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CANADA
DEPARTMENT
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MINES AND TECHNICAL SURVEYS

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QE
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52-33
1952

GEOLOGICAL SURVEY OF CANADA

PAPER 52-33

lat. 44°15' - 44°30'
long. 78°30' - 79°00'

PRELIMINARY MAP

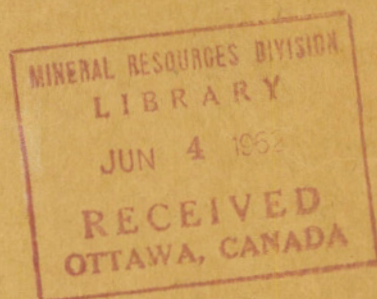
LINDSAY
VICTORIA, DURHAM, ONTARIO, AND
PETERBOROUGH COUNTIES
ONTARIO

(MAP AND DESCRIPTIVE NOTES)

scale 1 in. to 1 mile

By

B. A. Liberty



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Paper 52-33

Preliminary Map

LINDSAY

VICTORIA, DURHAM, ONTARIO, AND PETERBOROUGH COUNTIES

ONTARIO

(Descriptive Notes)

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DESCRIPTIVE NOTES FOR LINDSAY MAP, ONTARIO

STRATIGRAPHY

Outcropping rocks of the map-area are of Precambrian and upper Trenton (Sherman Fall^{*} and Cobourg) age. Descriptions of

^{*}Correlations inferred by this and other, similarly indicated, named subdivisions are provisional, pending further studies.

Ordovician units below the Sherman Fall beds are taken from the logs of two wells drilled in the area, namely: the W. Arnot No. 1 well, in lot 5, con. IV, Verulam tp., completed in 1943, and logged by H. R. Belyea of the Geological Survey of Canada; and the J. Perdue No. 1 well, in lot 2, con. XI, Emily tp., completed in 1923, and logged by B. V. Sanford, also of the Geological Survey.

PRECAMBRIAN

The Precambrian is represented, in outcrop, by one inlier about 1 mile northwest of Thurstonia Park on Sturgeon Lake. It consists of pink granite. Subsurface descriptions refer to these basement rocks as biotite granite.

ORDOVICIAN

Black River

The 'Basal' beds rest unconformably upon the Precambrian surface. In the well cuttings, they consist of green and red arkose; fine to very coarse sand and subangular to subrounded pebbles, chiefly of quartz; and buff and green argillaceous dolomite and dolomitic shale, with large sand grains. From outcrop studies in the Orillia-Brechin and Fenelon Falls map-areas, this unit may vary from 15 to 45 feet in thickness, appearing to be thickest in depressions on the surface of the crystalline rocks. The unit appears to be overlain with apparent conformity by strata that, on outcrop, enclose a Black River fauna, which may be Pamela in age.

Resting on the 'Basal' beds are limestone strata that may be equivalent to the Pamela[★] beds. In the subsurface, the lowest 5 feet consists of buff, lithographic limestone. This is overlain by 10 feet of light grey to buff, sugary textured, dolomitic limestone, with scattered sand grains, succeeded, in turn, by 10 feet of light grey and light buff, finely crystalline limestone, carrying a few large quartz grains.

The strata that succeed the Pamela[★] are Lowville[★] beds of neighbouring map-areas. In their lower part, they may be of Pamela age; the upper part is probably Lowville. In the well cuttings, the lowest 5 feet consists of light grey, dense, very finely crystalline limestone and argillaceous limestone, in part sandy, with some green shale. The succeeding 5 feet are described as composed of brown lithographic limestone, with greenish, calcareous shale. Above these strata, in turn, are 30 feet of light buff to brown, lithographic limestone with some pyritic and argillaceous material. In outcrop, in the Fenelon Falls map-area, the uppermost 12 feet of the Lowville represents Okulitch's¹ Moore Hill formation, which includes some grey, fine-grained limestone.

The Leray[★] beds (Coboconk limestone) overlie the Lowville, and constitute the uppermost Black River unit. From the well samples they are seen to consist of 25 feet of buff to brown, fine-grained limestone, with a minor amount of crystalline calcite and with some milky and translucent chert nodules in the upper part. These strata are fairly fossiliferous. Paralleling detailed outcrop work in the adjoining Fenelon Falls map-area, subsurface samples show the presence of fine to medium fragmental (clastic) limestone in the top of the Leray beds. This clastic material includes a conglomerate of Lowville and Leray lithology, and may contain abundant fossils.

Trenton

The lower part of the Trenton has been grouped and dated tentatively as Rockland[★]-Hull[★] beds. Well-log descriptions indicate that these beds comprise 60 feet of buff to light brown, finely crystalline to dense, fossiliferous limestone; greyish brown to brownish grey, fine-grained, argillaceous, fossiliferous limestone; and grey, medium crystalline limestone, with dark grey calcareous shale. Chert is reported about 30 feet above the base. In general these beds are distinctly more fossiliferous than the underlying Leray limestones.

The succeeding Sherman Fall[★] strata have been subdivided lithologically into a lower and an upper part. Surface exposures and well data in the map-area indicate a thickness of about 170 feet for the lower part. In outcrop, this part consists mainly of buff to rusty weathering, grey, fine-grained, argillaceous limestone, with greenish grey shale partings and grey, medium crystalline limestone. The brachiopod genus Dalmanella is very abundant throughout. The basal 6 feet comprises rusty weathering, grey, fine-grained, argillaceous limestone, which is very fossiliferous, the bryozoan Prasopora occurring in great abundance.

