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turnips should be stored, of easy access. It does not pay to handle turnips, especially in the winter. A temperature of about thirty-two to forty-five degrees Fahrenheit will keep turnips sound until May. If turnips are kept in a warm cellar during the winter—say above fifty degrees—the bulb commences to sprout or growth is excited, and the consequence is before spring it turns soft and loses the greater part of its nutriment. Turnips do not want to be frozen; but better to be below and on the freezing side, than too warm.

Agricultural Education.

There is a disposition on the part of nearly all civilized governments to foster agriculture and agricultural advancement by means of a higher education of farmers' sons, as the production of the first necessities of life is what national prosperity depends upon. The world is going apace in the arts and sciences; commerce and manufactures are making rapid strides, and it is an age of progress in every department of life. The ox-cart of our fathers will not do now, and the reapers, hooks and scythes have been superseded by self-binders. In all this advancement the potent factor is, and has been, *intelligence*; all great results and improvements have been brought about by this; to say this is almost axiomatic. Intelligence produces the same results, whether in the workshop or the farm; but education of the one is not fitted for that of the other—these require a special knowledge and training; every man to his trade. Besides a farmer requiring a general education as a citizen of the world, it is necessary that he should have a special education the same as those who are fitted for law, medicine, or any of the trades. Indeed, so broad is the scope of what knowledge should be, that it has no end. Look! He has the whole domain of nature to deal with in the animal and vegetable kingdoms, including the broad sciences of chemistry, botany, the breeding and diseases of animals, entomology (insect lore), and kindred sciences. With this a successful farmer requires to know something about political and domestic economy. There is no doubt a man can make money on a farm who is not versed in any of the so-called sciences; he may work by the rule of thumb and do well; he may do, but the chances are ten to one that the active, educated farmer will win and be successful. What we mean by an *educated* farmer is not the cramming into a young man's head a lot of book learning out of scientific text books—theory without practice. The *Advocate* has always contended for advanced education for farmers, and a higher class of farming. We think that great good can be done by Experimental Stations and Model Farms in teaching and disseminating agricultural knowledge, if economically and practically conducted, so that the results will show that intelligent farming can be made profitable. Here is where the rub is—making farming pay. If there ever was a time when educated farmers were needed, it is now, especially in the older settled districts of Canada. There is a great strife between capital and labor. Our older lands are becoming gradually depleted of their virgin fertility; plant food is scarce. The Ontario farmer, for instance, has to compete in the markets of the world with the great Northwest, with its millions of acres of rich organic soil; with the expansive States and Territories of the American Union; with the large continental island of Australia; with the extensive wheat belts of India, and the heavy exports of productions from Russia. All these, as steamboat and railway communications are opened up, are pouring their productions into the marts of the world, and all are competi-

tors. That brains—education—and capital have to be depended upon for a successful farmer, is at present evident. Look at the power of capital that is invested in some of the western cattle and sheep ranches; and again, wheat farms, like that of Dalrymple's, where everything is conducted with the same precision and method as characterize any other business. The conditions of farming are altogether changed from what they were even a few years ago, when the country was settled; it was labor then—now it is intelligence, and the consequent proper use of capital in farming. Farming now is commenced to be looked upon as not merely a life of drudgery, and farmers as hewers of wood and carriers of water, but as a business, and even as a speculative business; for capitalists, like Dalrymple, find that they can make a surer investment to buy land and raise wheat than in any other business. But then it requires intelligence and method, and educated men to superintend the affairs.

The necessity of having thoroughly trained and educated farmers is becoming so apparent that, as we said before, nearly all governments are moving in the matter, considering that a more general study of the science of agriculture will prove of the utmost importance to those engaged in farming. In Germany agricultural sciences are taught and form a special study from the lowest graded school to a university course. In England and Scotland, too, certificates of merit are granted for proficiency in subjects pertaining to the science of agriculture. This is right; and we are pleased to see the Council of the Agriculture and Arts Association of Ontario have proposed a scheme for the encouragement of a higher agricultural education. They propose to grant certificates—2nd and 3rd—to those who pass through a curriculum of studies prescribed by the Minister of Agriculture. The examination is free to all, whether they attend a Model Farm school, college or not. The examinations are to be held at the same places, and subject to the same rules, regulations and supervision as the High School examinations of July next. Besides the granting of certificates, ten prizes ranging from \$30 to \$15 are given to candidates obtaining the greatest number of marks.

