

MEMORIAL AND DIMENSION STONE

by

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INTRODUCTION

During the second season of a two year program to assess the dimension stone potential of Insular Newfoundland, the gabbros and granites of the Mount Peyton Batholith in Central Newfoundland were examined. The determination of the mafic gabbro's potential as a source of memorial stone (industry's 'black granite'), is the primary concern of this study. The rock was assessed for its color and textural qualities which must be in keeping with the high degree of aesthetic beauty needed for use in the monumental stone industry. Structural qualities were studied to see if sufficient size slabs are available to quarry. A minimum block size of 1.0 m x 1.2 m x 1.5 m is considered economic by most major stone operations.

LOCATION - ACCESS

The Mount Peyton Batholith is located in Central Newfoundland between the towns of Glenwood and Bishops Falls and is bounded on the south and east by the Northwest Gander River valley and on the west by the Rattling Brook valley. The northwestern section is bordered by the Trans Canada and Bay d'Espoir highways, to which are connected numerous logging roads offering good access. The remainder of the batholith, with the exception of Mount Peyton itself, is low lying, offering little exposure and is less accessible by road.

GEOLOGICAL HISTORY

The Mount Peyton Batholith is an elliptical intrusive complex which has an outcrop area of 30 x 60 km. The Devonian batholith has intruded volcanics and sediments of the Silurian Botwood and Ordovician Davidsville Groups.

The batholith consists of two main phases: (1) a dark green to black pyroxene gabbro and (2) a pink granite phase which intrudes the gabbro. The gabbro and granite are believed to have separate origins of derivation from the upper mantle and crustal anatexis, respectively, rather than a common origin due to fractionation (Strong, 1979).

FIELD WORK

The study concentrated on the northwestern section of the batholith, centred around Borney Lake and Rattling Lake, where outcrop is well exposed along a series of NE-SW striking ridges. After three weeks of mapping and traversing the area, five areas having the greatest potential were selected to be studied in further detail. The fracture patterns of the potential quarry sites were mapped in detail and samples from each area were collected for polishing and for thin sections. Several shallow holes were drilled with a packsack diamond drill to test the quality of the stone and the continuity of joint patterns at depth.

PRELIMINARY RESULTS

The following five areas of the Mount Peyton Batholith show some potential for the removal of large blocks of gabbro. The gabbro at these five locations are similar in structure and texture and differ mainly in the degree of jointing and weathering. There are also minor mineralogical differences.

(1) Black gabbro outcrops at five or six locations along the southeastern shore of Borney Lake. These outcrops are spread out over a half kilometre of shoreline.

The rock is massive and jointed. Two joint directions, one parallel (32°) and one perpendicular (112°) to the shoreline and fracturing, are the only structural features present. A 1 m joint interval is present in half the outcrop area, with at least one 2 m x 2 m joint free area in each outcrop.

The rock is black and fine grained with modal mineralogy as follows:

| | |
|---------------------|-----|
| Plagioclase | 50% |
| Pyroxene | 40% |
| Quartz | 7% |
| Opagues (Magnetite) | 3% |

(2) A small outcrop approximately 10 m x 10 m is exposed one kilometre north of Borney Lake, beside a logging road and less than one kilometre from a power line.

Few joints are present on surface or to a depth of 6.5 m. Surface joints strike 100° and 031° which are similar to the joint pattern of the outcrops beside Borney Lake. The rock is black, massive, fine grained (0.5 - 1.0 mm) and similar to the rocks at Borney Lake. Mineralogy is as follows:

| | |
|--------------------|-----|
| Plagioclase | 50% |
| Pyroxene | 30% |
| Hornblende | 15% |
| Opaque (Magnetite) | 3% |
| Quartz | 2% |

(3) Gabbro outcrops on the north side of the Trans Canada Highway near Norris Arm and extends for 35 m. This rock is massive and although the jointing is regular and closely spaced, the degree of fracturing and jointing due to blasting is uncertain.

The gabbro is black and fine grained (0.5 to 1.0 mm) and consists mainly of plagioclase and pyroxene. This outcrop was studied as it is well exposed but should not be considered a potential quarry site due to the close proximity to the Trans Canada Highway.

(4) A large 60 x 20 m gabbro outcrop is located 200 m south of the Trans Canada Highway along the Rattling Brook, near Norris Arm.

The joint pattern is regular with a well developed joint set at 50° . Dips of 45° and 90° are associated with this joint direction. A second poorly developed joint set strikes perpendicular to the first.

The joint interval ranges from 1 m to 4 m for the well developed joint set and 4 to 8 m for the poorly developed set.

The rock is black, massive and fine grained. Quartz veinlets and stringers striking 50° appear to be associated with one joint direction. Mineralogy is as follows:

| | |
|--------------------|-----|
| Plagioclase | 50% |
| Pyroxene | 25% |
| K-feldspar (white) | 20% |
| Opaque (Magnetite) | 5% |

(5) An outcrop of massive and moderately well jointed gabbro is located on the northwestern shore of Amy's Lake. The joint interval is closely spaced in sections of the outcrop, but in other sections, the joints form sufficient sized blocks.

