

## Editorial

### THE ENGINEER IN HIGHWAY FINANCING.

In this issue space has been devoted to some of the lectures which the Ontario Office of Public Highways gave last week to its county road superintendents and engineers. One cannot speak too highly of this procedure in view of the fine incentive it creates towards better road-building and maintenance throughout the Province.

There is much to learn about roads. In this connection it is regrettable to state that the public is often disposed to lay upon engineering the blame for practically everything connected with a road scheme, if it goes wrong. It is not always engineering, however, that has been at fault. Many projects have been failures because of mismanagement of finances rather than of defective principle in construction and maintenance. Further, it is not always possible for the engineer's opinion respecting improved grades and proper drainage to prevail against public desire for speedy construction of a superficial nature and over excessive mileages. In such instances, and in others where different factors, such as the selection of materials to be used, enter, engineering is frequently charged with many things that are quite unjust.

The first cost of construction is not the total cost. At last a clearer understanding of this fact is beginning to filter through the maze of vague ideas respecting the building of roads. The tendency is now to consider the cost of highways for a period of years. This is an essential with money raised by bonds issued for a definite period. Undoubtedly the term of the bond should be restricted to the probably useful life of the original type of road under actual conditions. This caution is not always observed by municipalities, and to-day there are many worn-out roads, some of them already renewed, and others sadly in need, while the bonds covering their construction have still years to run.

The total cost of a highway for a term of years involves a study of the nature and volume of the present and increased future traffic, and a comparison of the total probable costs of the kinds of road surfaces best adapted to that traffic. Many items are still lacking for an accurate calculation and actual comparison of different surfaces. It is not generally economical to build a road of cheap first cost and high maintenance charges. This is a consideration that depends upon the local conditions. On the other hand, it is not economical to finance the construction of an expensive surface, under the impression that no provision need be made for maintenance charges during the life of the bonds.

Recent years have brought out a great deal of valuable road information and data. They cannot be too thoroughly studied by municipalities contemplating the issuance of bonds as a method of capitalizing their resources for the purpose of providing funds for road-building. The economic benefits arising from the projected road improvement are not all unmeasurable. It is true that one can hardly estimate in figures in what degree the attendance at church on Sunday mornings will be increased, to what extent business in adjacent towns will be stimulated, or what saving will be realized annually by the automobilist and the user of the motor truck, as a result of the good roads. But there are measurable economic

benefits, as the owner of adjoining farm lands will speedily acknowledge. The service rendered by highways radiating from a town may be measured directly by the tonnage hauled over them. Traffic areas, traffic estimates and hauling-cost data are factors susceptible to measurement.

The place of the engineer in investigations of this nature is quite obvious. The location of the roads to be improved should not be determined by argument, but upon sound engineering and economic principles. Before an issue of bonds is decided upon the community should understand thoroughly what roads are to be improved and the approximate cost of their construction and maintenance. It should understand its needs, and should be familiar with carefully prepared maps of the proposed system of improvement. No sum should be voted until it is reasonably known what it will accomplish.

When a commission is appointed, therefore, under whose jurisdiction the bond money will be expended, the next step should be to retain the services of a highway engineer. A recent bulletin issued by the United States Department of Agriculture on the subject of highway bonds has this to say respecting this item in the financing of highways: "In all engineering construction it is customary to allow a certain percentage of the cost for engineering and supervision. There is no reason why highway building should be made an exception to this rule. At least 5 per cent. of the bond issue may well be set aside for engineering and supervision alone. Money spent to hire a competent engineer to make preliminary investigations before bonds are issued and to plan and supervise construction will be well spent. It is not uncommon to find counties that will repeatedly postpone the sale of bonds in order to obtain an increase of 1 per cent. in a bid for \$100,000 or less and then proceed to construct the roads in a most haphazard and ill-planned manner."

### DECREASED BORROWINGS AND ECONOMICAL MANIPULATION OF MUNICIPAL FINANCES.

The economic effect of the European war upon Canada has made itself felt, more than in anything else, in our borrowings abroad. Canada has been borrowing at the rate of from two to three hundred million dollars annually for some years past. For the six months preceding the war our loans abroad and principally in Great Britain aggregated two hundred million dollars, or over a million dollars a day. This is a subject that was aptly referred to by Hon. W. T. White, Minister of Finance, in his budget speech before the Dominion House a few weeks ago. He pointed out that these borrowings represented the sale of securities by the Federal and Provincial Governments, by municipalities and by railway, public utility, industrial and financial corporations. For the most part the purpose of loans so effected was to provide funds for the construction of public undertakings, works and services, railways and industrial and other plants and establishments. The war at once cut off this stream of borrowed money, and only recently have there been evidences of its resumption upon a greatly reduced scale. Until the war is over and for a consider-