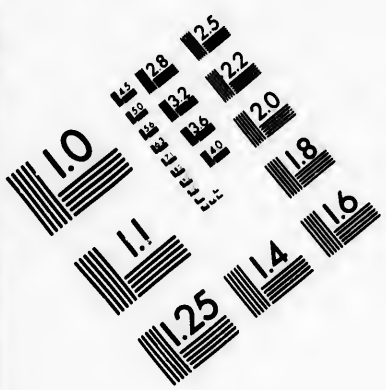

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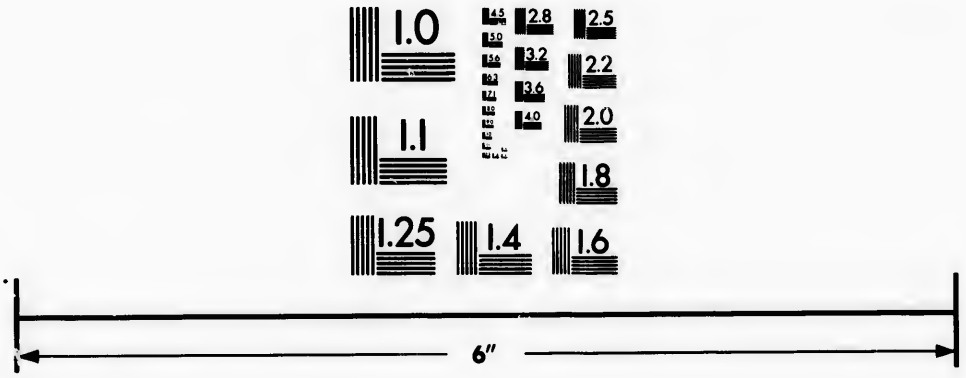

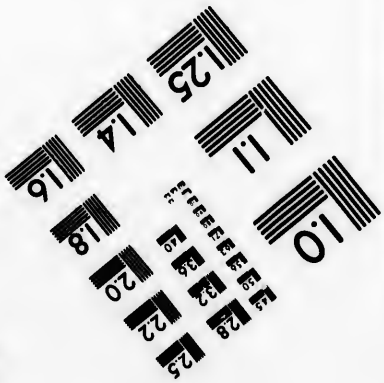

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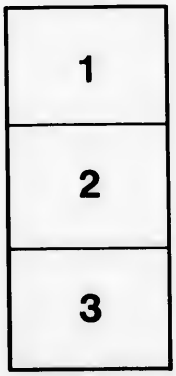

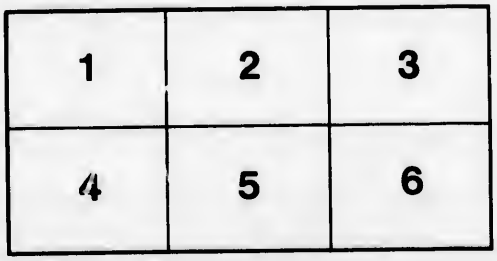

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ONTARIO DEPARTMENT OF AGRICULTURE.

THE TEACHING OF AGRICULTURE IN OUR PUBLIC SCHOOLS.*

BY C. C. JAMES, M.A.,

DEPUTY MINISTER OF AGRICULTURE FOR ONTARIO.

The terms "ancient and honorable" are to-day applied to various offices and bodies, to mark them with special distinction, but there is no calling or profession more deserving of this distinction than that of agriculture. You who are assembled here belong to the ancient and honorable order of agriculturists. Those who are not so intimately associated with agricultural work as you are, may be ready to admit the appropriateness of the term "ancient," but rather slow to allow that of "honorable." Before preachers preached, and doctors practised, and lawyers argued, and teachers taught, man began to produce his daily bread by the sweat of his brow. This ancient order preceded that of dukes and earls, kings, queens and presidents, monopolists and magnates and political bosses. If length of years, antiquity and priority add importance to any calling, agriculture stands first and foremost.

And to this priority in time we may add priority of importance, for out of the initial or basic wealth of the soil has grown nearly all the wealth of the world,—it is the foundation upon which all other wealth has been built. Its distribution and handling have resulted gradually in the building up of the other trades, callings and professions. The teacher, the doctor, the lawyer, the engineer, and even the preacher, are all preceded by the farmer.

But is it honorable? We think so. All truly cultured people think so. And it is of prime importance that the great mass of farmers be brought to recognize it, to live up to it and to be honestly proud of it. A calling or an occupation that draws together from the four corners of the North American continent such an honorable body of men as have gathered here in this city must have some right to the title "honorable." You are not

* An address to the Farmers' National Congress, at Boston, in 1899.

gathered to formulate a political platform in the ordinary sense of the word political; you have not gathered to enrich yourselves by the formation of a continental trust; you have not gathered to make war upon any other class of human beings,—but you are gathered as a great peace conference, to help on the greatest industry of this continent and to try to improve the condition of the millions of farmers of America, and thereby increase the wealth and happiness and good morals of the whole people.

Do the people of this State or city appreciate the importance of the work in which you are engaged? Do the people of the United States and Canada appreciate it? Do *you yourselves* appreciate it? I trust that you do,—I feel sure that you do, otherwise you would not have come here. The conditions of your organization, its very life, depends upon such an appreciation.

Is there any other class of wealth producers on this continent that could meet in this city without arousing the jealousy or envy, or at least the close scrutiny, of some other class? The manufacturers of implements and machinery, the great mill owners and their operatives, the wholesale and retail storekeepers, the railroad presidents and the trainmen, the Wall Street brokers and their country agents, the doctors and lawyers, the teachers and preachers,—yes, even the homeless tramps, wish you well; you have the good wishes of all classes, for when you make money they prosper, and when you fail they go down. The motive power of this continent of people takes its rise in you, and in your success all are interested. This is significant, and it has an important bearing upon what I shall say later on. Your object is to increase the wealth, happiness and good morals of the whole people. Let me for a moment refer to these in more particular terms.

We in Canada, and you also in the United States, have read the never-ending story of the gold discoveries of the Yukon. During the present year perhaps twenty-five millions of dollars of gold have been produced. A few, a very, comparatively, have made fortunes. Scores of lives have been lost, hundreds have shattered their health, thousands have spent their savings,—more money, in all probability, has been spent in seeking the gold than has been produced. Still the rage continues, and the papers fill their columns with the news. During the same period of time the farmers of the Province of Ontario produced wealth amounting to nearly $250,000,000. If we could increase the farm products of Ontario by only 10 per cent., we would add as much wealth to the country as the Yukon has produced. And when we consider the great extent of what may be called average farming, or poor farming, and the comparatively small amount of profitable, high-class, or, if you will, "scientific" farming that is carried on, the possibility of improving the production by 10 per cent. appears away below the mark. You have seen the poor fields asleep and inert because of their undrained condition; you have seen the luxuriant weed growth stealing the fatness of the land from the farmer's family; you have seen the poor seed, underbred, weak and low in vitality; you have seen the poor scrub, the cow that boards with the farmer winter and summer and is

unable to pay her board bill; you have seen the gnarled and scurfy orchards, the undisturbed breeding grounds of the marvellous insects that are so beautiful to the entomologist but so death-dealing to the agriculturist. I need not multiply the examples; you know them all. But multiply them by hundreds,—rather by thousands,—and foot up the cost, and your total will reach millions upon millions,—figures which will appal the calculator.

