# GRANITE GEOCHEMISTRY PROJECT-BAY D'ESPOIR AREA

by P. Elias

## INTRODUCTION

The Bay d'Espoir Granite Geochemistry Project was started in 1978 (Elias, 1979). Twelve intrusions, mostly granitoid, were sampled and analyzed. During the 1979 season, the field aspect of the project was completed with the mapping and sampling of two additional plutons in the Twillick Brook (2D/4) and Burnt Hill (2D/5) map areas. Plutons sampled so far are shown in figure 1. The project continues to be a joint undertaking between the Mineral Development Division and the Geology Department, Memorial University of Newfoundland.

## MAPPING AND SAMPLING

Mapping of the Partridgeberry Hills and Through Hill plutons on a 1:50,000 scale was completed during the 1979 field season by Colman-Sadd (this volume). Sample locations were obtained by means of a slightly modified version of an inverted nested grid sampling method (Garrett and Goss, manuscript). Sample locations within 4 $km^2$ grids were selected on an opportunity basis where outcrop distribution warranted. 71 samples were taken from the Partridgeberry Hills Granite and 19 from the Through Hill granite.

## ANALYTICAL AND OTHER WORK

The granite samples collected will be examined petrographically and analysed for all major elements in addition to the following trace elements:

Ba Be Ce Cr Cu F Ga La Li Mo Nb Ni Pb Rb S Sr Th U V Y Zn Zr.

The following preliminary results are reported on the basis of follow-up work on plutons sampled in 1978.

1. Provisional calculations on an eleven-point Rb-Sr whole rock isochron yield an age of 344±52 Ma for the Gaultois Granite. Refinement of the calculations, currently underway, should considerably reduce the uncertainty factor (52 Ma) associated with the age. The initial ratio of $Sr^{87}:Sr^{86}$ was 0.7105.

2. Attempts to erect an eleven point isochron for the North Bay Granite and associated intrusions have been less successful. Data points define three separate subparallel isochrons yielding a provisional age of *ca.* 420 Ma and initial ratio of 0.7065. Further processing of the data is in progress.

3. Samples from the Long Pond diorite, Missing Island Granodiorite and the North Bay Granite (all in the Twillick Brook map area) plot on a six point Rb-Sr whole rock isochron, indicating the same age for them (420 Ma), and a probable genetic relationship.

4. It is proposed to establish a ten point Rb-Sr whole rock isochron for the Partridgeberry Hills Granite. Samples for this project have already been collected.

5. The southeast equigranular and Northwest Cove Granites are virtually identical in chemistry, mineralogy and texture. They probably have a close genetic relationship, and may even belong to the same pluton.

