HARBOUR BRETON MAP AREA

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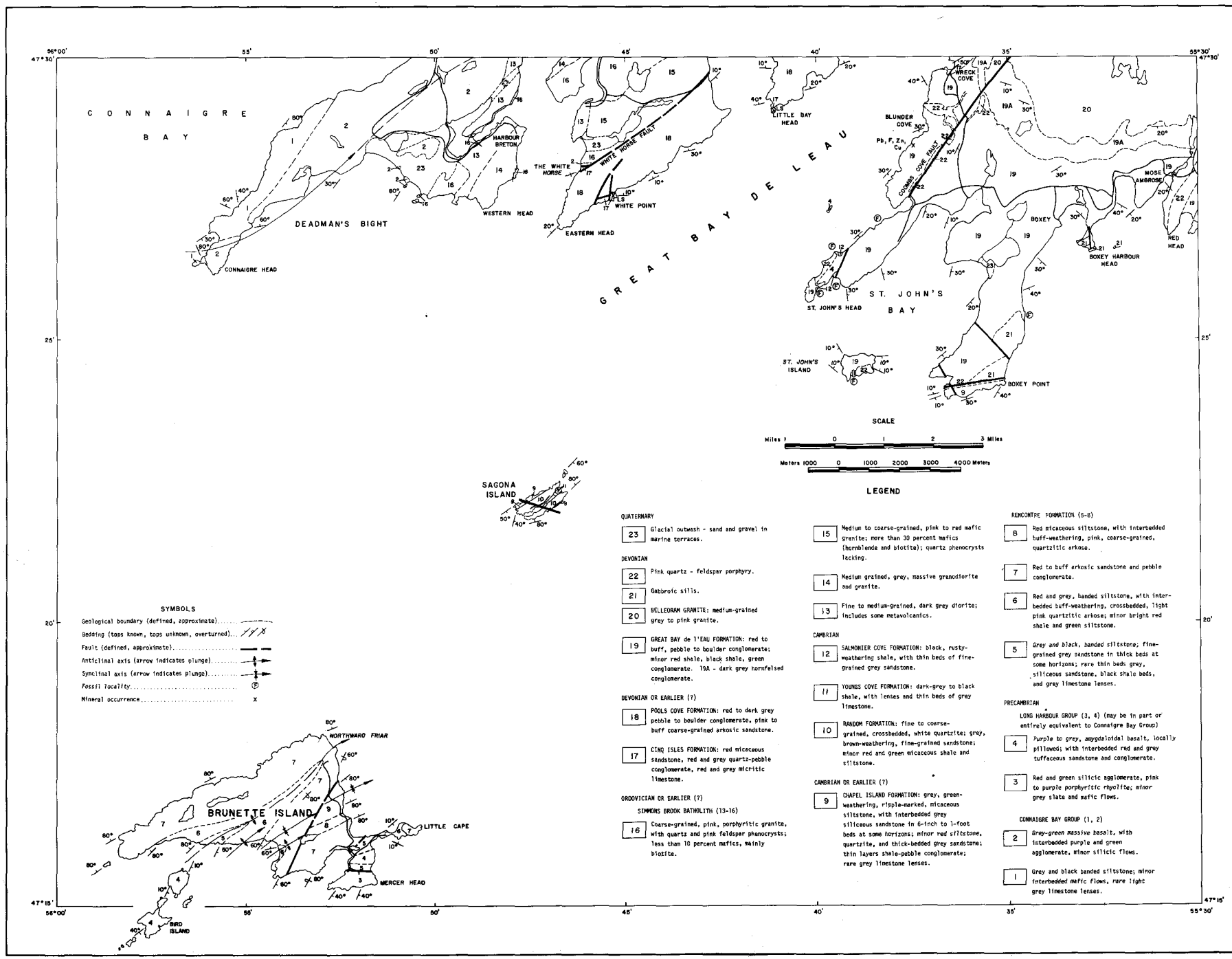
Introduction

Field work during the 1974 season on the north side of Fortune Bay consisted of initial reconnaissance work in the Harbour Breton and Gaultois map areas, followed by 1:50,000 mapping of the Harbour Breton sheet. 1:50,000 mapping was also begun in the east half of the Gaultois sheet, which will be completed in 1975.

General Geology

The Harbour Breton area is divided into two geologically contrasting terranes by the White Horse fault. The area northwest of the fault is underlain mainly by the Connaigre Bay volcanics and by a suite of intrusive rocks referred to the Simmons Brook Batholith (Widmer, 1950; Williams, 1971); the area southeast of the fault is underlain largely by Devonian conglomerates and granites, with local outcrops of Precambrian to Upper Cambrian volcanic and sedimentary rocks.

