

The area is a featureless plain into which streams have cut youthful valleys. The average elevation along the west boundary is about 1,000 feet above sea-level; midway of the area it is about 350 feet and in the southwest it is about 500 feet. Maximum relief, in the valley of Nepisiguit River, ranges from 400 feet in the west to about 30 feet in the north. The area is thickly drift covered, and exposures are rare in the inter-stream areas.

The oldest rocks are those of the Tetagouche group, which can be divided lithologically into mainly lavas (1) and dominantly sedimentary rocks (2). These subdivisions have no stratigraphic significance. The group as a whole has been described by Young¹ and Alcock² from its exposures some 15 miles north of the map-area.

The extrusive rocks (1) comprise grey, porphyritic and non-porphyritic rhyolite, and altered, intermediate to basic lava (greenstone), together with minor, interbedded, grey to green slate, buff, and greywacke, all of which are commonly schistose. Acidic varieties predominate east of Bathurst. Mines on Nepisiguit River, west as far as Nine Mile Brook, and along Nepisiguit Brook, upper Portage River, and Tozer Brook. Greenstones predominate south and southeast of Bathurst Mines, and west of Nine Mile Brook. The phenocrysts in the porphyritic rhyolites consist of glassy quartz or cream to pink alkali feldspar, or both together, and range up to 1/2 inch in length. The greenstones are light to dark green, fine-grained rocks, commonly composed of actinolite, chlorite, albite, calcite, epidote, clinzoisite, quartz, sphene, leucosphen, and pyrite.

The sedimentary rocks (2) of the Tetagouche group are grey and green, medium- to fine-grained greywacke; grey, green, red, and black slate; grey, green, and red siltstone; grey, quartzite; and grey and green tuffs, and are interbedded with minor acidic to basic flows. The greywackes contain angular to subrounded particles of quartz, feldspar, and rock fragments embedded in a shaly or silty matrix. Commonly all the fragments are of quartz or quartzite, but as much as 10 per cent of them may be feldspar or slate. The fragments range in size up to 1.5 mm., and constitute from 30 to 70 per cent of the rock. The matrix is commonly chloritic and sericitic. Greywackes occur in beds from a few inches to a few feet thick, and grade upward into siltstone and slate. These rocks commonly show colour banding and graded bedding. Greywackes on the Portage River and Tozer Brook are distinctive in being spotted with particles of kaolin, which is probably the weathered product of feldspar. Minor sedimentary beds or lenses intercalated with the lavas (1) are commonly grey, green, and red slates, some of which are graphitic.

The diabasic gabbro (3) is a light to dark green, medium-grained, ophitic, commonly massive, tremolite-albite rock, with minor amounts of calcite, zoisite, epidote, and chlorite. It occurs mainly as sills in the lavas (1), and immediately east of Nepisiguit Falls, in the iron deposit at Bathurst Mines, and on Nepisiguit River immediately south of the mine, and is considered to have been intruded during a late phase of Tetagouche volcanism.

The granite (4) is commonly pink and coarsely granular to semiporphyritic, and is composed of about 35 per cent pink microperthite and orthoclase, 25 per cent albite, 30 per cent glassy quartz, and 10 per cent biotite. Small red garnets were observed in exposures along Nepisiguit River. The granite mass is the southern part of a batholith that extends 10 miles north of the map-area to Bathurst. Within the area there are no exposed contacts with Tetagouche rocks. Rhyolite dykes cut the granite, but no pegmatite was observed.

The eastern half of the area is underlain by undeformed Pennsylvanian continental strata (5, 6), which were divided by Alcock³ into two formations. The Bathurst formation (5) overlies the granite and Tetagouche group unconformably. Its basal beds are mainly light red to pink conglomerate, with intercalated arkose and grit. The pebbles are rounded to sub-rounded fragments of greenstone, quartzite, and quartz up to 2 inches in diameter. The conglomerate is succeeded by red sandstone, siltstone, and shale.

The Clifton formation (6) overlies the Bathurst conformably, and may be distinguished from it by its dominant grey colour. The lowest beds are mainly light grey to grey-green, thinly-bedded siltstones or very fine-grained sandstones, with minor, medium- to coarse-grained, predominantly grey, massive to flaggy sandstones. The massive sandstones are commonly crossbedded, and carry quartz pebbles. Thin discontinuous beds of olive-green and chocolate-brown shales were noted throughout the Clifton, and *Calamites* stems and detrital plant remains are common. On the basis of fossils collected by Alcock⁴ north-east of the area, the formation has been correlated by Bell with the Pictou or Morien group of Nova Scotia.

The pre-Pennsylvanian rocks lie in a broad syncline whose axis is west of the area and trends east of north. Minor folds that trend west of north have been superimposed upon this major structure. The lavas (1) are commonly rudely schistose as a result of cataclastic metamorphism, which is more pronounced in the acidic than in the intermediate and basic members. In the broad band of sedimentary rocks (2) lying just west of the area of Pennsylvanian beds, cleavage and bedding are essentially parallel, whereas in the narrower belts of similar rocks farther west and north, these structures are commonly at variance.

