Geology of the Wolf Mountain (east half) and Dolland Brook (east half) map areas, south-central Newfoundland

by

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Abstract

The Wolf Mountain (east half) and Dolland Brook (east half) map area, in south-central Newfoundland, contains metasedimentary and minor volcanic rocks assigned in part to the Lower to Middle Ordovician Spruce Brook Formation(?), Baie d'Espoir Group and Bay du Nord Group. These rocks have been deformed and metamorphosed in the greenschist facies, with migmatization of the northern part of the Spruce Brook Formation and all of the Bay du Nord Group. A small area around Dolland Pond contains metasediments of possible Silurian age. The Ordovician units have been intruded by the Silurian-Devonian North Bay Granite, a large batholith composed primarily of massive to very weakly foliated, biotite ± muscovite, K-feldspar porphyritic granite. Some of the smaller, earlier granitoid units of the North Bay Granite possess a strong foliation. The Burgeo Batholith, within the map area, is strongly mylonitized and forms part of a 100 km long mylonite zone.

A one kilometre wide, curved belt of strongly foliated muscovite ± garnet ± biotite granite and pegmatite extends across the north part of the area (from Meelpaeg Lake to Dolland Pond) and continues to the east into the D'Espoir Lake map area. The belt of granitoids may represent a cataclastic zone formed by southwesterly directed overthrusting of the Ordovician metasediments and the granitoids which intruded them across the main mass of the North Bay Granite.

The youngest igneous rock unit consists of a number of north trending large quartz-feldspar porphyry dikes which have intruded the North Bay Granite in the southern part of the map area.

Minor scheelite mineralization was discovered in the North Bay Granite and this corresponds with an area of anomalous tungsten in lake sediments. Several large quartz veins, associated with faults, occur within the North Bay Granite but contain no apparent mineralization.

Introduction

Regional Setting

The North Bay Granite in south-central Newfoundland is a large (>3000 km^2) composite pluton which intruded Lower to Middle Ordovician sedimentary rocks during the later stages of the Silurian-Devonian Acadian Orogeny. The batholith is curved in outline and lies in the central part of the Hermitage Flexure, a major structure defined by pronounced swings in the generally northeasterly Appalachian trend of the Lower Paleozoic rocks in eastern and southern Newfoundland (Williams et al., 1970).

The North Bay Granite is economically significant as it is the host of W-Mo mineralization at its northern termination 10 km northwest of Meelpaeg Lake. With mapping carried out by Blackwood (1984), and O'Brien and Tomlin (1984), this work completes mapping and geochemical sampling of the North Bay Granite in south-central Newfoundland (Blackwood, 1983; Colman-Sadd, 1976, 1983; Colman-Sadd et al., 1981; Dickson, 1982; Dickson and Tomlin, 1983). Possible continuations of the North Bay granitoid terrain in central Newfoundland will be examined during 1984 and 1985.

Location and Access

The Dolland Pond (11P/15E) and Wolf Mountain (12A/2E) map area is located in south-central Newfoundland. The closest, easily accessible settlement is the town of

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St. Alban's, located 50 km east of the Dolland Brook map area. Access is gained to Meelpaeg Lake in the Wolf Mountain map area by woods roads and Newfoundland Hydro access roads from Millertown, 80 km to the north. Helicopter support is available from St. Alban's and nearby Milltown.

The area was mapped at a scale of 1:50,000 mainly from helicopter-placed fly camps and by boat around Meelpaeg Lake. The poorly exposed area between 47°50'N and 47°55'N was surveyed by helicopter.

Previous Work

The earliest work in the map area was carried out by the Buchans Mining Company with a survey carried out to the southeast of Meelpaeg Lake (Phendler, 1950) and to the southwest of Dolland Brook (Scott and Conn, 1950; see also Smyth, 1979). The only other major work in the area was by Williams (1970, 1971) who carried out 1:250,000 mapping and outlined the major units.

