

At the present moment there are no pea-weevils recorded for British Columbia, a fact which is indeed fortunate, because this small beetle has frequently made the growing of peas an impossibility in certain parts of Ontario. There is no doubt that this beetle will thrive in British Columbia if it is introduced, and it can only be introduced through such a medium as mentioned above; that is, the importation of seed from an infested area.

Inquiry in Ontario has elicited the information that peas are not subject by law to fumigation before sale or distribution, but seedsmen, to protect their own business, usually fumigate on their own responsibility. Further, I am informed, the numbers of the pea-weevil in Ontario are gradually increasing in those districts where peas are being grown. Hence, those Provinces, and in particular British Columbia, where the pest does not occur at present, must guard against the introduction of this beetle, which is unquestionably one of the most serious to the pea-growing industry of Ontario.

The adult weevil is about $\frac{1}{2}$ inch long. In general its colour is black, with irregular markings of black and white, over which may be seen a slight brown pubescence. Farmers in British Columbia will recognize it from these characters and from the fact that it may be found as a beetle inside the peas. Its presence is indicated by circular round holes in the pea; consequently when these signs are seen there should be an immediate report made to the Government.

ENTOMOLOGY IN THE PUBLIC SCHOOL.

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By way of introducing the topic upon which I desire to devote a few minutes of your precious time, and which I shall treat from a standpoint, theoretical as well as practical, permit me to quote William W. Campbell on the subject of agriculture in general. He states: "The nation of the future which will rule the world will be that one which lays most stress on her rural population and her rural wealth. She will be the one in which the great mass of her people till the land. My hope for my Canada is that she will turn all her energies in the direction of the soil, and that she will become a country of orchards and vineyards and wheat-fields and meadows, and a great pasture for the herds of the earth."

Also, the Royal Commission on Technical Education and Industrial Training has this to say: "In all progressive countries education is being adjusted to meet the needs of the children . . . to interest them in rural life, and to qualify them to follow it with advantage."

And let me add a note from the Report of the Royal Commission on Agriculture: "We would suggest the teaching of the fundamental principles of agriculture, with the art of giving . . . some knowledge of botany, soils, and kindred subjects."

The above excerpts will tend to make manifest the standing of authorities who have the real welfare of their country at heart upon the position and status of the subject of agriculture in the school curriculum; and perhaps no part of it has a more important bearing upon its success or failure, its improvement or its retardation, than the study of entomology in its various phases of interest.

A metropolis to be ideal must, besides constant consideration of the æsthetic and the means and methods of attaining a maximum in that respect, note very carefully that all its putrefaction and festering sewerage is deposited at no little distance from its vicinity; all that would mar or destroy must be slowly, carefully, and permanently, if at all possible, removed; so, also, the most profound and intricate study must be made of all the causes responsible for the attainment of the highest and noblest results in agriculture. Perhaps in no other branch is there such a field for research along these lines than in the subject of entomology; besides affording us means to accomplish with satisfaction some of the finest results in nature's processes in agriculture, it gives us a means of removing or at least checking to a degree much which tends to make agriculture a burden and a care, which many engaged in its pursuit would rather shirk than carry.

Our boys and girls of to-day will be our farmers and farmers' wives of to-morrow. Where, then, is there a more fruitful area to sow this knowledge than in our schools, colleges, and universities? And judge for yourself which of the three is the most desirable institution in which to impart it: the school, where the interest is obtained for the first time in the wonderful vistas of new worlds opened to view, where the mind is most receptive to influences of whatever nature they be; or the college, where in cases innumerable the youth has other multitudinous interests among which to divide his time and substance; or at the university, where the curriculum is so diversified that something must be eliminated to make room for the course of the particular bias or trend which the student may have developed through force of circumstances or otherwise.

This subject, then, should be commenced in school just as soon as a child obtains an interest in any object which seems to command his attention, a graded course being essential according to the ability of the pupils. Thanks to the Department of Education, with the substantial aid which it has received from the Dominion Government, many teachers have qualified in this subject. But since the success of its teaching and the resultant enthusiasm of the class proportionately depends upon the dynamic or inert interest of the teacher in the subject, many schools, ideally situated for attaining the acme of perfection in this regard, have not reached the standard they might. Entomology is of such tremendous import that, in my mind—and in this statement, of course, I mean in its relation to agriculture, not apart from it—every teacher should have to qualify in it before he takes up the all-important profession of teaching. To realize how many active teachers are like-minded in this respect, one need only call to mind the large number of men and women in attendance at our recent summer schools. I might state in this connection that the course already referred to and fitting teachers to engage in imparting instruction in entomology might more satisfactorily be carried on in connection with the Department of Agriculture in the University, where men trained in pedagogy, and with this sole aim and interest at heart, the teaching of agriculture in its various aspects, including the instruction, practical, theoretical, and biological, in entomology, could and would no doubt devote their time along these lines. The summer vacation could be utilized as before for this purpose, the teachers receiving remuneration as a matter of course. Should other qualified Dominion experts be required, it seems but fair that they too should receive some extra recognition of their service.

