CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

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PRELIMINARY MAP

BATHURST

GLOUCESTER AND RESTIGOUCHE COUNTIES NEW BRUNSWICK

(Descriptive Notes)

By

R. Skinner

OTTAWA
1953

Price, 25 cents

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DESCRIPTIVE NOTES FOR BATHURST MAP, NEW BRUNSWICK

Introduction

The map-area is a rolling upland that slopes gently towards the east and attains an elevation of approximately 1,000 feet in the southwest corner. Streams flow in youthful valleys, and gorges are common. Most of the area is drift covered, and rock exposures are mainly confined to the valleys, but interstream outcrops of the harder rocks are not uncommon.

Geology

The oldest rocks in the area are those of the Tetagouche group, which is divided lithologically into mainly sedimentary rocks(1) and dominantly lavas(2), subdivisions that have no stratigraphic significance. They have been described previously by Young[1] and Alcock[2] .

The sedimentary members(1) of the Tetagouche group are medium- to fine-grained subgreywackes, grey, green, red, and black slates, and fine-grained grey quartzite, interbedded with massive basic lavas and some tuff. The subgreywackes are commonly grey, but may be green or red; a silt matrix comprises about 70 per cent of the rock, within which are subrounded quartz grains and minor feldspar fragments, the latter commonly altered to kaolin. The subrounded grains are commonly about 1/4 mm. long, but may range up to 2 millimetres. The beds vary in thickness from 1 inch to 10 feet, but are commonly 1 foot to 3 feet thick. Graded bedding can be seen on fresh surfaces in those beds that carry coarse grains. Crossbedding is rarely in evidence, but is well displayed in a limy conglomerate on Tetagouche River about a mile below the falls. Along the western margin of the granite batholith south of Bathurst these rocks are metamorphosed to hornfels and biotite schist.

The volcanic members(2) of the Tetagouche group are mainly massive, very fine-grained, spilitic basalts, in places amygdaloidal and, rarely, pillowed. The more massive varieties may be easily mistaken for fine-grained Devonian gabbroic and dioritic sills(6), and vice versa. Some rhyolite and porphyritic rhyolites along Little River are included with these rocks.

Silurian beds have been divided into three map-units, which in upward succession are, mainly: greywackes(3), conglomerates(4), and limy slates(5). The greywackes may be distinguished from the Tetagouche subgreywackes in that quartz is subordinate to fragments of feldspar, volcanic rock, chert, and slate, and in that the matrix consists of finer material. Fragments may be as much as 6 mm. long, but are commonly about 2

millimetres. The greywacke beds range from a few inches to 6 feet in thickness, and graded bedding is visible on weathered surfaces. In the coarser varieties fragments of red slate and chert are conspicuous. Much of the greywacke is calcareous, and is commonly interbedded with limy slates.

The conglomerates(4) are interbedded with the greywackes and vary only in grain size. Pebbles are rounded to subrounded, range up to 8 inches in length but average about 1 inch, and are composed of fine-grained basic lava, grey felsite, and grey, green, and red chert and slate. The matrix of the conglomerate is greywacke, and in places is limy. The pebbles are generally closely packed, but in places they are as well spaced as in a till. Flat pebbles are oriented parallel with the bedding planes. Graded bedding is not conspicuous in these rocks.

The limy slates(5) are commonly greenish grey and finely banded, with the lighter coloured layers more limy than the others. Rarely they are dark grey or red and contain no lime. Greywacke is interbedded with such slates in the neighbourhood of South Nigadoo River west of Otter Lake.

Poorly preserved fossils occur in all of these Silurian rocks, but are more common in the upper, limy slates(5). Collected specimens have been identified as of post-Ordovician, probably Silurian age, and diagnostic Silurian fossils have been identified from beyond this area along the strike of these beds.

Albitized gabbro and diorite(6) exhibit intrusive relationships with most of the previously mentioned formational units. They are massive, medium- to fine-grained, green-grey rocks, composed of augite and secondary albite, with some chlorite and magnetite and a little secondary hornblende. Some varieties carry hornblende in place of pyroxene, and others contain up to 5 per cent quartz. The rocks occur as massive, lenticular bodies that are concordant with the structural trends of the intruded beds. Because of the scarcity of outcrops, it is not known whether the larger bodies shown on the map are wider than indicated, and whether they may not each consist of two or more sills separated by bands of older rocks. Most of these rocks intrude the Ordovician Tetagouche group and are confined to an area northwest of the volcanic member(2) southeast of Grants Brook. In a few places they were seen to be intrusive into Silurian rocks, but they were not observed in contact with the granite(7). They are probably of Devonian age.