Lake sediment geochemical surveys in this area indicated that the granitoid rocks were relatively low in anomalous concentrations of Cu, Ag, Mo, U and F (Butler and Davenport, 1978; Davenport and Butler, 1981). However, tungsten values were anomalous over several parts of the North Bay Granite within the Dolland Brook map area (Davenport and Butler, 1982) and an area of the North Bay Granite with known tungsten mineralization, 10 km northeast of Meelpaeg Lake (Dickson, 1982). A stream sediment and soil survey carried out over the tungsten anomalies (McConnell, 1984) resulted in the discovery of minor scheelite-pyrite mineralization in granite bedrock east of Dolland Brook (Figure 1).

Adjacent map areas to the west, 11P/15W and 12A/2W, have been surveyed at a scale of 1:50,000 by Blackwood (1984) and Dickson (1982), respectively. The map areas to the east, 12A/1 and 11P/16, have also been mapped at 1:50,000 by Colman-Sadd (1984) and Dickson and Tomlin (1983), respectively.

General Geology

The Dolland Pond (11P/15E) and the western half of Wolf Mountain (12A/2E) map areas are dominated by a variety of granitoid rocks which form the southwestern part of the late Acadian North Bay Granite (Jewell, 1939) which underlies an area in excess of 3000 km^2. To the northeast, in the Wolf Lake - Meelpaeg Lake area, the geology is more complex with much of the ground underlain by a variety of metasediments provisionally assigned to the Lower to Middle Ordovician Spruce Brook Formation (Colman-Sadd and Swinden, 1982) and the Baie d'Espoir Group (Jewell, 1939; Colman-Sadd, 1976). To the southwest of Dolland Brook, the North Bay Granite is separated from the highly mylonitized granite of the late Acadian Burgeo Batholith by a narrow belt of migmatite and granite veins assigned to the Lower to Middle Ordovician Bay du Nord Group (Chorlton, 1978).

An elongate belt of highly deformed leucocratic granitoids separates the Ordovician metasediments and smaller granitoid intrusions, mainly within the Wolf Mountain map area, from the main mass of the North Bay Granite to the south. A similar zone of highly deformed granitoids with associated migmatite separates the Ordovician Salmon River Dam Formation in the north from the main mass of the North Bay Granite in the adjacent D'Espoir Lake map area to the east (Dickson and Tomlin, 1983).

In the southern part of the Dolland Brook map area, four quartz-feldspar porphyry dikes intrude the North Bay Granite and represent the last phase of acid magmatism in the area.

The map area is covered with a thick blanket of till in the vicinity of Meelpaeg Lake, Wolf Lake, Dolland Pond and the Dolland Brook area. Glacial striae and stoss and lee surfaces indicate a south-southeasterly direction of ice flow. Eskers are common with an 8 km long esker preserved in the northern half of Wolf Lake.

Description of Units

Lower to Middle Ordovician Spruce Brook Formation(?) (Unit 1)

The term Spruce Brook unit was informally introduced by Colman-Sadd and Swinden (1982) for a sequence of Lower to Middle Ordovician quartz-rich turbiditic sandstone and minor conglomerate and shale which had been overthrust by ophiolitic rocks in the Miguels Lake - Pipestone Pond area, 60 km northeast of Meelpaeg Lake. The name has since been changed to Spruce Brook Formation (Colman-Sadd, personal communication, 1983). Subsequent mapping by Colman-Sadd (1983, 1984) has tentatively extended the Spruce Brook Formation to the southwest, outside of the ophiolitic complex, and the unit continues into the Wolf Mountain map area.

Within the Wolf Mountain map area, the Spruce Brook Formation has been divided into four subunits, based on lithology and grade of metamorphism. Subunit 1a is dominantly a biotite ± muscovite psammitic schist with minor interbedded semipelite.