Let me put it in another form. Suppose that by improving farming we could increase the wheat production of the United States and Canada by only one bushel an acre (and when we see what is done by the experiment stations and the more advanced farmers, through clean cultivation and seed selection, we conclude that it is quite possible to increase it not simply by one but by several bushels); the wheat yield would be increased by 45,000,000 bushels. That would represent a yearly increase of over $25,000,000. When we apply the same to oats and barley and corn and the other cereals, we roll up a total that makes the gold and silver product of the Yukon, of California, and of Colorado, seem a small affair.

But we must not pass by the cow. There are some exceilent cows in America, cows that produce 6,000, 7,000, 8,000, 9,000, 10,000 pounds of milk per annum; but oh, the great host that produce 4,000 pounds and less. And it is not the poor cows' fault in all cases. The good cows are well cared for and well fed; the poor cows,—the bleak hill pastures and the lee side of the straw stack could tell their story. Ten per cent. increase in the yearly milk product of the cows of America would add $40,000,000 to the annual wealth.

Let us begin with the soil, and from this meeting as a centre send out our orders. We direct that all the soils of this continent requiring drainage shall be drained; that a better system of cultivation be followed; that useless fences be cleared away, and weedy insect-breeding grounds be broken up; that only the best varieties of seed be chosen, and that the sowings be carefully selected; that the cattle and stock be provided with clean water and wholesome food, and protection from storms that use up valuable food and from excessive heat that uses up vital energy; that care and kindness be part of their daily ration; that the unprofitable animals be kindly but firmly ordered off the farm; that the orchards be cleaned up, fed, pruned and sprayed; that the kitchen garden be run as an adjunct of the farmer's dining room: that the stables be cleaned out and lighted and ventilated; that the manure pile be covered and the leakages stopped in this savings deposit; that the creameries and cheese factories be overhauled, in accordance with John Wesley's preaching that "cleanliness is next to godliness;" that the lawns and flower plots about the farmer's house be trimmed and brightened up; that the country school-houses be changed from rural outbuildings into home-like, attractive pleasure grounds. You order all this, and by a miraculous power bring it into effect. The wealth of the people goes up by leaps and bounds of millions.

All this and more can be done by leading up or out the farmers. And what is this leading out? The technical word is "education." Need I stop to prove that the happiness of the workers will advance at the same time?

Need I even wait to prove that the good morals of the people will advance at the same time? The rural classes are the source of the people's strength, the very centre of the nation's life; and if the improvement can be started there, if we can add anything to that movement, it is not merely our privilege but our duty to do so. To accomplish this, education of the right form, well directed and properly stimulated, is, in my opinion, of first importance at the present time.

Departments of agriculture, with their manifold organizations and sub-divisions, are important. Associations of live stock owners and breeders are also important. Farmers' institutes have been called the farmers' schools, and they have accomplished much by their teachings. But they are for present, not for future farmers. Agricultural colleges are reaching out, and are important as training schools for teachers, but they touch only the fringe of the great mass of the rising host. We start the education of doctors and lawyers and preachers and teachers and engineers in our public schools. Suppose we were to say to the doctors, "Go to school and learn to read and write and spell, then begin practising, and later on, when you have been working for some years, we will form doctors' institutes, and send specialists to talk to you and enthuse you in your work, to tell you what mistakes you are making and to compare notes with you." What would you say? Do we let the lawyers go ahead with their work until they are full grown and experienced? Not at all. We arrange our school courses to help and assist the professional man as early in his career as possible; then we make every doctor, every lawyer, every teacher and nearly every preacher take a special course, as practical and as searching as possible, before we give him his diploma and turn him loose to work among his fellow men. But with the farmer we have acted so differently,—or, rather, we have not acted at all. Is it not time to act? Is the farmer not as important a factor in our country's weal as the lawyer, the doctor and the teacher? Is it not about time that we at least make an effort, in a rational manner, to see whether we cannot do justly and fairly by the agriculturist?

Hundreds of millions of dollars have been given by the governments and philanthropists to provide education for professional men and for training experts in the pursuits of town and city. Seven institutions of learning in the United States have a total wealth of over $90,000,000. *Education costs a great deal, but ignorance costs much more.* If one tenth of the amount expended in training for town and city pursuits had been expended in agricultural education and investigation, would there not have been produced some marvellous results? This question, then, is not to be dismissed because it would involve any large financial outlay.

I propose to discuss for a few moments the question of introducing the study of agriculture into our public schools. I can touch upon it but briefly, and in a suggestive manner. And in order to set myself right before you, allow me to make the announcement that, beginning with the September school term of 1899, the Minister of Education in Ontario has made agriculture a compulsory subject in two forms of all our rural public schools, and allows it to be taken as an option in all urban public and high schools. I

need not tell you that this is considered a forward movement of great importance in connection with agricultural education in Ontario. Manitoba also has had the subject upon her public school course for several years, Quebec for many years, and during the present year Nova Scotia and New Brunswick have added it to the curricula of their common schools.

"Perfect agriculture is the true foundation of trade and industry,—it is the foundation of the riches of States." These are the words of the great Liebig, one of the founders of the modern science of agriculture. They were uttered half a century ago, but they are more pregnant with truth at the end of the nineteenth century than they were in the middle of the century when Liebig was carrying on his agricultural investigations; or then at the beginning of the century, when Sir Humphrey Davy was unfolding for the first time his memorable proposal for agricultural investigation before the learned societies of England. They are applicable to all civilized and all semi-civilized countries, but they have a special significance when applied to Canada and the United States. Let me give you some figures from the wealth product of Canada. Our fisheries add annually to our wealth to the amount of $20,000,000, our mines nearly $40,000,000, and our forests about $80,000,000; agriculture adds no less than $600,000,000, or over four times as much as the other three sources of wealth combined.

Now let me quote a more modern educationist as to the workers in this field:—

Identified as I am by birth and early education with the agricultural population of this country, I regret to see so many of our agricultural youth leave the noblest of earthly employments and the most independent of social pursuits for the professions, the counting room, the warehouse, and even for petty clerkships and little shops. I know that persons in public offices, and inhabitants of cities and towns, who have no farms, must, for the most part, bring up their sons to other employments than that of agriculture; personal peculiarities and relations may prompt to the same course in regard to some farmers' sons; and a divine call may select from the farm, as well as from the shop and the college, for a divine vocation; but that, as a general rule, the sons of farmers, as soon as they begin to be educated, leave the farm, is a misfortune to the parties themselves, a loss to agriculture and the country. A boy's leaving the farm because he has, or is acquiring, a good education, is an assumption or admission by all consenting parties that a farmer does not need such an education; and as long as this error is admitted, by farmers not being educated, agriculture will be looked down upon, instead of being looked up to, as a pursuit for educated men.

