

1905, and are in a pioneer stage of development. Earth roads, with bridges, are the present need, and very little has been done toward good broken stone or gravel roads. Each of these provinces has a provincial highway department, however, and is drawing largely on its resources for road expenditure. The provincial governments in each case are grading and bridging the main roads. As fast as settlement permits, three or four townships are organized into Local Improvement Districts with Councils to expend money raised by local taxation. In the case of Saskatchewan, an annual provincial appropriation (in 1910, the sum of \$60,000) was set aside to be drawn upon by the municipalities under a plan of provincial aid. The chief provincial expenditure in these provinces is applied, however, to trunk highways, by the Provincial Highway Departments, through their own foreman. Steel and wooden bridges are also erected by permanent "bridge gangs." The provincial departments also carry on educational work. In Saskatchewan a special appropriation of \$5,000,000 for trunk roads, was made at the last session of the Legislature, of which \$1,500,000 will be spent this year; in addition to the usual appropriation of \$400,000 from current revenue. In Alberta a special grant of \$1,000,000 was made this year for a central north-and-south trunk road in addition to the usual sum of \$250,000 from current revenue.

MANITOBA.

Manitoba has for several years had a Provincial Highway Commissioner whose duties were largely educational. At the last session of the Legislature (January 1912), two important acts were passed. One of these, the Act Representing Provincial Highways, set aside \$200,000 annually for provincial aid to main roads. Townships are permitted to lay out a special system of main highways, and the plans with specifications are to be submitted to the Provincial Highways Department. If approved by the Provincial Authorities, the township may issue 30-year debentures and proceed with the work, receiving a grant of two-thirds of the expenditure from the Province. In this way it is expected that a serviceable system of Provincial roads will be constructed. The other Act, known as "The Good Roads Act", is one which relates to minor roads, and does not provide provincial aid; but requires any township undertaking the improvement of these roads to submit the plans to the Provincial authorities; and upon approval, the township may issue 50-year debentures to meet the cost—which debentures may be guaranteed or purchased by the Provincial Government. The work done under this Act is also subject to the inspection and approval of the Provincial Highways Commissioner.

ONTARIO.

Ontario is, physically, in two parts—Old Ontario, settled for over a century, and with complete municipal organization, and New or Northern Ontario, now being opened for settlement. In New Ontario, the Provincial Government is this year spending about \$850,000 on colonization roads—opening and grading the road allowance—and about \$250,000 for bridges. In Old Ontario, the local municipalities are spending yearly about 1,100,000 days of statute labor, and \$1,400,000 in cash. A large proportion of the latter goes into durable concrete culverts, and concrete and steel bridges. The Highway Improvement Act of Ontario is one of the most successful of Canadian road measures. County councils (composed of the reeves of the local municipalities composing the county) are empowered to pass a by-law assuming for construction and maintenance a system of main highways. To this work the Provincial Government contributes one-third of the cost of construction as the work progresses. The Provincial Highway Department fixes certain regulations as to construction and management, inspects from time to time, and co-operates with the municipalities to obtain good results, but the active control is vested in the county councils through their own county engineer. This Act has been in operation for eleven years, and the annual outlay under it is steadily increasing. In 1911 the total expenditure was \$711,000, of which the Provinces contributed one-third. This Act is largely educational in its aim, but at the same time is producing much excellent work at a low cost. The educational effect has several features:—

- (1) It brings about an increasingly high standard of road construction, which teaches the public what good roads are, and how they should be built.
- (2) It instructs county councillors in road construction and impresses upon them the principles of good organization.
- (3) The roads and organization become models which are observed and imitated by the township councils, so that all roads are affected.
- (4) It enables the Provincial Highway Department to prescribe good principles, and the results of investigation, in an effective way.

The Ontario Highway Department is also con-

structing, at various points, model roads at the sole cost of the province, or with a partial contribution from the municipality in which the road is built.

QUEBEC.

The Province of Quebec has been extremely active in the matter of road construction, and has adopted several measures of a progressive character.

(1) The Province loans roadmaking machinery to municipalities making request, and has ten complete outfits for this purpose.

(2) Grants are made to local municipalities which dispense labor tax, and build an extent of durable gravel or stone road. Nearly 600 out of a total of 1,000 townships are this year taking advantage of the measures.

(3) The sum of \$10,000,000, borrowed under 41-year bonds, has been set aside for main highways. Municipalities may, for their construction, draw upon that sum, and are only required to meet one-half the interest (2%) on the monies so used for the term of the bond issue, the province meeting the sinking fund and remainder of the interest.

(4) Three provincial highways aggregating 350 miles in length, are now under construction. To this work the local municipalities pay \$1,000 per mile, and the Provincial Government contributes the remainder.

NEW BRUNSWICK.

New Brunswick has not as yet developed a broad policy leading to permanent road construction, but the Provincial Engineer by means of a contribution to county and parish construction, is enabled to bring technical instructions to bear on the work. The province appropriated \$100,000 annually for this purpose.

NOVA SCOTIA.

Nova Scotia is very actively canvassing the road question. The province is sub-divided by county organization only, and the counties levy a statute labor tax amounting to about \$250,000 annually. But the province spends about \$200,000 annually on road construction through an active and well-organized Provincial Highway Department. The province constructs all bridges costing over \$500.

PRINCE EDWARD ISLAND.

