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GEOLOGY OF THE EAST PART OF THE SNOWSHOE POND (12A/7) AREA

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ABSTRACT

The eastern third of the Snowshoe Pond (12A/7) map area has been mapped at a scale of 1:50,000. It is divided into two parts by Noel Paul's Line, a tectonic and/or intrusive contact which passes southeast of Lake Douglas. Southeast of the line, stratified rocks consist of a single unit of polyphase-deformed clastic metasedimentary rocks, metamorphosed in the upper amphibolite facies. These rocks are interpreted to be equivalent to the Middle Ordovician Spruce Brook Formation. They have been intruded by a series of mafic dikes. Northwest of Noel Paul's Line, there is a succession of metavolcanic and metasedimentary rocks similar to the Lower to Middle Ordovician rocks typical of the Central Volcanic Belt. They are metamorphosed in the greenschist facies and are polydeformed. Deformation is most intense adjacent to their southeastern boundary.

Granitoid intrusions are of three main types. The earliest is equigranular biotite granite containing a folded foliation; it is in intrusive contact with the metasedimentary rocks southeast of Noel Paul's Line and is in either intrusive or tectonic contact with the metasedimentary rocks to the north of the line. Several phases of granite/granodiorite of the North Bay Granite have intruded the foliated granite and the southeastern metasedimentary rocks posttectonically. A small granite pluton that postdates at least part of the deformation truncates Noel Paul's Line.

The potential mineral deposits in the area are of three main types: 1) tungsten mineralization associated with the granitoid intrusions; 2) volcanogenic base and precious metal deposits in rocks of the Central Volcanic Belt, northwest of Noel Paul's Line; 3) gold mineralization associated with major tectonic lineaments that are marked by probable ophiolitic rocks outside the area. No major showings of economically exploitable minerals have yet been discovered.

INTRODUCTION

The Snowshoe Pond (12A/7) map area is located about 40 km south of Buchans in the centre of the Newfoundland Central Mobile Belt (Williams, 1964). It is accessible from Millertown by the hydro roads to Granite Lake and Ebbegunbaeg dam. Mapping at the 1:50,000 scale has been completed in the eastern one third of the map area (Figure 1).

The northwestern part of the area is underlain by Lower Paleozoic volcanic and sedimentary rocks (Units 3 to 10) typical of the Dunnage Zone (Williams, 1978), and is included in the Central Volcanic Belt of Kean *et al.* (1981). In the southeastern part of the area, the oldest rocks (Unit 1) are high grade, clastic, metasedimentary rocks, resembling the Middle Ordovician Spruce Brook Formation of Colman-Sadd and Swinden (1984). These rocks are intruded by several granitoids, one of which (Unit 18) intrudes rocks of the Central Volcanic Belt. The contact between the Central Volcanic Belt and the metamorphic and intrusive rocks to the southeast was referred to as Noel Paul's Line by Brown and Colman-Sadd (1976); this may coincide with the lineament proposed as the Iapetus suture by McKerrow and Cocks (1977). Kean and Jayasinghe (1980) and Dallmeyer *et al.* (1983) placed Noel Paul's Line along an assumed fault at the southeast edge of the Rogerson Lake Conglomerate (Unit 10), and they described the transition to the high grade metamorphic rocks of Unit 1 as gradational. In the eastern part of the Snowshoe Pond area, southeast of the Rogerson Lake Conglomerate, Units 3 to 9, are considered to be similar to the Victoria Lake Group of the Central Volcanic Belt and distinct from Unit 1. Noel Paul's Line is therefore drawn along the contact between Unit 3 and granite of Unit 11, but it remains uncertain as to whether this contact is intrusive or tectonic.

The earliest geological investigations in the Snowshoe Pond area were those of Cormack (1823), during his walk across the island of Newfoundland, and Howley (1917), when he led an expedition from Bay d'Espoir to the Exploits River in 1887.

