

# The Canadian Engineer

*A weekly paper for engineers and engineering-contractors*

## ROAD MATERIAL RESOURCES OF ONTARIO

NOTES FROM A GEOLOGICAL REPORT ON THE OCCURRENCES OF SUITABLE SAND, GRAVEL AND STONE, THROUGHOUT THE PROVINCE.

**W**ITHIN the last few years there has been a great awakening to the need of better roads in the various provinces of Canada. Two of the provinces, Quebec and Ontario, now have official departments or bureaus whose business it is to supervise the building of their country highways, and it is probable that other provinces will soon follow the good example set them by these two.

The materials with which the great majority of highways are surfaced are broken stone and gravel. Certain gravels and some kinds of stone are tough and hard, and may be used upon roads subjected to heavy travel; others are softer and soon wear out under the abrasive action of the traffic. The taxpayer and road-builder are interested, first, in the relative cost of placing any one of a number of available types of broken stone upon a particular road to be constructed; and, second, in the relative service or wear that can be obtained from them after they are on the road. A local stone, even if rather soft, can sometimes be used to advantage to cover a country road. If the traffic over the road is light, the surface may last long enough to repay the neighboring taxpayers, in the time and money saved in hauling their produce, for the cost of building. If the traffic is heavy, the surfacing with a soft stone may mean a great waste of money, for under such conditions a road surfaced with soft stone may wear out and need resurfacing in a year or less.

It is, therefore, important that the deposits of stone and gravel occurring in the more thickly populated districts of Canada be studied to determine their road-making qualities, and mapped to enable road engineers to estimate the amounts available and the distances of the deposits from prospective roads.

In the spring of 1914 the geological survey branch of the Department of Mines, Ottawa, began a general survey for road materials in the Province of Ontario.

The officers of the Geological Survey have been studying occurrences of stone and gravel in all parts of Canada for more than half a century, and have much information of this kind at hand; they are, therefore, able as an organization to carry on the work of further explorations in this department to advantage. The results of the first season's work are reported in the recently issued summary report (for 1914) of the Department.

The plan which is being followed is to co-operate with the provincial highway departments, and to carry on the surveys in such a manner that the information obtained can be put to immediate use in road-building operations. For example, a report upon the materials available for a concrete road, which is now being con-

structed between Toronto and Hamilton, was furnished to the provincial highway commissioner when the project was under contemplation, and another upon a road from Toronto to Oshawa was transmitted to his department later. Both reports are based upon surveys made last summer. Besides work of this kind, detailed surveys have also been made of particular counties and a general survey in order to locate deposits of high-grade material.

During the last field season the work has been entirely confined to Ontario, but the department expects to make explorations in both Ontario and Quebec in 1915, and in other parts of Canada.

The information obtained will be on file at the office of the Geological Survey, and will, under suitable restrictions, be available to the public. Reports upon materials for special highways will be furnished those engaged in building them wherever it has been possible to do the necessary field work, and the Survey will print reports upon the road metal deposits available in certain districts. These districts will probably comprise one or more counties, or may embrace a whole province, the report in such cases being a more generalized account of the better classes of road materials in the province.

The following is a brief résumé of the season's work. Information in greater detail upon road materials within the areas visited is on file in the office of the Survey and is available to those engaged in road-building upon application to the Director of the Geological Survey.

**North Shore of Lake Huron.**—Deposits of trap rock were examined along the north shore and on the outlying islands from a point north of Little Current to Blind River, and at Thessalon, Nestorville, and Bruce Mines.

At Bruce Mines a large quarry is now in operation with a crushing plant capable of handling 500 tons per hour. The quarry is on the water's edge and the crushed stone is loaded directly from the plant into large barges. The material is of very good quality for road and concrete work. The prices quoted in July, 1914, were \$1 and 80 cents, respectively, per ton f.o.b. quarry for two grades, the higher price being charged for four sizes of material from less than  $\frac{1}{4}$  inch to  $1\frac{1}{2}$  inches. Freight charges by boat without unloading were 35 cents to Detroit and 40 cents to Cleveland.

Other deposits of trap rock were found which contained several million tons of diabase, lying on the shores of islands and on the mainland. In most of them it would be possible in quarrying to obtain from 30 to 50 foot faces above the water level. Some of them lie near deep, natural harbors where docks could be constructed at low cost for boats drawing up to 20 feet of water. In other words, the deposits offer very excellent chances for