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THE DOMINION.

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The choice of the location for the barn is a question of no small importance, as the saving of time alone in travelling from house to barn in a lifetime may count for a good deal, if time is money, to say nothing of the comfort involved. Of course, reasonable provision should be made to guard against the contingency of fire, and the buildings placed in such position that house and barns would not be liable to go at once. The question of proper drainage should not be overlooked, and the stables should be dry, light, and well ventilated. For this reason the once popular "bank barn" is out of date, since it is almost impossible to disassociate it from dampness, and it is worth while to consider whether the stone-wall basement may not be improved upon by the substitution of either cement concrete or brick on stone foundation to a little above the level of the ground.

Cement floors have been so well tried that there is no longer any question about their claim to favor, being practically everlasting, while the saving of liquid manure where absorbents are used is complete, and as this floor absorbs no urine, it gives off no odors, and if the stables are cleaned out daily and freshly bedded, the air is pure and sweet.

It would seem hardly necessary to intimate that in planning a barn with basement stabling the dimensions of the structure should be governed by the number of animals the building is expected to accommodate, and with this in view, calculations should be made for the room required, allowing proper length and width for stalls and boxes and fairly liberal width of passages before and behind the cattle. Yet we have known not a few cases where a costly building has been utterly spoiled by planning first for the upper portions and then cramping the stabling to fit the building, with the result of an entirely unsatisfactory outfit, a source of vexation every day it is used. A supply of pure water within the stable, being at a moderate temperature, will be found conducive to economical gain in flesh or milk production, but should not be allowed to result in the constant confinement, particularly of young and breeding animals, for which reasonable exercise is imperative in order to the maintenance of health and vigor. This is a bald statement of a few of the thoughts which occur to us in this connection, but the subject is a big one and open to discussion.

Teaching of Agriculture.

BY RICHARD LEES, M.A., SCIENCE MASTER, COLLEGIATE INSTITUTE, ST. THOMAS, ONT.

In your magnificent Christmas number are contained two articles of a high class on this subject. Following them, it might not be out of place now to offer a few suggestions on a different phase of the question. Mr. McLean, in his admirable article, shows the necessity for agricultural education, and the advantages that would follow from a thorough education of the children of the farm, in raising their social position, making farm life more attractive, preventing the exodus from the rural to the urban districts, and in improving the financial condition of the farmer. He then proceeds to show that in his opinion our educational institutions have done their duty in the matter of agricultural education, after which he asks the question, "Should agriculture be taught in the public schools," to which, judging from the trend of his argument, the answer would be, "Yes, if properly taught." To these last two points it may be worth while to devote some attention, and in doing so to consider especially the question of what has been done in Ontario in the way of teaching agriculture.

For more than a quarter of a century the Ontario Agricultural College has existed, and notwithstanding the criticism to which it has been subjected—perhaps owing to that criticism—it has done what everyone now admits to be a splendid work. Besides the direct influence it has exerted on the several thousand students who have availed themselves of its teaching, it has, by means of research carried on there, and by gathering together into suitable form the results of research elsewhere, been a center for the spread of valuable information to all parts of the Province and beyond the Provincial boundaries. The influence exerted by the College for the improvement of agricultural methods and for the betterment of the condition of the farmer, especially during the latter half of its existence, cannot easily be overestimated.

Then an important means of education has been the Farmers' Institutes. By this means the work of the College and Experimental Farm has been brought to the door of the farmer. Many a one has been shown where he was going wrong, helped to better things when on the right road, pointed in the direction of more profitable industry, encouraged to new effort, and had his faith in agriculture revived by the discussions of these meetings. This has been a most important and profitable kind of "university extension" work. So far well, but when we come to consider the position that the teaching of agriculture occupies in the public schools of the Province, there is less room for congratulation, and more for serious consideration as to whether all has been done that might reasonably be expected.

Without going into a discussion of the subject now, it may reasonably be taken for granted that agriculture, or at least the sciences that lie at the foundation of agriculture, are well adapted for teaching in the public schools. That they possess in a very high degree the qualities necessary for training or development is not doubted. They are also acknowledged to be of the very highest importance, from a practical point of view. Indeed this is the ground on which their introduction into the public school curriculum is most frequently and most strongly urged. One would therefore imagine that in a community like ours, in which the majority of the people follow agriculture, and many of the others industrial pursuits in which a knowledge of the principles of science is of the utmost importance, something would have been done in the way of introducing nature studies of some sort into our public schools. Nominally, something has been done. There have been regulations and amended regulations, but so far as practical results are concerned, nothing has been accomplished. We have had at least three text-books on agriculture, two of which have gone to the lumber pile, and the third will probably soon follow them. Neither the text-books nor the regulations have done anything to advance the cause of agricultural education. What is required is not didactic teaching of the principles of agriculture, but scientific training that will fit pupils to grasp, understand and apply the principles when the proper time comes, besides giving that acquaintance with and love for nature that will furnish a stimulus for investigation and make farming a pleasant scientific experiment rather than a drudgery. That inspiration can never come from a text-book, however good.

