many cases, be better as one year seedlings and one year transplants.

The smaller the plants, the greater the proportion of roots and the easier they are handled. There is less risk of their being injured in the lifting. They are less easily blown out of the ground, as their tops are close to the surface, and besides, are much more flexible; and there is always, at least on the flat, a stratum of air about one foot from the ground which is warmer in a storm than the air above it.

The seedling plants would be raised in a situation convenient for such a purpose, and central to at least ten or twelve of the proposed plantations. All the areas to be planted would be ploughed and cropped with oats or other grain. These crops would serve to ameliorate and loosen the surface soil for the later operations, besides providing somewhat to help cover the expenses. After the lifting of the crop, and during the fall, all the plantation grounds would require to be trench ploughed about eighteen inches deep, and left rough over winter. This would loosen the soil for the plants and help to catch and retain moisture for the growing season. This is a most important consideration in Southern Alberta, for the frequent chinooks melt the snow which simply runs off the surface and by and by finds its way to the rivers and lakes, because the frozen ground will not allow it to penetrate into the soil. The rough broken land just left by the plough would help to collect this water and hold it till spring when it would be able to soak away.

In the meantime the plants for each area would have been transplanted into lines in the area they were to ultimately occupy. Another crop of grain would be taken off the trenched land, and the plants would be slipped in on the stubble in the spring following.

The plants, being already on the ground, much danger from drought during planting would be avoided. The ground being comparatively level and held by the stubble, there would be less risk of the plants being buried in dust, a condition of affairs which must be reckoned with in this country.

There would be little danger of the cattle damaging the plants, as in summer time they would not touch them, and in winter, when the grass was under snow, the trees, at first at any rate, would be under the snow also. By and by, when they got above the snow, they would be of size enough to recover any little damage that might be incurred.

Once established, growth would be most rapid. In about fifteen years the plantations would be at least as many feet high.

The drifting snow would be caught by the trees and remain there to gradually melt with the heat of spring. The ground, being then soft, a plentiful supply of moisture would sink into the soil for the use of the trees.

The falling needles and forest mosses would soon absorb and retain large quantities of water. The surplus would run off and help to vivify the grass of the prairie all round the plantations. In fact, it would just be on a great scale what is to be seen in every coulee and scrub patch in the country, the snow would be retained until the ground was soft enough to absorb it. This indeed seems to be the trouble with the so-called semi-arid regions of southern Alberta and Assiniboia. Plenty of moisture falls in the form of snow, but the chinooks melt it while the ground is frozen. It cannot enter the soil and so it finds its way at last to the rivers, or lies in shallow pools on the surface to be dried up by the first few days of real warm weather.

And another effect the afforestation would also probably bring about. Forests, as is well known, collect moisture from the air, and many additional springs would probably be formed around the woods, a matter of considerable importance, when perhaps for miles no water is available for the cattle except may be a small alkali-impregnated lake.

And yet another benign effect might result. The retention and subsequent gradual evaporation of increased quantities of water in the district would cause an increase of moisture in the atmosphere, and possibly also an increased rainfall as a result of that, and who can estimate the value of such a blessing to the sun-baked plains of the west. Even this alone would warrant the adoption of this, or some other such scheme as I have here indicated. The experiment, if conducted on a sufficiently comprehensive scale would be a magnificent one, and its execution would be well worthy of the intelligence and enterprise of the people of Canada.

Seed Grain Distribution.

To the Editor of The Commercial.

During the past twelve years samples of those varieties of grain, etc., which have succeeded best on the several Experimental Farms have been distributed on application in 3-lb bags, free through the mail, to farmers in all parts of the Dominion. The object in view in this distribution has been to add to the productiveness and improve the quality of these important agricultural products throughout the country, by placing within reach of every farmer, pure seed of the most vigorous and productive sorts. This work has met with much appreciation, and a large measure of success.

Under the instruction of the Hon. Minister of Agriculture another distribution will be made this season. Owing to the very large number of applicants annually received, it is not practicable to send more than one sample to each applicant,—hence if an individual receives a sample of oats, he cannot also receive one of wheat, barley or potatoes, and applications for more than one sample for one household cannot be entertained. These samples will be sent only to those who apply personally, lists of names from societies or individuals cannot be considered. The distribution will consist as heretofore of samples of oats, spring wheat, field pease, Indian corn and potatoes.