Further work was done in the early 1950's by the Buchans Mining Company, and compiled by Swanson (1952-60). Williams (1970) produced a 1:250,000 scale map of Red Indian Lake (east half) for the Geological Survey of Canada and this includes the geology of the Snowshoe Pond area. Work by the Newfoundland Department of Mines and Energy consists of a lake sediment geochemistry survey (Butler and Davenport, 1978; Davenport and Butler, 1981) and surficial geology studies (Sparkes, 1984). Geological mapping by the department at the 1:50,000 scale has been done in neighbouring map areas (Colman-Sadd, 1985; Dickson, 1982; Dickson and Delaney, 1984; Kean, 1977; Kean and Jayasinghe, 1980).

Recent exploration by mining companies, in the part of the Snowshoe Pond area shown in Figure 1, has concentrated

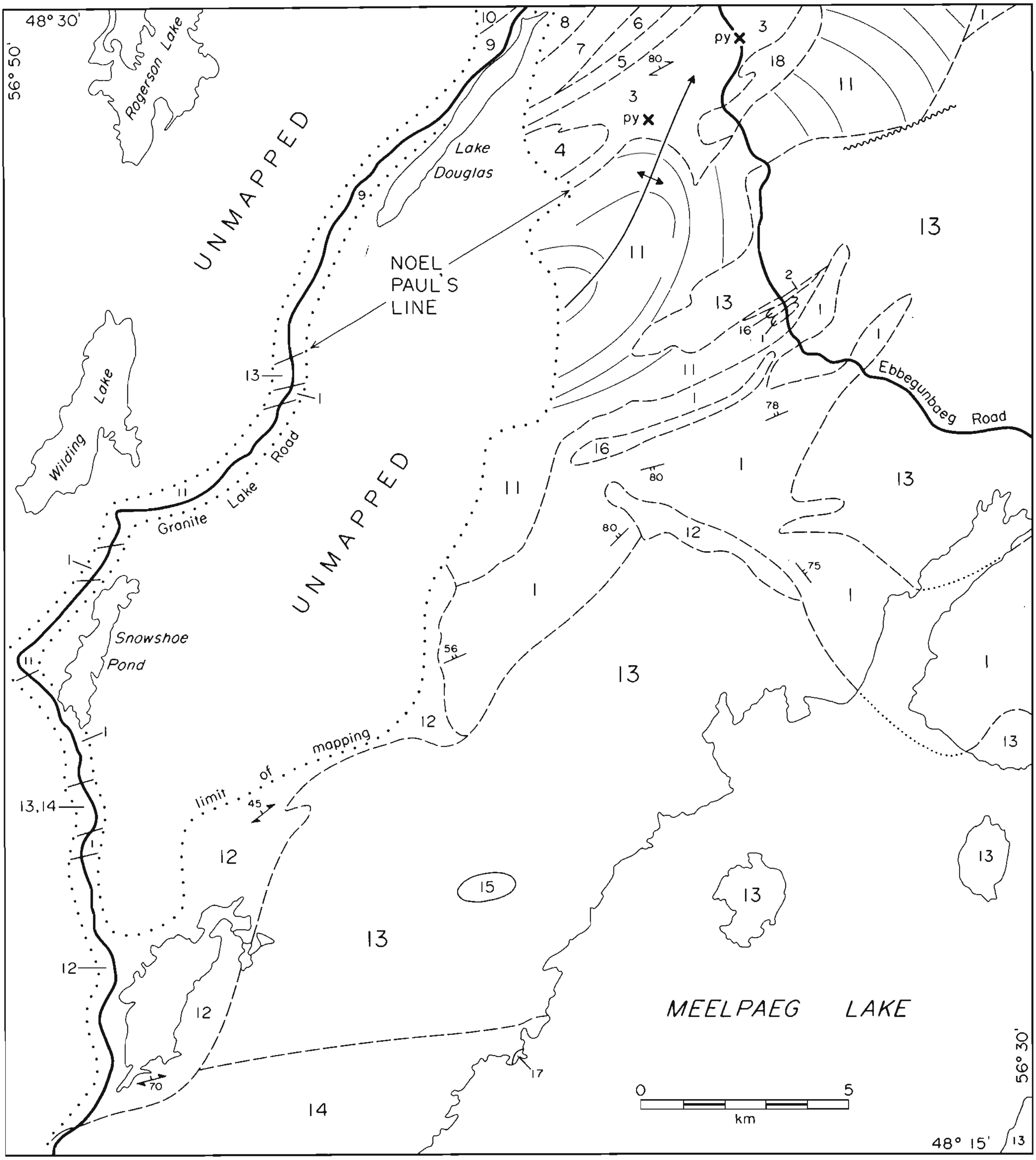

Figure 1: *Geological sketch map of the eastern part of the Snowshoe Pond (12A/7) map area.*

LEGEND

SILURO-DEVONIAN

18 Equigranular, medium grained, white, muscovite-biotite granite.

17 Equigranular, medium-fine grained, pink syenite(?).

16 Garnet-tourmaline-muscovite pegmatite.

NORTH BAY GRANITE (Units 13-15)

15 Equigranular, medium grained, white, muscovite-garnet granite (not exposed *in situ).*

14 Equigranular, medium grained, gray to buff, biotite-muscovite granodiorite.

13 Porphyritic to equigranular, medium grained, gray to pink, biotite granodiorite.

12 Migmatite, rich in biotite schlieren and metasedimentary fragments derived from Unit 1. Gradational into Unit 13 of the North Bay Granite.

11 Equigranular, foliated, medium grained, gray to pink, biotite granite. Locally mylonitic.

SILURIAN ?

10 Rogerson Lake Conglomerate: purple, clast-supported, polymictic conglomerate and sandstone.

ORDOVICIAN

9 Thinly bedded, brown, gray to green siltstone and shale with minor mafic volcanic rocks.

8 Gray, foliated to massive, felsic crystal tuff and/or felsic flows and/or subvolcanic intrusive rocks.