The Connaigre Bay Group (1-2) is believed to be Precambrian in age on the basis of lithological similarity to the Long Harbour Group to the east. It is divisible into two units in the Harbour Breton area: a lower unit of gray and black, banded siltstone, with minor interbedded mafic flows and rare grey limestone lenses; and an upper unit of gray to green, massive basalt with interbedded purple and green agglomerate and local pink silicic flows. Poorly developed pillows were observed at one



SYMBOLS

- Geological boundary (defined, approximate)
- Bedding (tops known, tops unknown, overturned)
- Fault (defined, approximate)
- Anticlinal axis (arrow indicates plunge)
- Synclinal axis (arrow indicates plunge)
- Fossil locality (F)
- Mineral occurrence x

LEGEND

QUATERNARY

23 Glacial outwash - sand and gravel in marine terraces.

DEVONIAN

22 Pink quartz - feldspar porphyry.

21 Gabbroic sills.

20 BELLEORAM GRANITE: medium-grained grey to pink granite.

19 GREAT BAY de l'EAU FORMATION: red to buff, pebble to boulder conglomerate; minor red shale, black shale, green conglomerate. 19A - dark grey hornfelsed conglomerate.

DEVONIAN OR EARLIER (?)

18 POOLS COVE FORMATION: red to dark grey pebble to boulder conglomerate, pink to buff coarse-grained arkosic sandstone.

17 CINQ ISLES FORMATION: red micaceous sandstone, red and grey quartz-pebble conglomerate, red and grey micritic limestone.

ORDOVICIAN OR EARLIER (?)

SIMMONS BROOK BATHOLITH (13-16)

16 Coarse-grained, pink, porphyritic granite, with quartz and pink feldspar phenocrysts; less than 10 percent mafics, mainly biotite.

15 Medium to coarse-grained, pink to red mafic granite; more than 30 percent mafics (hornblende and biotite); quartz phenocrysts lacking.

14 Medium grained, grey, massive granodiorite and granite.

13 Fine to medium-grained, dark grey diorite; includes some metavolcanics.

CAMBRIAN

12 SALMONIER COVE FORMATION: black, rusty-weathering shale, with thin beds of fine-grained grey sandstone.

11 YOUNGS COVE FORMATION: dark-grey to black shale, with lenses and thin beds of grey limestone.

10 RANDOM FORMATION: fine to coarse-grained, crossbedded, white quartzite; grey, brown-weathering, fine-grained sandstone; minor red and green micaceous shale and siltstone.

CAMBRIAN OR EARLIER (?)

9 CHAPEL ISLAND FORMATION: grey, green-weathering, ripple-marked, micaceous siltstone, with interbedded grey siliceous sandstone in 6-inch to 1-foot beds at some horizons; minor red siltstone, quartzite, and thick-bedded grey sandstone; thin layers shale-pebble conglomerate; rare grey limestone lenses.

RENCONTRE FORMATION (5-8)

8 Red micaceous siltstone, with interbedded buff-weathering, pink, coarse-grained, quartzitic arkose.

7 Red to buff arkosic sandstone and pebble conglomerate.

6 Red and grey, banded siltstone, with interbedded buff-weathering, crossbedded, light pink quartzitic arkose; minor bright red shale and green siltstone.

5 Grey and black, banded siltstone; fine-grained grey sandstone in thick beds at some horizons; rare thin beds grey, siliceous sandstone, black shale beds, and grey limestone lenses.

PRECAMBRIAN

LONG HARBOUR GROUP (3, 4) (may be in part or entirely equivalent to Connaigre Bay Group)

4 Purple to grey, amygdaloidal basalt, locally pillowed; with interbedded red and grey tuffaceous sandstone and conglomerate.

3 Red and green silicic agglomerate, pink to purple porphyritic rhyolite; minor grey slate and mafic flows.

CONNAIGRE BAY GROUP (1, 2)

2 Grey-green massive basalt, with interbedded purple and green agglomerate, minor silicic flows.

1 Grey and black banded siltstone; minor interbedded mafic flows, rare light grey limestone lenses.

locality in the upper unit.

The Simmons Brook Batholith (13-16) consists of four distinct rock types: diorite, granodiorite, pink alaskitic granite, and pink hornblende-biotite granite. The western edge of the batholith is a complex mixture of fine-grained, dark gray diorite and meta-volcanics (13). This mixture is intruded by medium grained, light gray granodiorite (14) and both diorite and granodiorite are intruded by coarse-grained, pink, porphyritic granite, with phenocrysts of quartz and feldspar and very little mafic material (16). The contact between the porphyritic granite and the diorite is marked in places by extensive zones of intrusion breccia. The fourth rock type is a coarse-grained, pink granite differing from the porphyritic variety in that it lacks quartz phenocrysts and contains more mafic minerals (15); it's contacts with the other units are obscure but it appears to represent a contaminated phase of the porphyritic granite. The Simmons Brook complex cuts the Precambrian Connaigre Bay Group and is overlain by conglomerates of probable Devonian age, north of the map area (Williams, 1971).

The oldest rock unit southeast of the White Horse fault is the Precambrian Long Harbour Group (3-4). The group is divided into two units on Brunette Island: a lower unit of silicic agglomerates and rhyolites, with minor sedimentary rocks and mafic flows, which is in fault contact with younger rocks; and an upper sequence of amygdaloidal pillowed basalts, with interbedded mafic agglomerate and minor red and

green tuffaceous conglomerate and sandstone. Mafic pyroclastics exposed at the Tolt on St. Johns Head are also assigned to this upper unit.

