

when full grown, about two months after, feed it off. It may also be sown to good purpose on summer-fallow, to be fed off, or a great advantage can be gained by sowing it on land from which an early grain crop has been taken, if the land contains sufficient moisture. In this way the land is kept growing something, which, if eaten off where it grew, the land will be the gainer as well as the stock, and ultimately the farmer.

As to the variety, Dwarf Essex seems to be most in favor. Be sure and give rape a trial this year, according to one or more of the methods outlined, and you will reap many times the value of your subscription by this one bit of advice, barring drought or accident.

Agricultural Education.

[An address delivered before the Ontario Central Farmers' Institute by John Dearness, I. P. S.]

On two occasions able papers on the teaching of agriculture in the schools have been delivered at Provincial conventions in Ontario, one by Mr. J. E. Bryant, M. A., before the Educational Association of Ontario, in 1890, and the other by Mr. C. C. James, M. A., before the Trustees' convention in 1892. Both dealt with the exceeding importance of agriculture as a pursuit in this country, viewed from the value of our agricultural products, the amount of capital invested in agriculture and the number of persons engaged in it. It is unnecessary here to magnify the importance of agriculture, so we proceed at once to the consideration of what the school system may do to promote its interests.

Mr. Bryant pointed to France as a country where scientific agriculture has had for thirty years a place in the course of study in the schools, and concurrently the average wheat yield per acre has greatly increased. He tells us that thirty years ago, 22 bushels to the acre was considered a good average; now 33 is considered but fair; from 40 to 50 is expected, and that even as high as 80 bushels per acre have been obtained.

Mr. James quotes a writer in the "Contemporary Review," the Rev. W. Tuckwell, who attempts to show the relation of cause and effect between the school-garden and Agricultural College of France, and the fact that 75% of its population is rural as against 33% in England. Doubtless many other causes contribute strongly to these results, so many and so strong that if England had done everything and France nothing towards the teaching of scientific agriculture, the latter country would still have a far larger percentage of rural population and a much smaller one of emigration. Yet it is significant that Mr. Tuckwell and others accord so much credit to the school-garden and Agricultural College for making the French peasantry prosperous and contented.

But it may be taken for granted that it is unnecessary, before the Central Farmers' Institute, to enter into a series of arguments to show that our schools can do much and should do all in their power to advance the status of agriculture. Is the subject taught now? If so, how efficiently? In attempting to answer the question, permit me to review briefly the history of the subject, for it has a history that dates back to 1871, and one of which I find that prior to the placing of the subject on the curriculum for the High School entrance examinations in 1888, many well-informed farmers are quite ignorant.

HISTORY OF "AGRICULTURE" IN THE SCHOOLS OF ONTARIO.

The 13th section of the School Act of 1871 made it obligatory that certain scientific subjects should be taught in the Public schools, and in defending the "new studies," the late Dr. Ryerson said, through the official "Journal of Education," that "these subjects are such, and are prescribed to such an extent only, as is absolutely necessary for the advancement of the country in agriculture, the mechanical arts and manufactures.... and when the cheap and excellent text-books prescribed are examined in connection with the subjects specified, it will be found that nothing has been introduced which is impracticable or for mere show, but everything for practical use and that which admits of easy accomplishment." The text-books referred to included Dr. Ryerson's First Lessons in Agriculture, which contained the course in chemistry, botany and agriculture for the Public schools and for the junior forms of the High School. Further, he made provision for a special certificate for the teaching of agriculture in the Public schools. A course of instruction was laid down and an examination established, and first and second-class teachers, who passed the special examination and taught the subjects, were led to expect their schools would receive an extra Government grant, an expectation I have reason to remember, for it prompted me to qualify for and pass the said special examination. An inflexible course of study was prescribed, and whether the teachers had studied agriculture and natural science or not, they were directed to use the "First Lessons of Agriculture" in the highest three classes.