The object aimed at is, no doubt, good; it is to advance agricultural education and to stimulate a taste for reading and the acquisition of valuable information on the science and most approved methods of farming.

On the Wing.

THE DOMINION EXHIBITION OF 1883.

This Exhibition has been the only one we have ever attended worthy the name of Dominion Exhibition. It has been a grand success, and the inhabitants of St. John deserve great credit for the enterprise, generosity and spirit evinced in setting such a pattern for others to follow. St. John has not the population, the wealth, or the amount of Government patronage that some of our western cities can command, but she has shown an example worthy of being copied by some of the owners of riches in the West; for instance, a wealthy merchant, Mr. Manchester (of Messrs. Manchester, Robertson & Allison), of St. John, N. B., being desirous of improving the butter products of the country, had, at his own expense, engaged Prof. J. P. Sheldon, of the Agricultural College of Salisbury, England, one of the leading dairy authorities in England, to come to this Exhibition and give an exhibit of the latest appliances in butter making now in use in Britain, and to give addresses and instruction on the subject in Canada. A large space of the horticultural buildings was fitted up for the display of

the utensils and for a lecture room, and as this had been well advertised, it drew a large concourse of farmers and their wives daily to see the appliances and hear the addresses, great interest being evinced in this department. Mr. Sheldon is a very pleasant speaker, and has awakened a great deal of thought upon this important branch of our industries, especially among those who have not had an opportunity of seeing the new process or reading about it. The cans for the different methods of setting milk were on exhibition and explained. The perpendicular and horizontal barrel churns were exhibited. The butter was churned in the perpendicular churn and was made up before the gaze of the spectators. The principal feature shown was the working of the butter in the globular state, and manipulating it by means of paddles instead of using the hand. The Laval centrifugal machine was exhibited in motion, but owing to some slight defects in the motive power, it did not separate the cream from the milk when we were there, and we watched it closely every day we attended the Exhibition. We do not consider the churning or the manipulating of the butter as shown at this Exhibition to be equal to what we have witnessed at the Kirkton Creamery in the county of Perth, which was described in this journal two years ago, or at Montreal, as described this year. In another part of the Exhibition there was the Danish centrifugal machine in operation, which separated the cream from the milk in an efficient manner. It was exhibited by Prof. Barre, of Montreal, and Mr. W. H. Lynch, of Danville, P. Q. It was a much superior and more complete implement than the one exhibited by Prof. Sheldon, but the cost is much greater. Mr. Barre has been employed by the Quebec Government to give instruction in butter making in that Province, where they have already five creameries using the centrifugal machine for separating the cream from the butter. The principles have been previously explained in this journal. Mr. Lynch was at the Exhibition. We believe he is preparing a publication on the butter question under the auspices of the Ontario Government.

There was a very good and large display of live stock of excellent quality. The stock on an average was not in as high condition as is generally to be seen at our large western exhibitions, although a considerable quantity exhibited showed that liberal feeding had not been neglected. The Government Stock Farms of Prince Edward Island and of New Brunswick strongly contested for the honors against each other; both carried off a large number of prizes, much to the chagrin and disappointment of the practical farmers who had brought their stock to the Exhibition. Loud and grievous were the complaints about this. It is a debatable question whether the Government stock of the different Provinces should compete for prizes at exhibitions; also whether the Government sales of stock are checking private enterprise. The stock exhibited by the two Government Farms did credit to the feeders, but they would not have carried off so many prizes had some of our best Ontario breeders exhibited. But the latter would not take their stock so far; in fact, some of our best breeders do not even exhibit at our Ontario Provincial Exhibition, although they hold stock that could not be excelled at any of the exhibitions.

At this Exhibition a few Polled Norfolk cattle were shown, the only cattle of that breed we have seen in Canada. There was exhibited one Holstein bull, a much larger and finer animal than any of that class that has been shown in Ontario. There were working oxen exhibited that would have taken the prize in Ontario; but what surprised us most was the large numbers of