

the rule, for the best effects of underdrains are not felt at first, but as time goes on the water seems to form channels, and finds its way to them from greater distances.

The more thoroughly land can be underdrained the better, but if the work cannot be thoroughly done let it be partially done, for it is a work which need not be complete before it becomes useful. Let no one be deterred from commencing because he feels unable to finish the job, because if there is a proper outlet for the water every rod of drain which is properly put in is a complete work as far as it goes. Its work will be done, and its benefits felt quite independent of its further extension, which may be done whenever it is convenient. If the whole field can be completed at once so much the better, but if this be too expensive, commence by putting in a drain or two where they are most needed, say along some hollow or small run where a plow furrow is generally made; this will save that annoyance, and trouble in the future, and make this the driest part of the field, and fit it for cultivation as soon as any other portion of the field. If there is any springy places put a few drains in them and lay them dry and sweet, and they will be the best parts of the farm thereafter. But in commencing to put in draining through the hollows and runs, be sure to make them large enough, not only to carry the water which would naturally come down that run, but to carry all the water which it may afterwards be found necessary to bring into them. Branch drains may then be brought into them at any time, and by degrees the work may be extended until the whole is perfectly underdrained. If the work is properly done with good tile it is a permanent work, and will improve with age, unless choked with extraneous matter, and unlike open drains will never have to be done again. The writer once saw an eight inch tile which had become completely filled for several rods with a fibrous growth from the roots of a willow tree in thirteen months from the time the tile was laid, which proves very conclusively that underdrains should not be laid within reach of the roots of trees.

#### A Trip in Manitoba.

It is pleasant travelling in the spring-time when the fields are getting their first coat of green, but it is more especially so in Manitoba, where the view is not marred by zigzag fences, and where the boundless prairie rivals the grain field in verdure. I know of no better place to start from than Brandon, as you can take a train to almost any part of the province. The southwest is looked to with more than usual interest this season on account of the construction of the Souris branch of the C. P. R. through it to the coal fields, which are about 150 miles distant. As Brandon is located in the valley of the Assiniboine river the grade west is heavy for seven miles, therefore the main line is used for that distance out to Kenney. Here the branch to the coal fields begins, coming straight south for twenty miles, touching the town of Souris. This is a bright little town built at the junction of Plum Creek with the Souris River. It is a pleasant situation. The valley in which the river runs is about seventy feet deep and wooded. When the Glenboro branch of the C. P. R. is extended twenty miles it will form a junction here with the Souris branch, further assisting the growth of the town. The farms surrounding this town for many miles are all occupied, and most of the farmers have large areas cultivated, some having for sale last season as high as ten thousand bushels of wheat—five thousand bushels per farmer being common.

Seven miles southwest of the town of Souris the railroad crosses the Souris River, following its banks more or less closely for forty miles. Eight miles from the crossing is the town of Hartney, so called after a prominent farmer of the district on whose farm the town site was first located. Although the site was only laid out in August last, and the rails were not laid that far until December, yet a prosperous business is already being done and a number of good buildings have been erected. Two elevators, with a capacity each of 35,000 bushels, were built last fall, through which were shipped during the winter some 250,000 bushels of grain.

This amount would have been largely increased had the train reached the town earlier in the winter. The district surrounding Hartney on the east side of the river is all well adapted to grain-growing, the land being clean and of such a nature as to be easily cultivated. The soil is warm and early, which induces the farmers to cultivate large areas, some cropping as high as 500 acres of wheat. Hartney is as far as the road is being operated at present, but the road-bed is graded for thirty-five miles farther to the town of Melita. Men are now at work on that portion building the bridges and laying the track.

In driving from Hartney to Melita the country is open, and nothing obstructs the view for miles; when the day is clear you get a view of the Pembina Mountains off to the southeast, and comfortable farm buildings are seen dotted here and there on the prairie between. Night overtook us on our journey, so we called on a farmer and asked the privilege of remaining with him during the night, which was readily granted. It was the home of Mr. J. W. Alcock, who came from Ontario in 1889 and purchased 640 acres, just east of the river, for \$4 per acre. He was just marketing the last loads of a large crop of No. 1 wheat, having completed his seeding of 110 acres. Some of his teams were busy breaking up the virgin prairie, thirty-five acres being already turned at the time of our visit, May 15th, and calculation made to complete 160 acres during the season. Mr. Alcock says he is much pleased with his venture in Manitoba and considers his farm to-day worth \$10 per acre.

