

than the first well. The old well is capped and used to furnish fuel for drilling purposes, and the present hole is being continued in hope of finding oil below the limestone, the gas having been cased off.

In June, 1912, fifteen or sixteen holes had been drilled between Athabaska Landing and Fort McKay, but no oil had been produced in commercial quantity. A number of companies formed for the exploitation of asphalt claims in this district have their headquarters in Edmonton, but as the lack of transportation facilities up to the present time has prevented the handling of such bulky material, their operations have consisted principally in stock-selling. The building of a railway to Fort McMurray, however, would make these deposits of considerable value for many purposes. A number of drilling outfits went north during the past summer to commence operations.

Geological Conditions.—The first exposure of Devonian limestone observed south of Lake Athabaska, occurs some 10 miles below the mouth of the Calumet river, and from near this point "tar sands," of an estimated thickness of from 50-250 feet, outcrop for many miles along the Athabaska river. The limestone, dipping to the south, disappears beneath the river near Crooked rapid, and the "tar sand," likewise dipping below the surface near Boiler rapids, probably constitutes the reservoir which contains the gas encountered at Pelican rapids. Continuing to dip southward, this formation lies at a depth of about 3,000 feet at Morinville, and near Calgary reaches an estimated depth of 5,000 feet. What is supposed to be the same sand has been discovered as the principal gas-bearing formation of southern Alberta, and in drilling for oil this horizon is the one desired by operators.

Status of Gas Developments.—The government gas well, drilled at Pelican Rapids in 1897, still has a pressure reported as about 500 pounds. The gas is used as fuel for drilling purposes. The well which is being drilled at present, 80 feet west of the old well, struck gas both in what was believed to be the Niobrara formation and also in the Dakota sand, but the gas was cased off and drilling continued in hope of finding oil.

The government test well at Athabaska Landing still shows a little gas bubbling through a hole full of water, although it never produced gas in any quantity, and did not reach the Dakota formation. The well which has been drilling at Morinville for the past five years has reached a depth of about 3,500 feet, and has found as yet only a small showing of gas in the upper part of the well. A dry hole was drilled some years ago at Edmonton to a depth of approximately 1,900 feet.

On June 18, 1912, a test drilled by the municipality of Tofield, 35 miles south-east of Edmonton, struck a small flow of gas, about 800,000 cubic feet, at a depth of 1,051 feet, without reaching the Dakota sandstone. A second well is now being drilled for the municipality. The success of the drilling at Tofield has led to the starting of a well by the town of Vegreville, about the same distance due east of Edmonton.

Methods and Cost of Development.—Development and drilling along the Athabaska river has been upon Government land. The expense of drilling, which is very great on account of the necessity of establishing camps and of the cost of transportation in this district, has made it difficult for an inexperienced man or one with small capital, to operate, most of the drilling being done by stock companies. A well on the Athabaska had already cost about \$25,000 at a depth of 1,400 feet, and the end was not in sight. Both United States Standard and Canadian Standard rigs are used with 72 ft. and 56 ft. derricks, respectively. A number of second-hand pole-tool rigs have also been taken into the north country. Drilling for gas at Morinville, Edmonton, Tofield, and Vegreville is all done by means of United States Standard rigs, and operated, as a rule, by drillers from the United States.