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CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PAPER 53-26

PRELIMINARY MAP

SCUGOG

DURHAM, ONTARIO, AND VICTORIA COUNTIES

ONTARIO

(Glacial Geology)

By

C. P. Gravenor

OTTAWA

1954

Price, 25 cents

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DESCRIPTIVE NOTES FOR SCUGOG MAP, ONTARIO

The Scugog region is made up of three main physiographic divisions; first, a drumlinized till plain that occupies the northern half of the area, second, the Oak Ridges kame moraine that extends in an east-west direction across the centre of the area, and third, a deeply eroded till plain south of the Oak Ridges moraine.

The surface materials are all Pleistocene and Recent in age. Although no outcrops of Palaeozoic rocks have been found, an examination of the pebbles in the glacial tills indicates that the underlying bedrock is mainly made up of Trenton and Black River limestones of Ordovician age. Small amounts of Collingwood black shales are found in the tills of the southwestern part of the area. As Collingwood shales are known to outcrop south and east of the Scugog area it may be inferred that the tills south of the Oak Ridges moraine were deposited from an ice lobe in the Lake Ontario basin.

The drumlins in the northern part of the area show that the direction of ice movement there was south 20 degrees west. South of the Oak Ridges moraine drumlins are scarce and confined to the eastern part. Exposures showing the internal structure and composition of the drumlins are mainly confined to shallow road cuts. These indicate that the drumlins are made up of a grey, calcareous, stony till similar to that of the surrounding ground moraine. In general the ground moraine south of the Oak Ridges moraine is less stony than that found in the north. This is a further indication that the movement of the ice south of the Oak Ridges moraine was from the south, where prior to the last ice advance lake clays existed in the Lake Ontario basin south of the Scugog area.

Two types of kames are found in this area; first, those that make up the Oak Ridges kame moraine, and second, those that were formed during the retreat of the last ice. The Oak Ridges moraine was formed between two ice lobes, one that existed in the Lake Ontario basin and another that moved in from northern Ontario, called the Simcoe lobe. Apparently these two lobes remained stationary in the Scugog area for a long period of time, as the Oak Ridges moraine has a depth of at least 400 feet of silt, sand, and gravel. This kame moraine is, in many places, composed of material that resembles outwash rather than true ice-contact material, because much of the gravel is horizontally bedded and there is no sign of faulting. These gravels extend to the north and south of the main ridge of the moraine and underlie the till in the northern part of the Scugog area. For example, Scugog Island is underlain by sand and gravel that forms a northern extension of the Oak Ridges moraine. In the northeastern part of the area sand and gravel are exposed in stream valleys and can be traced directly to the main ridge of the moraine.

The second type of kames found in the area are true ice-contact deposits and are stratigraphically above the till in the

northern part of the area. Most of them are associated with drumlins or other topographic high points, indicating that they were deposited during the waning stages of glaciation when hills protruded through the ice. They show the typical fault structures and rapid changes in grain size peculiar to ice-contact materials.

sp² — The only esker found in the area occurs north of the town of Bethany. In some places it shows a relief of over 75 feet and is alined in the direction of ice movement, as indicated by drumlins. One peculiarity of the esker is that, at its southern extremity, it grades into a series of small crevasse fillings similar to those found to the east of Bethany. There are several patches of crevasse fillings in this region and they occur as a series of narrow ridges up to 1/3 mile in length, spaced 25 to 50 feet apart, and about 15 feet in height. Their composition ranges from water-washed till to sand and gravel, which indicates that they were formed by water action.

Outwash sand and gravel occurs both north and south of the Oak Ridges moraine. The Village of Kendal for instance is built on sandy outwash derived from the moraine. The soil developed on this outwash is suitable for tobacco farming and at present is being utilized for that purpose. North of the Oak Ridges moraine there are many deep, wide valleys that contain outwash. From the amount of erosion necessary to excavate these valleys it is believed that they were present before the last ice advance.

On the retreat of the last ice in the Port Perry district, water was ponded between the ice and the Oak Ridges moraine. This gave rise to lacustrine sand, silt, and clay in that region. Part of this lacustrine material came from the ice and part was washed in from the Oak Ridges moraine. Lacustrine sand northwest of Port Perry is of similar origin, but in this case a pre-existing valley formed a basin in front of the retreating ice.

After the ice had disappeared from the Scugog area, winds scooped the sand out of the lake basins and deposited it on high ground to the east. Immediately after glaciation the Lake Scugog basin was probably filled with sand and was the source for the aeolian sands found on Scugog Island. Lake Scugog itself is a man-made lake and was formed by placing a dam in the drainage outlet at Lindsay, north of the Scugog region.

Recent materials, consisting largely of decayed organic matter and clay, are found in areas of low ground. These marsh lands form excellent natural ground-water reservoirs, and although useless for agricultural purposes they help to keep the ground-water table constant.