

## 12. GEOLOGICAL MAPPING - BURIN BONAVIDA BELT

B. A. Greene

### Introduction

The Burin-Bonavista project is a geological mapping project aimed at the elucidation of the geology of the belt of volcanic and sedimentary rocks that extends from northern Bonavista Bay to the Burin Peninsula and the north shore of Fortune Bay. The project was originally planned as a five-year one, involving an initial season of reconnaissance, followed by four years of 1:50,000 mapping. Six NTS sheets are to be mapped: St. Brendans (2C/13), Eastport (2C/12), Harbour Buffett (1M/9), Marystown (1M/3), Gaultois (1M/12) and Harbour Breton (1M/5). These sheets were chosen because they contain easily accessible, well exposed, coastal sections and because, when combined with existing mapping, they will provide 1:50,000 coverage completely across the Burin-Bonavista belt at its center, and at its northern and southern extremities.

Field work on the project was begun late in the 1973 season. After an initial period of reconnaissance, it was decided to begin mapping in the Marystown (1M/3) area. A preliminary map of the east half of the Marystown sheet was completed (Fig. 1).

### Marystown (east half) Map Area

#### General Geology

The Marystown (east half) map area is divided into two parts by a fault-bounded, east-northeast trending depression occupied by Cambrian and Eocambrian sedimentary rocks. Northwest of this depression, and separated from it by a northwest dipping thrust fault, is a sequence of acidic pyroclastic rocks, with subordinate acidic and basic flows, which has been assigned to the Harbour Main Group (Van Alstine, 1948). The group is dominated by pyroclastic rocks, mainly fine-grained, schistose, red to purple tuffs; and coarse, massive, red to tan lapilli and lapilli-crystal tuffs. Breccia and agglomerate are present locally. Acidic flow rocks are mainly pink, porphyritic, locally flow-banded rhyolites. Basic flows appear to be confined to a belt extending southwestward from Jean de Baie; they consist of dark grey to purple amygdaloidal basalts. Contacts of the group are not exposed within the Marystown map area, but similar volcanic rocks are conformably overlain by fossiliferous Lower Cambrian beds

near Grand Bank; correlation with the Harbour Main Group is therefore suspect.

Rocks within the fault-bounded north-northeast trending depression grade from red conglomerate and sandstone at the base, through red and green shales with pink limestone beds and nodules, to black shales at the top of the section. The red conglomerate and sandstone is similar to Eocambrian rocks exposed in the Fortune area to the west and on the islands in Placentia Bay to the east. Thin quartzite beds, possibly representing the Random Formation, occur in the lower part of the red and green shale sequence; the upper part of this sequence contains Lower and Lower Middle Cambrian trilobites and is therefore equivalent to the Adeytown Group of Jenness (1963). The black shales at the top of the section contain Middle Cambrian fossils, similar to those in the Manuels River Formation in other areas of southeast Newfoundland.

Southeast of the Cambrian-Eocambrian belt, and separated from it by a high-angle normal fault, are two rock groups: an upper sequence of pillowed basalts with minor interbedded tuffs, tuffaceous sandstones, and limestones referred to as the Burin Group (Van Alstine, 1948); lower shale-greywacke-conglomerate succession referred to as the Rock Harbour Group (Jooste, 1954).

The Rock Harbour Group consists primarily of well bedded, grey, white-weathering siltstones and fine-grained greywackes. Conglomerate beds, with boulders of acidic and basic volcanic rocks, granite, and blue-grey limestone, occur at several horizons within the group. Granite and limestone boulders to two feet in diameter are seen occasionally in the siltstones. The poorly-sorted conglomerates and the presence of isolated boulders in the siltstones suggest a glacial origin and possible correlation with the Conception Group.

The Burin Group conformably overlies the Rock Harbour Group and consists mainly of purplish-red to greenish-black, pillowed, locally amygdaloidal basalts. Sedimentary rocks, mainly black shales, red and green tuffaceous sandstones, blue-grey limestones and limestone conglomerates, occur at intervals throughout the group, but are most abundant in a belt extending from Burin Passage to Mortier Bay.

The Harbour Main Group within the map area is intruded by the Freshwater Pond Granodiorite, a pale grey to pale pink, medium to coarse-grained rock, probably a plagioclase-rich phase of the St. Lawrence granite. A smaller body of altered granodiorite or

quartz monzonite intrudes the Burin Group near Little Bay. Both the Burin and Rock Harbour Groups are intruded by concordant, elongate bodies of medium grained, equigranular, dark green, pale-green to white-weathering gabbro.

### Structural Geology

Structural relationships within the Harbour Main Group are obscure, because of the scarcity of measureable attitudes. Elsewhere in the area, structures appear to be related to compression from the northwest; fold axes and thrust faults strike northeastwards and dip to the northwest.

The Rock Harbour Group is folded into a series of southwest plunging structures with steeply-dipping axial planes. The Cambrian-Eocambrian beds are tightly folded adjacent to thrust faults, but appear to form a relatively open synclinal structure in the vicinity of Little Bay.

Of the major faults in the area, only that bordering the Cambrian-Eocambrian basin on the northwest is exposed; this is a thrust fault dipping about 45 degrees to the northwest. The fault along the southeast boundary of the Cambrian-Eocambrian basin is inferred to be a high angle normal fault because of its effect on the Harbour Main-Eocambrian contact in the vicinity of Little Bay (see Fig. 1).

### Economic Geology

Fluorspar mineralization occurs in a roof pendant of Harbour Main volcanic rocks in the Freshwater Pond Granodiorite. Chalcopyrite and pyrite are fairly common in quartz and calcite veins cutting the Burin Group. Talc occurs at several localities at the intrusive contact between the Burin Group and an elongate body of gabbro.

### References

Jenness, J.E.

1963: Terra Nova and Bonavista map areas, Newfoundland Geol. Surv. Can., Mem. 327, 187p.

Jooste, R.F.

1954: Report on exploration of exclusive permission granted to Newfoundland Fluorspar Ltd. on the Burin Peninsula; Nfld. Fluorspar Ltd., unpub., 18p.

Van Alstine, R.E.

1948: Geology and mineral deposits of the St. Lawrence area, Burin Peninsula; Geol. Surv. of Nfld., Bull. 23, 64p.

## LEGEND

## QUATERNARY

10 Glacial outwash; sand, gravel

## DEVONIAN AND EARLIER(?)

9 Granodiorite, quartz monzonite, quartz diorite

8 Gabbro, Amphibolite

## CAMBRIAN AND EARLIER(?)

7 Red and green slates, minor pink limestone. Included are sandstone and white quartzite which may be Precambrian. Includes rusty weathering olive slates of uncertain affinities.

## PRECAMBRIAN(?)

## BURIN GROUP (5-6)

6 Green, purple and grey sandstones, black shale, tuffaceous sedimentary rocks, pyroclastics; minor basic flows.

5 Pillowed, dark-grey to purple basic flows. Minor basic pyroclastics and sedimentary rocks.

## ROCK HARBOUR GROUP

4 White weathering, grey siltstone, fine-grained sandstone, and coarse conglomerate. Siltstone with isolated granite pebbles to 2' in diameter. Conglomerates possibly tillites.

## HARBOUR MAIN GROUP (1-3)

3 Purple, yellow and red acidic pyroclastics. Mainly schistose tuffs; massive tuff breccias locally abundant. Minor flow-banded rhyolite.

2 Amygdaloidal, purple green and grey basic flows; minor coarse pyroclastics.

1 Pink quartz feldspar porphyry; may be intrusive in part.

