GEOLOGY OF THE GREAT GULL LAKE (2D/6) - DEAD WOLF POND AREA (2D/10), NEWFOUNDLAND

by

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INTRODUCTION

The Great Gull Lake (2D/6) map area and the west half of the Dead Wolf Pond (2D/10) map area (that part underlain by the Middle Ridge Granite) were mapped on a 1:50,000 scale during the 1981 field season. This completes field work for the Gander Rivers Project, initiated in 1978 to map the GRUB line and adjacent rocks from the mouth of Gander River in the northeast to Great Gull Lake in the southwest.

The northern half of the Dead Wolf Pond (2D/10) area (Figure 1) is accessible from an old, rough woods road that branches off the Trans Canada Highway near Gambo and runs approximately east-west through the map area along the north side of Dead Wolf Pond. The southwestern part of this area as well as the area north and east of Great Gull Lake in the Great Gull Lake (2D/6) area (Figure 2) were mapped by fly-camps positioned by fixed wing aircraft and helicopter. The western part of the Great Gull Lake area is readily accessible from the Bay d'Espoir Highway.

Bedrock exposure is fair in the Middle Ridge Pond area but extremely poor in the western part of the Great Gull Lake map area. The Middle Ridge Granite is generally poorly exposed; the best areas of outcrop occur southeast of Dead Wolf Pond and east of Caribou Lake in the Dead Wolf Pond map area and south of Little Gander Pond and northwest of Newton Lake in the Great Gull Lake map area.

The northern part of the Middle Ridge Granite (Figure 1) was mapped on a one inch to four miles scale by Jenness (1963) for the Geological Survey of Canada. He showed it as intrusive into the Ordovician Gander Lake Group. The southern part of the granite was outlined by Anderson and Williams (1970) as part of a regional Geological Survey of Canada 1:250,000 mapping program that included all the Great Gull Lake map area. A pronounced metamorphic aureole was indicated around the Middle Ridge Granite and a smaller granite body at Third Berry Hill Pond. They also defined some of the ultramafic rocks and a quartz-feldspar porphyry, interpreted as intrusive or extrusive in Ordovician metasedimentary rocks of the Gander Lake Group. Sedimentary rocks in the northwestern part of the Great Gull Lake map area were indicated as undivided Ordovician and Silurian. The south-eastern part of the West Gander Rivers area (2D/11), *i.e.* the area west of the Middle Ridge Granite (Figure 1), was mapped in 1980; for details see Blackwood (1981).

GENERAL GEOLOGY

The map areas comprise six major subdivisions:

(1) Lower Ordovician or earlier ultramafic rocks (1).
(2) Lower Ordovician or earlier sedimentary rocks of the Gander Group (2, 3).
(3) Middle Ordovician volcanogenic and associated sedimentary rocks (4, 7).
(4) Middle Ordovician and later sedimentary and volcanic rocks of the Davidsville Group (8-10).
(5) Ordovician or Silurian sedimentary rocks (11, 12).
(6) Devonian granitic rocks of the Middle Ridge Granite (13-15),

