GEOLOGY OF THE SOUND ISLAND MAP-AREA (EAST HALF)

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INTRODUCTION

Mapping was initiated in the Swift Current area during the 1976 field season. The eastern half of the Sound Island map area (1M/16) was mapped at a scale of 1:50,000. Previous work includes the reconnaissance mapping of Rose (1948) and Anderson (1965).

GENERAL GEOLOGY

The eastern half of the Sound Island map area consists of two contrasting geological terranes separated by a system of faults extending from Baker Cove to the northeast corner of the map area. To the northwest of this fault system lies a belt of chlorite-sericite schists derived from volcanic, sedimentary and intrusive igneous rocks. To the southeast lie sedimentary rocks which are openly to tightly folded, but do not portray any schistosity.

Rocks of the Love Cove Group (1) outcrop in the northwest corner of the map area. These outcrops are part of a continuous belt of rocks which extends northwards to Bonavista Bay, where the type locality is situated (Jenness, 1963). Within the map area this group is represented by schistose black and purple rhyolite flows and tuffs. They are separated from other units in the stratigraphic succession by intrusive rocks but are assumed to be Precambrian in age because of relationships in Bonavista Bay (Jenness, 1963).

The North Harbour Group (2-4) is a name used here for a belt of volcanic and associated sedimentary rocks which outcrops within the northwest terrane east of the Swift Current Granite (7). Previously these rocks have been included partly in the Love Cove Group and partly in the Musgravetown Group (Anderson, 1965). The group consists of a conformable sequence which is subdivided into three formations. The names given these formations in this report are not meant to be used formally although some of them have been used by Rose (1949).

The Sound Island Formation (2) is a volcanic unit composed of steeply dipping mafic and silicic flows and pyroclastics, including crystal, lithic and crystal-lithic tuffs, agglomerates, and ignimbrites. It is overlain by the Goose Cove Formation (3), which is a sequence of purple to red, graded and cross-bedded conglomerate, sandstone and shale. The Baker Cove Formation (4) overlies the Goose Cove Formation; it consists of green, graded arkose and greywacke with interbeds of black shale.

Rocks of the North Harbour Group contain a strong penetrative foliation generally subparallel to bedding and have undergone low greenschist metamorphism resulting in chlorite-sericite schists.

Unit 5 is exposed along the western margin of the Swift Current Granite and as a roof pendant within it. The unit is composed of green greywacke and conglomerate with minor interbedded mafic and felsic pyroclastics. It is foliated and metamorphosed to chlorite-sericite schist. This unit is similar to the lower part of the Southern Hills Formation (Bradley, 1962), which has been mapped to the south of the map area. Its relationship to other rocks in the stratigraphic succession is unknown.

LEGEND

DEVONIAN AND EARLIER(?)

13 SALL THE MAID GRANITE: pink to orange and grey, medium grained alaskite and granite.

12 minor mafic intrusions including diorite, diabase and gabbro.

11 POWDER HORN DIORITE COMPLEX: grey-green to black, medium to fine grained diorite, gabbro and diabase. Minor phases of granite and felsite.

CAMBRIAN AND EARLIER

10 BONAVISTA FORMATION: reddish brown and pale green slate with nodules and nodular beds of pink limestone.

9 RANDOM FORMATION: white orthoquartzite with interbeds of green and grey micaceous siltstone and sandy shale.

MUSGRAVETOWN GROUP

8 green, grey and red graded and crossbedded sandstone and pebble conglomerate. Interbedded black shale and conglomerate.

CAMBRIAN OR EARLIER

7 SWIFT CURRENT GRANITE: 7a, medium grained, foliated to massive, grey to pink, hornblende biotite granite and syenite; 7b, black to green medium grained diorite and gabbro. Minor diabase.

HADRYNIAN OR EARLIER

CONNECTING POINT GROUP(6)

6 green and grey, well bedded siltstone and sandstone.

5 green greywacke and conglomerate; minor interbedded mafic and felsic tuff.

NORTH HARBOUR GROUP (2-4)

4 BAKER COVE FORMATION: grey green sandstone with interbedded black shale

3 GOOSE COVE FORMATION: red to purple conglomerate, sandstone and shale.

2 SOUND ISLAND FORMATION: felsic and mafic volcanic pyroclastics and flows. Altered to chlorite and sericite schist. Minor interbedded sedimentary rocks.

LOVE COVE GROUP

1 purple to black felsic flows and pyroclastics.