7 Unseparated black phyllite and gray, foliated, felsic crystal tuff.

6 Conglomerate formed mainly of subrounded felsic volcanic clasts, interbedded with black phyllite.

5 Gray foliated felsic crystal tuff.

4 Very well cleaved, polydeformed, gray, fine grained, felsic tuff and/or rhyolite.

3 Very well cleaved, polydeformed, sericitic schist, black pyritic schist and fine grained felsic volcanic rocks.

2 Foliated, fine grained, amphibolite, probably derived from mafic dikes intrusive into Unit 1.

1 Interbedded quartzite, psammite, semipelite and pelite, intruded by unseparated mafic dikes; polydeformed and mainly metamorphosed at sillimanite grade (probably equivalent to Spruce Brook Formation).

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on two targets. Tungsten mineralization was discovered in the Wolf Mountain (12A/2) area to the south during follow up of lake sediment geochemical anomalies (Butler and Davenport, 1978; Dickson and MacLellan, 1981), and a number of claims related to this discovery extended onto the southern edge of the Snowshoe Pond map area (Godfrey and Lane, 1981; Neelands, 1980; Saunders, 1980a,b). Noranda Exploration Company and Price Newfoundland Company have explored rocks of the Central Volcanic Belt in the northwestern parts of the Snowshoe Pond map area under the Price-Norex Joint Venture. Some of their reports concern the area mapped in 1985, but all of these are presently confidential (Aerodat, 1983; Fitzpatrick, 1984a,b, 1985).

GENERAL GEOLOGY

The stratified rocks of the Snowshoe Pond map area are divided into the single unit of monotonous clastic metasedimentary rocks (Unit 1) to the southeast of Noel Paul's Line, and the eight units of very variable metasedimentary and metavolcanic rocks (Units 3 to 10) to the north of the line. Amphibolite (Unit 2), which at least in some cases represents mafic dikes, is widespread in the southeast, but is not volumetrically important; it may or may not be related to unseparated mafic flows, tuffs and dikes in the other units.

