

### Suggestions to Teachers and Pupils on the Study of Botany.

BY JOHN WADDELL.

When looking over the papers in botany, written by examinees in Grade IX., at the Provincial examinations of Nova Scotia, I have been forced to the conclusion that the object of the Education Department is being only imperfectly attained. Perhaps this is at least in part due to a lack of appreciation by teachers of the object that the Department has in view, and my desire in writing this article is to give some assistance to both teachers and scholars.

I think I represent the view of the Department when I say that the study of botany should be first of all educative, but that it should also have its practical bearing and its æsthetic interest.

Botany has several advantages as a science for the younger pupils of the high schools or for the older pupils of the common schools. The material costs nothing, elaborate apparatus is not required, and though a pocket lens, costing a dollar or less, is of great advantage, much work can be done without it. Moreover, botany is one of the simplest sciences and does not call for a mature mind. It appeals to the senses, it does not require the apprehension of abstract ideas, and is therefore a science that should be early studied. It cultivates largely the faculty of observation, that faculty which is a notable characteristic of children, but which unfortunately they may easily lose. Not only is the cultivation of the faculty of observation necessary, in order to avoid its deterioration, but, as in the case of all our faculties, exercise and training improves upon the natural capacity. The child's observation is liable to be of a very general kind and should be directed along proper paths. A superficial observation does not get at the most important characteristics, and a training in botany is very valuable in making observation more definite. A child's observation of the buttercup will give him the knowledge that the flower is yellow, but this is one of the less essential, though doubtless one of the more conspicuous characteristics.

The practical value of the study of botany is probably most apparent in the case of the farmer; and many of those in our schools who take up the subject do not look forward to being farmers, but on the æsthetic side everyone is interested. A walk through field or wood is made doubly attractive by even a slight knowledge of botany. A knowledge of the peculiarities of plants adds a charm to those whose beauty appeals to even the ignorant and gives an interest to others that are conspicuous or unattractive to the ordinary observer.

It is impossible that in the time allotted to botany in school anything like the whole of the subject should be gone over, but the papers set in the Provincial examinations give a larger choice of questions, and if thorough work has been done by the candidate it is almost impossible for him not to find enough that is familiar.

If he has made a study of trees he is liable to find some question where his knowledge will stand him in good stead; if he collects ordinary small plants, especially when they flower, he will have no difficulty, and if he has made a specialty of non-flowering plants he will have an opportunity of showing his knowledge. Such, at least, was the case in the examination in 1902, and I think there is rarely a paper set that would not give a careful student a fair opportunity for showing the examiner that he has devoted attention to the subject. After all, that is what an examiner wishes to find out. An examination is not a fiendish device on the part of the examiner to puzzle the examinee; its object is as far as possible to discover whether the student has done conscientious work along the right lines, and whether his mental capacity is suited to the work that he has undertaken.

Accuracy is essential. Since one of the main uses of the study is a training in exact observation and in observation of important characters, answers that show only a superficial examination of the thing described, cannot get high marks. The questions asked are specially framed for the purpose of encouraging accuracy. But accuracy of knowledge is conspicuously wanting, though I think I am correct in saying that there is an improvement, if comparison is made with past years. But still a strawberry flower is described as though it were like a buttercup, except in its color. The Canada Cinquefoil (*Potentilla Canadensis*) has a yellow flower like the buttercup, but in essential characteristics it is much more like the strawberry; for instance in the calyx, also in the position of the petals and stamens. The sepals of the buttercup may be removed without disturbing the other parts of the flower, but if an attempt be made to remove the sepals of the strawberry or of the cinquefoil, it will be found that the rest of the flower will be torn.

It should be borne in mind by the examinee in botany that most children six years old know that the strawberry is good to eat, and that the statement of this fact, even if enlarged by the recommendation of sugar and cream, can hardly be expected to impress the examiner with the idea that the pupil has made strenuous efforts to acquire botanical training. I remember once reading a very interesting book descriptive of what the writer saw in his walks near his home on a New England hillside. Much botanical information was given in a very pleasing manner. One chapter began with the remark, said to be a quotation, "Doubtless the Almighty might have made a more luscious fruit than the strawberry, but doubtless He never did." Such a remark was admirable in this little book. It drew the attention of the reader and fitted in with the surroundings. But such a remark would be entirely out of place in an examination paper. The examiner has no desire to have his attention drawn to irrelevant matters. It merely gives him that much more to read. He wishes to find out how much the candidate knows of the subject. It is hard work for an examiner to look over paper after paper, and