



## DESCRIPTIVE NOTES

The group of ancient volcanic rocks (1) resembles those customarily referred to as Keewatin. It forms an assemblage of andesitic lavas, which show pillow structures in a few places. The rocks are mainly fine to medium grained, coarse types, and were seen at only a couple of places east of Cooper Lake, near the eastern boundary of the map-area.

Toward the southeast, the andesite is amphibolitized (1a). The amphibole crystals lie in all directions in the rock, and vary from very short to prisms up to 1 inch long, the longest having been observed particularly near the borders of the pillows.

East of the south arm of Lac Villebon, the acidic lavas (1c) are similar to apilites in colour and sugary texture, but most of them preserve a flow structure and cannot be considered as dykes.

In the area immediately west of the highway the Keewatin volcanic rocks are separated from the biotite schist by a narrow band of basic pyroclastic rocks (2), characterized by a distinctive colour banding. Their contact with the lavas (1) is believed to be gradational, but the nature of their contact with the biotite schist (4) is obscured by drift.

Altered andesites (3) occur in three widely separate localities: on islands in Lac Granet to the west of Lac Camille-Roy, and just south of Lac Louvicourt. The association of pegmatite with the exposure on the islands suggests that the flow is an inclusion or pendant, and both of the occurrences to the north appear as flows interbedded with the biotite schist (4). Field observations and microscopic studies indicate that these rocks are lavas in which the original minerals have been entirely altered to a pale green amphibole and carbonate, with accessory pyrite and a few residual grains of quartz and feldspar.

The rocks mapped as biotite schists (4) are probably of sedimentary origin. Neither crossbedding nor conglomeratic bands were observed. The rock is normally grey, with regularly spaced, dark, thin bands of biotite parallel with the schistosity. Under the microscope the quartz is seen to be accessory, and nowhere represents more than 15 per cent of the rock, the other pale-coloured minerals being orthoclase and plagioclase. West of the Mont Laurier highway the biotite schists appear to be more diversified than they are to the east. Staurolite is common enough in some localities to justify the subdivision staurolite-biotite schist (4a). Garnet is widely distributed through the schists, and may or may not accompany the staurolite. Near the batholith other variations have been observed, including tremolite-biotite schist (4b) and tourmaline-sericite schist (4c).

On both shores of Mink Narrows are outcrops of mylonitic rocks. These are mostly dark brown, except for white linear patches of felsitic material that stand out on the weathered surface. In thin section, the felsitic material proves to be highly fractured grains of feldspar in a dense matrix probably composed of crushed quartz and feldspar. This texture and the brittle, highly fractured nature of the rock lead to the conclusion that it is a mylonite. Towards the west it grades into the well-bedded biotite schist (4), and towards the east into the highly contorted, garnetiferous paragneiss (A). Both in the adjoining schist and paragneiss, and here and there in the mylonite itself, can be seen narrow dykelets of a brown, flinty crushed rock. In addition, the mylonitic rocks include several highly sheared pegmatite dykes. On the whole, it appears that Mink Narrows follows a large fault zone along which the paragneisses have been thrust northwesterly over the biotite schist and pegmatite to the west.

The contact between the biotite schists (4) and volcanic rocks (1) is not sharply defined, but is apparently gradational across a zone of indeterminate, but not great, width, within which the schists, on the one side, carry some amphibole, and the amphibolitic rocks, on the other side, contain biotite.

South of Cooper Lake, on the Bonville property, is a body of rocks mapped as peridotite (5) from its similarity to the peridotites found by Norman west of Val d'Or. They are dark rocks, with a peculiar radiating pattern, readily apparent on the weathered surface. At one place only, a narrow veinlet of chrysotile was found. A narrow sill of a black rock (5) has been observed in the biotite schist east of Grand Lake Victoria. It is characterized by a radiating pattern on the weathered surface similar to that described for the peridotite east of the road.

The area underlain by muscovite pegmatite (6) and its subdivisions, (6a) and (6b), includes about three-quarters of Granet township. The relief in this area is higher than in areas underlain by the biotite schist (4), and generally the hills are outcrops of pegmatite. Moreover, the pegmatite is the predominant rock type of the map-unit. Both it and the muscovite granite (6a) contain plagioclase feldspar (generally andesine), microcline, quartz, and either the normal type or the plumose variety of muscovite as the major constituents. Sericite, biotite, garnet, and zircon have a wide distribution as accessory minerals; in addition tourmaline and beryl occur locally. In the marginal zone of the batholith the size of the biotite schist inclusions increases, and such minerals as plumose muscovite and biotite become more prevalent. This local increase in the biotite has resulted in the formation of the biotitic phase of the granite (6b).

In the area immediately to the west of Lac Marrias a small stock of quartz-porphyry (6c) is exposed, surrounded by the biotite schist. The rock is composed mainly of quartz and feldspar with a noticeably small percentage of ferromagnesian minerals. This feature suggests that it is related to the large batholith to the south. The marginal zone of the stock is somewhat chilled and enriched with tourmaline, producing the tourmaline-bearing aplite (6d).

The most abundant intrusive rock in this area, east of Highway 58, is a biotite-hornblende syenite (7), which occupies about 15 square miles. Microscopic study reveals that the biotite is secondary after hornblende, but that this 'replacement' has not affected the whole intrusive body to the same degree. In places, biotite constitutes about 90 per cent of the mafic minerals, whereas at other places it forms only about 50 per cent of the same minerals. Quartz is an accessory mineral.

Two dykes of gabbro (8) have been found east of the highway. Both strike approximately northeast. The dyke immediately west of Lac Villebon has been located by exposures that outcrop as a series of knobs. The other, east of Cooper Lake, is not exposed, but has been revealed by diamond drill-holes on the Bonville property. A third gabbro dyke is exposed for several thousand feet in the northwest corner of Marrias township. It strikes in line with a similar dyke that lies to the north, in Louvicourt township.

On either side of Mink Narrows, in the southern part of the map-area, the Precambrian gneisses (A) are in faulted contact with the Keewatin and Timiskaming rocks. In all other places the contact is obscured by drift. The Precambrian rocks are mainly biotite-garnet paragneisses; they are everywhere much alike except that the amount of garnet present varies from place to place.

The assumed fault between Precambrian paragneisses (A) to the south and lavas (1), banded tuffs (2), and biotitic schists (4) to the north is indicated by a discordance in structure, as between the trends of bedding and schistosity in the biotite schists, tuffs, and lavas and the trend of the foliation in the gneisses. Furthermore, the banded tuffs (2) north of the fault have not been found on the south side.

Associated with the band of volcanic rocks (3) that outcrop in the north-east quarter of Marrias township, south of Lac Louvicourt, is a deposit of nickeliferous pyrrhotite carrying a low content, mostly less than 1 per cent of nickel. The ore occurs in a strongly sheared zone which has been intruded by a group of fresh gabbro dykes. The property has been drilled and considerable trenching has been completed, but no large body of the ore has been disclosed.