

United States educating the Cuban and Filipino children for free citizenship of civilization, while they held their parents in check by the force of arms, pointedly exemplified the impracticability of educating the adult masses, and the influence of education upon the children proved the true remedy. Excellent work had indeed resulted from the establishment of agricultural colleges and experimentation or illustration stations, but the principal point gained was in the mastering of problems involved in the principles of agriculture and the fitting of thousands of practical men for teachers. For teaching the Germans led the world, as they reduced the problems to the exactness required by science. The practical people of the British Isles carried out countless experiments and proved or disproved many theories.

CANADA AT THIS TIME

only had about five or six million people, largely of the Anglo-Saxon race. Her immense area of rich agricultural lands and hardy climate promised a grand field for the agriculturist. Her people were largely intelligent and her common free school system made them a fairly well educated class, with comparatively few illiterate. But children in the rural districts had not been taught the simplest principles of agriculture, and consequently when grown to manhood they failed to benefit to any appreciable degree by the best efforts of the agricultural teachers.

THE DEPARTMENTS OF EDUCATION

and agriculture of the various provinces of Canada determined to grapple with the problem, as they recognized that the future food supply was in jeopardy. They had already done much in the way of proving the value of Canadian farm products, and their farmers were yet in a fairly prosperous condition. Strange as it may seem to day they met the most strenuous opposition from the farmers, most of whom owed their prosperity to hard labor on comparatively new lands. They had never received education in agricultural or natural principles, and feared that such education would unfit their boys for work. They ascribed the forsaking of the farm for the cities by their boys to the education already obtained in the common schools.

WANING FERTILITY

of their lands was to them but an expression, and they looked to redoubled manual labor as the only true cure. The disastrous results of bad seasons or bad markets were respectively ascribed to providence and the government. They had to put up with one, and they generally took occasion to vent their wrath on the other by changing their representatives.

IT TOOK STRONG, BOLD MEN TO LEAD

the movement to introduce agricultural subjects into the common schools. Ready and forceable speakers were found among the farmers who denounced "book farming" in stirring addresses, and for years the future education of the agriculturist was in doubt. An attempt to make such education obligatory was sure to fail, and so the entering wedge was set in the form of optional teaching.

IN THESE ENLIGHTENED DAYS

when a study of all the underlying principles of agriculture is compulsory in the teaching of the city as well as the country schools, and every farmer is so trained that he is able to work in harmony with the natural forces attending the production of his crops, it is hard for us to appreciate the educational difficulties of the nineteenth century. Up to that time the old-fashioned mould-board plow was accepted as the undoubted standard, and when advanced thinkers questioned the ridiculous custom of continually turning the land up side down and often burying the valuable plant nutriment supplied one year and wondering at not getting any value from it the next, the farmers of that day

RIDICULED THEM AS HUMBUGS.

Yet these same farmers were playing the old game of a grandpa with his spectacles lost on his brow. Think of the the now obsolete mowing machine of the nineteenth century, which was but an improvement on the scythe of the ancients, and compare it with the splendid machine of the twentieth century which is adjusted to cut and bind the grains or the timothy and clover hay, and besides saving

the cost of the extra machine it saves ten times the amount of labor. In the latter part of the last century scientists were beginning to look upon clover as a nitrogen gatherer, but now any schoolboy can explain the function of clover and consequently the immense store of valuable atmospheric nitrogen is being utilized to form

THE GREAT CROPS OF THIS AGE.

The function of nitrogen is understood by all farmers, and so the size of their crops is controlled. In those days farmers and orchardists applied potash occasionally to their soil on the advice of some scientific authority, but being themselves entirely without exact knowledge of the nature of potash they were generally disappointed, as they usually expected almost impossible results. Compare that with the intelligent agriculturist of this day adding potash manures to flesh his fruits and tubers, already well supplied with nitrogen and phosphates.

The agricultural writers of the nineteenth century thought nitrogen the great essential manure for wheat growing, but now we know what a fallacy that was. We fully recognize the influence of nitrogen in giving us quantity of crop, but in the cereals we know that the great requirement is a hard, plump, nutritious seed. So we apply an excess of phosphate and so encourage the

REPRODUCTIVE ORGANS OF THE PLANT,

with the result that we obtain one hundred and even more bushels of good hard grain to the acre. Whereas the average crop of that age was about twenty-five bushels, now you will observe by these statistics it is about seventy. [The library contained all the latest agricultural works and statistics.] The orchardist of those days was afraid to apply sufficient nitrogen for fear of excessive wood growth, but now he no longer fears the wood growth, because he applies as well plenty of the mineral manures to balance the food requirements of his crop and to stimulate reproduction. We do not waste our nitrogenous manures on the clover or pea crop, as these plants get all the nitrogen they require when manured with the minerals, and from the refuse roots and tops supply us with nitrogen for the following crops.

EIGHT AND TEN TONS OF CURED CLOVER HAY

per acre is now obtained in two or three cuttings a season, a result considered marvelous in those days. The value of a crop of hay or roots is no longer measured by its bulk alone, but by its nutritive feeding power, and while in the old days turnips carrying ten per cent. of solid feeding value were a grand crop, now we consider it a very poor crop which does not have at least fifteen per cent. of solids. While the pastures of that age were large tracts of poorly-tilled land, to-day you notice small plots feeding two or three horned stock to the acre and still looking rich and fresh. You will see hemp grown now in climates which our great grandfathers considered totally unsuited to the plant, and the secret of it all is the plentiful application of nitrogen to give stature and toughness to the plant.

THE METHODS OF THIS AGE

are the result of education, and while we know by comparison they are vastly superior in results to those of past ages, yet we have still much to learn and many improvements to make. The agriculturist of to-day is the recognized leader in natural science, instead of the disheartened laborer slaving sixteen hours a day and sleeping the balance. The luxuries of the earth surround him in his home, and the women of his household live healthy, comfortable lives, thanks to the labor saving contrivances so easily obtainable. The people you see about you are healthier and better than the race used to be, because better food is produced and sounder principles are applied to its preparation. Yet we are only on the verge of discovery and the millennium is a long way off.

We have talked enough for one evening, but you will sleep now and to-morrow we will study the practical working out of the modernized farming methods of the twentieth century."

But I awoke and found myself in the easy chair in my room in Toronto with the daylight streaming in through the window and my own calendar showing 10th July, 1899, as the date.