

CANADA  
DEPARTMENT  
OF  
MINES AND TECHNICAL SURVEYS

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GEOLOGICAL SURVEY OF CANADA

PAPER 50-6

OSSIAN TOWNSHIP,  
ONTARIO

(REPORT AND MAP)

By

J. B. Currie



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OTTAWA

1950

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GEOLOGICAL SURVEY OF CANADA

Paper 50-6

OSSIAN TOWNSHIP,  
ONTARIO  
(Summary Account)

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J. B. Currie

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### Illustration

Preliminary map - Ossian Township, Ontario . . . . .	In envelope
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## OSSIAN TOWNSHIP, ONTARIO

### INTRODUCTION

Geological mapping of Ossian township was carried out during the field seasons of 1947 and 1948, and part of 1949. In this work the writer was ably assisted in 1947 by G. A. Wilson, and in 1948 by P. G. Haskey and D. R. J. MacLeod.

The eastern part of the township may be reached by means of a road along the interprovincial boundary from Cheminis to Labyrinth Lake. Western sections of the township are accessible only by a winter road from Cheminis, a canoe route through Waterhen Lake, or by poorly marked trails. A bush road from Dalby station to the property of Minedel Mines Limited (formerly Ossian Gold Mines Limited), has been reduced by forest growth to a single trail.

### GENERAL GEOLOGY

#### General Statement

The township is underlain entirely by volcanic and intrusive rocks, the oldest of which (1-4)<sup>1</sup> are lava flows interbedded with tuff,

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<sup>1</sup> Numbers in parentheses are those of map-units on accompanying map.

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agglomerate, and flow breccia. The sequence of these Keewatin map-units is only in general as indicated.

The volcanic series is cut by intrusive rocks (5-7) classified as post-Keewatin. The diabase (8) is lithologically similar to Proterozoic diabase elsewhere in the general region of the map-area.

#### Keewatin Volcanic Rocks

Light Green Andesite. The light green andesite flows (1) are predominantly pillowed; they are interbedded, fine-grained, massive lavas and flow breccias. South of Mulven Lake, a band of amygdaloidal, light green, pillowed andesite (1b) trends south 70 degrees west into Katrine township. On weathered surfaces, the greenish rock is spotted

with white, translucent quartz amygdules about  $\frac{1}{16}$  inch in diameter. Interbedded with the light green, fine-grained flows (1) are massive, coarse-grained lavas (1a), which show little or no flow structure and which exhibit gradational contacts with the fine-grained lavas. In thin section the coarse-grained rock has a crude diabasic texture, with highly altered feldspar grains enclosing areas of hornblende and augite partly altered to chlorite. In hand specimens, the massive flows are similar in appearance to the post-Keewatin meta-dabase (6), but they may be distinguished under the microscope. Pillowed and massive grey lavas (1c) were probably originally of dacitic to trachytic composition. Where possible, their contacts with the light green andesite (1) are shown on the map; in most places they are gradational. Rusty carbonate schist (1d) has formed in, and adjacent to, shear zones. A gradation exists from unaltered lava, through a chlorite schist with specks of rusty carbonate visible to the eye, to the rusty, fissile, sericite-carbonate schist within the shear zones. In the southwest part of the township, a black, fine-grained amphibolite (1e) has resulted from the metamorphism of light green andesite in contact with a syonite body (7) exposed mainly in Katrine township to the west. Locally, pillow structures remain in evidence in the amphibolitized lava.

Rhyolite (2, 2a). This is a dark green to pink, fine-grained, siliceous rock that weathers greyish white. No pillows or other flow structures were seen in it. The rock consists predominantly of fine-grained quartz and the products of feldspar alteration. Rhyolite breccia (2a), consisting of lenticular fragments up to 4 inches in length in a finer matrix, outcrops at scattered localities. Fractured and sheared rhyolite is exposed as fissile, rusty, quartz-sericite-carbonate schist (2b). Numerous shear zones have formed in the rhyolite band south of Mist Lake and eastward. These zones of rusty fissile schist trend east; range in general from 3 to 30 feet in width; and are up to several hundred feet long. Their occurrence is noted on the map by shear zone and

schistosity symbols.

Agglomerate and Tuff (3). These are interbedded with light green andesite flows throughout the northern half of the township. The agglomerate is poorly bedded; fragments of rhyolite and light green andesite,  $\frac{1}{2}$  inch to 6 inches long, lie in a matrix of finer fragments and tuffaceous material. Throughout the agglomerate and at scattered localities within the lavas, thinly bedded, light green tuff forms bands 1 foot to 4 feet thick. Single tuff beds extend along strike from a few feet to several hundred feet.

Dark Green Andesite. Andesitic flows (4, 4b) are mainly dark green to black, fine-grained, pillowed and massive lavas and flow breccias, and probably originally in part of basaltic composition. Interbedded with the fine-grained lavas are coarse-grained, massive lavas with diabasic texture (4a), possibly in part of intrusive origin. Along the south boundary of the township, variolitic pillow bands (4b) lie within the dark andesite pillow lavas. The variolites form light green spheroids up to  $\frac{1}{8}$  inch in diameter within the pillow selvage.

#### Post-Keewatin Intrusive Rocks

Trap Dykes. Fine-grained trap dykes (5) cut the volcanic rocks at several outcrops in the northeast part of the township. They range in thickness from a few inches to 50 feet. Weathered surfaces are dark green, but fresh surfaces are similar in colour to those of adjacent flows.