Prince Edward Island, the smallest, but one of the most fertile of the Provinces, has an isolated position in the Gulf of St. Lawrence. Except in the case of two cities, there is no municipal organization, and the Provincial Government exercises direct control of all the roads. The Province is divided into thirty-eight districts, each having about 100 miles of road, and a road overseer is in charge of the work in each. The Province spends about \$32,000 annually in maintaining earth roads, and very little macadamizing has yet been done.

THE FEDERAL GOVERNMENT.

The Dominion Government at the last session introduced a Bill to provide for grants to Provinces, to aid in highway improvement; to be distributed according to population, and also to provide for direct expenditure on construction by the Dominion. The Bill passed the House of Commons, but the Senate, while approving of subsidies, objected to the Dominion Government making direct expenditure. The amendments of the Senate were not acceptable to the Government, the Bill was not re-introduced into the House of Commons, and the measure thus failed to become law.

SUMMARY.

Canadian road systems have been, to the present, without enormous government appropriations or other spectacular features, and construction as a rule has been of a comparatively inexpensive type. Rather it is sought to build as substantially as possible for present requirements, and to establish efficient systems of maintenance that will thicken and widen the road crust as traffic requires. Such a policy will, we believe, lead to the more rapid and economical extension of good roads, without creating large public debts that will embarrass the future.

Summarizing the situation briefly, Canadian provinces have about 250,000 miles of public highways. Each of the provincial governments contributes directly to road improvement; generally in the form of provincial grants, where municipal organizations permit. Such grants rightly directed help the people to help themselves, combine all energy into one effort, and have a highly educative value. Each of the provinces has a highway department for building roads with which the educational object is more or less associated. The Canadian Highway Association is now carrying on an extensive propaganda to construct a road 4,000 miles in length from Halifax to Victoria, while the Ontario Good Roads Association, the Manitoba Good Roads Association, and other organizations are doing much to form public opinion. As a result of the interest created, provincial appropriations are now being

made in millions where they were formerly made in thousands. This year the total provincial expenditures, apart from the municipal levies, will amount to \$10,000,000. Canada has developed splendid railway and waterway systems, but it is evident that an era of common highway building is being entered upon that will connect the trunk lines of transportation with the homes and daily life of the people.

Plant Breeding at Svalof.

After many years of patient research at the famous institution of the Swedish Seed Association, Svalof, in regard to the variation and improvement of plants, the general conclusions of the investigators there are summed up as follows in L. H. Newman's recent work, "Plant Breeding in Scandinavia":—

(a) A progressive system of plant improvement cannot be a one-sided system, but must embrace all possible methods of reaching the desired end.

(b) Artificial hybridization provides an invaluable means of producing superior combinations of characters (sorts) which are not found in nature, and this method is now used largely at Svalof for this purpose.

(c) The old system of "mass-selection" can still be of value in special cases, and has never been fully abandoned.

(d) Superior strains may often be found in a mixed variety, but since these need not necessarily possess striking botanical or morphological characters, their isolation, on the basis of such characters, cannot safely be effected.

That Clover Silage.

Editor "The Farmer's Advocate":

I was particularly interested, upon looking over the issue of Oct. 3rd of "The Farmer's Advocate" to note an account of an experiment conducted at Weldwood, in connection with clover ensilage. I like that Weldwood scheme. I like to think that the editor of this paper is actively engaged in the same business as I am, and that the theories which he advances are worked out in practice, and that the message of his pen has been ripened by experience. And again, I like the fairness with which the results of the operations conducted from time to time, are given for our consideration. There is no attempt made to cover up, or gild over failures. This, in my humble opinion is one of the strong points in the general efficiency of "The Farmer's Advocate." For do we not often get more from observing the failures of others, than from their success? It makes us think, and we look around for a cause, or for a way in which that same failure might be avoided, and sometimes we strike the happy solution.

The slight mistake,—I would not call it a failure,—which the editor confesses to have made at Weldwood, in connection with the clover ensilage, attracted my attention at once, particularly as this has been a pet scheme of mine for some time. I have never tried it as yet, circumstances not allowing thus far, but I have always cherished the idea, that a considerable quantity of clover, as the editor says in conclusion, cut up fine, with depth sufficient to apply great pressure, would make a pretty desirable form of silage.

Or perhaps better still, a smaller quantity placed in the bottom of the silo, and the remainder filled with corn, the corn to supply the pressure, and also saturate the clover to a certain extent with its juice, might keep as other silage, and make a perfect summer food for cows, and,—also how would it do for hogs?

But whether it would prove a success or failure does not need to concern us vitally, so long as corn is king. With it we are safe. But it is my determination, despite the reported failures; to experiment a little along this line in the near future. There is an old saying that "variety is the spice of life," but I think that it is our privilege as farmers to get a good deal of the spice of life by experimenting a little now and then in our farming operations.

MAC.

[Note.—Thanks for this letter. The main purpose of Weldwood is exactly what our correspondent divines. As for clover ensilage we believe that if it can be made a success it will be in the manner proposed, or else by mixing with corn at filling. By all means experiment but, profiting by our experience, avoid risking too much.—Editor.]

Difference in Seasons.

As an illustration of the difference in seasons we will state that this year we filled two old silos at the Hoard's Dairyman farm from twelve acres of corn, whereas two years ago we ran in our entire crop on fifty acres, and then did not get as many tons of good silage as this year. The season of 1910 was the most destructive to the corn crop ever experienced in the southern half of Wisconsin, owing to the severe drought that prevailed from early spring to the last of August.

HOARD'S DAIRYMAN.