Educated farmers, educated merchants and educated manufacturers and mechanics will not only develop and advance the material interests of the country, but its civil and social interests, by enabling the people to select chiefly intelligent and well-to-do men from these classes as their representatives,—men not needing an office for support, or making politics a trade,—affording the best chance of practical wisdom and honesty in legislation and government, and the hope of producing the great public desideratum, —a generation of honest politicians and patriotic statesmen.

One might reasonably assume that this is an extract from an address before one of our farmers' institutes, or has been taken from a lately issued report of some department of agriculture, and that they are the words and

opinions of some leading agriculturist. Not so, however. These are the words of Egerton Ryerson, the founder of the public school system of Ontario, taken from the introduction to his text book on agriculture for use in Ontario public schools, and written in 1870.

I can well believe that twenty-five years from the present some student of the educational and economic history of Ontario will be hard at work studying out and trying to explain why so little progress was made in general agricultural instruction in that Province during the years from 1870 to 1899. During that period four text books at least were available and various attempts were made at encouraging the work; but in 1898, as far as Ontario was concerned, we were no futher advanced than we were in 1870.

Let me now briefly state my views under four heads:—

I. Should agriculture be taught in our schools?

II. When and where should it be taught in our school programme?

III. What can be taught, and how can it be taught?

IV. What benefits may we expect as a result of this work?

I. Should agriculture be taught?

If agriculture can be taught in our schools, that is, if there are time and place for it, and if it can be presented in a form adapted to school pupils, the more reasonable form for this question, it seems to me, is, "Should agriculture not be taught?"

The agriculture of the older States and Provinces is in a critical condition. We certainly have not yet reached the most acute condition that has come to the farmers of Great Britain, France and Germany, but we have reached a point which, compared with the conditions of the newer farming communities of the prairie States and Provinces, can be expressed by no better term than "critical."

The building up of the pure-bred live stock interest of Ontario and the development of our dairy industry have been the two main factors in saving us from a condition that could be described only by the term "desperate."

Just now the conditions are more favorable than they have been for some time. Prices have improved for us, partly because of the temporary misfortunes of agriculturists in other parts of the world, and partly because of general trade revival. One consequence of this is seen in the great rush at present in progress for the cheap productive lands of Manitoba and the North-west Territories. If nothing be done to give a decided upward movement to our eastern agriculture, however, we may soon find ourselves approaching the conditions now prevalent in the older farming lands of Europe. Let me give you a statement of that condition from the pen of one who is an authority. M. Tisserand, the late director-general of agriculture in France, speaks as follows in a report to the Recess Committee of the British House of Commons dealing with the question of the industries of Ireland;—

In this extraordinary century, when everything has been profoundly modified by steam, when distances have disappeared, and the Australian with his wool, the Indian

with his corn and the American with his cattle and his dead meat can reach the markets of Europe at less cost than it took the farmer of Yorkshire at the beginning of the century to get produce to London, old methods and paternal traditions have become insufficient for the struggle which has to be carried on against foreign competition. It is no longer the struggle for life between man and man which is in question; it is the struggle for existence between industry and industry, between agriculture and agriculture, between country and country.

The authorities of France are thoroughly awake to the situation, and are now carrying on the most thorough system of general agricultural instruction, in order to provide trained men to "man the ship" in her perilous career.

One of the distinguishing features of the agriculture of to-day is the rise of co-operative associations. In Ontario we have had agricultural societies ever since the Province was organized, in 1792, and for seventy years legislative grants have been made for their encouragement. But the societies for discussion of agricultural topics, for interchange of ideas and for teaching or instruction by experts are of more recent origin. We have associations of the owners and breeders, of all the leading breeds of live stock. We have a fruit growers' association, associations also of the poultry keepers and of the bee keepers, an association of experimenters, two associations of the dairymen and an entomological society. All these, through their many meetings, and the hundreds of meetings of farmers' institutes, have quickened the minds of the workers. Supplementing these meetings, reports and bulletins have been distributed by the hundreds of thousands in the past ten years. But the point that I wish to make here is as I said before, that the persons principally benefited by this work are the men and women of mature years. This is all very well in its way. These men appreciate thoroughly what is being done, they recognize the importance and the necessity of this instruction; but is it not beginning at the wrong end? Why should the farming class of this country have to wait until they become men before they learn that there is a science underlying their practice? If it is a good thing to educate a grown man or a grown woman in the principles of agricultural work, it is still more important, as far as practicable, to give the boy and the girl some training in these principles early in life, at the time when these principles are most easily acquired and when they will be of most permanent benefit. I therefere have no hesitation in answering my first question by saying that agriculture in some form should be taught to the pupiils of our schools.

II. When and where should it be taught?

Most persons, I think, are of the opinion that some instruction in agriculture should be given to pupils in rural schools, since they assume that these pupils are to be the future farmers. They are not, in general, of the opinion that the teaching should be given in town and city schools, because the pupils of such schools are likely to move out into professional pursuits, become school teachers, enter mercantile life, or follow some one of the many manufacturing lines. They are not quite sure that even all pupils in rural schools should be taught agriculture, as so many are yearly coming from the country to the

town to reinforce the struggling city classes with new blood and new physique. Right here I would present a debatable proposition. If agriculture can be taught in our schools in a manner such as I will suggest in my next division, I am of the opinion that it should be on the course of study for town and city pupils as well as on the course for rural pupils. Perhaps in city and town schools it might be made optional, but in rural schools it should be obligatory. The present situation is that with very few exceptions all town and city pupils will remain in city and town pursuits, and the country schools are also being annually drained of the majority of the brightest and most ambitious. That I shall not here discuss. If we can, by altering or rearranging our system, keep more of the best rural pupils in touch with agriculture, and if we can at the same time arouse in some of the town and city pupils a sympathy for agricultural methods and agricultural life, we shall be looking to the best interests of the pupils and of the country as a whole. I am of the opinion that a course of agriculture can be given in town and city schools that will be interesting and beneficial, and that will be in harmony with the best educational methods or system. I would put a course in the science of agriculture within the reach of every pupil in all of our schools, and I would therefore begin the work in the public schools, rural and urban alike. It might be best to begin the work here by making agriculture a compulsory subject in the fourth form of our public schools, and from this as a starting point work out in time a system of instruction adapted to our conditions, prefacing it first by a simpler course in the third form, and adding an advanced course to our high school work. I believe that agriculture can be taught just as well to the public school pupils as are some of the subjects at present on the course, and I believe that the pupils themselves will come to the subject with as much eagerness.

What should pupils learn in a public school?

Our public school pupils should learn to respect the truth, and to admire and emulate strong, sound morality. These virtues will be taught largely by the personality and deportment of the teacher.

They should be stimulated to a love of order and neatness and pleasant surroundings. This should be acquired from the arrangement and condition of the school building and the school grounds.

They should be taught to speak and read the English language with a fair degree of proficiency.

They should be taught to use the pen and pencil.

They should be able to make the simple, every-day mathematical calculations with accuracy.

They should know the main facts of their own country's history and its geography.

They should be taught to use their powers of observation; to see, to touch, to hear, and even to smell and taste. If their senses are rightly trained, they will be able to acquire facts for themselves. One of the greatest educational curses is to train a child to become an intellectual miser—a mere hoarder of facts. Would you prefer that your boy be given $100,000 in cash or be

given the ability and training whereby he can honestly acquire $100,000 for himself? The aim should be to make the education of our youth a blessing and not a curse

III.—What can be taught, and how should it be taught?

