

LEGEND

- DEVONIAN (?)**
- 9 Quartz-feldspar porphyry
 - 8 Pink biotite granite
 - 7 Grey granodiorite and quartz diorite, minor granite and diorite
 - 6 Metadiorite and metagabbro (in whole or in part may be genetically related to 4)
- CAPE ST. JOHN GROUP**
- 5 Siliceous agglomerate
- ORDOVICIAN (?)**
- 4 Serpentinized peridotite, serpentinite, minor serpentinized peridotite; 4a, carbonate and talc-carbonate derivatives
- BAIE VERTE GROUP**
- 3 Andesite, basalt, andesitic to basaltic tuff and agglomerate, minor sedimentary rocks; 3a, dominantly sedimentary rocks: greywacke, red and black slate - some graphitic, red argillite, grey to red chert
- PRECAMBRIAN (?)**
- 1 1. FLEUR DE LYS GROUP: muscovite-biotite gneisses, minor schists; 1a, chloritic varieties
 - 2 2. MING'S BIGHT GROUP: muscovite-biotite gneisses (probably equivalent to 1)
- Geological boundary (approximate, assumed)
- Limit of geological mapping
- Bedding (inclined, vertical, direction of dip known but top unknown)
- Schistosity and foliation (inclined, vertical)
- Fault (approximate, assumed)
- Anticline, arrow shows direction of plunge
- Syncline
- Glacial striae
- Shaft
- Mineral occurrence X Cu
- Mineral prospect X Au

- MINERAL SYMBOLS**
- Asbestos asb
 - Chromite Cr
 - Copper Cu
 - Pyrrhotite po
 - Gold Au
 - Lead Pb
 - Pyrite py

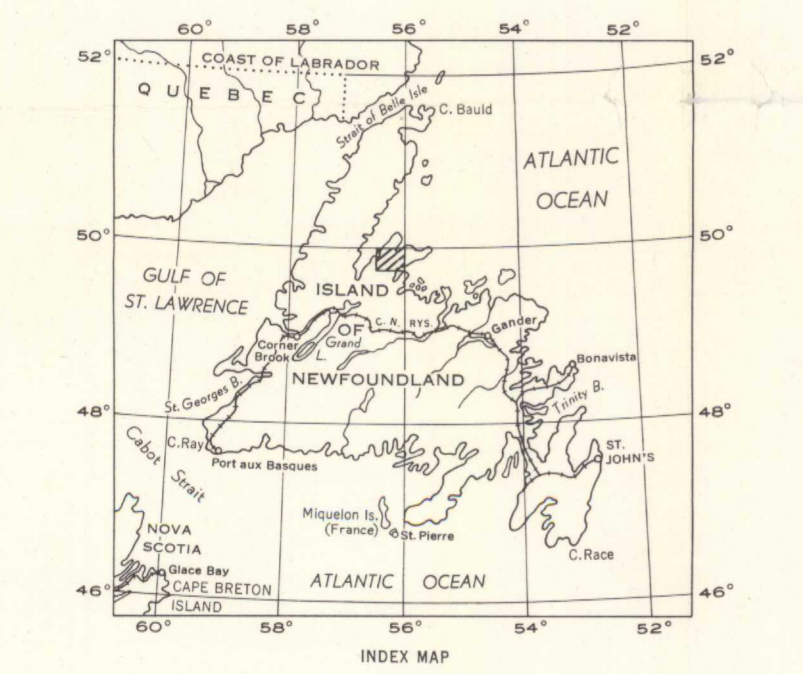
- Geology by E. R. W. Neale, 1957
- Road
 - Cart track
 - Trail
 - District boundary
 - Intermittent stream
 - Rapids
 - Marsh

Approximate magnetic declination, 29° 48' West

Cartography by the Geological Cartography Unit, 1958

In response to public demand for earlier publication, Preliminary Series maps are now being issued in this simplified form, thereby effecting a substantial saving in time. There is no loss of information, but the maps will be clearer to read if all or some of the map-units are hand-coloured.

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario



DESCRIPTIVE NOTES

The Fleur de Lys group (1), of probable Precambrian age, consists of medium- to coarse-grained, light to medium grey, biotite-muscovite-quartz-feldspar gneisses with faint to pronounced compositional banding. Hornblende and garnet are locally abundant. Rarely, graphitic schists are intercalated with the gneisses. Chloritic gneisses (1a) with abundant epidote and magnetite are common near the eastern margin of the group, particularly near contacts with ultrabasic rocks (4).

The Ming's Bight group (2) is similar to and probably correlative with the Fleur de Lys group.

The Baie Verte group (3), which overlies the Ming's Bight group with apparent unconformity, resembles Ordovician volcanic groups of the Notre Dame Bay region. Rocks of this group show partial to complete adjustment to the greenschist metamorphic facies. Ellipsoidal and bun-shaped pillows, feldspathic and epidotic amygdaloids, and variolitic structures are commonly preserved in the greenish grey andesitic and basaltic flow rocks. The estimated minimum thickness of the group is 9,000 feet². The stratigraphy is not known but it is suspected that the basal part of the group is composed dominantly of flow rocks. These rocks are exposed in Ming's South Brook and southeastward, and also in the axial region of the South Brook anticline. The assumed middle part of the group includes flow and pyroclastic rocks with intercalated thin beds of ferruginous chert. These rocks are exposed along the west shore of Ming's Bight and along both shores of Baie Verte whence they extend southward to Flatwater Pond. The assumed upper part of the group, dominantly sedimentary rocks (3a), is best exposed in the bed of Rattling Brook and in road-cuts northwest of Butler's Pond.