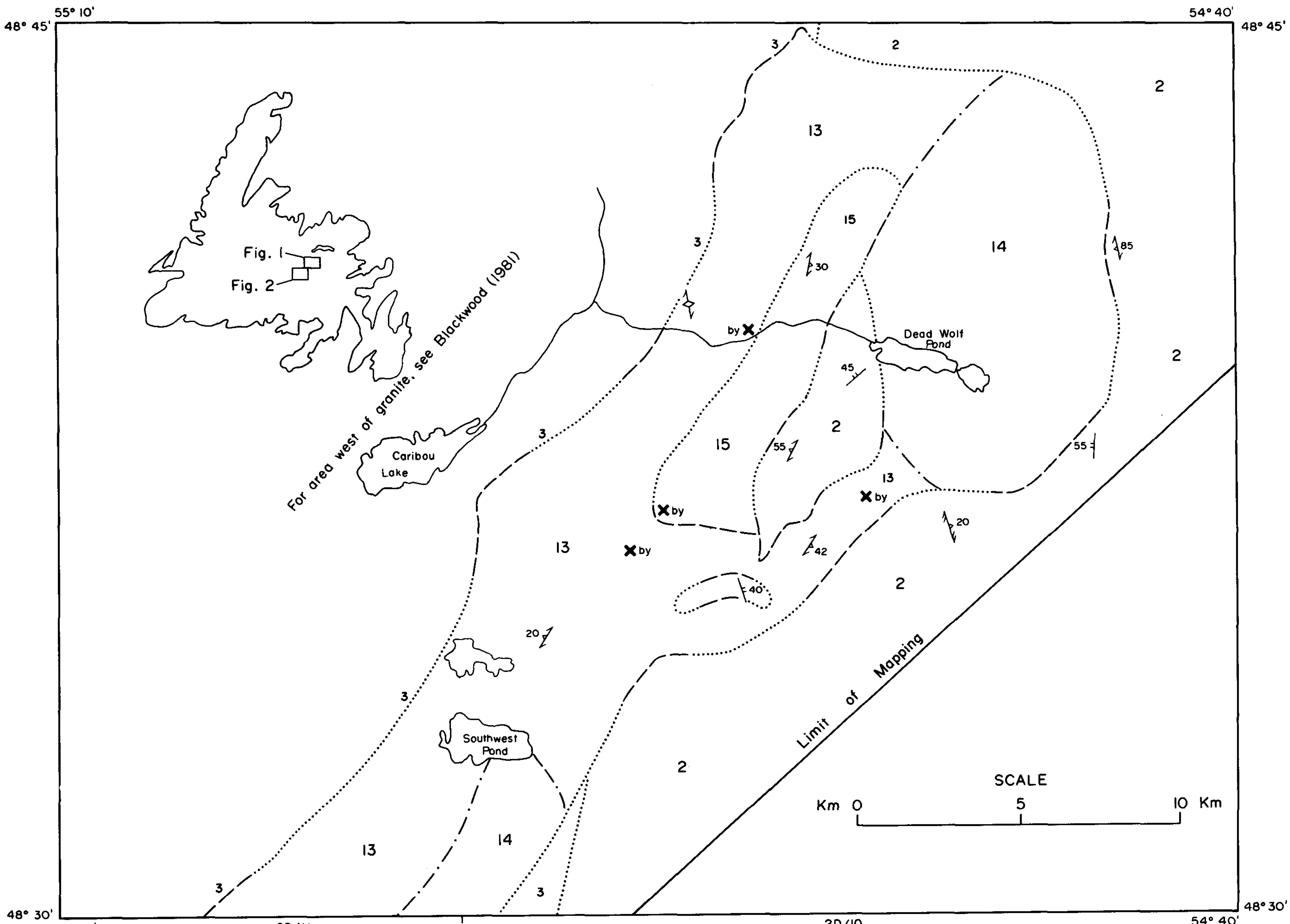

FIG. 1 DEAD WOLF POND

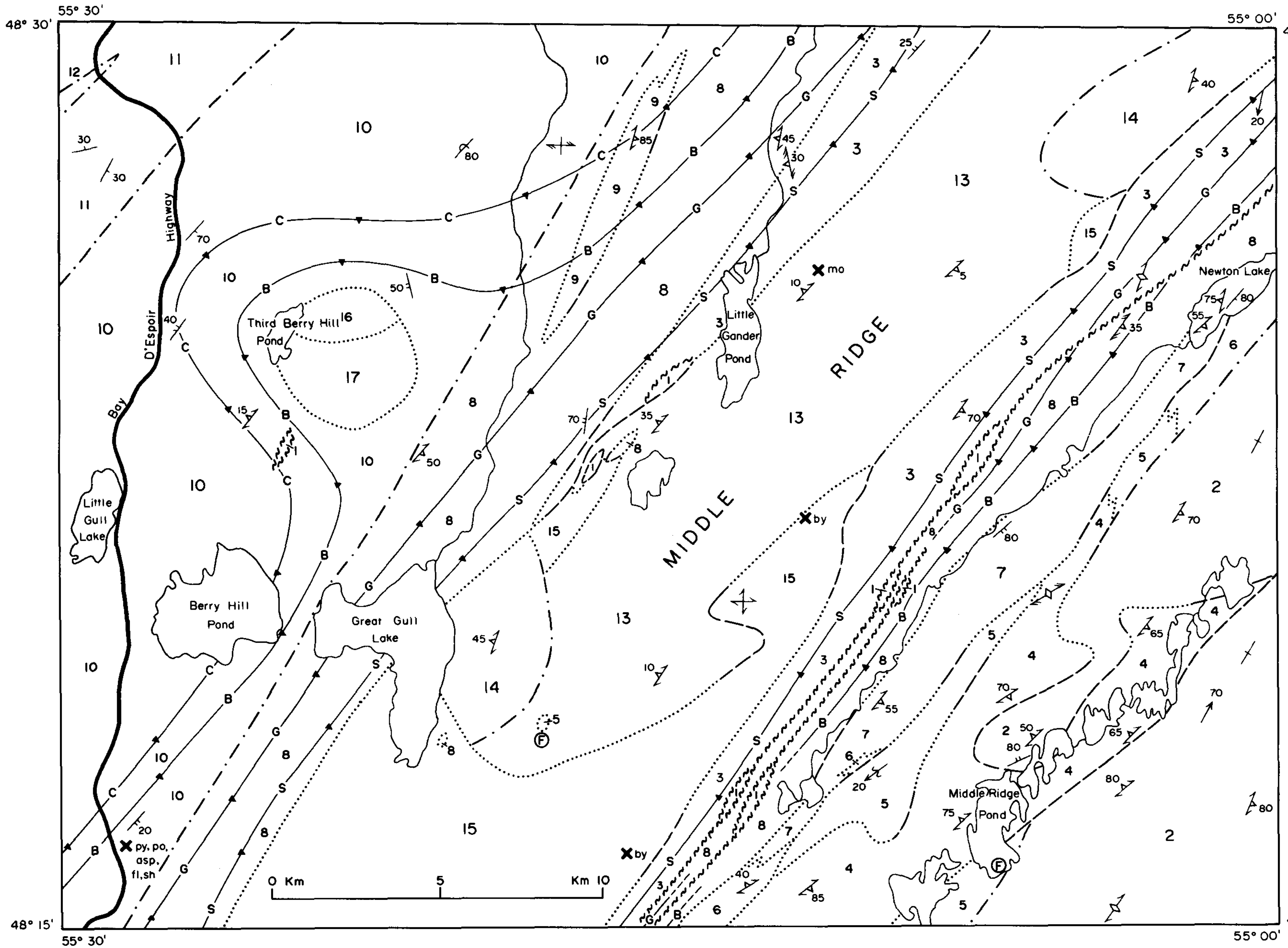

FIG. 2 GREAT GULL LAKE

LEGEND

DEVONIAN (?)

THIRD BERRY HILL POND GRANITE (16 and 17)

17 Fine to medium grained, muscovite greater than biotite, garnetiferous leucogranite. Locally contains quartz and feldspar phenocrysts.

16 Coarse grained, feldspar porphyritic, biotite granite.

MIDDLE RIDGE GRANITE (13 - 15)

15 Fine grained to pegmatitic, muscovite greater than biotite, garnetiferous, leucogranite.

14 Coarse grained, feldspar porphyritic, muscovite-biotite granite with rare garnets.

13 Medium to coarse grained, muscovite-biotite granite with minor garnets.

ORDOVICIAN OR SILURIAN

12 Polymictic conglomerate.

11 Laminated siltstone and minor, fine grained, thinly bedded sandstone.

MIDDLE ORDOVICIAN AND LATER

DAVIDSVILLE GROUP (8 - 10)

10 Fine to coarse grained, thickly bedded graywacke interbedded with gray siltstone and slate.

9 Blue quartz-feldspar porphyry.

8 Slate and thinly bedded siltstone.

7 Polymictic conglomerate and sandstone.

6 Mafic to intermediate volcaniclastic rocks, felsic crystal lithic tuff and minor basalt.

5 Graphitic slate and gray siltstone.

4 Quartz-feldspar porphyry with a fine grained greenish-gray matrix.

LOWER ORDOVICIAN OR EARLIER

GANDER GROUP (2 and 3)

3 Psammite, semipelite and pelite with minor concordant amphibolite bands and minor quartzite.

2 Fine to coarse grained, light gray, arkosic sandstone with minor gray slate and grayish-white quartzite; psammite.

1 Serpentinite, minor magnesite, pyroxenite and peridotite.

SYMBOLS

Mineral isograd, approximate position (cordierite, biotite, garnet, staurolite) . . . . C.B.G.S

MINERAL OCCURRENCES

Pyrite	py
Pyrrhotite	po