SYMBOLS

Geological boundary (defined, approximate, assumed) . . . . .

Bedding, tops known (inclined, vertical, overturned) 45 90

Schistosity (inclined, vertical) . . . . . .

Fault (defined, approximate, assumed) . . . . . .

Mineral occurrence . . . . . ×

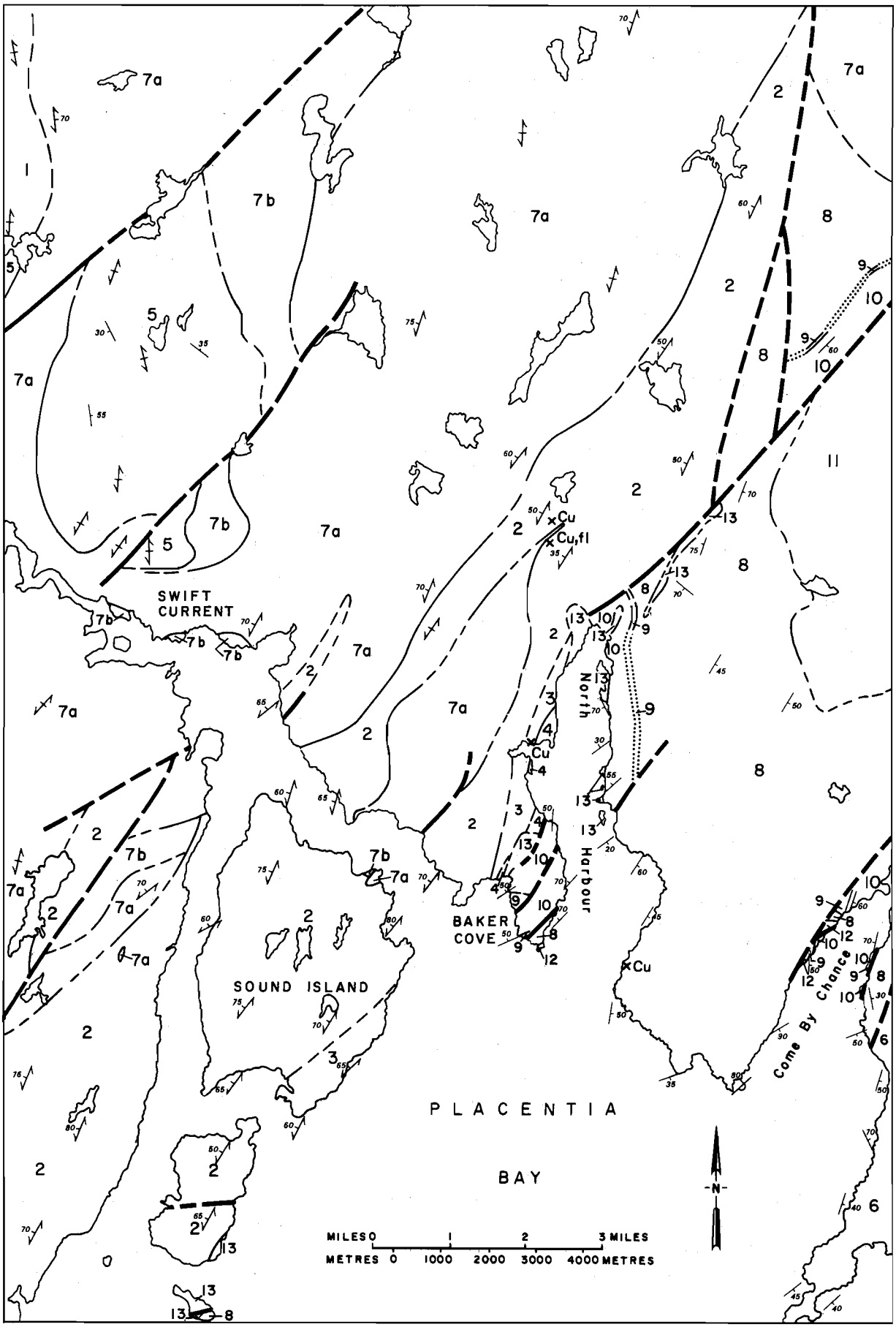
SWIFT CURRENT
SOUND ISLAND
BAKER COVE
North Harbour
Come By Chance
PLACENTIA BAY
Cu
Cu,fl
MILES 0 1 2 3 MILES
METRES 0 1000 2000 3000 4000 METRES
N

Figure 1.