Beginning with 1871, the annual Provincial reports showed that there were put in the study of agriculture, according to the lines laid down in Ryerson's First Lessons:—

In 1871.....	5,723 pupils.
1872.....	11,773 "
1873.....	22,617 "
1874.....	15,945 "

An Elective Council of Public Instruction was called into existence by the School Act of 1871, and although the same Act directed the Council

to provide for the teaching of natural history, agricultural chemistry, mechanics and agriculture, yet it must have taken cognizance of the adverse criticism of the text-book, and possibly, too, of the facts that many teachers were not trained to teach these subjects and but few schools equipped for teaching them in a practical manner, for the rigidity of the course of study was relaxed and the teachers practiced a limited discretion in following it. Accordingly, we find the number reported in chemistry and agriculture in 1875, 1,980 pupils. The year 1876 saw the control of the Education Department pass into the hands of a responsible Minister. A revised course of study was published in 1877, providing for the optional teaching of experimental chemistry, with applications to agriculture in the highest class in the Public schools. Succeeding annual statements reported the number in chemistry and agriculture, in:—

1877.....	3,965 pupils.
1878.....	1,902 "
1879.....	1,665 "
1880.....	1,574 "
1881.....	849 "

In the last named year the present Minister of Education took office, and in the first School Manual issued under his authority—the School Act and Regulations of 1885—we find the following direction:—

Agriculture.—In rural schools the subject of agriculture should occupy a prominent place, such points being considered as the nature of the soil, how plants grow and what they feed upon, how farms are beautified and cultivated, the value of shade trees, what trees to plant and when to plant them, the relation of agriculture to other pursuits, the effects of climate upon the pursuits of the people. Poetical selections on rural pursuits and talks on botany and natural history should form part of the instruction every Friday afternoon. [In the new series of Readers, prepared under his direction, there were lessons on the leaf, the flower, the fruit, and the seed in both the 2nd and 3rd; two on Canadian trees in the latter, and a capital one on agriculture, in the 4th.]

In the subsequent reports the number of pupils reported as studying agriculture were:—

In 1886.....	1,558
" 1887.....	1,602

In the School Manual of 1887 the above direction is repeated, prefaced with the statement that the authorized text-book on this subject (Agriculture, by Messrs Mills & Shaw) should be introduced into every rural school.

In July, 1888, the subject occupied an optional place as an alternative with hygiene on the H. S. entrance examination; then we find the number:

In 1888.....	2,064
" 1889.....	2,549
" 1890.....	4,393

In 1891, candidates were permitted to take both agriculture and hygiene as optional and bonus subjects at the entrance examinations; then there were reported as studying agriculture:

In 1891.....	15,787
" 1892.....	18,401

In 1893, both subjects ceased, in the interest of thoroughness, to be bonus subjects, the candidates taking them being required to make, as in grammar, arithmetic, etc., at least one-third of the possible marks. The statistics are not yet published, but judging from what I know of a few counties, I expect to find for 1893 a greatly decreased number studying agriculture, and for 1894, when it was not on the High School entrance curriculum, the number will probably fall back to two or three thousand. Just think of these tens of thousands of children studying agriculture, evidently not for the benefit it would some time be to them on their farms, but to get into the High School or to have the name of passing the examination therefor.

This review, of nearly a quarter century's teaching of agriculture in the schools, show two high-water marks: once about 1873, when the Chief Superintendent said to the teachers, "You should and you must teach this subject in the three highest classes from the text-books, 'First Lessons in Agriculture';" and again when the present Minister said, "You should, and if you do along the lines of the first seven chapters of this new text-book, your pupils will be rewarded by a bonus at the H. S. entrance examinations. The 'should' has been in the regulations ever since 1871. When the compulsion was relieved by the more flexible course of study of the Elective Council, and again when the stimulation was withdrawn, the sequels show that a sentiment had not grown up which made trustees insist on the continuance of instruction in agriculture in their respective schools. The authorities have tried both compulsion and persuasion by turn with admonition all along, and yet in the face of these facts, I have heard people blame the 'system' or the Education Department for its absence from the schools. Indeed, so far as the Regulations are concerned, there is to-day the same obligation to teach agriculture as to teach reading, writing, or arithmetic. Perhaps, not any one here is more anxious than I to see the principles of scientific agriculture taught in the schools, and yet I do not regret to see the attempts made to teach it by rote from text-books, with written examinations, fail. Arithmetic, grammar and literature may be taught in such a way—in fact, usually are so taught—as to discipline the intellectual faculties and prepare the learner, to some extent, to grapple with the complex problems that confront the farmer.