This is the most important of the four questions,—it is that upon which the whole argument turns. I think that delay in introducing agriculture into our schools has occurred principally because of the difficulty, in fact, the present impossibility of introducing into our schools instructions as to how to farm. Our schools could not be equipped for training in the practice of agriculture, except at an enormous cost; and our public school teachers could not be expected to teach the young idea how to farm, even in the crudest manner. Here is the point,—any instruction now given in our schools should deal simply with the science of agriculture; the practical application of the scientific principles may be left to the home training, and to such specially equipped institutions as our agricultural colleges. It is quite possible that in time something may be done for our rural schools as has been done in France, Germany and other European countries, in the way of adding small gardens and plots, wherein some of the lessons of the school-room may be applied, and where illustrations may be found in the growing trees and shrubs, and the development of the seeds sown by the hands of the pupils themselves.

The science of agriculture is eminently adapted for school instruction, and a student of natural science could not lay a better foundation for his future work than by first mastering the general principles of the various sciences which together form what we call the science of agriculture. Let us briefly note what it includes.

Agriculture consists mainly in the growth of plants, the feeding of some of these plants to animals, and the working over of the animal products resulting.

First of all we have the air and the soil. A study of these gives us an introduction to chemistry, geology, meteorology and physics.

The growth of plants brings in the study of botany, and is closely followed by an introduction to entomology.

The study of the animals at once calls for some of the simplest principles of zoology, anatomy and physiology.

Bacteriology comes in when we study the diseases of plants and animals and the making of cheese and butter.

And so we might sum up by saying that a study of the science of agriculture implies a beginning in all the natural sciences that are afterwards found in our high schools and colleges. The study of the science of agriculture is, to a large extent, a course in "nature study;" and since the illustrations are taken from plants, soils, insects and animals, with which all boys and girls are more or less familiar, the subject may be made to appeal to the everyday observation of the pupils.

You will understand, of course, that I do not advocate the placing of all these sciences upon the school course, but the first principles of all, in as far as they constitute a part of the composite science of agriculture.

What I am trying to lay before you as my idea of how agriculture might and should be taught in our schools has been more clearly and forcibly put by that master teacher, Huxley, who, in addressing a farmers' club in England on the subject, spoke as follows :—

There are some general principles which apply to all technical training. The first of these is, I think, that practice is to be learned only by practice. The farmer must be made by thorough farm work. I think I might be able to give you a fair account of a bean plant, and of the manner and condition of its growth ; but if I were to try to grow a crop of beans, your club would probably laugh consumedly at the result. Nevertheless, I believe that practical people would be all the better for the scientific knowledge which does not enable me to grow beans. It would keep you from attempting hopeless experiments, and would enable you to take advantage of the innumerable hints which Dame Nature gives to the people who live in direct contact with things.

And this leads me to the general principle which I think applies to all technical training of all school boys and school girls, and that is, that they should be led from the observation of the commonest facts to general scientific truths. If I were called upon to frame a course of elementary instruction preparatory to agriculture, I am not sure that I would attempt chemistry, or botany, or physiology, or geology, as such. It is a method fraught with the danger of spending too much time and attention on abstractions and theories, on words and notions, instead of things. The history of a bean, of a grain of wheat, of a turnip, of a sheep, of a pig, or a cow, properly treated, —with the introduction of the elements of chemistry, physiology and so on as they come in, would give all the elementary science which is needed for the comprehension of the processes of agriculture, in a form easily assimilated by the youthful mind, which loathes anything in the shape of long words and abstract notions, and small blame to it.

Every rain that falls, every tiny stream by the roadside, the shooting of the green blade in the spring, the nodding buttercups, the golden-rod, the tall bull thistle, the early dropping apple with its worm hole, the ball of blackknot upon the cherry, the jumping grasshopper, and the hundreds of nature's children, should attract the attention of our children out of doors, and arouse in them a love that is not born of ignorance but of true knowledge. Nature in the country, in the village, in the town, and even in the city, lies before our children as a great unnoticed, unmeaning book. Our children, by their natural sympathy with nature and by their God-given faculties, appeal through us to the great Creator of nature. "Open Thou mine eyes, that I may behold wondrous things out of Thy Law."

Instruction in agriculture in our schools may be very limited, but if nothing more be done than to start our rural pupils thinking, to give them an impetus or a turn in the right direction, to develop in them a taste for agricultural study and investigation, to arouse in them a desire to know more and to read more about agricultural affairs, and especially to increase in them a respect for their work and a pride in their calling, then the most important end of their education will have been attained.

IV. What benefits may we expect to result from this work ?

1. Our pupils will be learning in school the simple principles of their work at home; their school work and home work going hand in hand, the

science of school with the practice of home, they will make more rapid progress in both; their educational development will be more certain.

2. Their pleasure in home work will be quickened, the dreariness of dull farm labor will disappear, farm work will assume a new aspect, the attractions of town and city life will fade away—not because city life becomes less attractive, but because farm life becomes more attractive. The old and oft-quoted story from mythology is very suggestive here. On a rocky, dangerous coast in the Mediterranean the entrancing music of a siren lured many sailors to their destruction. Ulysses, as he passed that way, filled his sailors' ears with wax that they might not hear, and tied himself to the mast that he might not be overcome. But Orpheus, as he passed by, produced upon his own boat such exquisite melody that the siren's music was passed by unheeded. Sermons and lectures, and even statutory laws, will be of no avail in turning the best of our youth towards agriculture. It can be done only by making it more attractive than any other pursuit.

3. All over this land the agricultural status will be raised, and farming may be expected to assume a more lucrative form.

4. The development of a strong, sturdy, prosperous, contented rural community will solve many social problems that to-day threaten the peace of this continent.

One hundred years ago there was but little to teach to the agriculturists of the world. When Sir Humphry Davy, in the years 1802-12, delivered his lectures on chemistry applied to agriculture, he was standing as a prophet on the threshold of this century, proclaiming the wondrous things that might and would be done for this great industry. Liebig, a generation later (1840), spoke to the world, and showed what marvellous advance had been made. The light was coming over the apparently unending dark ages of agriculture. A call was made for scientific investigation and instruction. I was reading only a few days ago a powerful argument in favor of the establishing of agricultural colleges in the United States, by Allan, author of the "American Herd Book." It appeared in the "Agriculturist" in 1847. These agricultural colleges for which he appealed have been established, and experiment stations have been equipped. It has taken fifty years to do it. In the agricultural papers of Ontario fifty years ago strong pleas were made for agricultural instruction in our public schools. But little has been accomplished. We are just taking the first steps. Perhaps all things are working for good, however, and it may have been the wisest course to allow our agricultural colleges and our experiment stations to become thoroughly established and recognized before attempting the wide dissemination of agricultural truth. To-day we stand on the threshold of the twentieth century, and in my humble opinion the time is opportune, the conditions are right and the duty is imperative for beginning the work of agricultural instruction in our public schools in a rational, thorough manner. May our successors of the next century say of us, "They builded better than they knew."