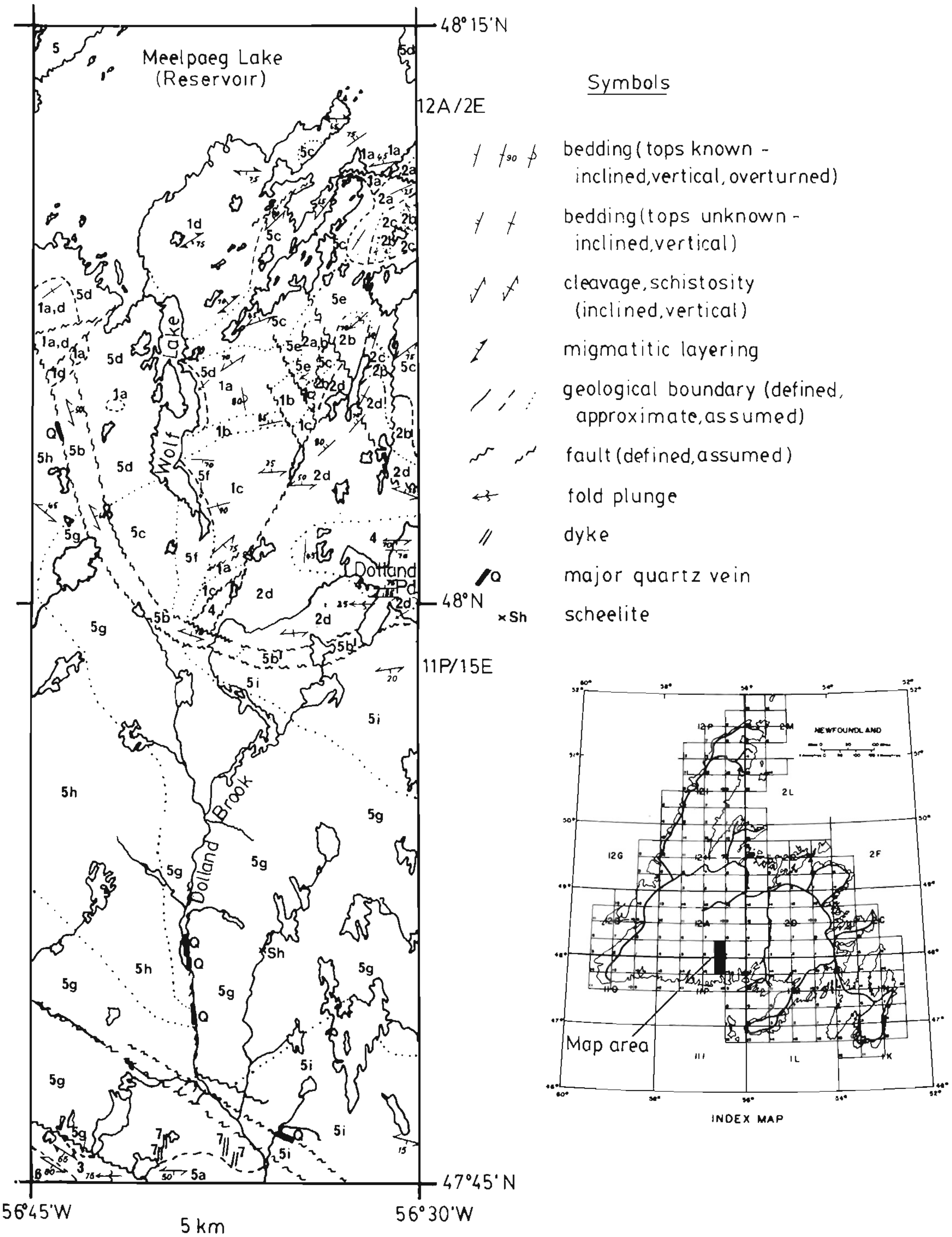

Figure 1. *Geological map of the Wolf Mountain (12A/2E) and Dolland Brook (11P/15E) map areas.*

LEGEND

DEVONIAN OR YOUNGER

7 Pink, massive, very fine grained to fine grained, quartz-feldspar porphyritic dikes.

SILURIAN TO DEVONIAN

Burgeo Batholith

6 Pink, protomylonitic to mylonitic, very fine grained to medium grained, locally K-feldspar porphyroclastic, biotite granite.

North Bay Granite (subunits 5a-5b)

5a Pink to buff, foliated, medium grained, equigranular to porphyritic, biotite ± muscovite granodiorite and granite.