Arsenopyrite	asp
Molybdenite	mo
Beryl	by
Scheelite	sh
Fluorite	fl

and the Third Berry Hill Pond Granite (16, 17).

ULTRAMAFIC ROCKS (UNIT 1)

Ultramafic rocks and their altered equivalents occur in narrow, northeast trending fault slivers on either side of Middle Ridge. One body forms a large raft in the Middle Ridge Granite southwest of Little Gander Pond and a single occurrence of peridotite was mapped north of Berry Hill Pond. These rocks are interpreted as being correlatives of the GRUB line (Blackwood, 1979) defined in the north-northeast.

Serpentinite and pyroxenite constitute most of the zones adjacent to Middle Ridge. The light brown weathering serpentinite (possibly originally peridotite) contains relict pyroxene crystals and locally a fish-scale structure is developed. The tan weathering pyroxenite is generally massive. Talc, tremolite and magnesite are variably developed in association with these ultramafic rocks. A 2 to 4 mm spaced cleavage is locally developed in the serpentinite; it becomes a pronounced schistosity in serpentinite and magnesite along faulted contacts east of Middle Ridge. All these rocks exhibit hornfels textures related to the intrusion of the Middle Ridge Granite, particularly the enclave and zone adjacent to the granite contact southwest of Little Gander Pond. The serpentinite is recrystallized to form a pseudo-spinifex texture (Evans and Trommsdorff, 1974) with 1-4 cm long and 1-2 mm wide, olivine crystals that are disposed in a radiating, criss-crossing pattern. The interstitial material is probably antigorite and commonly triangular in shape. Also, talc rosettes overprint the foliation in talc-tremolite schist. The grayish brown weathering peridotite north of Berry Hill Pond is massive.