NATURE STUDY.*

The Teaching of Agriculture in our Public Schools.

What are the true objects of teaching? What ends are to be aimed at? Some teachers appear to give greatest prominence to the training of the memory. Tasks are given and lessons assigned for home work, and the correct reproduction of these from memory form the principal work of the school, the pupils being credited according to their ability to reproduce word for word the tasks assigned. Others place great stress on discipline, as though school life were largely a military training wherein the exact observance of certain fixed rules and methods of conduct were of prime importance. Others look to the "accumulation of facts," as though a large amount of knowledge could be imparted in school that would in after life be directly beneficial in earning a livelihood. The true teacher, however, while not despising the training of the memory, the proper discipline of pupils and the imparting of facts that will afterwards prove useful, will seek properly to train, or develope, or educate his or her pupils by leading them to the true development of their powers of faculties so that they may help themselves. The training of our pupils to see things as they are, to use their senses, to observe correctly, to think for themselves so that they may become observant, wide-awake, self-directing, thoughtful, progressive and independent citizens—herein, it seems to me, lies one of the greatest, if not the greatest, objects of our teaching.

You are asked to teach agriculture to your pupils of the 4th and 5th forms. At once objections will arise; difficulties will present themselves. Let us consider some of these.

You say: "I cannot teach my pupils how they should plow, harrow, sow seed, reap the grain, thresh, feed stock, milk cows, make butter, etc. I have no special facilities in my school for giving such instruction." My answer to this is that you should not be expected to do it. You could not do it if you wished. There is only one way of giving such instruction, namely, on a first-class farm. Even the Agricultural College is not conducted for such purpose. Practical agriculture must be learned upon the farm, and it cannot be taught in our schools. This is the *art* of agriculture. The teaching of agriculture with which you should concern yourselves is that which we call the *science* of agriculture—the knowledge of the *why* as distinguished from the knowledge of the *how*. This science of agriculture explains the origin and nature of the soil; the changes that take place through the action of the weather, and the various operations of draining, plowing and cultivating; the sprouting of seed and the growth of plants; the nature of plants and their relationship to one another and to animal life; the nature of animal life and its continuance by feeding; the produc-

* Abstract of a talk to public school teachers, by C. C. James, M.A., Deputy Minister of Agriculture.

tion by animals of beef, wool, and milk ; the making of butter and cheese ; the relation of insects to one another and their effect upon plant life ; the diseases of plants ; the part played by birds and bees in the production of foods ; trees, and their relation to our farm economy. The science of agriculture at once assumes a relationship to such sciences as geology, chemistry, botany, entomology, bacteriology, etc. ; in fact it is made up as a composite science from all these other sciences.

Then comes the next objection : "If agriculture is a composite science, how can I be expected to teach it when I am not an expert or am not well grounded in all these other sciences?" To this, answer may be made that but the very simplest principles of the science of agriculture should be attempted, and the knowledge of these other sciences required for such teaching is very limited. All that should be attempted is to give the pupils a right start, to open their eyes to the fact that agriculture is or may be studied as a science, and every teacher is or should be intelligent enough to grasp the first principles of the sciences underlying agriculture. If you have no knowledge whatever of these first principles you should at once set yourself right, and find out for yourself what a wonderfully interesting field of knowledge there is in this subject that may be opened up so easily. You do not require to be a geologist, a chemist and a botanist in in order to direct your pupils to a knowledge of the beauties of nature. The study of agriculture in our schools should be a study of nature.

"But is not the subject dull, uninteresting, commonplace? Is it not lacking in what may be called *the intellectual?*" It is difficult to answer this question without unfolding the subject itself. No more inviting, more promising, more attractive field of study is opened up to-day than that of agriculture. The listless boy in school is full of life out of doors ; the truant is a truant frequently because he likes out-of-door nature better than what he calls the dull teaching of the school-room. Study nature, get close to her, and your faculties will be keen and active, your interest will be aroused, your whole mental being will be quickened.

"What am I to teach?" The text book prescribed aims to lay down a course of study beginning with the simplest form and proceeding to the more complex. Its aim is not to impart facts, but to arouse the observing habits and the questioning powers, so that the boys and girls may readily find out things for themselves. In beginning the work in the fourth form you may assign subjects for talks and questions, such as the soil of the fields, grasses, the wild flowers, the bees, the trees, the birds. Space does not permit taking up these in detail, but perhaps I can best indicate what can be done by giving you a series of questions on a subject that is familiar to us all, yet to which little attention is directed. Here follows a series of questions on "grass," the answers to which can be found in the text book by careful observation and questioning others. Put these or such as these before your pupils, but let them find out the answers for themselves. Then take up the subject in the form of talks. Even so common an object as grass can be made interesting and instructive as a subject in public schools :—

1. Whence comes the grass in spring time?

2. What makes the grass green? How many shades of green in grass can you determine? Does it keep green always?

3. What is sod? Can you take up other plants in the same way? Why not?

4. How do the grasses spread? Do they all reproduce in the same way?

5. What varieties of grass are to be found in your school section? (Have the pupils make collections.)

6. Name our common pasture grasses. Name the common hay grasses. Name grasses that are weeds.

7. What are the peculiarities of grass that distinguish it from other plants?

8. Why is June grass so called? What is Canadian blue grass?

9. Wheat is a grass—why?

10. Corn or maize is a grass. Compare it in form and make up with timothy.

11. Clover is not a grass—why not?

12. How do you distinguish a grass from a sedge? Is bulrush a grass?

13. What qualities or characteristics should distinguish a good pasture or lawn grass from a hay grass?

14. What common weeds are to be found in pastures and in hay fields?

15. How would you make a grass lawn?

16. How is grass seed sown for pasture or for hay? Why is the method adopted? What does timothy seed cost a bushel? How much does a bushel weigh? Why does it cost more than grain?

17. What kills out the grass in the pasture or hay field?

18. What insects destroy the grass?

19. What birds build their nests in the grass?

20. What uses are made of grass besides as a food?

Agricultural Instruction in England and Wales.*

The Board of Education are anxious to call the attention of Managers and Teachers of Elementary Schools situated in the agricultural districts of England and Wales to the importance of making the education in the village school more consonant with the environment of the scholars than is now usually the case, and especially of encouraging the children to gain an intelligent knowledge of the common things that surround them in the country. From experience gained in various districts it is found that by a suitable arrangement and handling of the school curriculum this object can often be attained without necessarily adding any new subjects to the time table, or demanding any undue burden or work from teachers or scholars.

The Board would depreciate the idea of giving in rural elementary schools any professional training in Practical Agriculture, but they think that teachers should lose no opportunity of giving their scholars an intelligent knowledge of the surroundings of ordinary rural life and of showing them how to observe the processes of Nature for themselves. One of the main objects of the teacher should be to develop in every boy and girl that habit of inquiry and research so natural to children; they should be encouraged to ask their own questions about the simple phenomena of Nature which they see around them, and themselves to search for flowers, plants, insects and other objects to illustrate the lessons which they have learnt with their teacher.