5b Pink to white, strongly foliated, medium to coarse grained, equigranular to pegmatitic, muscovite-garnet and muscovite-biotite granite; **5b'** contains numerous xenoliths of migmatite, psammite, and foliated tonalite.

5c Buff to gray, foliated, medium to coarse-medium grained, equigranular, biotite granodiorite and minor tonalite; locally intruded by garnet-muscovite aplite and pegmatite veins.

5d Buff, massive, medium grained, equigranular, biotite granodiorite and granite; granite becomes fine grained and muscovite-bearing southwest of Meelpaeg Lake.

5e Buff, massive, medium grained, equigranular, biotite granite; includes minor biotite-muscovite granite.

5f White to buff, massive, coarse grained, equigranular, biotite-muscovite granite.

5g Pink to buff, massive to weakly cleaved, medium to coarse-medium grained, K-feldspar porphyritic, biotite granite; screens of foliated granite and migmatite common southwest of Dolland Brook.

5h Pink to buff, massive to weakly cleaved, medium to coarse-medium grained, K-feldspar porphyritic, biotite ± muscovite granite.

5i Pink to buff, massive to weakly cleaved, medium grained, K-feldspar porphyritic, biotite-muscovite granite.

SILURIAN?

4 Interbedded sandstone, siltstone and pebble conglomerate; minor subangular cobble conglomerate.

LOWER TO MIDDLE ORDOVICIAN

Bay du Nord Group

3 Highly deformed migmatitic metasediments cut by numerous granitoid veins, dikes and small granitoid plugs.

Baie d'Espoir Group (subunits 2a-2d)

2d Gray and green, thinly bedded, cleaved pelite and semipelite.

2c Very thickly bedded, brown weathering, gray massive sandstone, minor interbeds of subunit 2b.

2b Thinly bedded, highly folded black graphitic pelite and semipelite.

2a Thickly bedded, schistose quartz-crystal tuff and coarse tuffaceous sandstone.

Spruce Brook Formation (subunits 1a-1d)

1d Migmatite, psammite, and numerous granitoid dikes; high grade equivalent of 1a, 1b.

1c Orthoquartzite cobble clast-supported metaconglomerate, with minor slate and quartzite matrix-supported breccia and coarse metasandstone.

1b Thinly bedded pelite and minor psammite and semipelite.

1a Dominantly biotite psammite and orthoquartzite with minor semipelite.

Bedding is rarely preserved. Locally the unit consists of 15 to 30 cm thick beds of quartz-rich sandstone with minor cross-laminations. Subunit 1b is dominantly a pelitic sequence with minor interbedded psammite, and probably overlies subunit 1a. Subunit 1c is a coarse clastic unit which comprises orthoquartzite - cobble conglomerate, coarse pelitic-clast breccia and minor interbedded granule conglomerate, coarse sandstone and semipelite. The clast lithologies can be matched to those of underlying subunits 1a and 1b.

Subunit 1d is considered to be the high grade equivalent of subunit 1a, and is dominated by migmatite and biotite psammite which are intruded by abundant granitic veins and pegmatite. Two small basic dikes, now converted to amphibolite schist, intrude the Spruce Brook Formation west of Wolf Lake.

Lower to Middle Ordovician Baie d'Espoir Group (Unit 2)

The Baie d'Espoir Group (Jewell, 1939; Colman-Sadd, 1976) lies to the southeast of the Spruce Brook Formation and is separated from it by assumed faults throughout much of the map area. Only in the area east of Meelpaeg Lake is there no apparent evidence for a fault contact between the two units.