LEGEND

1 Piccaire Granite: Massive equigranular biotite granite.

2 Gaultois Granite: Foliated megacrystic biotite granite.

3 Northwest Cove Granite: Foliated muscovite-biotite granite.

4 Straddling Granite: Foliated muscovite-biotite granite.

5 Southeast equigranular granite: Foliated muscovite-biotite granite.

6 Dolland Bight Granite: Foliated muscovite-garnet granite.

7 North Bay Granite: Mildly foliated biotite-muscovite granite and granodiorite.

8 Missing Island Granodiorite: Massive biotite granodiorite.

9 Long Pond diorite: Massive hornblende diorite.

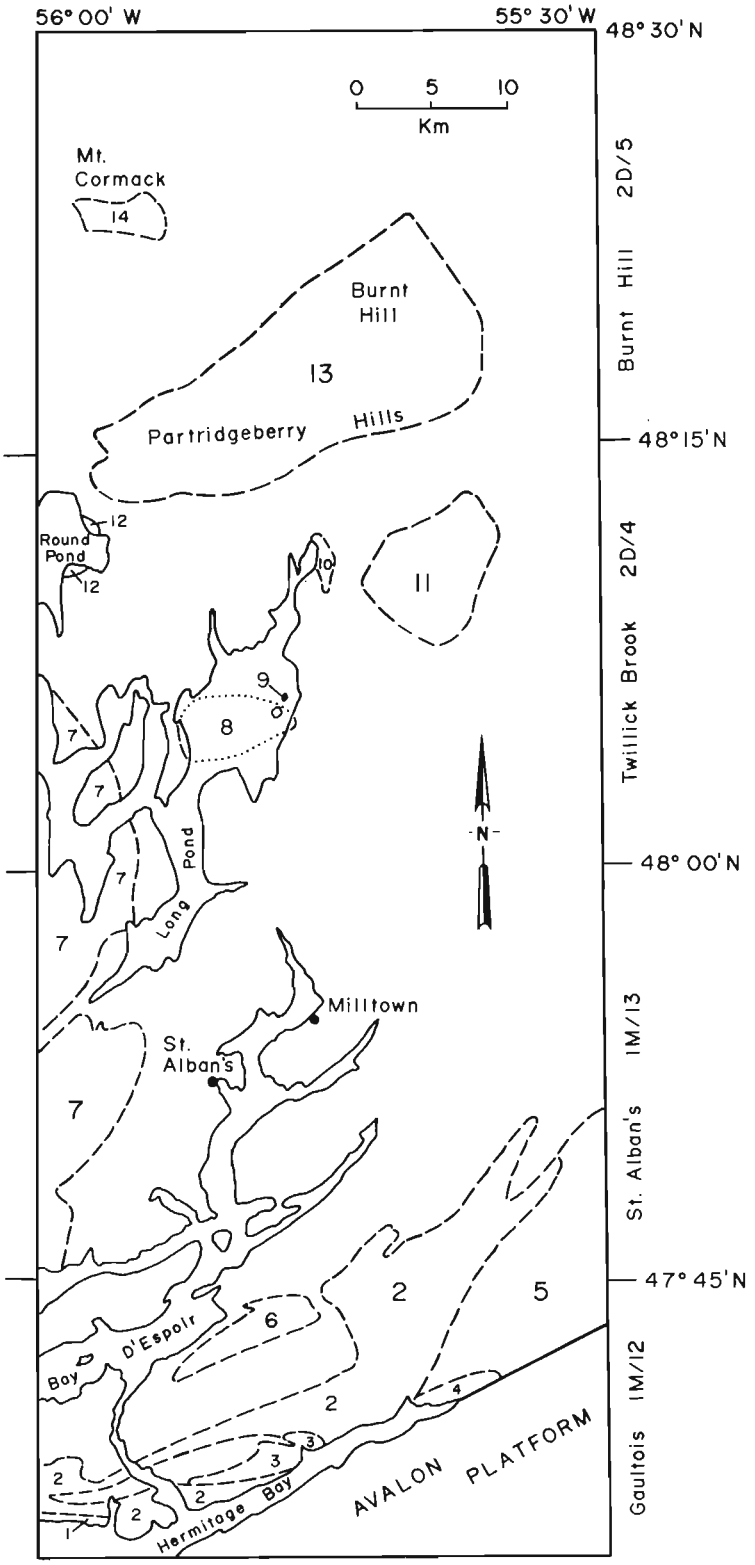
10 Rocky Bottom Tonalite: Massive biotite tonalite.

11 Matthews Pond Granodiorite: Massive biotite granodiorite.

12 Round Pond Gabbronorite: Mildly foliated gabbro and granodiorite.

13 Partridgeberry Hills Granite: Mildly foliated biotite granite and granodiorite.

14 Through Hill granite: Massive muscovite - garnet granite.



6. Except for small showings of molybdenite in pegmatites associated with the North Bay Granite, and a small fluorite occurrence in the southeast equigranular granite, the granites are devoid of economic mineralization. Radioactivity counts are about 100-200 cps. Beryl and apatite occur only rarely in pegmatites most of which are otherwise barren, despite their abundance.

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REFERENCES

Elias, P.
1979: Granite geochemistry project-Bay d'Espoir area. *In* Report of Activities for 1978. *Edited by* R.V. Gibbons. Newfoundland Department of Mines and Energy, Mineral Development Division, Report 79-1, pages 35-37.

Garrett, R.G. and Goss, T.I.
manuscript: UANOVA: A Fortran IV program for unbalanced nested analysis of variance. Submitted to Computers and Geosciences.