As it would seem that the teaching of some of the sciences that lie at the basis of agriculture would form a most useful and desirable part of the public school course, it may be worth while to inquire into some of the reasons why, in spite of regulations for their introduction into the schools, practically no progress has been made.

One reason, undoubtedly, has been the indifference of the people, both locally and as a whole. The trustees and people of rural sections have rather inclined to regard the time spent by their teachers in nature study as time wasted, and have hinted, if not said openly, that it might with more propriety be spent in teaching the children "something useful." There has not been that general interest and desire for this work that would enable those in authority to press on with the matter, so that regulations that were well meant have often been a dead letter. There has been no public opinion back of them. It is probable that a change is now coming about in the sentiments of many, and

people generally are beginning to realize the importance of and necessity for the kind of training here referred to. The most serious danger of the present is the tendency to put knowledge before training, and to think that the learning of a few isolated facts about agriculture or any other science is of more importance than the development obtained by gaining an experimental knowledge of the fundamental principles of the science. We are too apt to want results that come quickly to view, and are not content to wait for growth.

In the second place, the craze for examinations that has crept into our system of education during the last twenty years has had an important influence in hindering the progress of true scientific teaching in all our schools, both primary and intermediate. The science subjects do not lend themselves readily to the purposes of the examiner, and the better and more scientific the teaching, the harder to test it by means of an examination. The chief object of the teacher has been to get pupils through the various examinations, and subjects in which no papers are set receive scant consideration. This, to be sure, is not the fault of the teacher; it is what he is expected to do, and his success is measured by the examination results. These are advertised, and the best teacher is supposed to be the one with the longest list. Those who can not or will not keep up to the standard as thus set have to give way. There are, however, indications of a change in this respect also, and it is to be hoped that the time is not far distant when examinations will cease to be the only standard of educational efficiency.

While these things may have had their influence, undoubtedly the most important cause for the failure so far to introduce nature studies into our public schools is to be found in the lack of properly-qualified teachers. As has already been implied, no text-book will be found of much use. It is perhaps more nearly true of science teaching than of any other branch of instruction, that for success there must be interest and enthusiasm; the pupil must himself do the work under the direction and inspiration of an enthusiastic teacher.

It is also, perhaps, equally true that nature study, more than any other, requires the teacher to have a broad and thorough knowledge of the subjects he is dealing with. Do the public school teachers of the Province possess these qualifications? On this point there can be no room for question. Many of them have had no scientific training whatever, and possess no knowledge of science, while the great majority of the rest have so little knowledge of this branch and of methods of teaching scientific subjects, that it is of very little use to them. It must not be supposed that the teachers are in any way to blame for this. Such knowledge has not been required of them, and they have been taught to believe that if possessed it would be of no use to them. For some years it was possible for students to become qualified as teachers without any training whatever in the science subjects. For the past five years, things have been nominally a little better. During that time an examination in Botany and one in Physics has been required, the former being taken in most cases one year before the latter, after which the subject of Botany was dropped from the course and not required either for second or third class certificates, except by those who chose to take the science option for these grades, perhaps about one-third of the whole. The training thus obtained, especially in Botany, which is altogether the most important of the science subjects from the point of view of the teacher, as being the best adapted to public school work and having the most direct relationship to agriculture, is of little use. It generally extended over but one year, and as the teaching of that subject has to be discontinued to a large extent during the winter months, it is practically confined to about four or five months only. The work is done at an early stage in the student's course, then dropped entirely, so that its usefulness to the teacher is much less than if it had formed one of the subjects of the latter part of his course. Besides, the training is wholly inadequate. Think of boys and girls going out to teach English or mathematics, for instance, having had only one or two years' training in the subjects of these branches of knowledge! It is quite within the mark to say that the only teachers turned out in recent years with anything like the qualification necessary to teach the science subjects are those who have taken Senior Leaving (First-class) standing with the science option, and with few exceptions, the only public schools in which anything like efficient work has been done in science teaching are those in charge of teachers so trained. To make matters worse, recent changes in the curriculum of studies have removed Botany entirely from the course for Second and Third class Certificates, except in so far as it is taken up in the preliminary part of the course, to which reference has already been made.

So much for the non-professional training of our teachers. Now, what about the professional training they receive? It might have been supposed that if desire for uniformity with university requirements or unsuitability of the subjects for high school work tended to prevent proper training in science being given to those studying for teacher's certificates, that at any rate some effort would be made to remedy the defect in the Normal and Model schools, where the only purpose in view is to do for the students what will best fit them for their future work. Especially is this so in view of the ac-