The Baie d'Espoir Group is divided into four subunits based on rock type. Subunit 2a consists of thickly bedded, schistose quartz-crystal tuff and coarse tuffaceous sandstone. The subunit may overlie the Spruce Brook Formation in the area southeast of Meelpaeg Lake but the contact is not exposed. A significant geological break is present, however, as the Spruce Brook Formation in the area consists of thinly bedded pelitic, semipelitic and psammitic biotite-muscovite-andalusite schist which is distinct from the tuff. Subunit 2b consists of thinly bedded, graphitic-pyritic, black semipelite and pelite which is interbedded with subunits 2a and 2c in the area southeast of Meelpaeg Lake. About 10 to 15 km east of Wolf Lake, subunit 2b is extensively developed without the other subunits. Subunit 2c consists of very thickly bedded, virtually featureless, brown weathering, gray metasandstone with minor interbeds of pelite similar to subunit 2b. Subunit 2d consists of the gray to green pelitic and semipelitic units which are poorly exposed in a zone around Dolland Pond. About 5 to 8 km north-northwest of Dolland Pond, the unit is reasonably well exposed and consists of brown weathering, 5 to 10 cm thick, parallel bedded, massive green pelite and semipelite with a poorly developed cleavage. Southwest and west of Dolland Pond, pelite and interbedded pelite and semipelite are exposed. These rocks are tentatively correlated with subunit 2d to the north.

Lower to Middle Ordovician Bay du Nord Group (Unit 3)

Unit 3 is exposed in the southwest corner of the map area and consists of a narrow belt of migmatite and foliated granitoid dikes. The migmatites are interpreted to be part of the Lower to Middle Ordovician Bay du Nord Group which is more extensively developed immediately to the west (Blackwood, 1984). The migmatites consist of biotite ± muscovite psammite with a granitic melt fraction, both of which have been intruded by numerous mainly muscovite-biotite granite and pegmatite veins. Locally, small plugs (<200 m diameter) of foliated, leucocratic, muscovite-garnet granite intrude the migmatite. The unit was post-tectonically intruded by the North Bay Granite.

Silurian(?) Sandstone, Siltstone and Conglomerate (Unit 4)

Unit 4 consists of a weakly metamorphosed, deformed and cleaved, medium bedded (30 cm) sandstone, pebble conglomerate and siltstone which is exposed mainly around Dolland Pond (see also Colman-Sadd, 1984). Three kilometres west of Dolland Pond, the unit consists of a thickly bedded, poorly sorted, matrix-supported, angular, subangular to subrounded cobble to pebble conglomerate. Clasts are mainly of sedimentary origin with chert and shale fragments being the most abundant. The matrix consists of poorly sorted rock and crystal fragments cemented by pelite. The sandstone and siltstone beds locally display crossbedding and graded bedding, but more commonly only parallel laminations are present. Williams (1970) noted that this unit is similar to the Silurian Goldson Formation in Notre Dame Bay, and Colman-Sadd (1984) notes a similarity to the Silurian Botwood Group exposed to the northeast in the West Gander Rivers area (see Blackwood, 1981; Colman-Sadd, 1982).

Silurian-Devonian North Bay Granite (Unit 5)

The North Bay Granite within the map area has been divided into nine subunits based on mineralogy and degree of deformation. The essential features of each subunit are listed in the legend to Figure 1. The numerous smaller intrusions east of Wolf Lake are tentatively included in the North Bay Granite.

The main mass of the North Bay Granite (subunits 5g, 5h, 5i), in the Dolland Brook area, is dominated by very similar granites which vary only in the presence or absence of muscovite. Xenoliths of migmatite and foliated granite are common in subunit 5g within 5 km of the contact with Unit 3. A large xenolith of amphibolite schist was found at one locality and is probably derived from the Bay du Nord Group (see Blackwood, 1984).

Subunit 5a is considered to predate subunits 5g and 5i as it usually contains a strong penetrative fabric generally absent in subunits 5g and 5i.

Subunits 5b and 5b' form a major zone of highly deformed leucocratic granitoids. There is generally an abrupt change in rock type and degree of deformation between subunits 5b and 5b' and the juxtaposed granitoid subunits 5c, 5d, 5f, 5g and 5i and subunit 2d. The contacts are interpreted to be faults and the effects of the faulting are exposed on Dolland Pond, Dolland Brook, southwest of Wolf Lake and west of Wolf Lake where the granite has been injected by abundant quartz veins. In the other areas, the granite is brecciated and strongly sheared.