Ultrabasic rocks (4), of possible Ordovician age¹, intrude the above groups (1-3). Those plutons near the eastern margin of the Fleur de Lys group are part of a discontinuous belt that extends 30 miles southward. West of Baie Verte, the rock is reddish brown weathered peridotite in which greyish green and greenish brown pyroxene crystals are set in an aggregate of dark green serpentinized olivine gneiss. Serpentinization is more pronounced in peridotite of the Flatwater pluton but relict pyroxenes are discernible in more than half the outcrops. Serpentinization is almost complete in the Ming's Bight peridotite. Serpentinized pyroxenite constitutes prominent dykes in a small peridotite pluton northwest of Goldenville Mine, but is rare elsewhere. Rusty weathered carbonate and talc-carbonate rock (4a) containing numerous quartz stringers was derived largely or wholly from alteration of the ultrabasic rocks. The carbonate near Flatwater Pond is chiefly pale green quartzite, elsewhere it is chiefly buff magnetite and/or ferro-dolomite.

Metadiorite and metagabbro (6), with minor pegmatitic facies, occur as concordant intrusive bodies in the Baie Verte group. They are light greenish grey, medium-grained, commonly massive rocks that consist of saussuritized plagioclase, actinolite, and, rarely, relict pyroxene. The spatial relationship to the ultrabasic rocks (4) suggests a genetic relationship although at least some metadiorite and metagabbro may be related to the younger intrusive rocks.

The younger intrusive rocks (7-9) resemble intrusive sequences of probable Devonian age elsewhere in Newfoundland. Grey and greenish grey, medium-grained, massive granodiorite and quartz diorite (7), "Burlington granitic rocks"¹, contain saussuritized sodic plagioclase, about 30% quartz, and a total of 15% of hornblende, biotite, muscovite, and chlorite. With these rocks are small amounts of pinkish grey, chlorite-biotite granite and, near Burlington village, dark grey hornblende diorite.

Pink, medium- to coarse-grained, biotite granite (8), "Dunamagon granite"¹, intrudes both Ming's Bight and Baie Verte groups. Localized foliation within this otherwise massive granite is due to smeared-out, partly assimilated biotite inclusions.

Quartz-feldspar porphyry (9), "Cap Breton granite"¹, is the youngest intrusive rock of the area. Between Burlington and Flatwater Pond the outcrop pattern of this porphyry suggests a ring-dike structure. Phenocrysts of blue to grey quartz, greyish pink sodic plagioclase, and pink potash feldspar, up to 1/2 inch in greatest dimension, constitute 50% to 70% of the rock. The fine-grained, greyish red groundmass consists of quartz, muscovite, and both feldspars.

Two small, downfaulted blocks of siliceous agglomerate on the east shore of Flatwater Pond belong to the Devonian (?) Cape St. John group (5).

The area is characterized by northeast- and north-northeast trending structures. Despite variable directions of dip in the Fleur de Lys gneisses mapped, regional considerations² suggest that they occupy the east flank of a northeast-striking anticlinorium. The most conspicuous structure of the Baie Verte group is the northeast-plunging South Brook anticline which is intruded along its axial region by granodiorite (7). This anticline is flanked by a syncline in the vicinity of Butler's Pond, wherein the youngest Baie Verte rocks are exposed, and by another syncline in the area southeast of Three Corner Pond.

An assumed northeast-striking, southwest-dipping reverse fault separates the Fleur de Lys and Baie Verte groups although rock attitudes on either side of this fault are roughly parallel. Evidence for the fault includes local zones of intense contortion and shearing, and the apparent truncation of the west limb of Butler's Pond syncline. Initial movement along the fault probably preceded, and served to localize ultrabasic (4) intrusion. Elsewhere in the map-area final faulting along northeast lines is known to post-date the latest (9) intrusive rocks. West- and northwest-striking faults generally post-date the northeast faults.

Pyrite and copper were produced from Terra Nova mine between 1862 and 1914, and a small amount of gold was produced from Goldenville Mine in 1904 and 1906. These old mines, the Rambler copper-gold prospect and the Mud Pond copper prospect, are described in detail elsewhere²; all are located in shear zones within the Baie Verte group. Numerous additional occurrences of sulphides in this group have been discovered recently. Pyrite and pyrrhotite are particularly abundant in pyroclastic beds between Baie Verte and Ming's Bight and sulphide mineralization is also abundant near the sheared contacts between Baie Verte group rocks and ultrabasic rocks, which suggests that these localities warrant careful prospecting for base metals.

Cross-fibre chrysotile asbestos occurs in three zones within a pluton of serpentinized peridotite, 3 miles north of Baie Verte village. Advocate Mines Ltd. have explored this deposit by drilling and by a test shaft on the west ore zone. Ore estimates vary from 15 to 30 million tons. This company also has asbestos prospects in the ultrabasic pluton west of Butler's Pond and in the northern part of the Flatwater pluton. A chromite prospect in the Flatwater pluton consists of a lens of chromite, with a maximum exposed length of 8 feet and a width of 28 inches, within serpentinized peridotite.

¹Baird, D. M.: The Geology of Burlington Peninsula, Newfoundland, Geol. Surv., Canada, Paper 51-21 (1951).

²Watson, K. deP.: Geology and Mineral Deposits of Baie Verte-Ming's Bight Area, Geol. Surv., Newfoundland, Bull. 21 (1947).

MAP 10-1958
BAIE VERTE
WHITE BAY AND GREEN BAY DISTRICTS
NEWFOUNDLAND
Scale: One Inch to One Mile = 1/63,360 Miles

CSC
10-1958

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