Metamorphic grade northwest of Noel Paul's Line is principally in the greenschist facies, although a few restricted areas may be in the lower amphibolite facies. To the southeast of the line, metasedimentary rocks of Unit 1 are mostly at sillimanite grade (upper amphibolite facies).

The granitoid rocks fall into three main groups:

1) the pretectonic biotite granite (Unit 11) that intrudes Unit 1 and is in either intrusive or tectonic contact with Unit 3 along Noel Paul's Line

2) the largely posttectonic biotite and biotite-muscovite granodiorite (Units 13 and 14) of the North Bay Granite with associated migmatite (Unit 12), muscovite-garnet granite (Unit 15) and pegmatite (Unit 16)

3) the syn to posttectonic leucogranite of Unit 18 that has intruded the units on either side of Noel Paul's Line.

Metasedimentary Rocks (Unit 1)

The rocks of Unit 1 are a direct continuation of a metasedimentary unit that extends eastwards across the Great Burnt Lake (12A/8) map area to the western edge of the Great Burnt Lake volcanic belt (Colman-Sadd and Swinden, 1982; Colman-Sadd, 1985). This unit is equated with the Middle Ordovician Spruce Brook Formation of Colman-Sadd and Swinden (1984), which occurs on the east side of the Great Burnt Lake volcanic belt, and with which it is not in direct contact. A similar correlation was made by Higgins (1951).

Unit 1 consists of interbedded quartzite, psammite, semipelite and pelite (Plate 1). Bed thickness varies from 3 cm to over 1 m and the proportions of the rock types are also quite variable. Overall, quartzite and psammite each form between 15 and 25 percent of the whole. The quartzite is light gray on fresh surfaces, but weathers white. Its grain size is 2 mm or less and generally fairly uniform. Beds commonly have sharp bases and laminated more micaceous upper sections. The psammite is dark gray and weathers brown, reflecting its greater mica content. Bed contacts are sharp but internal sedimentary structures are not prominent. The semipelite and pelite are dark gray or black and are locally rich in pyrite and/or tourmaline. They are generally faintly laminated and have thin interbeds of cross laminated psammite and quartzite. In some exposures, the semipelite has myriads of bedding-parallel quartz segregations.

Two main periods of deformation have affected the rocks of Unit 1. The first formed a ubiquitous cleavage in the micaceous beds which is commonly, but not exclusively, parallel to bedding. In the quartzite beds, either there is no mesoscopic cleavage, or there is a micaceous parting, spaced 0.5 to 2 cm apart; a similar fabric is interpreted as a spaced cleavage in the Great Burnt Lake (12A/8) map area (Colman-Sadd, 1985). This interpretation relies on the observation that the cleavage is discordant to bedding in first deformation fold hinges; however, no such occurrences were observed in the Snowshoe Pond area. The second deformation formed tight to isoclinal folds of bedding, the first cleavage, and migmatitic sweats. The folds are very common in some localities, for example in the northern inlet of Meelpaeg Lake, and rarely developed in others. A slight to moderate crenulation cleavage was formed during the second deformation in a few places, but is nowhere very prominent.

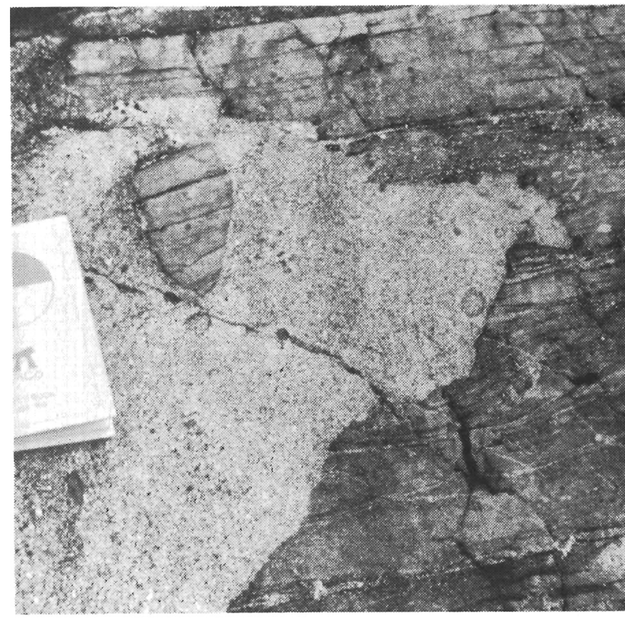

Plate 1: *Interbedded quartzite and sillimanite schist (Unit 1), intruded by biotite granodiorite (Unit 13), north shore of Meelpaeg Lake.*