Subunit 5b' is distinguished from subunit 5b by the presence of abundant xenoliths of foliated diorite and tonalite, migmatite and psammitic schist in subunit 5b', of which the latter two may have been derived from the Spruce Brook Formation. The adjacent Baie d'Espoir Group, to the north, consists mainly of low grade slate and is clearly not the source of the migmatite.

Silurian-Devonian Burgeo Batholith (Unit 6).

A small portion of the Burgeo Batholith, which is an extensively developed granitoid unit located to the southwest of the Dolland Brook map area (Chorlton, 1980a,b; O'Brien, 1983; Blackwood, 1984; O'Brien and Tomlin, 1984), occurs in the southwest corner of the map area. The granite is a strongly mylonitized body which forms the northeast margin of the Burgeo Batholith and forms only a small part of a mylonite zone which extends from Dragon Bay 40 km to the southeast (Blackwood, 1983) into the adjacent Dolland Brook map area (11P/15W) (Blackwood, 1984), and beyond into the White Bear River (11P/14) (O'Brien and Tomlin, 1984), Ramea (11P/11) and Burgeo (11P/12) map areas where the mylonite zone bisects the Burgeo Batholith. The total length of this mylonite zone, which is about 1 km in width, is more than 100 km. Blackwood (1984) has shown that the mylonite zone bifurcates into zones of non-mylonitic to protomylonitic granitoids and ultramylonitic granitoids. These subdivisions of the mylonitic zone can be traced into the Dolland Brook (east half) map area (Figure 2) where the ultra

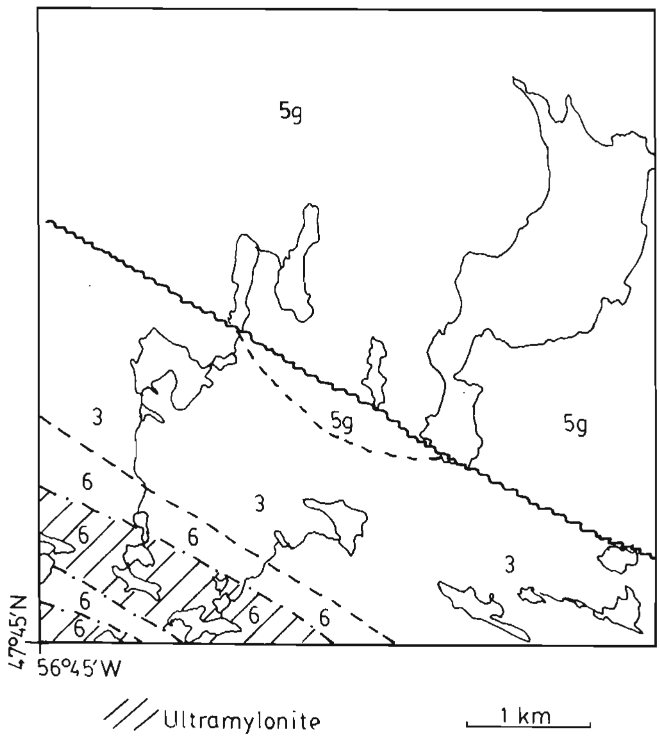

Figure 2: *Detailed map of the bifurcation of the mylonite zone in the southwestern corner of the Dolland Brook (east half) map area.*

mylonite portions of the mylonite zone are separated by a zone of protomylonitic granite.

The protolith of the mylonitic granitoids may be determined from the less deformed areas of the mylonite zone where the rock is a pink, slightly porphyritic, medium grained, biotite granite that is free from xenoliths of migmatite or foliated granitoids.

Devonian or Younger Quartz-Feldspar Porphyry Dikes (Unit 7)

Unit 7 consists of four quartz-feldspar porphyry dikes which intrude subunit 5g and may extend south to intrude subunit 5a (Scott and Conn, 1950). The dikes are straight, parallel sided, up to 15 m in width and more than 200 m long. They contain conspicuous 2 to 3 mm wide terminated quartz crystals and euhedral to anhedral feldspar in a fine grained, pink matrix. Two of the dikes contain a selvage of gray, very fine grained quartz-feldspar porphyry, up to 1 m wide, along their eastern margin. This may be a separate intrusion, as a similar zone was not observed on the western margin of the dikes.