So much for the teacher and his qualifications. What about the mind and attitude of the child?

One of the most powerful instincts inborn in every child that may be used in the school-room is innate curiosity. He wants to know the origin, the working, and the use of everything his eyes alight upon; this period can be religiously used to direct the child along the lines of learning just what bearing these things have upon his own life. Amid these introductions to the new objects of his world, he wonders much about the phenomena of nature. He is again most curious and feels he must know what and why these things are, and advantage of this desire must be taken immediately in the study of that which bears upon entomology; his standard of judgment should again be its attitude upon his own life, whether it is beneficial or pernicious, noting as a consequence the advisability of its preservation or its extinction. The wise teacher will allow him to investigate freely in nature's domains whatever he is interested in, and will be very ready to prompt and lead into further research along these channels.

Entomology is especially suitable for stimulating and training the power of observation and manipulation, the ability to really see and carefully handle. The child doubtless, to begin with, will prove himself a thorough savage in the wanton destruction of insect-life in order to satisfy his thirst for knowledge. But here the opportunity of presenting the ethics of the subject would be seized and presented to his little mind—to live and let live the beautiful or ever-common creatures which are beneficial to him and to those who provide for him, and to destroy that which

is a pest. Also, the principle of cause and effect are easily grasped here. He sees that things are not left to chance, but that this universal rule governs all actions. Later in his school-life he can apply this same rule in history, politics, and personal conduct. Stress generally can be put upon the value of any life in nature, his attention riveted upon the heinousness of destroying any creature without a fair trial, and the British sense of justice and fair play introduced to him for the first time; he will develop a love of the beautiful, the toleration of the useful, even though it is ugly; the general principle that everything has some particular function after all; in fact, this study opens up the widest fields to the student of nature in the wonderful insects of the world, their beautiful fitness for their existence and peculiar characteristics, and he feels a greater reverence for that Great Influence which introduced them all. In fact, a foundation is laid for the moral standing of his after-life.

This subject lends itself well in correlation with the other subjects in the class-room. It is the life of nature-study, which otherwise might be and too often is dry and prosy. In literature, in reading and discussing the lesson, new words are added to the vocabulary; in spelling and dictation likewise; in geography, in the examination of the particular physical and prevalent conditions obtaining in the habitat of special insects, a depth of information is sounded; and perhaps it is most advantageous in the realm of art-work. Here the pupil is introduced to the real and living creature; he sets to work to study its general characteristics; he portrays its likeness to the best of his ability, and he has the satisfaction of knowing that whatever he produces is his own conception of the object, not his portrayal of some other's design or conception. It is his own work, his personal reproduction; he has the wonderful knowledge that he himself without any aid has produced something non-existent before. He is the originator and he revels in the fact. Given such an impetus, much may be expected from such a source, and disappointment is seldom attending.

Let me state that the teaching of this subject is meeting with a largeness of success. Its practicability appeals to the live teacher; he gains a greater control over his class than ever before through his association with their victories and their disappointment and defeats. A general enthusiasm, determination, and perseverance is instilled into pupil and teacher alike, which result in the improvement of the other subjects of the curriculum. It affords a rest, a change from the constant routine of the other work; even outings which the youngsters relish to look forward to with keen interest are quite in line with the idea of teaching this subject; as a matter of fact, are perhaps the entire stimulus of the work.

It is not at all within the bounds of this short paper on a wonderfully extensive topic to outline a course in the subject. That has already been attempted and successfully completed by abler hands than mine; suffice it to say that noble work is being done along these lines in our schools of the Province, a work which in time will be crowned with the success it so meritoriously deserves.

In closing, let me thank you for the opportunity of presenting my ideas on the subject to you, an audience of practical men, thoroughly conversant with the topic in hand; in fact, living exponents of its possibilities. We in the schools admire your work, and fully grasp the significance of it, in the world of nature-study. We feel grateful for instruction imparted by various members of the Society during the recent summer schools, deeply appreciating many minor details which have been of untold value in the presentation of the subject to the class, practical hints by experienced men. Had it not been for such advice, our work of a necessity would have been a veritable drudge instead of the pleasure it became for us, and through us was made for others.

Mr. Chairman, I thank you.