Applications should be addressed to the director of Experimental Farms, Ottawa, and may be sent any time before the 1st of March, 1901, after which date the lists will be closed, so that the samples asked for may all be sent out in good time for sowing. Parties writing will please mention the sort of sample they would prefer, naming two or three different varieties of their choice. Should the available stock of all the varieties named be exhausted, some other good sort will be sent instead.

The samples of grain will be sent early but potatoes cannot be distributed until danger of injury in transit by frost is over. No provision has been made for any general distribution of any other seeds than those named.

Letters may be sent to the Experimental Farm free of postage.

WM. SAUNDERS,
Director Experimental Farms.
Ottawa, Dec. 27.

Testing Vitality of Seeds.

To the Editor of The Commercial.

The past season has in certain localities been unfavorable for the perfect maturing of grain. In some districts it has been injured by rain during harvest or from being stacked before fully dry, thus causing it to sprout or heat, while in other localities it has suffered more or less from early autumn frost. When exposed to either of these conditions cereals are apt to lose a portion of their vitality or to have it so weakened as to produce when sown an unsatisfactory growth. The character of the crop is greatly influenced by the quality of the seed used, and to obtain the best results it should have its germinating power unimpaired, so that when placed in the soil the young plants may make a prompt and vigorous start. Hence it is very important that farmers should ascertain whether the grain they are holding for seed possesses the vitality necessary to produce a good crop.

By instruction of the honorable minister of agriculture, provision has been made whereby the vitality of seed can be ascertained without cost to the individual, and any farmer in the Dominion, who may have any varieties which he desires to have tested can get the information he seeks, by forwarding to the director of the experimental farms, Ottawa, samples of such grain or seeds. Samples may be sent free through the mail and an ounce or two is sufficient for the purpose About two weeks are required to complete a test. It is hoped that all who desire to avail themselves of the provision offered will send in their samples early so that the work may be completed in good season.

WM. SAUNDERS,
Director Experimental Farms.
Ottawa, December 26.

Manual Training.

Through the generosity of Sir William Macdonald and under the able direction of Prof. Robertson, manual training schools are being founded throughout the Dominion. Four rooms have been fitted up in Winnipeg, one on McDermot avenue, two at Mulvey school, in the south, and one at Machray school, in the north. When these are all in full working order they will accommodate all the boys in our public schools, who are in grades V, VI, VII and VIII, 1,000 in number. These will be drafted in classes of 20 or 40, to the various centres once every week for 2½ hours. Wm. J. Warters is superintendent of the Winnipeg school, and he already has two assistants, while three or four more men (experts in this work) will soon arrive from England and the whole of the rooms will then be used. At present the room in Stovel block, accommodating 40, is the only one open.

Manual training is purely educational in its aims. It is not a trade teaching, its object being the development of the general intelligence by training the hand and the eye. This branch of school work, the utility of which has long been recognized in Europe and the United States, will fill a long felt want in our schools. The hand, so important to man, has been too long neglected and the effects of its use upon the brain has not received the attention justified by known results. Sir James Crichton Brown, the eminent physiologist is of opinion that much of the bashfulness, stuttering, stupidity, and irresolution found among all classes is caused by defective muscular training and the insufficient development of the motor centres of the brain. It is to educate the hand and the eye and through them to systematically develop these centres that manual training has been added to the curriculum of our schools. The boys are provided with tools in a properly equipped school room and there the eye is taught to see aright and to carry that impression to the brain and the hand to carry out the dictates of the mind so impressed. The learners are so delighted and pleased with the work that they do not realize that it is a lesson and that habits of perseverence, self-reliance, accuracy, neatness, concentration of thought and self-control are being formed and becoming part of their character. In writing to The Commercial this week regarding the work here Mr. Warters says. "I would particularly ask anyone interested in the welfare of our boys not to form any hasty opinions, but to watch the progress of this work and by visiting our schools and seeing our work and methods judge for themselves of its value."

Commercial Education in Saxony.

Nowhere in the world does commercial and technical education hold such a prominent place as in Germany, and of all the states which compose this empire, Saxony takes the lead in this direction, writes Consular Agent Harris from Eibenstock. This little kingdom has about fifty handelsschulen or commercial schools. These schools are in the first instance organized by the Kaufmannischen Vereine, or merchant unions, which exist in every little town in the country. The state exercises a supervising influence over each school. The merchant union supports the school, but if there is any deficit at the end of the year, this is made good by the state.