The Board consider it, moreover, highly desirable that the natural activities of children should be turned to useful account—that their eyes, for example, should be trained to recognise plants and insects that are useful or injurious (as the case may be) to the agriculturist, that their hands should be trained to some of the practical dexterities of rural life and not merely to the use of pen and pencil, and that they should be taught, when circumstances permit, how to handle the simpler tools that are used in the garden or on the farm, before their school life is over.

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The teacher should, as occasion offers, take the children out of doors for school walks at the various seasons of the year, and give simple lessons on the spot about animals in the fields and farmyards, about ploughing and sowing, about fruit trees and forest trees, about birds, insects and flowers, and other objects of interest. The lessons thus learnt out of doors can be afterwards carried forward in the school-room by Reading, Composition, Pictures and Drawing.

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* Extracts from Circular to Managers and Teachers of Rural Elementary Schools entitled "The Curriculum of the Rural School," issued by the Board of Education, Whitehall, London, S.W., April, 1900.

In this way, and in various other ways that teachers will discover for themselves, children who are brought up in village schools will learn to understand what they see about them, and to take an intelligent interest in the various processes of Nature This sort of teaching will, it is hoped, directly tend to foster in the children a genuine love for the country and for country pursuits.

It is confidently expected that the child's intelligence will be so quickened by the kind of training that is here suggested that he will be able to master, with far greater ease than before, the ordinary subjects of the school curriculum.

The Board would further urge upon any teachers now in rural schools who happen themselves to be of urban up-bringing or to have been trained in urban centres, to seize every opportunity of gaining a closer insight into the special conditions and problems of rural life, and they trust that those whose previous education has not enabled them to obtain full knowledge of the main principles and phenomena of rural life and activities, will be able to attend such holiday courses and classes as may be placed within their reach for this purpose by County Councils or other Local Committees; since it is only when the teacher is genuinely interested in, and well informed about, the occupations of country life that any such results can be looked for in the children as have been referred to as the proper object of rural schools in the present Circular.

"The college and university of our day makes ample provision and spreads ample repasts for everybody but the farmer. But if the young man is to cultivate the soil, he knows there is nothing on the intellectual table that will help him in the field or with the herd. Much has been observed, and a good deal written and laid away in libraries, but very little is taught in schools or practised on the farm. If one college, for example, would make the movement of moisture in the soil a specialty, and turn a full faculty toward its demonstration from every standpoint, it would bless the country more than any university under our flag."—*(James Wilson, U. S. Secretary of Agriculture.)*

"Fortunate are the children whose early years are spent in the country in close contact with the boundless riches which Nature bestows.

Amid these environments, instinct and spontaneity do a marvelous work in the growing minds of children, arousing and sustaining varied and various interests, enhancing mental activities and furnishing an educative outlet for lively energies.

Most fortunate are they to whom, at the moment when the unconscious teachings of nature need to be supplemented by thoughtful suggestions, wise leadings and judicious instructions, there comes one with a deep and loving sympathy with child life, an active interest in all that interests them and a profound respect for all that children do well, and for all they know."—*(W. T. Harris, U. S. Commissioner of Education.)*

NATURE STUDY IN SCOTLAND.*

In the 1899 Code of Regulations for Day Schools issued by the Scottish Education Department, an important step, which authorities on education cannot fail to appreciate, has been taken by the introduction of facilities for carrying out a scheme of instruction in the comparatively new subject of "Nature Knowledge"—a subject which was christened in Germany, which has been taught with considerable success in the United States of America, and which is beginning to be understood and welcomed in this country. The words of the Code are appropriate, as they leave the position open to those interested in the work to shape a course suitable to local conditions. Under Junior Division, it says that provision shall be made for instruction in—

Nature Knowledge (object-lessons)—the acquisition by the children, by means of observation and inquiry, of a knowledge of common objects, natural phenomena, and the surroundings of the school. In the Senior Division, instruction in the foregoing subject shall be continued and amplified, and some acquaintance formed with the natural features, the plant life, the industries and the productions of the district.

I have no hesitation in saying that I believe the subject of Agriculture when properly defined, and when its teaching has been established on judicious lines, will be one of the most popular of the group of Nature Knowledge subjects found suitable for rural districts. The unpopularity of agricultural teaching among farmers is largely due to the misconception of the method by which the schoolmaster should deal with the subject, and also to the fact that the teachers have either not had opportunities, or have not embraced available facilities, to qualify themselves to teach it.

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Returning to the subject of the present classes, I want it to be understood, in the most unmistakable manner, that it is not the belief of any of the promoters of the scheme for the education of teachers who will teach Agriculture in schools, that schoolmasters will ever be converted into farmers, or become qualified to instruct farmers or their sons in the actual practices of husbandry. Teachers are not to be transformed into farmers in the course of a few weeks as by a magic wand. It is intended merely that they should, by building on the foundation of a good general education, become literary experts in the subject of Agriculture, and be able to direct the youthful mind in proper grooves; above all, to encourage the development of the power of observation, for which there is so much necessity as a training for every walk in life, and so much scope and material constantly at hand in a country place. It is a notorious fact that boys are reared in our rural districts without knowing, and I might add, without noticing intelligently, the thousands of objects of interest that surround them. Trees, flowers, grasses, wild beasts, and birds, are, with a few

* Extracts, by permission, from an address by Professor Robert Wallace, Prof. of Agriculture and Rural Economy in Edinburgh University, delivered to teachers at Sciennes School, February 17th, 1900. Edinburgh: The Darien Press, sixpence.

insignificant exceptions, sealed books, as it were, to the rustic youth. It is hardly to be wondered that it is so, because his father before him knew equally little, and the instruction he receives at school deals with altogether different subjects, useful in their way, no doubt, and necessary, but barren of interest to youth as compared with the book of Nature when properly opened and explained. I am not speaking from heresay, but from a personal knowledge of the facts, and a strong assurance that it might be very much otherwise were a suitable key provided for the opening up of Nature's mysteries. It is painful to think of the position of the young mind struggling for a light whereby to read Nature.

Imagine a country lad inspired with a desire to know and learn about his surroundings. There is no one to help him. His early efforts, at least, must be cramped and disappointed, if, indeed, he is not altogether disheartened and dissuaded from following his natural inclination.

If those who at first framed our educational system had looked back upon their own youthful experiences, and recognized that *interest* in the subject of study is the first essential towards success in the matter of learning, we should have had more value attached to what I might call object-lessons from Nature. We should have had a wider and deeper appreciation of the things of the country taken by the boys belonging to the country, and less of the growing tendency to crowd into large urban centres—in many cases much to the disadvantage of those who go. Boys who do not take kindly to the ordinary routine work of a school are unprovided for—their mental development is either neglected, or it is left to chance to determine what objects of interest may absorb their thoughts.

I shall rejoice to see the time when farmers' sons and labourers' sons alike will examine intelligently all objects which come before their eyes, and have the means within their reach of solving difficulties as they appear. The advantage to be reaped is a double one. Not only would the information be of use to them in after-life, but the power and habit of observation would grow with the accumulation of knowledge. Observation is like any other faculty—it can be cramped by misuse or dwarfed by neglect.