The volcanic rocks of the Long Harbour Group are conformably overlain by the Rencontre Formation (5-8), which underlies most of Brunette Island. The Rencontre Formation consists of gray and black banded siltstone at the base, followed upward by red siltstone and cross-bedded, quartzitic arkose, red pebble conglomerate, and red siltstone and cross-bedded quartzitic arkose, red pebble conglomerate, and red siltstone and cross-bedded quartzitic arkose at the top. The formation grades upward into the Chapel Island Formation (9), which consists of gray, green-weathering, micaceous, ripple-marked siltstone, with thinly bedded, fine-grained grey siliceous sandstone prominent at some horizons; red siltstone and pink quartzitic arkose occur near the base of the formation on Brunette Island, and red siltstone occurs near the top of the formation on Boxey Point; gray limestone lenses are sparsely distributed throughout the unit on Brunette and Sagona Islands.

The Chapel Island Formation is conformably overlain by the Random Formation (10), which consists of fine-grained, gray, brown-weathering, flaggy sandstone and white, cross-bedded quartzite and quartzitic sandstone. The Random Formation underlies most of Sagona Island; smaller outcrops occur on Boxey Point and St. Johns Island. The quartzites at the top of the formation are overlain on Sagona and St. Johns Islands by dark gray shales, with gray limestone lenses; both the shales and the limestone

lenses contain early Middle Cambrian trilobites. These rocks are assigned to the Youngs Cove Formation (11). Several small outcrops of the Upper Cambrian Salmonier Cove Formation (12), of black shales and gray, micaceous sandstones, occur near St. Johns Head; all of these occurrences are separated from the Youngs Cove Formation, and from younger rock units, by reverse faults or quartz-feldspar porphyry intrusions.

The Salmonier Cove Formation is unconformably overlain by the Cinq Isles Formation (17) just north of the Harbour Breton map area (Widmer, 1950). Within the map area, the Cinq Isles Formation outcrops at Wreck Cove, Little Bay Head, White Point and the White Horse; its contact with older rock units is not exposed, except at the White Horse, where it is in fault contact with Connaigre Bay volcanics. The formation consists of red sandstone, micritic limestone and quartz-pebble conglomerate. The Cinq Isles occurrences on the west side of Great Bay de l'Eau are overlain disconformably be red to buff arkose, and red to dark gray, pebble to boulder conglomerate formerly assigned to the Great Bay de l'Eau Formation (Widmer, 1950). These beds are here included in the Pools Cove Formation (18) because they are lithologically similar to, and lie on strike with, that formation in the type area. The Cinq Isle is overlain on the east side of Great Bay de l'Eau by pink to buff, pebble to boulder conglomerate of the Great Bay de l'Eau Formation (19). This formation contains Upper Devonian plant fossils at Coombs Cove (Widmer, 1950) and at Boxey Point.

The Great Bay de l'Eau Formation is intruded by the Belleoram

granite (20) of probable late Devonian age. The conglomerate has been altered to a dark gray hornfels for some distance from the granite contact. The granite is a fine-to-medium grained, grey to pink rock, characterized by the presence of numerous small dark inclusions and sub-horizontal sheeting. The conglomerates (Pools Cove and Great Bay de l'Eau) are also cut by gabbro and diabase dykes and sills (21), and both the conglomerates and the basic intrusions are cut by dykes and plugs of pink quartz-feldspar porphyry (22).

Structural Geology

The area northwest of the White Horse fault forms part of a major, northeast-plunging, open, upright syncline, with an axis running through the Connaigre Head - eastern Deadmans Bight area. The southeast limb of the syncline has been intruded by units of the Simmons Brook batholith.

The White Horse fault is a high angle reverse fault, dipping steeply to the northwest. Three fault sets are present in the area southeast of the White Horse fault. One set includes the Coombs Cove fault, the fault trending north-northeast across the eastern part of Brunette Island, and the faults cutting the Pools Cove and Cinq Isles Formations near White Point. These are similar in attitude and direction of movement to the White Horse fault. A second set, striking approximately at right angles to the first, is made up of steeply dipping normal faults of small displacement; e.g., the faults on Boxey Point and Sagona Island. A third

set trends approximately east-west and consists of steeply dipping faults along which the south side has moved upward relative to the north side; this group includes the fault cutting across the tip of Boxey Point and that at Mercer Head on Brunette Island.

The Precambrian and Cambrian (?) strata on Brunette Island are folded into northeast plunging open folds, which are locally overturned toward the southeast. The Cinq Isles, Pools Cove, and Great Bay de l'Eau Formations are very little deformed, exhibiting only very gentle folding.

Economic Geology

There are few mineral prospects in the Harbour Breton area. Thin calcite veins cutting the Great Bay de l'Eau conglomerate near Blunder Cove carry small amounts of galena, fluorite, sphalerite and chalcopyrite. Limestone possibly suitable for agricultural use occurs in the Cinq Isles Formation at Wreck Cove, Little Bay Head, and White Point.

References

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1971: Geology of Belleoram map area, Newfoundland (1M/11); Geol. Surv. Can., Paper 70-65, 39 pp.