The average salary of the director and teachers depends upon their age and the size of the town. A director in a large city will get from $1,000 to $1,500. In the smaller cities, however, the salaries range from $600 to $800 per annum. All these teachers have been prepared for their work by completing either a classical education or some thorough course without the classics, where more attention is paid to modern language and business methods. It is the general belief that the latter course secures greater practical results in the schools.

The students who attend these schools come from families of the middle class. They are apprenticed to merchants during their whole attendance at school. Their ages vary from fifteen to eighteen. The law governing the relations between master and apprentice is very strict, and while the pupils are in attendance at school the director takes the place of the master. A number of commercial schools in Saxony take only students who devote their whole time to attendance; but the majority have aprentices who spend half the time in some business house. The latter plan has been found to be conducive of better results, owing to the opportunity of combining theory with practice. There is some complaint made on account of the disposition of many merchants to employ clerks who have not completed the full course of two years.

How Circular Saws Are Made.

These saws are now made of cast steel specially manufactured for the purpose. An ingot heated to the requisite temperature is reduced to the proper thickness in powerful rolls. The plate is then centered and a circle scribed upon it, after which it is passed to the shearer, who reduces it to a circular form. The centre hole is then bored. It is then handed to the toother, who punches out the teeth around the edge, after which they are rough filed or ground on an emery wheel, to take off the burr left by punching. The rough saw is now again heated in a large furnace until it is of a bright red color. It is then plunged into a bath of sperm oil, which makes it hard and brittle. The oil is then partly cleaned off, and the rest burnt off in a furnace to give the saw the required temper. When cold the saw is hammered on a steel-faced anvil until it is straight. It is next ground between vertical grindstones revolving in opposite directions, and then polished with emery on a large disk. Once more the hammer men take it, and strike it with smooth-faced hammers on an anvil as before until it is absolutely straight and true, and has acquired the proper tension which allows for expansion while the saw is revolving at work. The teeth are now set, alternately right and left, to allow for clearances when sawing timber. They are then sharpened by being filed on the front and tops of the teeth, which operation completes the manufacture. — American Manufacturer.

Winnipeg Raw Fur Prices.

Following is a list of the prices now being paid by responsible fur buyers in Winnipeg for consignments of furs from all parts of the west.

	From	To
Badger, prime	$ .25	$ .50
Bear, black, small	4.00	10.00
Bear, black, middling	8.00	12.00
Bear, black, large	12.00	20.00
Bear, brown, small	3.00	8.00
Bear, brown, middling	8.00	12.00
Bear, brown, large	12.00	18.00
Beaver, large	5.00	7.50
Beaver, middling	3.00	5.00
Beaver, small	1.50	2.50
Fisher, according to size and color	4.50	8.00
Fox, silver, according to size and color	50.00	150.00
Fox, cross, according to size and color	5.00	15.00
Fox, red, according to size and color	1.00	2.50
Lynx, according to size and color	1.00	4.00
Marten, large, dark	5.00	10.00
Marten, large, brown	4.50	7.00
Marten, large, light, pale	3.50	4.00
Mink, according to size and color	1.00	2.00
Musquash, winter	.03	.10
Musquash, spring	.06	.12
Otter, according to size and color	5.00	10.00
Skunk, according to size and color	.25	.75
Wolf, timber	1.50	2.50
Wolf, prairie	.50	1.00
Wolverine, according to size and color	3.00	6.00

The above prices are for prime skins only, and vary according to size and color.

"I met a grocery drummer on the road as I drove in this morning," said a man from Minot to a friend in Auburn, recently. "I was driving a pair of heavy horses and was going slowly, but I can't see how that was any business of the drummer. Nevertheless, he stopped me and entered into conversation with me. 'Why don't you swap that team for a horseless carriage?' said he. 'Why, I don't know,' said I. 'I never thought much about it.' 'Well,' said he, 'these horseless carriages are all the go now.' 'What kind of motor power would you advise me to get?' I asked. 'Mules,' said he, and with that he clucked to his horse and drove along before I had time to get my breath back sufficiently to swear at him."