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DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

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PRELIMINARY MAP

RICE LAKE

NORTHUMBERLAND, DURHAM, AND PETERBOROUGH COUNTIES ONTARIO

(SHOWING GLACIAL GEOLOGY)

By

C. P. Gravenor

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DESCRIPTIVE NOTES, RICE LAKE AREA, ONT.

Indian River, which empties into Rice Lake, flows over limestones of Trenton age. These rocks form the only outcrops found in the Rice Lake area. Certain of the glacial features in the northern part of the area may be controlled by bedrock highs, but generally the drift obscures bedrock irregularities.

Rice Lake probably occupies the position of a preglacial valley that carried water draining from the Canadian Shield southwestward toward the Lake Ontario basin. During glaciation this valley was clogged with glacial drift at the southwest end of Rice Lake. After the retreat of the ice the drainage was reversed and the water that then entered this part of the valley flowed toward the northeast. Post-glacial tilting of the land drowned the valley and resulted in the formation of Rice Lake.

Otonabee and Indian Rivers are part of the Trent River system, which extends from Georgian Bay to the Bay of Quinte on Lake Ontario. The drainage along Trent River is very youthful, characterized by marshes and rapids. Many of the streams in the Rice Lake district appear to be misfits, as they meander on wide glacial spillways.

The Oak Ridges kame moraine, which extends in an east-west direction across the centre of the Rice Lake area, forms a drainage divide between north- and south-flowing streams. Lack of vegetation on this moraine has led to rapid run-off, and to prevent flooding and to counteract erosion extensive reforestation has been carried out.

The ground moraine is made up of grey stony till that is highly calcareous. Areas of ground moraine, which appear as islands on the Oak Ridges moraine, are thin layers of till overlying the kame materials. North and south of the Oak Ridges moraine the till is sufficiently thick to allow excellent drumlin accumulation. The drumlins are alined in a direction north 20 degrees east both north and south of the Oak Ridges moraine. This together with the presence of patches of till over the moraine indicates that it was overridden from the north by ice.

The Oak Ridges moraine is composed largely of sand and fine gravel at the surface and well borings indicate that it is at least 350 feet deep. If no bedrock high exists under the main section of the moraine the depth of drift in this area may reach a maximum of 700 feet. In several places on the Oak Ridges moraine there is an acute water shortage. This lack of water and the fact that a large part of the soil has been stripped off by water and wind erosion makes this part of the area unsuitable for farming.

On the southern flank of the Oak Ridges moraine glacial meltwaters deposited large quantities of sand and gravel in localized spillways. Subsequent downcutting by the much

smaller post-glacial streams has left these gravels as terraces. Especially notable is the large spillway that occupied the Ganaraska Valley and that built a large delta out from its mouth into glacial Lake Iroquois, which occupied the Lake Ontario basin.

Glacial Lake Algonquin, which occupied the Lake Huron basin area, drained by way of Otonabee and Indian Valleys to Lake Iroquois. Extensive deposits of glacio-fluvial sands and gravels now found along the Trent system mark the position of this ancient spillway. Although this outlet widened in places to lake proporrions, it is believed that river currents prevailed and that these materials should be classified as of glacio-fluvial origin. Clays were deposited in the back-swamp areas along the spillway. In a few localities these clays are varved, but in most places they are only roughly stratified and have partings of stream deposited sands.

During the retreat of the last ice in this region the southern part of the Rice Lake area was occupied by part of Lake Iroquois. Generally the Lake Iroquois strand line is well defined by cliffs and beach materials, but in certain areas its position must be inferred from the presence of lacustrine materials and the altitude. Post-glacial tilting deformed this strand line and it is now higher at the western end than at the eastern end of Rice Lake area. South of this shoreline many bars, spits, hooks, tombolos, and other beach materials are found that afford excellent gravel pits. Farther north in the Rice Lake area gravel is obtained from kames and spillway terraces and no immediate shortage is anticipated.

Some low areas were filled with water immediately following retreat of the ice, and clay was washed into them from adjacent highlands. These depressions were later filled with vegetation and now show 10 to 15 feet of muck and peat overlying blue-grey calcareous clay.

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