

INAUGURAL ADDRESS,

*Delivered by Prof. R. Ramsay Wright before the Literary Society.
(Concluded from last week.)*

Let me now briefly point out what I believe to be necessary to promote Biological teaching in our educational system. Many of you are aware that the question of introducing Biology in some form or other into the schools has been frequently raised. I do not propose to touch upon this subject as regards primary education, for the object lessons in Natural History which alone ought to be employed at this stage, although of great value in cultivating the faculties of observation, and in awakening interest in the study of Nature, do not share the special features which render Biology valuable in University training.

Here it is the object of the teacher to inculcate general principles, and to cultivate power of generalization and induction. The question now arises, at what point may the introduction of this method be safely attempted? I believe that an Introductory Text Book to Biology, embodying the general principles of the science, illustrated as far as possible with familiar concrete examples, and by good figures, might be with advantage introduced into the High Schools. In some American High Schools a plan has been adopted somewhat similar, although more elementary than the Elementary Practical Course in University College, in which certain types of plants and animals are selected for practical study.

I have formerly held and expressed the opinion that something of the sort might be done in the High Schools of Ontario, but I now incline to the opinion expressed above that a simple but at the same time scientific exposition of the more important principles of Biology would form the best stepping-stone to the practical part of University training. Thoroughness is the first requisite, and we expect beneficial results from the first practical work of the student: this requires much expenditure of time on the part of both teacher and pupil, as well as natural aptitude and acquired skill on the part of the teacher, which could not always be expected. Prof. Bain has stated with much force the danger of devoting too much time to practical teaching, when the object is intellectual training, but the danger would be removed entirely if the student before entering on his practical work were provided with knowledge of that general character which would guide him at every step. There are two proposals under consideration by the Senate of the University, which, if they receive the sanction of that body, will I think be productive of much service in furthering Biological Education. One of these advocates the establishment of the degree of Ph.D. with the view of stimulating post-graduate study and research; the other urges the preparation of the way for such research as regards the natural sciences, by suggesting further requirements in the knowledge of the French and German languages, and by allowing students to confine themselves during the fourth year of their course to the special science which they propose to pursue. Such differentiation is now carried to a much greater extent in most Universities than is now proposed for ours, but we must await the increase of the teaching power of Univ. Coll. before venturing so far as they have done. That such an increase of the teaching power in the subject I represent is very desirable, has been already urged in public by the Chancellor of the University, who not only advised the establishment of a separate professorship of Botany, but also one of Animal Physiology. The latter appears to me the most pressing want, for the difference between physiological as compared with morphological study renders it difficult to combine the two in the person of one teacher. The physiologist must be an expert in physical and chemical methods of investigation, and his training is therefore wholly different from that of the zoologist, or botanist, who concern themselves primarily with investigations into structure. It is extremely desirable that the experimental side of Biology should not only be represented on our teaching staff, but in our Arts curriculum.

The encouragement of research aimed at, however, will be rendered inoperative if funds are not forthcoming for the improvement of the University Library. I can only speak confidently of my own department, of course, but the incompleteness of our Library in that is a serious embarrassment in the prosecution of original work. Several graduates who have been anxious to work up special subjects have been met with this difficulty, and I hope that in the schemes which are now before the public to aid the University, the Library question will not be forgotten. No chemist, or physicist or biologist ought to enter on a research without having access to the important literature on the subject. This is one of the chief arguments for the compulsory acquisition of the French and German languages as part of a scientific education; for science is now cosmopolitan, and the tendency of the interfering an orderly division of labor. The duty of the scientific man is to know not only what has been done but what is being done, and one of the most notable features of the scientific literature of the present day is the publication of preliminary notices indicating the nature of researches in progress, and thus saving time and dividing labor in the

search after truth. So a periodical literature has to a large extent succeeded to the publication of monographs, and it is the completeness of such periodical literature that we ought to be specially anxious to secure for those who are pursuing original researches.

Not only must our library be improved, but our facilities for research in the way of further apparatus, increased accommodation, and enlarged collections must be arranged for,

And now I think I can point out a method in which the Government may extend substantial aid to the University, while receiving quite as much as it gives. A Provincial Museum is much required for Ontario. Hardly a state in the Union but is possessed of such an institution, in which the natural products of the state are exhibited, and its arts and manufactures illustrated. Such a Provincial museum, as an important educational instrument, would fill a gap in the educational system of the Province. To fulfil such a function, however, the museum would require to be arranged on very different lines from our University collection. They have been formed to meet the wants of students, who study the contents under the guidance of their professors. In a museum, on the other hand, which is primarily intended to instruct the visitors, every object should as far as possible form an object lesson. The arrangement of a collection on such lines, however, means the expenditure of both money and time, and the funds of our University neither admit of expensive additions, nor of the employment of officials to supervise such re-arrangement.

A Provincial Museum, however, of the kind indicated might readily be established by the Government in connection with the Ontario School of Practical Science. The present buildings could, at a small cost, be extended so as not only to receive the University collections and exhibit them to much greater advantage than at present, but to permit of that growth of the collections which would take place under curators specially appointed to look after them. After the first cost of fitting up such additions, a moderate sum for maintenance would suffice to create in a short time a museum of which Ontario might be proud.

Here the natural products of the Province might be exhibited, and especially the practical bearings of Biological study illustrated. It would be well, *e.g.*, to arrange for a Department of economic Entomology, such as we find in connection with similar institutions in the United States. The great practical importance of this branch of Natural History has been recognised by the appointment of State Entomologists, who have turned out an immense amount of useful work. Much has also been done in Canada in the same direction by private individuals, and the Government might very properly recognise these services by creating a position of the nature indicated where such work might be carried on under the most favorable circumstances.

In the Geological department the Geological structure of the Province might be illustrated by maps, models, &c., and special attention paid to its mineral resources. The development of these would be sure to ensue, if the public had access to the kind of information which might this way be afforded.

The School of Practical Science was originally instituted as a College of Technology and it appears to me that the sort of training which is contemplated in that expression could in a large measure be made available to the public by making the Provincial Museum also a Museum of Technology. The professor of Chemistry and of Engineering would thus have departments under their care, which would be of the highest educational value. The combination I have suggested has been effected with the highest possible success in Edinburgh, where an arrangement of a similar character was carried out between the University authorities and the British Government, the University collections being transferred to Government control, and suitable sums provided for additions to them and for their maintenance, while money was provided by the Government—the technological part of the result is one of the most extensive museums of Science and Art in the world.

In conclusion let me urge upon the members of the Society, not to allow the *esprit de corps* which is largely fostered by societies like this, to be extinguished in the struggle for existence which takes place when they leave their Alma Mater. Rather let them combine, whether in convocation or in other methods, to press the claims of the Provincial University upon the Government.

The scheme which I have suggested in the foregoing remarks is one I think in which the University authorities and the Government might co-operate not only to the advantage of the Scientific education of the country, but to the material prosperity of the Province at large.

ENTREVUES.

The French have decidedly the advantage of us in subtlety and exactness of expression. Here is a word expressing a provokingly elusive and evanescent, but at the same time universal, phase of mental experience, of soul-life, and the closest English equivalent we have is some such clumsy periphrasis as 'catching a glimpse of.' It irresistibly suggests the thought of valley-mists, in which we walk, rifting for