Similar quartz-feldspar porphyry dikes are intrusive into the Burgeo Batholith (O'Brien and Tomlin, 1984) and the feldspar in these dikes is sanidine.

Structure and Metamorphism

The Spruce Brook Formation (Unit 1) and Bay d'Espoir Group metavolcanics and metasediments (Unit 2) are strongly deformed with a generally northeast trending cleavage or schistosity. This fabric is generally the only fabric present, but locally there is a transposed earlier fabric. Subunit 2b is characteristically highly folded with isoclinal folds plunging to the southwest at around 70°. Overturned folds were found in a few places. The migmatitic Spruce Brook Formation (subunit 1d) commonly contains at least two planar fabrics, the second commonly parallel to the migmatitic layering. The migmatites of the Bay du Nord Group (Unit 3) contain tight F_1 folds, which plunge to the west, and an associated axial planar cleavage. This cleavage is commonly transposed by a northwest trending schistosity considered to be S_2.

Unit 4 contains a weak cleavage which is generally parallel to bedding. At Dolland Pond where younging directions are known, an easterly plunging syncline can be defined (see also Williams, 1970).

The grade of metamorphism of the Spruce Brook Formation increases northward from lower greenschist facies, south of Wolf Lake, to upper amphibolite and migmatite grade toward Meelpaeg Lake. Andalusite is locally abundant in the amphibolite facies metasediments. The migmatite locally contains conspicuous pre-S_2 cordierite porphyroblasts. East of Wolf Lake, subunit 1a contains andalusite and cordierite porphyroblasts which are post-tectonic and are probably related to contact metamorphism from subunit 5d of the North Bay Granite.

The Baie d'Espoir Group lies generally within the greenschist facies. Close to contacts with the granitoid units, the rock is converted to a hard hornfels with skeletal andalusite in the pelitic units of subunit 2b.

Unit 4 lies within the lower greenschist facies which is similar to the surrounding pelites of the Baie d'Espoir Group.

The granitoid rocks (subunit 5c), southeast of Meelpaeg Lake, contain a moderately to strongly developed cleavage which is parallel to the main fabric in the metasediments. The fabric is defined by aligned biotite and flattened quartz and feldspar. There is no evidence of recrystallization.

Subunit 5b is deformed throughout its length with a strong fabric parallel to the strike of the subunit, and a relatively constant dip of between 50° and 70° to the northeast. This subunit may represent a major zone of dislocation as it lies along strike from a 1 km wide, 8 km long mylonite zone, well exposed to the northwest between Meelpaeg Lake dam and Granite Lake ditch to the north (Dickson, 1982). The zone of strongly deformed granitoids may be a continuation of the zone of strongly deformed granitoids which form the northern margin of the North Bay Granite in the adjacent D'Espoir Lake map area (Dickson and Tomlin, 1983). In this area, the Ordovician Salmon River Dam Formation is juxtaposed against the granite, and the contact varies from a probable faulted intrusive contact to a possible thrust contact where highly sheared magnesite and limestone slivers are present along a shear zone between D'Espoir Lake and Salmon River (Dickson and Tomlin, 1983). It is, therefore, possible that the granitoids and metasediments between Granite Lake ditch and Salmon River which lie to the north of the zone of highly deformed granitoids are in thrust contact with the North Bay Granite.

Mineralization

Lake sediment geochemical anomaly patterns indicate that the Dolland Brook area shows a potential for W mineralization (Davenport and Butler, 1982). Follow-up work by McConnell (1984), working east of Dolland Brook, has resulted in the discovery of minor scheelite-pyrite mineralization in brecciated, K-feldspar porphyritic, biotite granite.

