GAULTOIS MAP AREA

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INTRODUCTION

The objective of the 1976 field season was to complete the 1:50,000 mapping of the Gaultois map area (1 M/12) started by Greene and O'Driscoll (1976). Unfortunately, only six weeks of field work were done because of mechanical trouble at the beginning of the season and health problems during August and September.

Part of the area had already been studied by Colman-Sadd (1974) for a Ph.D. thesis at Memorial University of Newfoundland. Information from that work will be incorporated in the final report and is included in the sketch map that accompanies this report. Work during the 1976 field season was restricted to inland traverses and the coastal section between Little Passage and the head of Hermitage Bay.

The Gaultois map area is divided in two by Hermitage Bay and the Hermitage Bay Fault, which trend in a northeasterly direction across the central part of the area. The fault is considered to mark the boundary between the Avalon and Gander Zones of the Newfoundland Appalachians (Blackwood and O'Driscoll, 1976). Greene and O'Driscoll (1976) mapped the southern part of the area belonging to the Avalon Zone and the Hermitage Bay Fault zone, and did some reconnaissance studies in the Gander Zone. The present project is concerned only with the rocks of the Gander Zone, north and west of the Harbour Breton Road.

The rocks of the Gander Zone exposed within the map area can be divided into three groups: (1) Basement gneisses, (2) Metasedimentary and metavolcanic cover rocks, and (3) Granitoid intrusions. The basement gneisses include a variety of lithologies and are referred to the Little Passage Gneiss Complex of Colman-Sadd (1974). They are overthrust in the northwest by the cover rocks, belonging to the Isle Galet and Riches Island Formations of the Ordovician Baie d'Espoir Group (Colman-Sadd, 1976); these cover rocks have undergone polyphase deformation and metamorphism up to garnet grade. The granitoid intrusions within the Gaultois map area are restricted to the basement terrane; they postdate the gneissic foliations of the basement rocks, but have mostly been affected by later deformations apparently associated with tectonic activity in the Baie d'Espoir Group and along the Hermitage Bay and other faults. Work during the 1976 field season was almost completely restricted to the basement rocks and granitoid intrusions, and the reader is referred to Colman-Sadd (1974) for descriptions of the Baie d'Espoir Group.

BASEMENT GNEISSES

The outcrop of the basement gneisses lies between that of the Baie d'Espoir Group and the Gaultois Granite, and extends from the western to the northern edge of the map area; it is continuous with the outcrop of gneisses described from the St. Alban's map area (1M/13) (Colman-Sadd, 1976).

The most important group of gneisses is psammitic in composition and medium to coarse grained (Unit 2). The feldspar content is variable and either muscovite or biotite may be the principal mica. Garnet and amphibole occur locally as prominent accessory minerals, and some of the more quartz-rich varieties of the gneiss have a deep red hematitic staining. The gneissic foliation is defined by mica which is generally segregated on a 1 to 2 cm scale; intrafolial folds are common. Included within the psammitic gneisses are bands of fine grained biotite granitic gneiss; the biotite, comprising about 10 percent of the rock, has a strong preferred orientation and its inhomogeneous distribution imparts a diffuse banding to the rock.

Tonalitic gneiss (Unit 3) occurs in the area around Little Passage between the psammitic gneiss and the Gaultois Granite. The gneiss is inhomogeneously deformed; in places it has a strong foliation but has undergone only minor metamorphic segregation, whereas elsewhere it has a gneissic banding on a 2 to 5 cm scale with numerous intrafolial folds. The major minerals are quartz, plagioclase, and biotite, with accessory garnet, hornblende, and fibrolitic sillimanite. Within the tonalitic gneiss there are numerous inclusions and sheets of amphibolitic gneiss (Unit 1); the banding in the latter is commonly discordant to the foliation in the tonalitic gneiss. The amphibolitic gneiss may represent an earlier metamorphic complex which was incorporated into the tonalite as xenoliths. The relationship between the tonalitic and psammitic gneisses is uncertain. In some outcrops in the Little Passage section it appears that some of the psammitic gneisses may have been derived from the tonalitic gneiss; however, in one exposure in the same section, psammitic gneiss is clearly intruded by tonalite.

Within about 1 km of the thrust fault separating the Baie d'Espoir Group from the basement gneisses, the psammitic gneiss has been partly or wholly mylonitized. Its grain size has been reduced and compositional inhomogeneities have been largely obscured. Over much of this reworked zone, there has been some growth of minerals, particularly plagioclase and mica, after the main period of mylonitization.