Magnetite iron ore occurs as lenses in volcanic rocks (1) about 1 1/2 miles west of Bathurst Mines post office,⁵ in 1913 and in 1943 a total of 300,000 tons was mined. The mine is connected with the Canadian National Railways at Nepisiguit Junction by the Northern New Brunswick and Seaboard Railway, 16 miles long. Ore reserves are estimated⁶ to be 7,000,000 tons carrying 46 per cent iron and 18 per cent quartz.

Copper sulphides have been noted at Middle Landing, on Nepisiguit River 1/3 mile below Nepisiguit Falls, and on Knight Brook 1 1/4 miles north-northwest of Bathurst Mines. All of these deposits have been trenching and some diamond drilling was done at Middle Landing.

The area has been covered by an aeromagnetic survey⁷, and the largest magnetic anomaly was obtained in the vicinity of the iron mine. Other large anomalies occur east of Palineau River north of the Tote Road, and near the headwaters of Gordon Meadow Brook. The rocks causing these anomalies have been investigated by the New Brunswick Resources and Development Board and were found to contain magnetite that had been hydrothermally introduced along shear zones.

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

⁴Alcock, F. J.: Jacques River and Tetagouche River Map-areas, New Brunswick; Geol. Surv., Canada, Mem. 227, 1941.

⁵Alcock, F. J.: Geology of Chaleur Bay Region; Geol. Surv., Canada, Mem. 183, 1925.

⁶Lindeman, E., and Bolton, L. L.: Iron Ore Occurrences in Canada; Mines Branch, Dept. of Mines, Canada, vol. 1, No. 217, 1917.

⁷Sidwell, K. O. J.: Iron Ore Occurrences in New Brunswick; New Brunswick Resources and Development Board, Fredericton, N. B., Oct. 1951.

⁸Geol. Surv., Canada, Map 58G, Aeromagnetic Series, Nepisiguit Falls, New Brunswick, 1951.

⁹Sidwell, K. O. J.: Anomalies in the Bathurst Iron Mines Area, New Brunswick Resources and Development Board, Fredericton, N. B., Feb. 1952.

LEGEND

PENNSYLVANIAN

6 CLIFTON FORMATION: grey sandstone; grey-green siltstone; minor olive-green and red shale

5 BATHURST FORMATION: red conglomerate, grit; red sandstone, siltstone, shale

DEVONIAN

4 Biotite granite

ORDOVICIAN

MIDDLE ORDOVICIAN

3 Diabasic gabbro

TETAGOUCHE GROUP

1 Acidic to basic lavas; minor slate, greywacke, tuff, interbedded with 2
2 Greywacke, slate, siltstone, quartzite, tuff, minor lava

Rock exposures are indicated by a bedding symbol, by x, by v (lava), by T (tuff), or by S (sedimentary rock)

Bedding (horizontal, inclined, vertical, dip unknown)

Schistosity, cleavage (inclined, vertical, dip unknown)

Lineation (plunge known)

Anticlinal axis (assumed)

Synclinal axis (assumed)

Glacial striae

Esker

Kame

Iron deposit

Mine (abandoned)

Prospect

Main road 8

Other roads

Trail

Building

Electric power line

Triangulation station and lookout tower

County boundary

Parish boundary

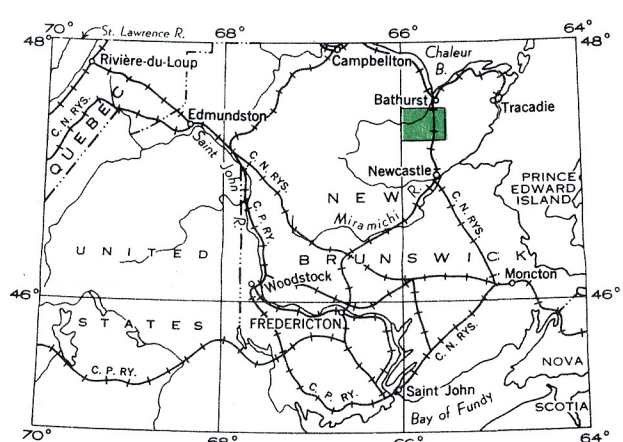
Stream (position approximate)

Marsh

Height in feet above mean sea-level 521

Cartography by the Geological Cartography Division, 1952

Approximate magnetic declination, 23° 42' West



PRELIMINARY MAP 52-23

NEPISIGUIT FALLS

GLOUCESTER AND NORTHUMBERLAND COUNTIES

NEW BRUNSWICK

Scale: One Inch to One Mile = $\frac{1}{63,360}$