In the well cuttings, the lowest 20 feet of the lower Sherman Fall beds consists of buff, crystalline and fragmental (clastic) limestone, with numerous fossil fragments, intermixed with soft, greenish grey to light brownish grey, calcareous shale. The succeeding 75 feet comprise light grey to buff to dark brown, finely crystalline fossiliferous limestone, and grey to brownish grey, fine-grained argillaceous limestone. Most samples include a few fragments of medium to dark greyish green, calcareous shale. The uppermost 75 feet consists of grey to grey-buff, fine to medium crystalline, fossiliferous limestone, and grey to greyish brown to brown, argillaceous, fossiliferous limestone. Most samples include

a few fragments of medium light grey calcareous shale, which is fossiliferous.

In surface exposures, the upper Sherman Fall beds appear as brown and grey, fine to medium to coarsely crystalline, crinoidal limestone, which is very fossiliferous. The limestone weathers into beds 2 to 14 inches thick. In the J. Perdue No. 1 well, it has an apparent total thickness of 27 feet, and appears as a grey to buff, medium crystalline limestone. The contact with the lower Sherman Fall beds has been observed at three localities in the map-area: (1) 2.5 miles south-southeast of Zion, in lots 10-11, con. IV, Fenelon tp.; (2) 5.9 miles north-northeast of Woodville, in lot 16, con. VI, Eldon tp.; and (3) 3.1 miles south-southwest of Kirkfield, in lot 20, con. VIII, Eldon tp.

The succeeding Cobourg formation comprises the highest Trenton unit of the map-area. Its contact with the Sherman Fall beds may be seen in lot 10, con. IV, Fenelon tp., and is very nearly exposed in the railway- and road-cut in lot 15, cons. VII and VIII, Eldon township. Within the map-area, the unit is represented mainly by argillaceous limestone, and only the stratigraphic position of the lowest 60 feet or so is known. In outcrop, the Cobourg appears as grey, fine-grained, argillaceous limestone and grey to bluish grey to brown, fine-grained to dense limestone, for the most part in irregular beds, 1 inch to $1\frac{1}{2}$ inches thick, with shale partings between most bedding planes. Occasional beds of crinoidal, crystalline limestone and clastic limestone occur, and these commonly enclose 12- to 16-inch lenses of coarse to fine conglomerate. The more typical argillaceous limestone commonly weathers to a loose, greenish grey rubble. In most places the Cobourg is very fossiliferous, but only a few forms appear to be confined to it, the most important being the brachiopods Cyclospira bisulcata and Rafinesquina deltoidea and the gastropods

Hormotoma trentonensis and Trochonema umbilicatum.

In the well cuttings, the lowest 27 feet of the Cobourg appears as light grey and grey-buff to brown, finely crystalline, fossiliferous limestone and grey, argillaceous limestone. Some chert has been reported from 10 to 27 feet above the base. The Cobourg is nowhere known to attain its true stratigraphic thickness in the map-area, but in the adjoining area to the south its aggregate thickness is about 185 feet.

GLACIAL GEOLOGY

The entire map-area has been glaciated, and most of the bedrock is concealed beneath a mantle of drift, which, in the northern part of the area, may average some 30 to 50 feet in thickness. There, the physiography is essentially a reflection of the bedrock geology. South of an east-west line through the north end of Lindsay, however, the bedrock is more deeply buried, and at least the eastern third of this part of the map-area is included in the Peterborough drumlin field. Outcrops are, accordingly, much less numerous, and the topography is controlled by glacial drift to a much greater degree. A description of the physiography of the area can be found in the publication "The Physiography of Southern Ontario"²,.

STRUCTURAL GEOLOGY

As the Precambrian surface is exposed in only one locality, very little is known of its general relief in the map-area. This single Precambrian inlier is in lower Sherman Fall beds, thereby implying a minimum relief on the Precambrian surface of about 160 feet. The relief of this surface has undoubtedly closely influenced the dip of the Ordovician strata.

Within the map-area it has proved difficult to find a reliable horizon for attitude determinations. The contact between

the upper and lower Sherman Fall beds has been found in three localities, and can be placed in the J. Perdue No. 1 well samples. In the northeastern part of the area, Black River data from Bobcaygeon, in the adjoining Fenelon Falls map-area, can be used in conjunction with the well data, and further attitude determinations can be computed. Some results are shown in the following table:

Locality	Dip (Feet per mile)	Direction of dip	Contact
Northwest eighth of area	17	South-southwest	Upper and lower Sherman Fall beds
Northeast eighth of area	26	South-southeast	Lowville-Leray beds
Northeast quarter of area, southwest of Dunsford	24	South-southwest	Cobourg-upper Sherman Fall beds

ECONOMIC GEOLOGY

There are no rock quarries in the map-area, but Goudge³ lists one analysis for the Cobourg limestone (No. 18, p. 203). The mantle of glacial drift that covers most of the area has provided a few gravel pits, although no large pit is now in operation.

The two wells drilled for oil and natural gas in the map-area, one near Dunsford and the other near Downeyville, were reported to be dry holes.

¹Okulitch, V. J.: The Ordovician Section at Coboconk, Ontario; Trans. Roy. Can. Inst., vol. 22, pt. 2, p. 319 (1939).

²Chapman, L. J., and Putnam, D. F.: The Physiography of Southern Ontario; Univ. of Toronto Press, 1951.

³Goudge, M. F.: Limestones of Canada, Part 4, Ontario; Bureau of Mines, Dept. of Mines and Resources, Ottawa, Pub. No. 781, 1938.