GANDER GROUP (UNITS 2 AND 3)

The Gander Group (McGonigal, 1973) occurs on either side of the Middle Ridge Granite and also in the southeast corner of the Great Gull Lake map area. In the latter area, it consists of fine to medium grained, light gray to white weathering, arkosic sandstone (Unit 2). The sandstone is interbedded locally with minor quartzite, siltstone and slate. A clastic texture commonly marks the arkose and quartzite with well rounded and equigranular quartz grains being locally quite prominent. Bedding generally varies from 30 to 50 cm thick, but may be as thin as 1 to 3 cm or as thick as 2 m; crossbedding occurs locally. Siltstone beds, 2 mm to 3 cm thick, are interbedded with the sandstone. Minor, 25 to 30 cm thick conglomerate beds containing mostly arkose clasts also occur. Unit 2 occurs east and north of the Middle Ridge Granite in the Dead Wolf Pond map area and forms two large enclaves within the granite. It mostly comprises fine grained, gray psammite and semipelite in that region. The psammite commonly contains a fine, 1 to 3 mm wide pinstripe banding defined by disoriented biotite porphyroblasts.

The main foliation is a widely spaced, 2 mm to 2 cm, phyllitic cleavage which overprints Unit 2 south of Newton Lake (Figure 2). It transposes a finer bedding parallel foliation and is axial planar to variably plunging, moderate to tight folds. The main fabric is mimetically recrystallized to form fine to medium grained muscovite-biotite schists where Unit 2 is adjacent to the Middle Ridge Granite in the Dead Wolf Pond area.

Unit 3 occurs adjacent to the western contact of the Middle Ridge Granite (Figures 1 and 2) and also along the granite's eastern contact in the Great Gull Lake map area. It is generally more pelitic than Unit 2 and is conformable with that unit along the south shore of Gander Lake in the northeast (Blackwood, 1980). Unit 3 comprises psammite, semipelite and pelite beds that are 8 to 40 cm thick; the psammite commonly contains 1 to 4 mm laminations. Minor, 12 cm thick, quartzite beds occur locally. However, the most distinctive aspect of Unit 3, and the main reason for separating it from Unit 2, is the presence of rare 30 cm wide concordant amphibolite bands. These bands are conformable with the enclosing metasediments and are interpreted to represent mafic volcaniclastics.

Unit 3 occurs within the metamorphic aureole of the Middle Ridge Granite and consequently is dominated by hornfels textures. Staurolite porphyroblasts range from 4 mm to 2 cm in length and are common in pelitic units. Garnet and biotite occur throughout, with the latter commonly forming oriented, 2 to 6 mm long, tabular porphyroblasts. Disoriented biotite also accentuate the laminations in recrystallized psammite. These porphyroblasts overprint the mimetically recrystallized main foliation. Locally, a widely spaced strain-slip cleavage appears to form augen around some of these porphyroblasts.

VOLCANOGENIC AND ASSOCIATED SEDIMENTARY ROCKS (UNITS 4-7)

Porphyry, flows, tuffs, conglomerate and slate form a northeastward thinning wedge in the Middle Ridge Pond - Newton Lake area (Figure 2). These rocks are conformable with Unit 2 of the Gander Group and represent an abrupt change in lithofacies from the relatively mature arkosic sandstones. The Gander Group is succeeded by the Middle Ordovician Davidsville Group to the north where the change in lithofacies occurs in a fairly regular fashion from east to west and without much of a volcanogenic component. The facies change in the Middle Ridge Pond - Newton Lake area is more easterly situated and interpreted to represent a southwestward interdigitating of the Gander Group with Middle Ordovician volcanics and turbidites.

Unit 4 is a quartz-feldspar porphyry that occurs in the Middle Ridge Pond area. It contains subhedral to euhedral quartz and plagioclase phenocrysts that are generally evenly distributed in a fine grained, steel gray to grayish green, felsic matrix. The quartz phenocrysts range from 1 to 7 mm across and are translucent to milky white. They commonly are square or triangular in cross-section with dipyramidal shapes occurring locally. The plagioclase phenocrysts range from 2 mm to 1.5 cm across and are light green. They generally have rectangular or square outlines and locally contain oscillatory zoning. The relative abundance of quartz and feldspar phenocrysts varies slightly for different parts of the unit. Chlorite and disseminated pyrite are locally developed in the matrix. Finer grained versions of the porphyry (phenocrysts are less than 4 mm across) were observed in two contact areas, east and north of Middle Ridge Pond. Its eastern contact is concordant with arkosic sandstone (Unit 2) of the Gander Group; the fine grained porphyry is locally fragmental along its contact with conglomerate north of Middle Ridge Pond and apparently grades into it. Unit 4 is interpreted as a synsedimentation intrusive porphyry and/or a porphyritic lava flow.