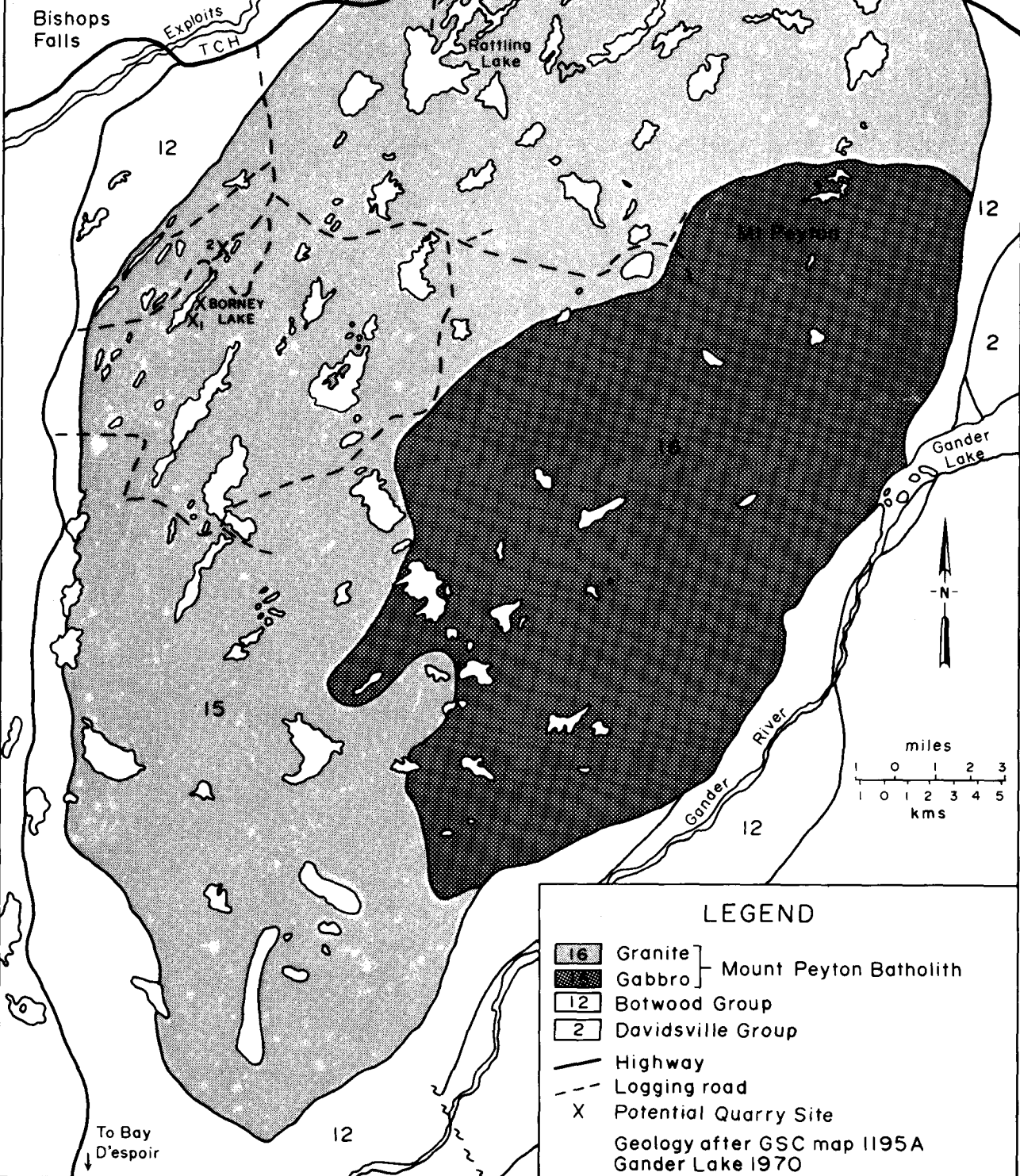
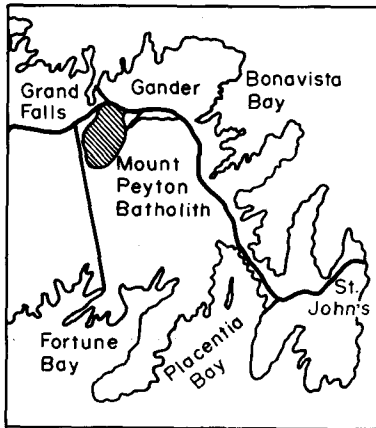
Small veinlets of leucogabbro occur within the dark gabbro, but these can be easily removed by trimming of the slabs after quarrying. The mineralogy is as follows:

| | |
|--------------------|-----|
| Plagioclase | 50% |
| Pyroxene | 30% |
| Hornblende | 15% |
| Opaque (Magnetite) | 5% |

OTHER AREAS

Granite outcrops near Seal Cove on the Hermitage Peninsula. The rock is massive, even textured, medium grained and is a deep red colour. The joints are well spaced and form blocks larger than 4 m x 4 m.

THE MOUNT PEYTON BATHOLITH, NEWFOUNDLAND
POTENTIAL DIMENSION STONE QUARRY SITES



LEGEND

| | | |
|--|-----------------------|--------------------------|
| 16 | Granite | } Mount Peyton Batholith |
| | Gabbro | |
| 12 | Botwood Group | |
| 2 | Davidsville Group | |
| — | Highway | |
| - - - | Logging road | |
| X | Potential Quarry Site | |

Geology after GSC map 1195A
Gander Lake 1970

The Grole Diorite outcrops in this area adjacent to the granite. This dark stone is highly desirable because of its colour and even fine grained texture. However, the rock is highly fractured and not suitable for memorial stone. This rock would make an excellent 'black granite' if suitable massive outcrops are discovered.

CONCLUSION

At this stage in the study, all areas mapped in detail show some potential as quarry sites for dimension and monumental stone. Further tests are

needed to determine the aesthetic properties of the stone after slabbing and polishing. Thin section studies will give additional mineralogical data to determine the degree of alteration of the pyroxene and feldspars.

REFERENCE

- Strong, D.F.
1979: The Mount Peyton Batholith, Central Newfoundland: A Bimodal Calc-Alkaline Suite. Journal of Petrology, Volume 20, Part 1, pages 119-138.