

Experiments and Practical Demonstration of Underdrainage.

The Department of Physics, at the Ontario Agricultural College has for several years past been doing a great work in the encouragement of farm underdrainage, but the greatest step forward has been made very recently. A part of the grant which the Dominion Government made this year to the various Provincial Governments to be used as an aid in agricultural development, is being used to demonstrate the advantages of farm underdrainage. A gasoline traction ditcher has been purchased, and demonstrations are to be held in several districts to show the people the actual operations connected with putting in drains. It was not enough to take the surveys of the land and demonstrate to the people the use of the level, how to lay out a drain, how to determine the grade over a ditch, and how to dig the ditch to a grade by use of charts. Something even more practical was needed. Besides there are many living on low, comparatively level land, which is more or less of a heavy clay, who do not believe that underdrainage is practicable, or would be at all successful on their land. Then, too, there is a great difference of opinion as to the distance apart, and the depth drains should be placed in different kinds of soil. Actual demonstration and experiment will solve all these problems.

The first demonstration was held Friday, October eleventh, on the farm of Neil McDougald, Tara in Bruce Co., Ontario. The people of this district are much interested in underdrainage, and in July last the Farmer's Club of Hall's Corners held a drainage picnic, at which Prof. W. H. Day, of the O. A. C. gave an address during the course of which he mentioned the fact that practical demonstrations were soon to be held in digging ditches and laying tile. Accordingly a field was reserved, and the demonstration held. Over three hundred farmers attended, and witnessed the underdrainage of a field which had only produced one crop in ten or twelve years. During the afternoon Prof. Day, N. C. McKay, B. S. A., District Representative for Bruce, and C. L. S. Palmer, B. S. A., Asst. Rep. for Grey, gave addresses on the value of underdrainage.

The plan of the demonstration and experiment is this. The plot to be drained must consist of from five to ten acres, must be situated on a main road lying towards the road, must be so situated as to leave so much land as nearly identical with it as possible, underdrained for a check. The owner must agree to sow the same crop on the drained and underdrained land each year for three years, and must report all differences in yield, etc. The drained portion is divided into sections with drains two feet deep and two rods apart, two feet deep and four rods apart, three feet deep and two rods apart, and three feet deep and four rods apart. This besides testing the value of underdrainage against underdrained soil, compares different depths and different distances apart for the drains. This demonstration was a decided success, as far as putting in the drains was concerned.

Next spring work of this kind will commence in Haldimand Co., where eleven of these demonstration fields will be put in. Six of these are already located and five more will be secured, each township getting one, and the two largest townships two each. All the work of surveying, digging and putting in the tile is done by the Department of Physics. The farmer must hereafter supply the tile, and as these demonstrations are bound to be of great value to the tile business, manufacturers should be induced to supply the tile free of charge. This work should eventually dispel all doubt as to the value and practicability of underdrainage.

Experimental work is being carried out with underdrainage on the College farm as well. A large field is divided into ranges on either side of a mile-long main drain. The first range on one side is underdrained, the second section is divided into plots of 1½ acres each, one plot being drained by drains 30 feet apart, one plot 60 feet apart and one 90 feet apart, all drains two feet deep; the third section is laid out the same as No. 2, but the drains are three feet deep. These have the narrow drainage in the low ground, and the wide drainage on the higher ground, while plot four with three-foot drains has the wide drainage in low ground and the narrow on the high ground. The order of the ranges is reversed in the opposite side of the main drain. By the use of basins and a water meter, the exact amount of drainage from each system is to be calculated. Some of the most valuable information on drainage yet available should come from this, and the actual demonstration of digging and laying tile should prove a great stimulus to underdrainage.

Canadian Road Systems.

By W. A. McLean, Chief Engineer of Highways for Ontario, at American Road Congress, Atlantic City, October 2nd, 1912.

The creation of a thoroughly efficient system of highway construction and maintenance, is a task which, in Canada and the Canadian provinces, is being actively considered and dealt with. While some satisfactory progress has been made, measures to the present time have been those of the formative stage. Evolution rather than revolution has been the history of legislation in countries of the North, and highway systems and measures of Canada are following that general rule.

while the real improvement and construction of these roads is a municipal function, as settlement becomes established and municipal organization is created.