The porphyry varies from strongly foliated to undeformed. Where most intensely developed, the fabric has a cataclastic component marked by a well developed augen structure and streaked feldspar. The undeformed parts of the porphyry are generally marked by a coarse grained phenocryst rich phase. Generally a weak to moderate foliation overprints the unit. Locally, the main fabric is transposed by a strain-slip cleavage. This is best seen in the fine grained porphyry phase where the main fabric is also well developed.

Unit 5 consists of interbedded slate and siltstone. Beds in the slaty material are 0.5 to 6 cm thick; the more siliceous, silty interbeds are approximately 12 cm thick. The area along and south of Middle Ridge Pond is marked by black graphitic slate and siltstone containing graptolite fragments. These fossils have been dated as Middle Ordovician (Anderson and Williams, 1970). Similar graphitic slate occurs south of Newton Lake where it is gradational over 5 m with light gray bedded psammite similar to Unit 2. Graptolitic slate also forms a raft in the Middle Ridge Granite east of Great Gull Lake. A strong slaty cleavage overprints most of Unit 5; the enclave in the Middle Ridge Granite is hornfelsed with fine grained white mica replacing the graptolites.

Unit 6 consists mostly of mafic to intermediate volcaniclastic rocks, including some felsic tuffs. The volcaniclastic rocks are fine to coarse grained and green to grayish green. Feldspar and quartz grains range from 1 to 3 mm across and occur in a chloritized matrix. Locally, isolated epidotized clasts up to 20 cm long occur and are interpreted as volcanic bombs. Pinkish white to purplish red crystal lithic tuff is developed locally in the southernmost outcrop area of Unit 6. It contains quartz and feldspar fragments less than 3 mm across and lithic clasts 0.5 to 1.5 cm long. These rocks are interlayered in the same area with mafic tuffs (which contain siliceoeus lithic clasts) and mafic flows. The massive(?) flows are basaltic and/or andesitic in composition and generally porphyritic, with 1 to 3 mm plagioclase phenocrysts. They are also locally vesicular or amygdaloidal, containing calcite and epidote amygdules. A sericite or chlorite foliation is well developed throughout Unit 6.

Unit 6, southeast of Newton Lake, is gradational with the quartz rich sandstones of Unit 2 and elsewhere is interbedded in the contact area with slates of Unit 5.

Unit 7 comprises gray polymictic conglomerate and interbedded sandstone which occurs in a linear belt southwest of Newton Lake. Clasts in the conglomerate consist of fine grained, light gray, felsic volcanics, psammite, arkose, slate and quartz-feldspar porphyry similar to Unit 4. Rare, soft, black clasts of chlorite and/or serpentinite also occur. The clasts are matrix supported, angular to round, poorly sorted, and range from 0.5 to 35 cm in diameter; most, however, are pebble size. Medium to coarse quartz and feldspar grains generally form the matrix. Locally, however, the matrix is very fine grained, suggesting some sort of debris flow. The conglomerate is not well bedded, but where developed, *e.g.* Newton Lake area, bedding varies in thickness from 30 cm to 1.5 m. Interbedded sandstone and pebbly siltstone occur as 2 to 20 cm thick beds. Fine grained quartzite (containing minor, bright green, fuchsite bearing clasts) is interbedded with rare reddish brown conglomerate in the Newton Lake area. Laminated siltstone, black slate and granule conglomerate containing blue quartz grains occcur with pebble conglomerate along the lake shore. A pronounced cleavage overprints the conglomerate; locally, clasts are flattened and form augen structures in the foliation planes.

Unit 7 overlaps Units 4, 5 and 6 and forms a westward limit for this volcanogenic-sedimentary assemblage. It is the youngest unit of the four since it contains detritus from the others, particularly the quartz-feldspar porphyry. This implies a general westward facing direction for this assemblage of rocks.

DAVIDSVILLE GROUP (UNITS 8-10)

The Davidsville Group (Kennedy and McGonigal, 1972) occurs west of Middle Ridge except for a narrow belt of slate and siltstone, tentatively included in the group, that occurs east of Middle Ridge (Figure 2). It is interpreted to conformably overlie the Gander Group (Blackwood, 1980) except where contacts are fault modified in association with emplacement of ultramafic rocks, *e.g.* east of Middle Ridge.

Unit 8 forms a linear belt on each side of Middle Ridge. It consists of grayish black to gray slates, pelite and semipelite with interbedded siltstone and minor fine grained sandstone. The slates form 1 to 8 cm wide beds that commonly contain 2 to 6 mm laminations. Siltstone beds are generally light gray and 2 to 10 cm thick. Intensely foliated black pelite is generally found in fault contact with the ultramafic bodies. The main tectonic fabric in Unit 8 varies from a slaty-phyllitic cleavage to a muscovite-biotite schistosity, depending upon its proximity to the Middle Ridge Granite. Within the granite's metamorphic aureole, cordierite, biotite and garnet porphyroblasts are common. These minerals overprint the mimetically recrystallized schistosity. A locally developed strain-slip cleavage transposes the main foliation.