Most of Unit 1 was metamorphosed at sillimanite grade and 2 to 5 mm aggregates of fibrolite are common features in the semipelitic and pelitic beds. Between the outcrops of foliated granite (Unit 11) and pegmatite (Unit 16), Unit 1 is probably of lower grade and contains porphyroblasts of possible andalusite and staurolite. Much of Unit 1 is migmatitic, due in part, to the injection of sheets of granite or granodiorite (Plate 1). However, in many places there has been *in situ* melting, resulting in a complete range from small, isolated granitic segregations to migmatitic gneiss and granitoid containing metasedimentary xenoliths.

The timing of metamorphism relative to structural development is uncertain at present because the relationship between cleavage and fibrolite aggregates is difficult to determine in the field. However, there are strong indications from the relationship of structures to migmatization that the peak of metamorphism postdated the first deformation and predated the second. Granitoid veins crosscut the main cleavage and have been folded by the second generation folds. Also the North Bay Granite (Units 13 to 15), which has a close spatial relationship to the highest grade metamorphic rocks (Colman-Sadd, 1985), contains many prefoliated xenoliths of Unit 1.

Amphibolite (Unit 2)

The amphibolite of Unit 2 is generally a fine grained dark green rock containing a single well developed foliation. In a few isolated localities, unfoliated medium grained gabbro occurs, but its relationship to the other rock units was not determined. The only outcrop area of amphibolite or gabbro that is sufficiently large to be separated on the map occurs on the Ebbegunbaeg road. It consists of foliated fine grained amphibolite and is intruded by foliated and unfoliated granite veins. Elsewhere, particularly in the northern inlet of Meelpaeg Lake, amphibolite has formed by the metamorphism of mafic dikes that have intruded metasedimentary rocks of Unit 1. In one exposure, the foliation in the amphibolite is continuous with the first cleavage in Unit 1. A first deformation fold in the dike is cut by a granite vein related to the North Bay Granite; the granite vein itself was folded during the second deformation.

Polydeformed Schist and Metavolcanic Beds (Unit 3)

Unit 3 consists of a variety of metasedimentary and metavolcanic rock types, interlayered on a scale of 2 cm to 2 m, and all intensely deformed. It occurs as the southeasternmost unit of the Central Volcanic Belt, adjacent to foliated granite of Unit 11, and is well exposed along the northern part of the Ebbegunbaeg road.

The dominant rock type of Unit 3 is light greenish-gray sericitic schist, commonly containing disseminated pyrite and amphibole. The sericitic schist grades into zones of gray to black pyritic schist which locally includes bands of massive pyrite and pyrrhotite up to 3 cm thick and 2 m long. Interlayered with the schist is a fine grained, white, pyritic, quartzofeldspathic rock, interpreted as felsic tuff, and a few occurrences of foliated fine grained amphibolite.

Plate 2: *Composite shear and flattening fabric in sericitic schist (Unit 3), Ebbegunbaeg road.*

The schist has a first deformation composite foliation, consisting of shear(C) and flattening(S) fabrics that have destroyed all fine sedimentary structures in the original rock (Plate 2). The C fabric planes have a spacing of 0.5 to 1 mm and are marked by a metamorphic differentiation between the micas and quartz and feldspar. The white quartzofeldspathic layers have a single first deformation foliation containing a very pronounced stretching lineation on cleavage surfaces (Plate 3). The second deformation has formed tight folds of the layering, the first fabrics, and numerous quartz segregations. The folds plunge gently to the northeast and their axes make angles of about 70° with the first deformation lineation. A crenulation cleavage, formed during the second deformation, is present in the schist layers.

