

THE VARSITY.

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Now that the Provincial Government has been returned to power, and its hands greatly strengthened, it is to be hoped that it will do something definite, and something generous, in aid of the Provincial University. There is one department of the University which should receive, as it most certainly deserves, special attention. We refer to the department of Practical Science. Since its re-organization on a singularly narrow basis, little or nothing has been done to enable it to maintain its proper place as one of the recognized departments of the University. That it has succeeded as well as it has is a matter for congratulation.

As far as we are able to judge, the position of the present School of Practical Science is this: It has afforded lecture and laboratory room for the Natural Science Department, and has eased the pressure on the space of University College. Most, if not all, the lectures to students taking the Natural Sciences course are delivered in the school. So far, so good. But the Engineering Department, what of it? Beyond the establishment of a Professorship and a Fellowship in Engineering, no progress has been made towards the development of the institution. The principal work which the Engineering branch is doing is to turn out surveyors and draughtsmen. No provision is made for practical work in the Mechanical Department. And this is not the fault of the school authorities. The Engineering Department is practically called on to make bricks without straw. In such a course, the very essential to good and thorough work—an intimate acquaintance with all the practical details of engineering, which are only to be acquired by constant practice in the use of machines and tools—is entirely left out. Surely this is not logical. At the present time, when so much attention is being given to the subject of Technical Schools, the one which should be the cap-stone of the system is left without proper means and appliances for the adequate and even necessary performance of its work!

The duty of the Government in this matter is plain. Workshops, supplied with the latest models, patterns of machines and tools necessary for all the purposes required, should be provided. A competent instructor should be engaged to superintend the machine shop. The Professorship of Engineering should, moreover, be placed upon exactly the same footing as the other chairs in University College. In saying that the School turns out practically nothing more than good surveyors and draughtsmen, we are by no means disparaging its work. The School does as good work as many other institutions which are more thoroughly equipped. But what we do say is this: That the object of such a School should be to afford every facility for instruction in a complete course of technical and scientific education. This is what might reasonably be expected of it by the public, and by those who desire to attend its sessions. As it stands now, it only fulfils a part of its proper work. Is it too much to expect that justice will be done to this long-suffering and most excellent School? We hope not.

If we take a look at similar institutions abroad, we shall soon see how much more comprehensive they are in the scope of their operations. Take, for instance, the Massachusetts Institute of

Technology. There are nine regular courses pursued therein, each of four years' duration; for proficiency in any one of which the degree of B. Sc. in the course pursued, is conferred. The courses are as follows: Civil and Topographical Engineering; Mechanical Engineering; Mining Engineering; Architecture; Chemistry; Electrical Engineering; Natural History; Preparatory to the Professional Study of Medicine; Physics; and General Course. There are, in addition to the President, 13 Professors and 14 Assistant Professors, who are still further supplemented in their labors by thirty instructors and assistants. There are in connection with this School, Draughting-rooms, Laboratories of Chemistry, Physics, Applied Mechanics, Mechanical Engineering, Mining and Metallurgy, and Biology; besides Museums and Libraries. This School has over 660 students in attendance, and her graduates amount to about the same number. The Institute is a thoroughly independent School. The Worcester Free Institute, though not on such an extensive scale, is still a very complete Industrial School. It offers a good education—based on the Mathematics, Living Languages, Physical Sciences and Drawing, and affords sufficient practical familiarity with some branch of Applied Science, to secure its graduates a livelihood. It has a large staff of Professors and Lecturers, and grants the degree of B.Sc. It has a large Machine-shop, fully equipped, and presided over by experienced practical workmen. The Sheffield Scientific School, at New Haven, is, perhaps, one of the most complete and extensive of the kind in America. It used to be in close connection with Yale College, but has been re-organized upon a new basis, and is now, practically, an independent Institution, presided over by a Director, assisted by about thirty Professors and Instructors. The complete course occupies three years. The first year's work is the same for all, and the last two years are devoted chiefly to instruction—practical and theoretical—in seven special departments. These are: Chemistry, Civil Engineering, Dynamical (or Mechanical) Engineering, Agriculture, Natural History, Biology (preparatory to Medical studies), Mining and Metallurgy, and Preparatory work for other higher studies. Those taking the course in Mining and Metallurgy, take the regular three years in Engineering, and at its close spend a fourth year in the study of Metallurgical Chemistry and Mineralogy. The course preparatory to other higher studies includes general instruction in Arts and Science, and also in Meteorology, Sanitary Science, Political Economy, Constitutional Law, and so forth. The degrees conferred by this School are: Bachelor of Philosophy, on those who have completed any of the regular three year courses, and have passed the examination at its close; Civil Engineer and Dynamic Engineer, on Bachelors of Philosophy who have taken the first degree in Engineering study, and who pursue a higher course for at least two years, sustaining a final examination, and giving evidence of ability to design important constructions and make the requisite drawings and calculations therefor; also the degree of Doctor of Philosophy, given for high attainment and original research.

We have selected these three American Science Schools as typical examples. They are all different from one another, are managed differently, and appeal to separate and distinct constituencies. The Worcester Free Institute is largely devoted to the industrial training of young boys, who serve their apprenticeship, as it were, at this school. The Massachusetts Institute of Technology is recruited chiefly from the artisan class, who receive thorough training as handicraftsmen. The Sheffield school affords instruction in the higher branches of engineering and advanced scientific research. Speaking generally, the Worcester Institute represents the elementary, the Massachusetts Institute the intermediate, and the Sheffield School the advanced departments respectively, in the system of technical and scientific education as pursued in the United States. The number of Technical and Industrial Schools of all kinds supported out of national funds in the different States is 45, attended by over 500 students. The tendency everywhere is to multiply such institutions, and to represent every branch of industrial art and science. The three we have referred to, are selected as being fairly representative institutions of their respective classes. The experience in these schools is that they flourish better as independent institutions than as appendages to