Thinly bedded slate and siltstone of Unit 8 are interpreted as conformable with Unit 3 of the Gander Group. In fact, the more pelitic top (Unit 3) of the Gander Group probably represents the transition between the mature arkosic sandstone of Unit 2 and distal turbidites of the Davidsville Group (Unit 8). Rocks included in Unit 8 east of Middle Ridge may be continuous with the volcanogenic and sedimentary assemblage in that area. However, contacts are not exposed and the presence of a local cataclastic fabric in the western part of Unit 7 conglomerates may indicate that a fault separates Units 7 and 8. Unit 8 is also separated from Unit 3 of the Gander Group by a zone of faulting and emplacement of ultramafics in that area.

Unit 9 forms a lens in Unit 8 northwest of Little Gander Pond (Figure 2). It is a quartz-feldspar porphyry consisting of blue quartz and plagioclase crystals, ranging from 2 to 8 mm across. Locallly, in the northeastern part of the unit, the crystals appear to form clasts of varying concentrations in a fine grained, phyllitic matrix. Here poorly developed bedding and minor interlayered slate occur, suggesting the porphyry originated as a crystal tuff. A penetrative foliation overprints Unit 9.

Unit 10 consists mostly of fine to coarse grained, locally graded, gray sandstone with minor granule conglomerate. Locally, interbedded gray siltstone and slate are quite prominent. Quartz, feldspar and minor cherty lithic clasts predominate in the sandstone (litharenite). Some quartz clasts have a blue hue in the poorly sorted granule conglomerate. Sandstone beds vary from 20 cm to 1 m in thickness and locally have 1 to 10 cm thick siltstone tops. The siltstone commonly contains 0.5 to 1 mm laminations. Locally, areas of thinner, interbedded, fine grained sandstone, siltstone and slate occur, *e.g.* west of Third Berry Hill Pond, where beds are 2 to 10 cm thick. Irregular laminations mark the central portions of some of the sandstone beds which grade into regularly laminated siltstone tops. A slaty to phyllitic cleavage or a fine grained schistosity overprints Unit 10, depending upon its spatial relationship to the metamorphic aureole around the Middle Ridge and Third Berry Hill Pond Granites. Biotite porphyroblasts are rare but cordierite and possibly andalusite are profusely developed in a classic fine grained, dark colored, flinty hornfels around the Third Berry Hill Pond Granite.

Unit 10 marks the top of the Davidsville Group in this area (Figure 2). It is interpreted to represent more proximal turbidites, which along Gander Lake are demonstrably conformable with the distal turbidites of Unit 8 (Blackwood, 1980).

UNITS 11 AND 12

The northwest corner of the Great Gull Lake map area is underlain by siltstone, sandstone (Unit 11) and conglomerate (Unit 12). These rocks are along strike with rocks defined as the Silurian Botwood Group (Williams, 1962) to the northeast (Blackwood, 1981) and are interpreted as possible Silurian (or Upper Ordovician) rocks in this area.

Unit 11 consists mostly of interbedded grayish green siltstone and fine grained sandstone. Beds range from 0.5 to 16 cm in thickness with well developed, regular bedding surfaces. Locally, beds have sandy bases that grade into thicker laminated (1-4 mm) siltstone tops. In some places, massive, medium to coarse grained, gray sandstone occurs. A slaty cleavage is axial planar to tight, recumbent folds. Locally differential movement along cleavage surfaces in the axial zone of these folds produces bedding displacements of a few centimetres.

Unit 12 is a light gray weathering, polymictic conglomerate. Clasts in the conglomerate consist of green and light to dark gray chert, chlorite bearing plagiogranite, grayish black slate and siltstone, gray sandstone, green laminated siltstone, feldspar porphyry, and minor leucogabbro; chert clasts are the most abundant. The poorly sorted clasts are matrix supported, well rounded (some with a high degree of sphericity) and range from 0.5 to 20 cm in diameter; most are pebble size. The matrix is coarse grained and consists of coarse grained, lithic sandstone. A fracture cleavage is locally developed.

MIDDLE RIDGE GRANITE (UNITS 13-15)

The Middle Ridge Granite (Strong *et al.*, 1974) forms a linear pluton that has a northeast-southwest trend throughout both map areas. It gives a whole-rock Rb-Sr isochron age of 370 $\pm$ 15 Ma (Bell *et al.*, 1977). The granite is subdivided into three phases based on variations in texture and composition.

Unit 13 consists of medium to coarse grained, crudely equigranular, muscovite-biotite granite that weathers white to pale pink. For the most part the two micas are equally developed. Minor red garnets, 1 to 2 mm in diameter, occur locally, as do large (0.5 to 4.0 cm across), disoriented biotite phenocrysts. Leucocratic aplite and pegmatite dikes are common.