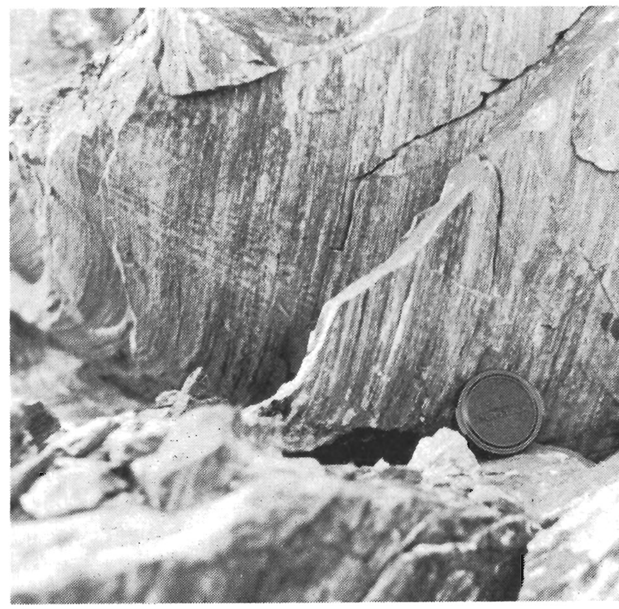

Plate 3: *Stretching lineation on cleavage surface of quartzofeldspathic layer in Unit 3, Ebbegunbaeg road. Note curvature of lineation around F_2 fold hinge in bottom left of photograph.*

Felsic Metavolcanic Rocks (Unit 4)

Felsic interbeds of Unit 3 thicken and become the dominant rock type in one area east of Lake Douglas, where they are separated as Unit 4. The well-cleaved, fine grained, light gray to white, quartzofeldspathic rock is generally featureless. However, near the northwestern edge of the outcrop area, where deformation is less intense, quartz and feldspar crystals and flattened pumice fragments are visible in a few exposures.

Felsic Crystal Tuff (Unit 5)

Unit 5 forms a narrow outcrop area bordering the northwestern boundary of Unit 3. It consists of a dark gray crystal-lithic tuff, in which the crystals are either all feldspar or feldspar and quartz. It also contains minor amounts of disseminated sulfide minerals. The tuff has a penetrative first deformation cleavage, but is not nearly as deformed as the rocks of Units 3 and 4, and has negligible second deformation structures.

Conglomerate (Unit 6)

Conglomerate (Unit 6) lies just northwest of Unit 5. Clasts consist mainly of flow-banded rhyolite, crystal tuff and indeterminate felsic volcanic rocks. They are up to 30 cm in length and are flattened, with an approximate length to width ratio of 3:1, in a plane that is slightly oblique to the cleavage. The clasts are subangular and the conglomerate is clast supported. Lenses and interbeds of black slate occur in a few places. The rock has a single cleavage, and associated tight to isoclinal folds occur in quartz veins.

Unseparated Phyllite and Felsic Tuff (Unit 7)

Unit 7 consists of interbedded gray to black phyllite, felsic lapilli tuff and sericitic schist. All the rock types have a single penetrative cleavage.

Felsic Igneous Rocks (Unit 8)

Unit 8, which forms the two large hills just east of Lake Douglas, contrasts with neighbouring units in its homogeneity. It consists of gray, fine grained, felsic igneous rocks, locally containing quartz crystals. Either a fracture cleavage or a weak penetrative cleavage is developed. It is, at present, uncertain whether the unit represents tuff, flows or a subvolcanic intrusion.

Siltstone, Shale and Mafic Volcanic Rocks (Unit 9)

Unit 9 is exposed along the Granite Lake road and is not in direct contact with Unit 8. It consists principally of laminated brown weathering siltstone and gray to green shale containing a few beds of arkosic sandstone. Bed thickness is between 1 and 5 cm. At the north edge of the map area, the sedimentary rocks, which are exclusively green at this locality, are interbedded with pyritiferous, silicified, mafic volcanic rocks. The first deformation formed a weakly penetrative or fracture cleavage in the siltstones and shales, and disrupted bedding and laminae near fold hinges. Second deformation structures consist of crenulations and, in one locality, a weak crenulation cleavage. Rocks to the northwest of Unit 8, around the shores of Lake Douglas, have not yet been mapped.