Nothing struck me more forcibly during my travels in India during 1887 than the extraordinary amount of knowledge relating to all sorts of details of their surroundings possessed by the native agricultural population. One could not find a plant or creeping thing, injurious or otherwise, that had not a local name with more or less of a history attached to it, and was not well known to the masses of the people. Nothing that could be seen seemed to escape observation. The very fact was a guarantee of the pleasure the people derived from the possession of the knowledge, and from the exercise of the faculty of observation, as their attainments in this direction were altogether voluntary. Nothing could be more completely the reverse of all this than the state of matters among a corresponding section of the community in this country. It is a regrettable fact, too, that the present generation is more profoundly ignorant than preceding ones. It is pretty well established that about the beginning of this century farmers had a much better knowledge and appreciation of

the natural pasture grasses of the country than is possessed by farmers of our time. Again, it is well known that many of the youthful cattlekeepers and shepherds of the future (more especially in lowland districts) are, in virtue of School-Board regulations, in a great measure dissociated from the animals, the habits of which it should be their first duty in life to study. The result is a perfectly natural one,—youths are being reared with a deplorably imperfect knowledge of the business by which they are to live.

The advantages of the new departure are not, however, to be summed up in the one word *observation*. There are numerous generally accepted agricultural principles which can be explained, and many to be discussed, besides the results of valuable experiments which demand consideration and attention.

I believe that an immense amount of useful elementary knowledge can be disseminated by school teachers if they will confine themselves to principles, leaving the practice entirely to those who have spent their life in it. Where a doubt exists, it should be the duty of teachers to state both sides of the question, and they should at all times rather convey information from acknowledged authorities than personally advise from their own opinions.

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Agricultural Instruction in Ireland.

In the course of their reports on the advisability of introducing manual work into Irish schools the Commissioners on Manual and Practical Instruction in Primary Schools, make the following extract from a recent publication by the Government on "The Teaching of Elementary Ideas of Agriculture in Rural Schools."

Instruction in the elementary principles of agriculture, such as can be properly included in the programme of primary schools, ought to be addressed less to the memory than to the intelligence of the children. It should be based on observation of the everyday facts of rural life, and on a system of simple experiments appropriate to the resources of the school, and calculated to bring out clearly the fundamental scientific principles underlying the most important agricultural operations. Above all, the pupils of a rural school should be taught the reasons for these operations, and the explanations of the phenomena which accompany them, but not the details of methods of execution, still less a *resume* of maxims, definitions, or agricultural precepts. To know the essential conditions of the growth of cultivated plants, to understand the reason for the work of ordinary cultivation, and for the rules of health for man and domestic animals—such are matters which should first be taught to everyone who is to live by tilling the soil; and this can be done only by the experimental method.

The master whose teaching of agriculture consists only in making the pupils study and repeat an agricultural manual, is on the wrong path, however well designed the manual may be. It is necessary to rely upon very simple experiments, and especially on observation.

As a matter of fact, it is only by putting before the children's eyes the phenomena to be observed, and that they can be taught to observe, and that the principles which underlie the science of modern agriculture can be instilled into their minds. It should be remembered that this can be done for the rural agriculturalist only at school, where it will never be necessary to teach him the details which his father knows better than the teacher, and which he will be certain to learn from his own practical experience.

The work of the elementary school should be confined to preparing the child for an intelligent apprenticeship to the trade by which he is to live, to giving him a taste for his future occupation ; with this in view, the teacher should never forget that the best way to make a workman like his work is to make him understand it.

The following extracts are made from Pamphlet No. 5, "Agricultural Education in Ireland," by John C. Medd, issued by the Agricultural Educational Committee, 10 Queen Anne's Gate, Westminster, London, S. W.

Agriculture is a compulsory subject for boys of the fourth and upper classes in all rural schools, and it is optional for girls; even in town schools the subject may be taught to boys and girls. In 1898 the subject was taught to 85,000 pupils. Some 82 schools have school gardens attached to them, and here very useful practical work is done, although the method of instruction might be considerably improved. Elsewhere the subject is taught, as a rule, entirely from a text book, by Prof. Carroll, entitled, "Introduction to Practical Farming," and is unaccompanied by any practical illustrations, a knowledge of the text book alone being required by the rules of the commissioners. The evidence produced before the Royal Commission on Manual and Practical Instruction in Primary Schools (1898) went to show that the subject so taught was of little practical value. The children do not obtain any real grasp of the subject, as no efforts need be made to give them a practical acquaintance with the objects and processes described in the lessons. In the Final Report of the Commission (p. 40) it was recommended that the course in agriculture should be altered; that it should consist of instruction in the elements of the natural and physical sciences that have a direct bearing on agriculture, and that this instruction should be given with the aid of experiments of a simple character, performed as far as possible by the pupils themselves. In the opinion of the Commissioners such instruction would afford a good disciplinary training for all children, even for those who are not to be subsequently engaged in the practice of agriculture, while it would enable those who are to be so engaged at a later stage to make intelligent use of scientific treatises on the subject. Professor Carroll, Superintendent of the Agricultural Department of the National Board of Education, in his report for 1899, makes some very valuable observations, which are given below, upon the importance of this type of instruction.

"Instruction in agriculture should proceed upon the lines recognized in general education; the faculty of observation, the spirit of enquiry, and the training of the reasoning powers of the children should be the principal work of the teachers. In agriculture more than in any other industrial occupation are these qualities of the mind necessary. In no other subject of education are there so many details within which may be found matter of disciplinary value in training the minds of children; but the teaching of agriculture requires that the teacher shall place the matter before his pupils in an appropriate way that the elements for mind-training that exist in the subject may be turned to the best account. The efforts of the teacher should be mainly in the direction of bringing to the minds of his pupils scientific principles that bear upon agricultural practice. In agriculture there exists, ready in its every phase and varied in its extent, matter for useful instruction, provided that the teacher has "that within" to enable him to turn the opportunity to account. The rocks and soils of a district may be utilized for object lessons in geology. How much may be learnt in a walk along a roadside fence. The weathering of the rocks; the first efforts of soil-formation in the growth of lichens and mosses; the mixture of mineral matters at the base of the wall—are object-lessons that cannot be so well observed in the lecture hall. How instructive will be the sight of matter of considerable weight being taken long distances by earth worms, and of their attempts to take them into the earth, in illustrating Darwin's teachings on the influence of earth-worms in soil-formation. No diagram or drawing upon the blackboard can prove such an exponent of natural processes as is the witnessing of the acts themselves. In vegetable physiology and botany there is in the neighborhood of all rural schools matter for thought, observation and teaching. In the farm implements may be found material for lessons in mechanics. The opportunities for illustrating physics abound in the material world. The village forge or roadside smithy will provide considerable matter for profitable instruction. How much might be taught in reference to the scales that fall from the hammered iron! What experience can better illustrate expansion and contraction through the influence of temperature than the shoeing of a wheel! 'Nature teaching,' conducted upon well-defined lines, is one of the most useful methods for promoting the education of our people. Here we have at least a sufficiency of the illustrations and processes that are necessary for cultivating the faculty of observation. Results are traced to causes; the reasoning powers are developed; and thus our young people may have lessons adapted to cultivate their intelligence, and such teachings as will enable them afterwards to acquire information that will be useful to them in most of the occupations of life. But in order that this teaching may be given successfully, the teacher must have in the first place a varied amount of information himself, and he must be of sufficient skill and judgment to apply that information and knowledge to good purpose."