Unit 14 consists of coarse grained, feldspar porphyritic, muscovite-biotite granite that is also white to pale pink weathering. Feldspar phenocrysts are rectangular to square in shape and range in length from 0.5 to 2.0 cm. They occur as clusters in glomeroporphyritic granite. Locally, the phenocrysts consist of plagioclase crystals which exhibit well developed oscillatory zoning. The relative amounts of muscovite and biotite varies, but the two are everywhere present; rarely, tiny red garnets occur. Leucocratic aplite and pegmatite dikes are common.

Unit 15 consists of white weathering, fine grained to pegmatitic, muscovite-biotite granite. Muscovite generally greatly exceeds biotite and locally biotite is not developed. Garnets are common in the leucogranite and vary from 1 to 5 mm in diameter. Minor tourmaline and beryl occur in parts of the unit. Aplite and pegmatite zones have diffuse boundaries with the fine to medium grained leucogranite.

Aplite and pegmatite dikes of similar composition to Unit 15 occur throughout the Middle Ridge Granite. These dikes range from a few centimetres to one metre in width and generally have regular, sharp contacts with the two-mica granite of Units 13 and 14. The pegmatite consists of quartz, white feldspar (up to 8 cm long) muscovite books (3 to 4 cm across) and garnet (locally up to 2 cm in diameter). Some pegmatite dikes have biotite books and one such dike contains a 10 x 30 cm zone of mostly biotite. Graphic intergrowths and/or myrmekite are common, locally in association with cone shaped masses of finely fibrous sillimanite. Minor tourmaline and beryl occur in both aplite and pegmatite dikes.

A pronounced metamorphic aureole surrounds the Middle Ridge Granite. Mineral isograds representing the appearance of cordierite, biotite, garnet and staurolite porphyroblasts, based on field observations only, are indicated for the Great Gull Lake area. These porphyroblasts overprint the regional foliations in the country rock; locally a strain-slip cleavage in the country rocks appears to form augen around some of them. The isograds west of the pluton are wider spaced than those to the east, indicating a relatively gentler dipping contact for the western margin (also no apophyses of granite occur east of the main pluton, whereas two, the Third Berry Hill Pond Granite and a small plug northeast of Caribou Lake (Blackwood, 1981), occur in the west.

The Middle Ridge Granite is weakly foliated to unfoliated, generally by a L-S fabric defined by partially oriented mica. In a few localities where the fabric is most pronounced, there is minor flattening of quartz in the foliation planes. The mica orientation generally dips gently to the east or west, towards the nearest margin, and parallels the granite contacts. Locally, a steep orientation occurs right at the contact and flat attitudes are measurable away from the contacts. This foliation is interpreted to be related to the intrusion of the Middle Ridge Granite such that it broadly conforms to the attitude of the granite/country rock boundaries. Thus, the gentle to flat mica orientations that occur within the granite would suggest that the exposed part of the pluton represents the top of the intrusion. The rafts in the Dead Wolf Pond area and in the Great Gull Lake area are probably roof pendants.

THIRD BERRY HILL POND GRANITE (UNITS 16 AND 17)

The Third Berry Hill Pond Granite is a small circular body that occurs west of the Middle Ridge Granite and is interpreted to be an apophysis of the larger pluton. Although granite outcrop is rare, the intrusion can be delineated by the profusion of white weathering boulder heaps. The granite is subdivided into two phases based on texture and composition.

Unit 16 consists of coarse grained, feldspar porphyritic, biotite granite. Feldspar phenocrysts range from 0.5 to 2 cm in length. Muscovite was not observed in hand specimen. The granite is unfoliated.

Unit 17 consists of fine to medium grained, muscovite greater than biotite, granite. Locally, the granite is porphyritic with globular, translucent, quartz phenocrysts that range from 4 to 7 mm in diameter and rectangular plagioclase phenocrysts that are up to 1.5 cm in length. Biotite is a minor component and rarely, fine grained biotite is concentrated in patches. Tiny red garnets are common. In one area, granite boulders contain vugs lined with blue, white and red botryoidal chalcedony. No foliation was observed.

CORRELATIONS OF UNITS TO THE SOUTH AND WEST

The geology of the Mount Sylvester (2D/3) map area to the south of Great Gull Lake (2D/6) was compiled by Swinden and Dickson (1981). Ultramafic rocks in that area (Unit 1) form an elliptical zone and occur along strike with ultramafic rocks (Unit 1) in the Great Gull Lake area. Arkose and psammite (Unit 2) of the Gander Group correlate with similar rocks (Unit 9) defined as part of the Baie d'Espoir Group (Jewell, 1939) to the south. These rocks are restricted to the northeastern corner of the Mount Sylvester map area and are interpreted by Swinden and Dickson (1981) and this writer to represent the southwestward termination of the Gander Group. Quartz-feldspar porphyry (Unit 4) in the Middle Ridge Pond area continues throughout the Mount Sylvester map area (Unit 10) where it is defined as part of the Twillick Brook Member (Colman-Sadd, 1980a). Units 3, 5, 6, 8, and 10 in the Great Gull Lake map area continue or pinch out in undivided sedimentary and minor volcanic rocks (Unit 2) in the Mount Sylvester map area. No outcrops of the Middle Ridge Granite occur in the boundary area of these two map areas. For this reason it is not indicated on the Mount Sylvester map, although Anderson and Williams (1970) assumed it terminated just south of that map's northern boundary.

