

branches in every city, town and municipality and in creating a real live interest on the part of the people. The task set before the National Council is by no means a small one, and the work devolving on the Council will not be light, if the function of that body is fully organized and put into operation. The field for activity is great and fertile. Canadian municipal government is passing through the early stages of development and growth, when mistakes are common and experience is gained at considerable cost. The demand for various public improvements was great in the past and will continue so in the future. Experience in the administration of municipal affairs was limited but it is now great, and it remains to be seen how much we have profited by past errors. It is in this regard we hope the new League to assist the people to develop new lines of thought and new ideals of government, because the tendency for the people to become apathetic, owing to inadequate or inefficient administration, is strong and is liable to become increasingly so unless there is some organization to reawaken public interest in municipal affairs.

The objects of the League, as set out in the report, cover sufficient ground for thought and action, so that lethargic branches should be rare exceptions. If the objects are discussed from coast to coast and periodical conferences are held, we anticipate lively debates, when the best minds will act in unison for the development of great things in Canadian municipal politics.

REPORT OF WELL-DRILLING FOR OIL AND GAS IN ONTARIO.

THE Ontario Bureau of Mines has recently issued a very useful report, consisting of records of wells drilled for oil and gas in the province.

The report was compiled by Cyril W. Knight, and should be of considerable value to the practical driller. Mr. Knight points out in his introductory paragraphs that of the 407,262 square miles comprising the Province some 30 per cent. are underlain by rocks of Paleozoic age, the remaining 70 per cent. by pre-Cambrian. Over half of the surface area of the Paleozoic lies in the northern part of the Province adjacent to the flat-lying coasts of Hudson and James Bays, and the remainder occupies the region in the vicinity of Lakes Huron, Erie and Ontario. There is also a comparatively small Paleozoic area near the junction of the Ottawa and St. Lawrence Rivers. The northern Paleozoic region is virgin ground in so far as prospecting for oil and gas is concerned. Oil and gas do not occur in economic quantities in the granites, gneisses, quartzites and other rocks of the pre-Cambrian. Hence, when the driller passes through the Paleozoic sediments and encounters the pre-Cambrian he invariably, if he is well advised, ceases drilling.

The important oil and natural gas wells of the Province are confined to the Paleozoic rocks of the Erie-Huron peninsula, which is defined as that part of the country west and south-west of a line between Georgian Bay and Toronto. It may be pointed out that wells which have been drilled show that these almost flat-lying undisturbed sediments have a thickness of nearly 3,800 feet in Lambton county, and that their thickness decreases as the pre-Cambrian rocks to the north are approached. No reliable estimate can be made regarding

the thickness of the Paleozoic adjacent to Hudson and James Bays.

The two main conditions necessary for the accumulation of oil and gas in economic quantities, states Mr. Knight, are (1) a porous sandstone, limestone or other rock, and (2) impervious strata of shale, or other material, capping the porous reservoir to prevent the escape of the oil or gas.

The porosity or vacant space of an ordinary sandstone is from 8 to 10 per cent., but there may be a rapid change in the same strata from dense rocks, almost impervious to oil and gas, to loose, porous sand. Some sandstones are uniform over large areas. In others the size of the individual grains varies, as does also the amount of the cementing material, both these conditions causing variations in porosity. Sandstones may pass into conglomerates, which, if loosely cemented, may be more porous than sandstones.

The pores or vacant spaces are filled with varying amounts of water. In the Appalachian field, for instance, the lowest strata seem almost dry, but, as higher members are approached, they become more and more saturated.

If oil and gas are present in a dry, porous rock, the oil may descend and collect at the bottom, or near the bottom, of synclines. In a porous rock saturated with water, however, the oil and gas are forced to rise on account of the differences in specific gravity. When saturated strata are gently folded into anticlines, the gas may be found at the top of the anticlines, the oil on the flanks, and the water in the basins or sides. The occurrence of oil or gas in anticlines is known as the anticlinal theory. In rocks partly saturated with water, the oil may collect at any point on an anticline or syncline.

Regarding the accumulation of gas, it may be said that under all conditions it will most probably be found in the anticlines.

The report goes into considerable detail respecting the geology and physical features of the western peninsula. The production of crude oil in Ontario up to the end of 1914 is given in tabular form, from which the various totals for the past nine years are extracted:—

	Barrels.
1906	588,959
1907	779,974
1908	528,956
1909	420,660
1910	314,408
1911	288,632
1912	240,935
1913	226,166
1914	212,496

The production of natural gas from the six gas fields in the province shows, on the other hand, a very large increase during recent years, having an approximate value of \$250,000 in the year 1904, and of \$2,350,000 in 1914.

The well records which the publication presents are quite extensive, occupying as they do some 70 pages of tables.

Canada's war loan of \$50,000,000 will enable the Dominion to finance its share of the war expenditures for almost four months.