Melita is built close to the Souris River and on its west bank. It is a pleasant situation for a town, being fully sixty feet above the level of the water, and the subsoil being of a gravelly nature, the streets will always be dry. The town site is surveyed on property belonging to the C. P. R., and the lots are being sold on the front streets at \$200 each, and on the side streets at \$100, all being fifty feet in width. The prospects are that this may be one of the principal towns in Manitoba, as it is located in the centre of a good agricultural district, built at the junction of the Manitoba Southwestern and Souris branches of the C. P. R. It is located just eighteen miles from the boundary, and within easy reach of the Great Northern road, on the south side of the line. Much confidence is being shown in the future of this new town by people throughout the province, who are investing in property and erecting buildings. Some forty new buildings were in course of erection when we visited it, and as soon as the train is able to reach the town and bring in building material, many more buildings will be erected.

The valley of the Souris, at the foot of the town, is more than a half mile in width, the river bending gracefully toward the town, forming a peninsula on the opposite side, which has scattered over it large elm trees. This has been secured by the town, and will be fenced and otherwise improved, and will make a beautiful park. The river here is still and deep, making it well adapted for boating. The railroad line west for fifty miles has been located, and will be constructed this summer. Tests are being made for coal, and it is fully expected sufficient quantities will be found; if so that is as far as the road will be built this season. Should coal not be found there the road will be pushed on twenty-five miles further where coal is abundant.

#### Advanced Agriculture.

By the methods usually practised, from the first breaking up and clearing of the land for farm crops, a steady but sure exhaustion of the fertility of the soil has been going on. This applies to the whole country at large, whether originally forest or prairie, heavy clay or lightest sand, from the richest alluvial or the strongest loam. "Run out" is the too general cry whenever land has been in cultivation for anything over two or three decades, and in many instances much shorter periods. This cannot be the fault of the soil itself from any mechanical cause or natural condition, for many notable exceptions are to be found where land of only mediocre quality naturally is now even producing better crops than when first worked. The deficiency must, therefore, be ascribed to the lack of proper method in the cultivation of the soil, or rather lack of management that causes the show of exhaustion by decreasing production. When nature is left to herself fertility increases. The soil or loose material of which the surface of the earth is formed, from the crumbling of the rocks, by the formation of vegetable soil, mostly created by the trees and herbage from materials taken up in solution by the roots from the soil and absorbed by the leaves from the air, and has gradually accumulated from the decay of the leaves, or the trees and plants themselves. By this means our forest lands are always abounding in fertility when first cleared. The same may be said of prairie and grass lands. Instead of the production of grass on the prairie or cultivated fields exhausting the soil, it is invariably enriched while producing large crops of grass. Then, may be asked, what is the difference, and the cause of grain crops diminishing fertility, and the opposite effect while the land is in grass? The immense growth of forest trees may not be produced by the surface soil alone, but when we consider the immense production of timber forests that are universally known to leave newly cleared lands rich in fertility, which invariably produce large crops of grain, why should a few years grain-growing exhaust the fertility when enormous timber growth leaves the surface soil rich in fertilizing elements? The reason must be ascribed to the moisture and mellowness of the soil being preserved by the shade of the trees which prevents the sun and action of the air from drying up the surface. Both the soil and the vegetation it willingly nourishes undergo slow but natural changes. Lay down a piece of land to grass, and after the lapse of years the soil, originally, perhaps, a stiff clay, is found to have a surface of rich vegetable mould, bearing a thick sward of grass. This, on being broken up with the plough, and properly worked and mixed with the clay, forms a soil that is in the proper mechanical condition to absorb the fertilizing gases contained in the rain that falls, and also to absorb dampness from the air itself. How is it that the skilful agriculturist makes the elements help the soil to produce what crops he wishes to grow? The great factor in crop production is moisture, in the case of an entire absence of which the richest soils would become a barren waste. As it is by moisture that all plant life obtains its sustenance, therefore is found the necessity of obtaining the proper mechanical condition that will add to and retain the moisture in the land. From the first draining becomes a necessity, by which earlier seeding is the first step toward covering the

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