Several major quartz veins occur along faults which cut subunits 5g, 5h and 5i of the North Bay Granite. Along Dolland Brook a prominent north trending fault scarp contains three large quartz veins. These veins are 10 to 15 m wide and more than 200 m long. They contain several generations of quartz which range from vuggy to massive milky quartz. The veins also contain inclusions of highly altered granite. East of Dolland Brook and southeast of the other quartz veins, another major quartz vein was discovered. This vein also lies along a fault and is similar in all respects to the other quartz veins. The veins will be analyzed for their gold content.

West of Wolf Lake, a large number of thin (5 to 10 cm) parallel quartz veins are injected into highly sheared granite of subunit 5h. During field work, another large quartz vein, similar to those at Dolland Brook, was discovered just to the west of the Wolf Mountain (east half) map area, about 2 km southeast of Meelpaeg Lake dam. These two occurrences both lie along the fault which extends toward the ditch at Granite Lake and contains two large quartz veins (Dickson, 1982).

Examination of all samples from these veins under ultraviolet light did not reveal the presence of fluorescent minerals such as scheelite or fluorite.

Geochemistry

Geochemical samples of granitoid rocks and quartz veins were collected using a 2 km by 2 km grid sampling system. Paucity of outcrop over much of the area prevented use of a random sampling technique. Granite samples were collected from 150 sites, and seven samples are from quartz veins. All samples will be analyzed for major and trace elements including W, U, Sn, Mo, Li and F. Samples collected in 1982 have been analyzed for major and trace elements including Li, F and Mo but not as yet for W, Sn and U. No anomalous values are readily apparent from the raw data.

Summary

The area of Wolf Mountain (east half) and Dolland Brook (east half) contains Lower Ordovician to Silurian(?) metasedimentary rocks intruded by a variety of granitoids which form part of the much more extensive Silurian-Devonian North Bay Granite.

The dominantly metasedimentary Units 1, 2 and 3 are assigned to the Lower to Middle Ordovician Spruce Brook Formation, Baie d'Espoir Group and Bay du Nord Group, respectively. The Spruce Brook Formation consists of psammite, pelite and a coarse cobble conglomerate. The formation is metamorphosed in the greenschist to upper amphibolite facies, and the northern portion of the formation has been converted to migmatite. The Baie d'Espoir Group is mainly in fault contact with the Spruce Brook Formation and is composed of a lower tuff unit overlain by a thick sequence of interbedded pelitic, semipelitic and psammitic units. The pelitic units are strongly deformed with tight isoclinal folds. The other units are less obviously deformed. Metamorphism is generally in the lower greenschist facies. The Bay du Nord Group (Unit 3) is composed of highly deformed and metamorphosed metasediments which are converted to migmatite. This migmatite is intruded by numerous syntectonic granitoid dikes and posttectonically intruded by the North Bay Granite.

Around Dolland Pond, a poorly exposed unit of siltstone, sandstone and pebble conglomerate (Unit 4) is tentatively assigned a Silurian age. The unit contains a weak cleavage and has been metamorphosed in the lower greenschist facies. The unit has a synclinal structure.

The North Bay Granite (Unit 5) is a composite intrusion with medium grained, porphyritic, massive, biotite ± muscovite granites (subunits 5d, 5e, 5f, 5g, 5h and 5i) as the dominant rock type. The foliated granitoids (subunits 5a and 5c) contain a moderate to strong foliation which probably developed with the main fabric in the metasediments. Subunit 5b is dominantly leucocratic muscovite ± garnet ± biotite granite and pegmatite which have been strongly deformed possibly as the result of southwesterly overthrusting of the Ordovician units and the granitoids which lie to the northeast.

Unit 6 is the strongly mylonitized, northeast margin of the Burgeo batholith and forms only a small part of a northwest trending zone of mylonites over 100 km in length.

Unit 7 comprises four quartz-feldspar porphyry dikes which posttectonically intruded the North Bay Granite. These northerly trending dikes are more than 200 m in length and 10 to 15 m in width.

Minor scheelite-pyrite mineralization has been discovered east of Dolland Brook in sheared granite. Several major quartz veins were also found but have no apparent scheelite or fluorite mineralization. The scheelite mineralization corresponds with a lake sediment W anomaly.

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