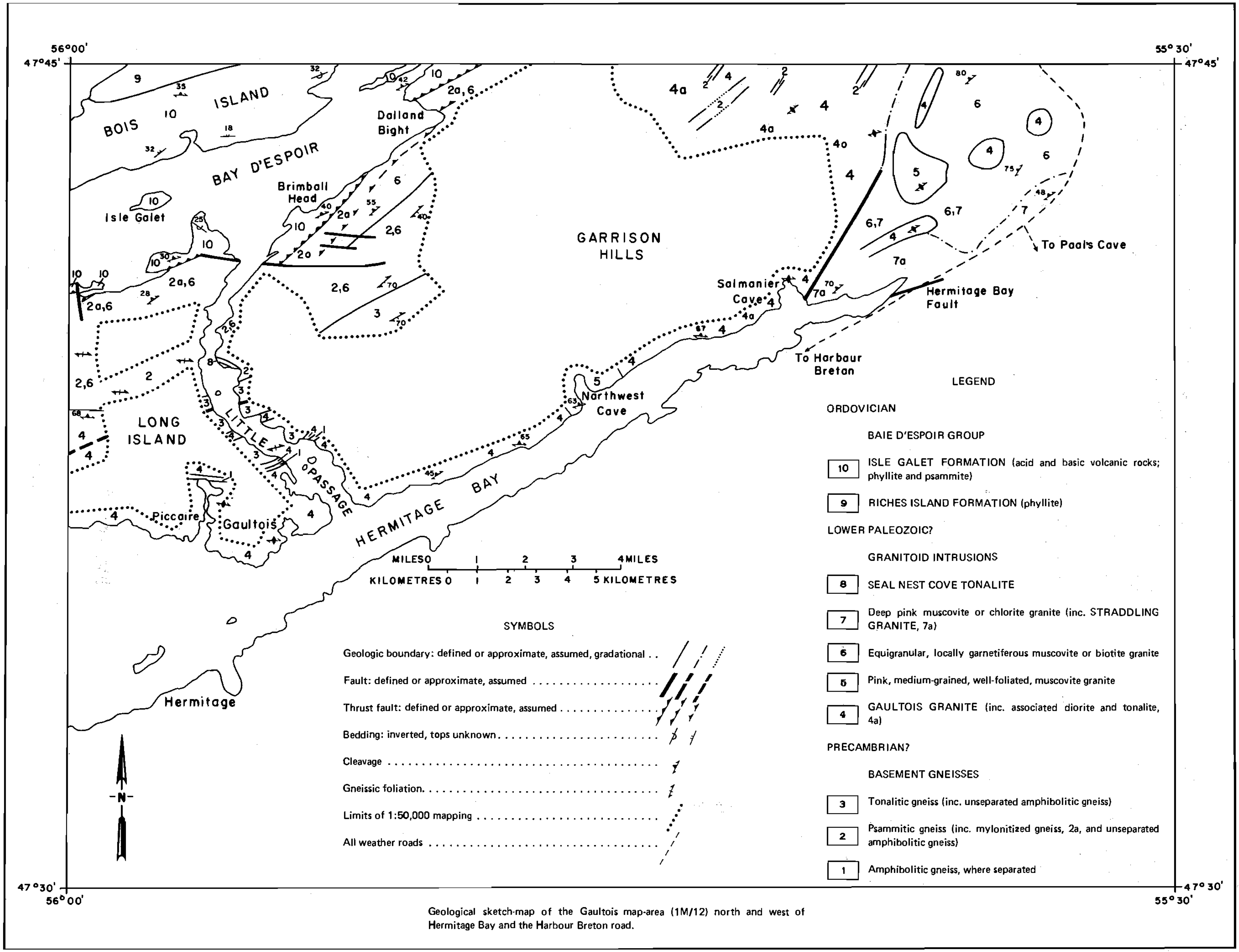
GRANITOID INTRUSIONS

Five groups of granitoid intrusions postdate the basement gneisses. Four of these were examined during the 1976 field season; the fifth, the Seal Nest Cove tonalite (Unit 8) in Little Passage is of minor importance and the reader is referred to Colman-Sadd (1974) for a description.