Some of you may not agree with me, but I have no doubt that a rational course in parsing, analysis, fractions, mensuration, etc., will, up to the age of fourteen years, better prepare a boy for success on the farm than the rote learning of any or all of the text-books I have yet seen on agriculture.

It may be useful here to examine what other countries have done in respect to teaching agriculture in their public schools. The opportunities afforded by the great educational exhibit at the World's Fair rendered it easy to get much literature on the subject. Suffice it to say that of European countries, so far as I know, France has done most, and to the reports of her methods and results I'll ask your attention for a moment.

(TO BE CONTINUED.)

Crops for Summer Feeding.

Dairymen, in many parts of this continent, have had sufficient experience to teach them that pasture alone is a poor and unreliable prop to lean upon for summer feeding. This is especially true in connection with the fact that the falling off of milk is not the only drawback to a shortage in feed. With many cows the tendency to milk production is so great that they will draw on the substance of their own bodies to produce milk, unless the food is ample to meet all the demands of the animal. This, however, can only last for a short time without more or less diminution in the milk and injury to the animal. If cows are once allowed to fall off in their milk product, it is almost impossible to bring them back to their former capacity, even though the feed may be greatly increased.

Among the first and best soiling crops of the season are the different clovers. After these will come oats, peas, and tares, which will have been sown before this time. Next in order comes corn, which it is now in order to plant. Hungarian grass and millet, too, come in with good effect to feed early in August, if sown the first week in June. These can be had at a time when most other green feeds are not available. Most of our successful dairymen are finding out that corn is the best green fodder for late summer and early fall feeding. It is well not to confine the crop to one variety, nor even to one time of sowing. Aim to secure a succession of fairly well matured crops for feeding, because, though bulky and heavy, the green, watery, immature stalks do not contain the feeding value necessary to make milk, or maintain the cow in good condition. If more fodder is produced than can be consumed by the cows or other stock (because young cattle frequently require extra feeding in the fall, if they are to go into winter quarters in proper condition) it can be preserved in the silo, or as dry fodder. Before next spring it will be most acceptable, taking the place of hay that may be sold.

Corn for the Silo and Corn for the Crib.

SIR,—In response to your inquiry regarding the corn you saw growing here last year, it is called the Butler Co. Dent, and for my soil and location I find nothing better. For the silo, it grows just as much forage in proportion to corn as is profitable; and for the crib, more bushels of shelled corn to bushels of ears than any corn I have yet grown. And I want to make a point just here. I am repeatedly asked the best corn to grow for the silo. My reply is, "The corn that does best in your neighborhood"—that which produces the most bushels of sound corn to the acre. And the proper time to cut is when the corn is in fit state to shock.

The mystery regarding ensilage is being gradually made plainer. At the present stage it seems evident that the big, soft Southern corn is doomed in this location, and for the future I shall make no distinction between crib corn and the silo. And so satisfied am I as to the Butler, that I shall experiment no more (Eureka, it might well be named). It is as early as Longfellow; that is, it will be ready to shock earlier, will outyield it in ears, and produce one-third more shelled corn from same amount of ears.

R. GIBSON, Delaware, Ont.

DAIRY.

"While Canada has been steadily at work improving the quality of its cheese and building up a foreign market by producing a first-class article, cheesemakers in this country have been studying how to make cheese from skim-milk, to which lard or cottonseed oil have been added. Until we make honest cheese we must be prepared for a gradual decrease in our export trade, and the sooner we settle down on this basis the better it will be for all concerned."—[Creamery Gazette, Ames, Iowa.]

The directors of the Western Ontario Dairymen's Association this year continue the grant of \$100 toward the Western Fair dairy department prize list, and recommend a \$50 grant to the Industrial Exhibition. The annual convention will be held at Woodstock, on January 6, 7 and 8 next. The matter of holding joint dairy and farmers' institute meetings, proposed by Mr. Hodson, Supt. of Institutes, was referred to the Executive to deal with.

The Ohio Dairy Commissioner has found a swindler in that State who is making bogus milk. He mixes bicarbonate of soda, nitrate glycerine, salt and sugar with milk and water, and makes an emulsion closely resembling milk. This formula is also sold at \$5, so that dishonest milkmen may swindle their customers.