mr. Allderdice will be allowed to continue his stay at this University beyond next July. There is, therefore, no time to lose. The new Professor should be on the ground as soon as possible, in order to assist in the improvements about to be recommended below. To fill the position, a very competent man is needed. He should be not only familiar with the theory of steam and electricity, but above all, practically acquainted with machinery of all kinds. Your committee think that the care of the three classes in Dynamic Engineering will be sufficient to occupy his entire time, hence he can not be relied upon to teach Drawing, as is done by Mr. Allderdice the present year.

2. Next in obvious importance is the selection of a Tutor, who shall distribute his services in the departments of Mathematics, Physics, Astronomy, and Civil Engineering. For the present, your committee think that one Tutor will suffice for the extra work arising from the work of the fifth year, in the departments above mentioned.

3. The Department of Dynamics can never be what it ought to be without a suitable Laboratory of Dynamic Engineering. Such a laboratory should contain a large variety of apparatus for testing and illustrating the principles of the mechanics of engineering. For the first time in the history of the Polytechnic School, we are in a condition to appreciate and use such a laboratory. More than three-fourths

of the students in Dynamic Engineering next year will be graduates of the Manual Training School, and therefore, familiar with the use of tools and machinery. The time which in the past students have given to shop-work, should in their case be given to work in the proposed laboratory.

The following is a partial list of the apparatus needed in the proposed laboratory: —

(*a.*) Machines for testing the strength, elasticity and durability of the materials of Engineering, such as wood, bricks, stones, cements, iron, steel, and alloys.

(*b.*) Dynamometers, such as springs, brakes, gears, indicators, etc., for determining the power of a motor, or the energy transmitted, or that used by a particular machine or process.

(*c.*) Water-wheels and Turbines in connection with tanks and dynamometers.

(*d.*) Pumps, cylindrical and centrifugal, for liquids and for air, in connection with tanks and dynamometers.

(*e.*) A high-speed Steam Engine with a steam jacket and a condensor.

(*f.*) Special apparatus for testing lubricants and the coefficients of friction.

(*g.*) Calorimeters of various kinds for determining the specific heats of solids, liquids, and gases; also for determining the vaporizing heats of liquids in common use.

(*h.*) Electric Dynamos and Motors, and electrical plant in general.

One great use of such a laboratory consists in the stimulus it affords for original research in the realms of practical dynamics, on the part of students and professors.

During the past year the dynamic laboratory of the Massachusetts Institute of Technology, at Boston, has been fitted up with a close approach to the plan here outlined.

Similar laboratories may be found at Stevens' Institute, Hoboken, N. J., and at Cornell University, New York.

Within the University building there is no suitable room or rooms for such a laboratory. What is wanted is a large ground-floor room with plenty of overhead supports, heavy foundations, pump-wells, and pits for machinery.

Regarding such a laboratory as an essential feature of the University the coming year, your committee are led to their next recommendation, viz. : —

4. A new building for Chemistry and Dynamic Engineering. The site we suggest is on the corner of Seventeenth Street and St. Charles. The building should extend from the line of Seventeenth Street to the Gymnasium, a distance of about 130 feet. We assume that the present Chemical building would be removed to make room for the proposed structure. If a drive-way into the college yard is thought necessary, an arched way could be left.

It is probable that a three-story building would be best suited to our wants, though it is not necessary in this report to decide upon the details, either of the building or of its internal arrangements.

Having enumerated the essential steps of progress for the coming year, your committee might consider their main duty done, but they think it best to touch upon the subject of cost and endowment.

For the Professor of Dynamic Engineering a full salary must be provided. The difference between that and the sum allowed Mr. Allderdice represents the additional sum needed for that position. A Tutor can be had for $1,000 a year.

To properly equip the Dynamic Laboratory, at least $10,000 are necessary, even after taking into account all the apparatus we now have on hand. The estimate of Prof. Lanza, of the Institute of Technology, is $20,000, but he has several things which we should not value, and he includes some things which we already have. As to the cost

of the building, only an approximation can be made. It should be plain and substantial, well lighted and ventilated. It would seem that $18,000 or $20,000 would be ample.

The fittings of the Chemical Laboratories would cost considerable, but they would not all be needed at the very start. We ought not to expect to spend less than $40,000 for the building and its furniture. For the support of the new Professor, and the Laboratory, an endowment of not less than $50,000 should be secured.

Coming now to the second part of our report, the things desirable but not strictly essential, we suggest the establishment of some Fellowships for the benefit of students who have taken a degree in this University.

The University is not without free scholarships for the benefit of undergraduates; but as yet it has done nothing for the encouragement of still higher work. The experience of older Universities has abundantly proved the great value of Fellowships, not only to the students, who win them, but to the cause of education, and to the institution as well. We think that it would be a great point gained if a Fellowship could be established in connection with every department in the University. It would stimulate the students in the lower classes, raise the standard of scholarship in the institution, and greatly help to develop the several departments. A Fellowship worth $500 a year would suffice to keep a student here one or more years, during which time it should be understood that he would act as an assistant in one of our laboratories. The assistance a Fellow would render would be in the direction of his studies, so that he would be helping himself while helping us.

Nothing could be more appropriate than that a Fellowship should be named for its founder.

C. M. Woodward,
F. E. Nipher,
W. B. Potter,
J. B. Johnson.

April 7, 1886.

After discussion of the various features of the report, it was adopted unanimously and referred to the Board of Directors for their respectful consideration.

These recommendations are made on the implied condition that in every case adequate funds shall have been first secured to be paid into the Treasury, in such manner as to hold the University harmless.

For the convenience of all likely to be interested in the matter, it was voted to print the report.

MARSHALL S. SNOW,
Secretary of the Faculty.

WASHINGTON UNIVERSITY, APRIL 10TH, 1886.