PROVINCIAL SCHOOL REGULATIONS.

ONTARIO.

In the school year 1898-9 the regulations of the Ontario Department of Education prescribed Agriculture as an optional subject in Public Schools, to be taught on the order of the local Board of Trustees.

In August 1899 the Minister issued an amendment as follows :—

"The Public School course of study is amended so as to include Agriculture among the obligatory subjects in all rural schools for Forms IV. and V.; for the latter Form the text books are to be used by the pupils, but for the former the instruction is to be by conversation only. Agriculture will remain optional for all Public Schools in urban municipalities."

It may be mentioned that in 1900 Agriculture was ordered by the Board of Trustees of Toronto to be taught as a subject in all the city public schools.

The text book authorized by the Minister of Education, for use in Ontario Schools, is "Agriculture," by C. C. James, published by Geo. N. Morang & Co., Toronto.

QUEBEC.

Education in Quebec is directed by two bodies, the Roman Catholic Committee of the Council of Public Instruction and the Protestant Committee of the same Council. The public schools are in three grades known as the Elementary Schools, the Model Schools, and the Academies. In the Roman Catholic schools Agriculture is taught in oral lessons beginning in the 4th year, Grade II, of the Elementary Course, and continuing with closer use of the text books through the two years of the Model Course, and the two years of the Academy Course. Various text books in French are prescribed by the Committee. In the Protestant schools agriculture is included in the Special Course of Grades II and III of the Academies. In this course are contained Botany, Chemistry, Physics, Physiology and Agriculture, one or more of which may be taught "as may be determined by the local school authorities."

According to the Report of the Superintendent of Public Instruction for 1898-99, the Committee recommended the following text books for use in Agriculture : "Agriculture" by C. C. James (Morang & Co.,) for use in Elementary and Model Schools, and "First Lessons in the Scientific Principles of Agriculture," by Dr. Dawson, revised by Dr. Robins, (Drysdale & Co.,) for use in the Academies. It would appear, however, that as yet Agriculture is confined to the two grades of the Academy course.

In the McGill Normal School for teachers "Agricultural Science" is one of the prescribed course, Dawson's "Agriculture" being the text book.

NEW BRUNSWICK.

"Throughout the several grades of the Common Schools, Nature Lessons bearing directly upon Agriculture form part of the course." Agriculture has been assigned a place in all Grammar and High Schools as one of the subjects included under Natural Science in Grades IX and X. In Grade IX it is associated with Physics and Botany, parts I, II, and III of James' Agriculture being prescribed. It is recommended that Physics be taken up from January 1st to May 1st and Agriculture and Botany during the rest of the year. Field excursions under the leadership of the teacher recommended. In Grade X Agriculture is taught, the work prescribed being the completion of James' Agriculture. Botany is continued, an introduction to Chemistry given, and the first nine chapters of Blaisdell's "Our Bodies and How We Live" taken up. In Grade XI the subjects are Chemistry, Botany, Physiology and Hygiene; in Grade XII Physics, Astronomy and Geology.

NOVA SCOTIA.

The subject "Lessons on Nature" is prescribed for every Grade of the Common Schools beginning with the first. The following is the Course :—

Grade I.—Power of accurate observation developed by exercising each of the senses on simple or appropriate objects. Estimation of direction, distance, magnitude, weight, etc., begun. Common colors, simple regular solids, surfaces and lines. Simple observations on a few common minerals, stones, plants and animals.

Grade II.—As in Grade I, but more extended.

Grade III.—Geography of neighborhood, use of local or county maps. Estimation of distances, measures, weights, etc., continued. Color. Study extended to three or four each of common metals, stones, earths, flowers, shrubs, trees, insects, birds and mammals.

Grade IV.—As in Grade III, but extended so as to include four or five objects of each kind.

Grade V.—From mineral and rock to soil, as shown in neighborhood, and extended to five or six each of the common plants, trees, insects, other invertebrates, fish, reptiles, birds, mammals; and natural phenomena, such as ventilation, evaporation, freezing, closely examined. Health Reader No. I begun.

Grade VI.—As in Grade V, and with the study of specimens illustrating the stones, minerals, etc.; each class, sub-class, and division of plants; and each class of animals found in the locality. All common and easily observed physical phenomena. (Much of this course will be covered by a series of object lessons on the subject matter of any twenty of the easier chapters of *James' Agriculture*, and on the *Introductory Science Primer.*) *Health Reader* No. 2 begun.

Grade VII.—As in Grade VI, extended to bear on Health, Agriculture, Horticulture, and any local industry of the School Section. Local "Nature Observations." (Much of this course will be covered by a series of oral lessons completing the subject matter of *James' Agriculture* and on the *Chemistry Primer.*) *Health Reader* No. 2 completed.

Agriculture appears also on the Course of the High Schools in Grade X under Science, which consists of Chemistry and Agriculture or Mineralogy. The text used is the same as that prescribed in New Brunswick and Ontario (*Agriculture* by C. C. James) A series of twelve books on Nature Lessons is recommended for the use of teachers

Agriculture is on the Course for teachers at the Provincial Normal School, Truro, N.S., Prof. Hermon W. Smith, B Sc , the Principal of the School of Agriculture, being a member of the Faculty.

"To encourage a special study of agriculture at the Normal School at Truro, teachers who are successful in obtaining an agricultural diploma receive in a school, in which agriculture is specially taught, one hundred dollars more than a licensed teacher without such a diploma."

MANITOBA.

Agricultural instruction is given in all the Public Schools of the Province and in all the higher grade and secondary schools. The teachers in training at the Normal School take a course in this subject and are required to pass an examination in taking their non-professional certificates. Two text books specially prepared for Manitoba are authorized by the Advisory Board, entitled "Our Canadian Prairies" and "Prairie Agriculture." Each school is furnished with a chemical book sufficient to illustrate the subject and also with a portfolio of colored plates of prairie wild flowers.

NORTHWEST TERRITORIES.

"Nature Study and Agriculture" as one subject is compulsory in all the five Grades or Standards of the Public Schools, and a compulsory Course in this subject is prescribed for teachers' non-professional examinations of second and third classes,

The text books used are "Manual for Teachers of Nature Study" by Mrs. Wilson (The MacMillan Co.,) and "Agriculture" by C. C. James, (Morang & Co.,) and the following three reference works for teachers: Newell's "From Seed to Leaf;" Goodale's "Concerning a Few Common Plants;" and Grant Allen's "The Story of the Plants."

The following instructions are given by the Superintendent:—

"To interest pupils in Nature, to train them in habits of careful observation and clear expression, and to lead them to acquire useful knowledge are important aims in teaching this subject. The pupil must study the plant, the animal and the soil rather than book descriptions of them. He may consult books after he has made his observations. The study of plant life should be emphasized in Spring though not restricted to that season. The study should be connected with Language, Drawing and Geography."

Then follow the details of the work for the various Grades.

BRITISH COLUMBIA.

Agriculture is at present an optional subject in the schools of British Columbia. More attention is paid to mining than to agriculture.