Rocks of the Connecting Point Group (6) outcrop in the southeast corner of the map area; they include green, grey, regularly bedded and laminated siltstone, argillite, and sandstone. These rocks are separated from other rocks within the map area by a major fault but are established to be late Precambrian in age in areas where upper contacts are exposed (Hayes, 1948; Jenness, 1963; McCartney, 1967).

The Swift Current Granite (7) is composed of a number of intrusive phases ranging from pink, equigranular, medium grained syenite and granite (7a) to dark grey and black medium to fine grained diorite and gabbro (7b). It is intrusive into rocks of the Love Cove and North Harbour Groups but, because of poor exposure, the nature of its contact with rocks of the Musgravetown Group could not be established. The granite has yielded a whole rock Rb-Sr age of 510 ± 20 million years using a decay constant of 1.47×10^{-11} yr^{-1} for ^{87}Rb (Bell & Blenkinsop, 1975).

The Musgravetown Group (8) is exposed in the eastern part of the map area. It consists of green to grey, graded and cross-bedded sandstone, pebbly sandstone, conglomerate and grey to black, thinly bedded sandstone and shale. Towards the top of the group there are purple to red, graded and cross-bedded sandstone, conglomerate and shale. The Random Formation (9) overlies the Musgravetown Group conformably; it consists of white orthoquartzite, quartz sandstone with interbedded dark grey to green micaceous siltstone, and fine grained sandstone. The siltstone members contain trace fossils in the form of worm trails and burrows. Rocks of the Bonavista Formation (10) overlie the Random Formation conformably and are characterized by reddish brown and pale green shale and slate with many nodules and nodular beds of pink algal limestone. The limestones contain fossils consisting mainly of the shelly fauna hyolithids. The formation is preserved in discontinuous remnants around North Harbour and Come by Chance and in the northeastern part of the map area along the old Goobies-Terrenceville Road.

The Powder Horn Diorite Complex (11) intrudes and hornfelses rocks of the Musgravetown Group and consists of green to black, medium grained diorite and gabbro associated with green fine grained diabase. Also intimately associated with the mafic rocks are silicic phases consisting of pink to grey, fine grained granite and felsite.

The Sall the Maid Granite (13) comprises a number of discontinuous intrusive bodies which intrude rocks of the Bonavista Formation, Musgravetown Group and North Harbour Group around North Harbour. It is composed of pink to orange and grey, equigranular, medium grained alaskite, granite, and granodiorite. A contact metamorphic aureole is developed in places and is especially evident where the red and green shales of the Bonavista Formation have been metamorphosed to a black hornfels.

STRUCTURAL GEOLOGY

The system of faults between Baker Cove and the northeast corner of the map area juxtapose two belts of contrasting structural styles. The northwest belt consists of deformed and metamorphosed intrusive, volcanic and sedimentary rocks which contrast sharply with the relatively undeformed sedimentary and intrusive rocks to the southeast.

The rocks of the northwest belt have been isoclinally folded and are overprinted by a strong penetrative north to northeast trending, steeply dipping foliation. Within the intrusive rocks the foliation varies in intensity; it is locally well defined by elongated quartz, broken feldspar and aligned chloritized mafic minerals, but it is faint to nonexistent in large portions of the massive granitic bodies. The rocks have undergone low greenschist metamorphism with recrystallized

chlorite and sericite defining the schistosity. Locally, the rocks are refolded by small scale structures overturned to the east.

Rocks of the southeastern belt are gently to steeply dipping and are generally involved in open folds with northeast trending axes. A steeply dipping cleavage, with minor recrystallized sericite along cleavage planes, has been developed in shale units but it is not evident in the more massive sandstones. Fossils have been preserved in their original shapes, indicating no internal flattening. Rocks which exhibit large competency contrasts such as the interbedded quartzites and siltstones of the Random Formation are tightly folded locally with an east directed overturning of similar orientation to refolds in the northwest belt.

MINERALIZATION

There are few mineral showings within the map area. Chalcocite and fluorite occur disseminated in granite northwest of North Harbour. Also, in the same area, chalcocite occurs in quartz-epidote veins and along cleavage planes in volcanic and sedimentary rocks of the North Harbour Group. Minor occurrences of copper sulfides were found in quartz veins cutting the Musgravetown Group. Minor showings of specular hematite are present in quartz veins along the eastern margin of the Swift Current Granite.

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