Canada has a geographical backbone, a rocky mineral region about the center of the continent, extending northerly from Lake Superior to Hudson's Bay. West of Lake Superior the four provinces of Manitoba, Saskatchewan, Alberta, and British Columbia are comparatively new, having been developed since the construction of the first Canadian transcontinental railway, the Canadian Pacific Railway, in 1886. East of the Lake Superior region are the old provinces of Ontario, Quebec, New Brunswick, Nova Scotia, and Prince Edward Island.



Crowd Watching the Ditcher Work.

Drainage demonstration on the farm of Neil McDougald, Tara, Ont.

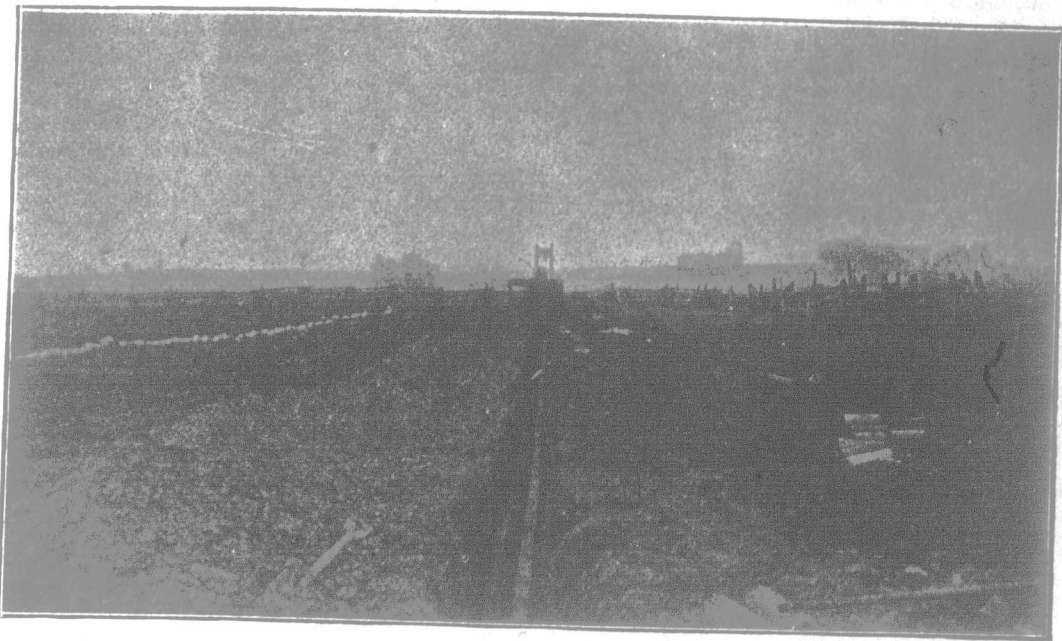
The Canadian form of government is similar to that of the United States in some respects. Canada is a union of provinces, with a federal administration at Ottawa, just as the United States is a federation of states with the seat of government at Washington. Each of the nine provinces has its own legislature, as has each of the states; and the provinces are again divided into local municipalities—the rural being townships and counties; while the urban are villages, towns and cities,—but as in the States, local government varies in the different provinces. The Canadian constitution, "The British North America Act", defines the powers and jurisdiction of the Provincial, and those of the Federal or Dominion Government. Under that Act, legislation respecting public roads and municipal organization is within the authority of the provinces, although the Dominion Government has power to subsidize road construction. The tendency in each province (with certain exceptions) until recently has been to regard the opening and grading of roads in new territory as a provincial function,

BRITISH COLUMBIA.

British Columbia, on the Pacific coast, is traversed by the Rocky Mountains, and municipal organization is, therefore, interrupted. In consequence, the Provincial Government has always contributed largely to road-building. At the present time a special fund is being spent on the construction of trunk roads at the rate of \$5,000,000 annually, under the direction of the Department of Public Works. Stone for macadam roads is plentiful, but the grading of mountain highways is expensive. The trunk roads now being built have an important scenic value, and upon completion will attract many tourists. In the past ten years approximately \$15,000,000 has been spent by the Province on roads and bridges, but the expenditure of an equal amount in the three years 1912-14 is now outlined.

SASKATCHEWAN AND ALBERTA.

Saskatchewan and Alberta, occupying the prairie country north of Montana and North Dakota, were granted provincial organization in



A Ditch Dug, and Tile Laid.

A demonstration of putting in drains with a traction ditcher, on the farm of Neil McDougald, Tara, Ont.