Meta-diabase. Dykes of meta-diabase (6), from 1,000 to 2,000 feet thick, form two intrusive bodies that cut the volcanic rocks at the south margin of the map-area and north of Wawagoshe Lake. The dykes trend east, and dip steeply south at the exposed contacts. The meta-diabase presents a rough, mottled brownish green, weathered surface; fresh surfaces are mottled green and greenish white. The grain size is invariably coarse, except toward the chilled borders of the dykes. In hand specimens, the diabasic texture is masked by alteration of the feldspar, but is evident

in thin section. Mineralogically the meta-dabase is composed of albite, hornblende, and chlorite, with minor quartz and magnetite. Within the dyke north of Wawagoshe Lake is a coarse-grained pegmatitic phase (6b), which weathers pinkish grey and exposes conspicuous dark amphibole blades up to 2 inches long. Fresh surfaces are white to pink, and are mottled dark green. In thin section, albite and quartz are seen to be abundant, and are associated with lesser amounts of hornblende, augite, chlorite, and magnetite.

Syenite. A syenite body (7) crosses the west boundary of the township. Where uncontaminated by older rock, the syenite is a pink, coarse-grained intrusion consisting of oligoclase, with minor hornblende, augite, and chlorite. It grades outward to a dark red, syenitic rock in contact with Keewatin lavas.

In the southwest part of the area and at scattered outcrops throughout the township, the Keewatin volcanic rocks are cut by numerous small hornblende syenite (7a) and feldspar porphyry (7b) dykes. These range in thickness from a few inches to 50 feet, and only a few of the larger ones are shown on the map. The hornblende syenite is a pink to dark red rock in which hornblende needles are visible. It consists of hornblende, partly altered to chlorite, in a groundmass of sodic plagioclase. The pink, feldspar porphyry dykes are medium to coarse grained; phenocrysts of pink oligoclase are abundant in a groundmass of fine plagioclase, quartz, hornblende, chlorite, and epidote.

Diabase. A narrow diabase dyke (8) outcrops on Labyrinth Lake. The rock is dark green and fine grained, with visible diabasic texture. Cooling cracks have formed normal to the dyke walls, and along them the adjacent diabase has been partly altered to epidote. In thin section, the rock comprises partly altered feldspar grains, with interstitial hornblende, zoisite, chlorite, and titaniferous magnetite.

## STRUCTURAL GEOLOGY

### Folds

Information on the attitude of the volcanic flows and agglomerate beds has been obtained from pillows, flow contacts, and bedding in tuff and agglomerate. Structural deformation has apparently been more intense in the southern part of the township, where the flows dip steeply south. At the extreme southeast corner the dip changes to steeply north on the south limb of a syncline. Glover Lake lies in the trough of the fold, whose axis trends north 70 degrees east. The rocks east of Glover Lake, adjacent to the synclinal axis, show evidence of shearing and the introduction of quartz into fractures. North of the fault, extending east from Mulven Lake, deformation of the lavas has been less intense, and the dip of formations rarely exceeds 45 degrees. The folds, which trend easterly, are of limited length. North of Mist Lake to the township boundary and eastward toward Sunrise Lake the lavas dip south.

### Faults

A fault, marked by a shear zone of sericite-carbonate schist, extends easterly from Mulven Lake roughly parallel with the trend of the lava flows. Its course through the eastern part of the township is indefinite, due to lack of outcrops necessary for its delineation. The fault that passes beneath Mist Lake occupies a pronounced valley for the remainder of its course through the township. No exposure of the fault zone was observed, but agglomerate bands northeast of Mist Lake show truncation by the fault structure.

Numerous small shear zones were observed throughout the area. Many small slippages occur in flow breccia between massive and/or pillowed flows. Where breccia is absent, the pillowed lavas show evidence of movement; the massive lavas are the most competent under stress.

## MINERAL DEPOSITS

Evidence of hydrothermal mineralization is confined principally to shear zones. The minerals comprise quartz, pyrite, and carbonate, and occurrences are noted on the accompanying map by 'trench' symbols, as all those observed had been explored by surface trenching.

Little or no active prospecting is now in progress. Some years ago development work was done on a group of claims held by Ossian Gold Mines Limited<sup>1</sup> (now the property of Minedel Mines Limited), and a shaft

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<sup>1</sup>  
Gledhill, T. L.: Ben Nevis, Munro, Kamiskotia and Other Base Metal Areas, Districts of Cochrane and Timiskaming; Ontario Department of Mines, Ann. Rept., vol. 37, pt. 3, p. 31 (1928).

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was sunk through a gold-bearing quartz vein in claims L11131 and L11132. The vein, which can be traced for 300 feet on the surface, trends about east, increases in width from 6 feet at its western limit to 20 feet at the shaft, and decreases to 3 feet and less farther east before terminating in the enclosing schist. The vein quartz is white and carries scattered cubes of pyrite up to  $\frac{1}{4}$  inch in size, as well as fine pyrite grains. The rhyolite adjacent to the vein is sheared and cut by veinlets of chlorite. In claim L11131, a rusty weathering shear zone containing fine-grained quartz and pyrite has been trenched. Similar mineralization is in evidence farther west, on claim L10803, which forms part of another property. Here, again, mineralization has involved a zone of rusty weathering schist.

Natjo Gold Mines Limited hold twenty-nine claims along the west shore of Labyrinth Lake. Surface trenching has been done on shear zones, 3 to 40 feet wide, of quartz-sericite-carbonate schist containing scanty pyrite.

Small quantities of pyrite, chalcopyrite, and vein quartz are associated with the feldspar porphyry dykes that cut the Keewatin lavas in the northeast and southeast parts of the township. No sulphide minerals

were observed in the hornblende syonite dykes.

A narrow sheer zone, containing fine-grained quartz and pyrite, lies along part of the north border of the meta-dabase dyke at the south border of the map-area. Western exposures of the meta-dabase dyke north of Wawagoshe Lake are intersected by narrow stringers of quartz with associated pyrite. The pyrite and quartz were probably introduced during the latest stages of dyke crystallization.