Gaultois Granite (Unit 4)

The granite outcrops along the north shore of Hermitage Bay from the west edge of the map area to Salmonier Cove; it also outcrops in the Garrison Hills north of Hermitage Bay and on the southern part of Long Island. Northwards from the Garrison Hills it extends to the northern edge of the map area, where it is continuous with the tonalite and diorite intrusion of the St. Alban's area (Colman-Sadd, 1976). The granite is intrusive into the basement gneisses, and sheets and xenoliths of gneiss are included in it.

The Gaultois Granite is a megacrystic biotite granite with prominent pink phenocrysts of potassium feldspar up to 4 cm long; locally the phenocrysts are absent and the rock resembles the the tonalite and diorite that predominate in the St. Alban's map area. The granite is cut by numerous dykes of pink pegmatite and aplite. Both the granite and the dykes have a tectonic fabric of varying intensity. The fabric is developed best on Long Island where it is defined by biotite and elongated quartz grains; it diminishes in importance eastwards.



Geological sketch-map of the Gaultois map-area (1M/12) north and west of Hermitage Bay and the Harbour Breton road.

Figure 1.

Pink, Medium Grained, Well Foliated, Muscovite Granite (Unit 5)

Two separate occurrences of this granite have so far been located. One, at Northwest Cove, has faulted or concealed contacts with the Gaultois Granite in the coastal section. The other, northeast of Salmonier Cove, is completely surrounded by and intruded by rocks of the equigranular, garnetiferous, muscovite/biotite granite suite.

The granite is light pink in colour and the muscovite occurs as prominent flakes defining a very good tectonic fabric. Locally the fabric has been kinked. In the outcrop northeast of Salmonier Cove, the fabric predated intrusion by the surrounding granites, but at Northwest Cove its relationship to the fabric in the Gaultois Granite is uncertain.

Equigranular, Locally Garnetiferous, Muscovite or Biotite Granite (Unit 6)

Rocks of this granite suite outcrop north of the head of Hermitage Bay and from Dolland Bight southwestwards into northern Long Island. The granite is intrusive into the basement gneisses, the Gaultois Granite, and the pink muscovite granite.

The outcrop north of the head of Hermitage Bay is a heterogeneous mixture of self-intruding, equigranular, grey or pink, biotite and muscovite granites. It extends northwards into the St. Alban's map area and eastwards beyond the Harbour Breton road. At its margins the granite is intruded by garnetiferous pegmatite and aplite dykes, and garnets are occasionally found away from the margins. One tectonic fabric is generally recognizable, but in many places there is no fabric, and in a few others there are two.

The granite between Dolland Bight and Long Island is mainly of the garnet and muscovite bearing variety, and occurs as dykes and sills in the gneisses. The only substantial outcrop is just southwest of Dolland Bight. The granite was affected by the deformation of the Baie d'Espoir Group and is mylonitized near the contact between the cover and basement rocks; further from the contact the intensity of deformation decreased.

Deep Pink Muscovite or Chlorite Granite (Unit 7)

This granite extends eastwards from Salmonier Cove along the valley at the head of Hermitage Bay. The southwestern end of the outcrop forms a part of the Straddling Granite (Greene and O'Driscoll, 1976). The granite is in faulted contact with the Gaultois Granite at Salmonier Cove. Contacts with the equigranular, garnetiferous, muscovite/biotite granite suite (Unit 6) are exposed in the brook at the head of Hermitage Bay and along the Harbour Breton road. They are gradational; the feldspar shows a progressive pink coloration, and biotite is altered to chlorite; the medium to fine grained, equigranular texture of the rock is unchanged. A tectonic fabric is visible in the granite on the shores of Hermitage Bay near Salmonier Cove, and along the Harbour Breton road. The rock has been brecciated by the Hermitage Bay Fault.

OTHER INTRUSIONS

Quartz veins, several metres in width, cut the basement gneisses in the north part of the Garrison Hills; they are barren of metalliferous minerals.

Basic dykes are present in the east of the area cutting the deep pink, muscovite/chlorite granite. None have been found which exceed a metre in width.

MINERALIZATION

The best prospects for mineral deposits are in the volcanic rocks of the Isle Galet Formation in the Baie d'Espoir Group. These are showings of copper on Bois Island, and lead and zinc along strike at Barasway de Cerf in the St. Alban's area.

No significant showings of metallic minerals have been discovered in the basement gneisses or granitoid intrusions, but the quartz veins were once investigated for their silica potential (Gale, 1965).

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