The granite(7) is commonly pink, is coarsely granular to semi-porphyritic, and is composed of pink microperthite and orthoclase, albite, glassy quartz, and biotite. Granite-porphyry dykes extend radially from the stock at Nicholas Denys into surrounding Silurian rocks. The latter contain banded cherts

that vary from a fraction of an inch to tens of feet thick, and that occur only within a radius of a mile from the granite contact. These cherts are believed to represent a replacement of the more limy layers in the limy slates, whereas, within the same zone, non-calcareous slates have been altered to hornfels.

A band of serpentinized peridotite outcrops along the Rocky Brook-Millstream 'break' from Stephens Brook westward to within 1/2 mile of the western crossroad. It is exposed across a width of 500 feet near Stephens Brook, but in most places is less than 200 feet wide. Occurrences of such rocks are indicated by a symbol on the map.

The Pennsylvanian Bathurst formation(8) unconformably overlies the granite, the Tetagouche group, and the Silurian rocks. The basal beds are mainly light red to pink conglomerate, with intercalated arkose and grit, in which pebbles are rounded to sub-rounded fragments of greenstone, greywacke, quartzite, and quartz up to 2 inches in maximum diameter. Red sandstone, siltstone, and shale overlie the conglomerate.

Structure

The Tetagouche group has a complex structure. It appears to lie in a broad syncline whose axis is west of the area and trends east of north. The sedimentary members are isoclinally folded, drag-folded, and faulted, the drag-folds commonly plunging southwest at about 50 degrees. Silurian beds are much less deformed and occupy a well-defined, northeast trending syncline within which the uppermost limy slate member(5) has been compressed into several, small, northeast trending folds. The assemblage as a whole has a well-developed cleavage striking about north 45 degrees east and dipping nearly vertically, whereas the axes of the Silurian folds trend about north 55 to 65 degrees east. These divergent attitudes indicate deformation subsequent to the folding, perhaps at the time of the granitic invasion.

The contact between the Ordovician and Silurian rocks appears to be a thrust fault. Numerous high-angle faults intersect both Silurian and Ordovician strata, and are commonly expressed by long, straight valleys. The more conspicuous of these indicate strike faults, but transverse faults are not uncommon. The so-called Rocky Brook-Millstream 'break' is a series of normal, en échelon, strike faults intersecting Silurian greywacke(3).

Mineral Deposits

Magnetite deposits occur near the Rocky Brook-Millstream 'break' and the principal deposit lies about 1/2 mile west

of the crossroad at Nicholas Denys, north of the 'break'[3]. The magnetite is fine grained, and occurs in streaks, irregular layers, and lenses interbanded with buff-coloured, banded, cherty hornfels. Two of the lenses have a combined length of 700 feet, a maximum width of 17 feet, and a content of about 35 to 40 per cent iron. Copper, zinc, and silver minerals are commonly associated with the magnetite, and the mineralization is probably of hydrothermal origin.

Several occurrences of chalcopyrite, galena, sphalerite, arsenopyrite, pyrrhotite, and silver are known near the Rocky Brook-Millstream 'break' and, apparently, are related to transverse faults[3]. The Rocky Brook lead-zinc-copper deposit is about 1/2 mile south of the 'break' west of the crossroad at Nicholas Denys, and occurs in Ordovician graphitic slates and greywackes along a shear zone up to 300 feet wide parallel with the Ordovician-Silurian contact. The shear zone has been traced for 10,000 feet westward from the crossroad.

A few narrow veins of galena, sphalerite, and pyrite were noted in Silurian conglomerate near the north boundary of the map-area. They are apparently related to the faults in this locality.

Manganese occurs as narrow seams and plates of manganite in quartz veins and as veinlets in red slates at Tetagouche Falls[1], and a deposit of bog manganese of unknown dimensions occurs on Middle River, about 5 miles west of the granite batholith.

The aeromagnetic map[4] of the area shows a pronounced anomaly along the zone of Ordovician volcanic rocks between Grants Brook and Peters River. The anomaly is caused by magnetite in narrow veins and seams up to a few inches wide.

1
Young, G. A.: Bathurst District, New Brunswick; Geol. Surv., Canada, Mem. 18-E, 1911.

2
Alcock, F. J.: Jacquet River and Tetagouche River Map-areas, New Brunswick; Geol. Surv., Canada, Mem. 227, 1941.

3
MacKenzie, G. S.: The Geology and Mineral Deposits of the Rocky Brook-Millstream Concession, Gloucester County, New Brunswick; mimeographed report, 1951.

4
Geol. Surv., Canada, Map 58G, Aeromagnetic Series, Nepisiguit Falls, New Brunswick, 1951.

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