The Great Gull Lake (2D/6) map area adjoins the Burnt Hill (2D/5) map area (Colman-Sadd, 1980b) to the west. Sandstone, siltstone and slate (Unit 10) which form the upper part of the Davidsville Group continue southwestward where they are defined as the North Steady Pond Formation (Unit 9) of the Baie d'Espoir Group. Felsic volcanic rocks (Unit 11a) in the Burnt Hill area are not exposed in the Great Gull Lake area and are interpreted by Colman-Sadd (personal communication, 1981) to pinch out near the boundary between the two map areas, possibly just northwest of Little Gull Lake. Rocks designated as Ordovician or Silurian (Units 11 and 12) in the northwest corner of the Great Gull lake map area are indicated as Ordovician Baie d'Espoir Group in the Burnt Hill area. The assumed contact between Units 10 and 11 (2D/6) extends into a poorly exposed area of Unit 9a (2D/5). Conglomerate of Unit 12 (2D/6) correlates well with conglomerates of Unit 10 (2D/5). The local mismatch in contacts is due to the poor exposure in this area and contrasting interpretations on the age of rocks. They are indicated as possible Silurian age in the Great Gull Lake map area because they are along strike with a belt of dated Silurian rocks (Anderson and Williams, 1970; Blackwood, 1979, 1980, 1981) and because the conglomerates of Unit 11 contrast ?rsharply with re-sedimented conglomerates noted elsewhere in the Middle Ordovician Davidsville Group. Unit 11 is, however, quite similar to conglomerates that occur along strike in association with the Silurian Botwood Group and are possible correlatives of the Upper Ordovician - Lower Silurian Goldson Formation (Twenhofel and Shrock, 1937).

MINERALIZATION

Beryl was found in a few localities in the Middle Ridge Granite. These showings are in the more evolved leucocratic phase of the granite (Unit 15) or in nearby dikes of the same material. The beryl occurs as small aquamarine crystals that range from 0.2 to 0.7 mm in cross-section. One occurrence of molybdenite was found in a pegmatite intruding two-mica granite (Unit 13) near Little Gander Pond. The molybdenite forms 0.5 to 2 cm tabular crystals in two or three places in the pegmatite. Molybdenite was also reported (Howse, 1936) in granite boulders from the Third Berry Hill Pond Granite. It occurred in 5 to 7 cm wide quartz veins and as fine disseminations in granite adjacent to the veins.

A variety of mineralization is associated with leucocratic granite veins that intrude sandstone and siltstone of Unit 10, south of Berry Hill Pond; these veins are probably related to the Middle Ridge Granite. The showings are located in a rock quarry on the east side of the Bay d'Espoir Highway. The granite veins consist of quartz, plagioclase, microcline and muscovite and vary from 2 to 25 cm in width. They also appear greisenized, *i.e.,* some of the mica is greenish-yellow in color and may be lepidolite; calcite and small flecks of purple fluorite occur locally. Scheelite forms grayish-white patches in the veins and fluoresces a bright blue. Euhedral crystals and small patches of pyrite, pyrrhotite and minor arsenopyrite also occur. The margins of the dikes are locally muscovite rich with the mica forming 0.5 to 1 cm wide rims. Two to thirty centimetre wide alteration zones, rich in muscovite and containing euhedral crystals of pyrite and pyrrhotite, occur in the sediments adjacent to the granite veins. These zones also contain narrow, 2 to 6 mm wide veins of gray fibrous anthophyllite.

The economic potential of the map areas mostly centers around the following rock units:

(1) Volcanic and related rocks in the Middle Ridge Pond - Newton Lake area. The quartz-feldspar porphyry (Unit 4) is probably subvolcanic to extrusive and is continuous with the Twillick Brook Member (Colman-Sadd, 1980a). It represents subaqueous felsic volcanic activity, with associated conglomerates and tuffs that could host base metal deposits.

(2) Ultramafic rocks localized along faults. These rocks (Unit 1) are interpreted as remobilized and altered fragments of oceanic crust that were emplaced along faults during the Acadian Orogeny. Thus, they have potential for gold, nickel, and other ophiolite related mineralization.

(3) The Middle Ridge Granite. Greisen zones in the granite and related dikes are a good target for tin and tungsten mineralization. These may follow the more evolved phase of the pluton (Unit 15).

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