Rogerson Lake Conglomerate (Unit 10)

The Rogerson Lake Conglomerate is the continuation of a formation mapped to the northeast in the Lake Ambrose (12A/10) and Noel Paul's Brook (12A/9) map areas by Kean and Jayasinghe (1980). It extends across the Snowshoe Pond map area (Williams, 1970). The only exposure examined during this study occurs on an island in Louis Lake.

The conglomerate consists of subrounded clasts, 1 mm to 2 cm across, of chert, felsic and mafic volcanic rock, red shale and vein quartz. It is poorly sorted and clast supported. Massive sandstone is gradational with the conglomerate, but the contacts are not sufficiently distinct to give a clear indication of bedding. The conglomerate and sandstone are light purple. A moderate cleavage is developed and is openly folded by a second period of deformation.

Foliated Biotite Granite (Unit 11)

Unit 11 consists of pink or gray, equigranular, medium grained, biotite granite. In most exposures, the biotite defines an anastomosing planar fabric, spaced 2 mm to 10 cm apart (Plate 4). A stretching lineation is also defined by mica, feldspar and quartz on cleavage surfaces. In some zones, most notably on the Granite Lake road, west of Snowshoe Pond, the fabric is mylonitic and the granite is reduced to a schist (Plate 5). The granite also erodes as a series of ridges (Plate 6) controlled by the first deformation fabric, and these ridges clearly define large-scale, second deformation folds (Plate 7). The folds have wavelengths in the order of 2 km and plunge gently to the northeast. The curved contact of the granite with Unit 3, west of the Ebbegunbaeg road, defines the hinge of an antiform, and the folds in the granite correspond to the smaller second deformation folds in Unit 3.

The foliated granite has an intrusive contact with clastic metasedimentary rocks of Unit 1. The contact is exposed on the Ebbegunbaeg road and there is continuity between the first deformation fabrics in the two units. There does not appear to be any increase in metamorphism toward the granite, but if there was originally an aureole, it is likely to be obscured by the subsequent posttectonic metamorphism associated with the North Bay Granite.

The contact between the granite and Unit 3 represents Noel Paul's Line as envisaged by Brown and Colman-Sadd (1976). However, the nature of the contact remains uncertain because of lack of exposure. As noted above, the contact follows the outline of a second deformation fold, and thus appears to have been folded. There may be a slight increase in the metamorphism of Unit 3 toward the granite, but the most prominent feature is the intense deformation of Units 3 and 4, compared with the rocks to the northwest. This focus of deformation is not reflected in the granite, which is less deformed along its northwestern edge than in the mylonite zones in its interior. The choice of origin for Noel Paul's Line lies between an intrusive contact which has been modified by faulting and subsequent folding, and a folded fault contact.

Migmatitic Gneiss (Unit 12)

Migmatitic gneiss (Unit 12) is distinguished from partially melted metasedimentary rocks of Unit 1 by the absence of sedimentary layering. There is, in fact, a gradation from Unit 1 metasedimentary rocks into migmatitic gneiss which, in turn, grades into granodiorite of the North Bay Granite.

The migmatitic gneiss consists of an equigranular, medium grained, biotite-muscovite granite leucosome, and varying proportions of biotite-rich schlieren. There are also xenoliths of psammite and quartzite. The foliation in the gneiss is defined by a preferred orientation of the schlieren, but there is no tectonic fabric within the granite leucosome. The gneiss is commonly cut by muscovite-garnet aplite and pegmatite veins.

North Bay Granite (Units 13, 14 and 15)

Two lobes of the North Bay Granite extend westward from the Great Burnt Lake (12A/8) map area (Colman-Sadd,

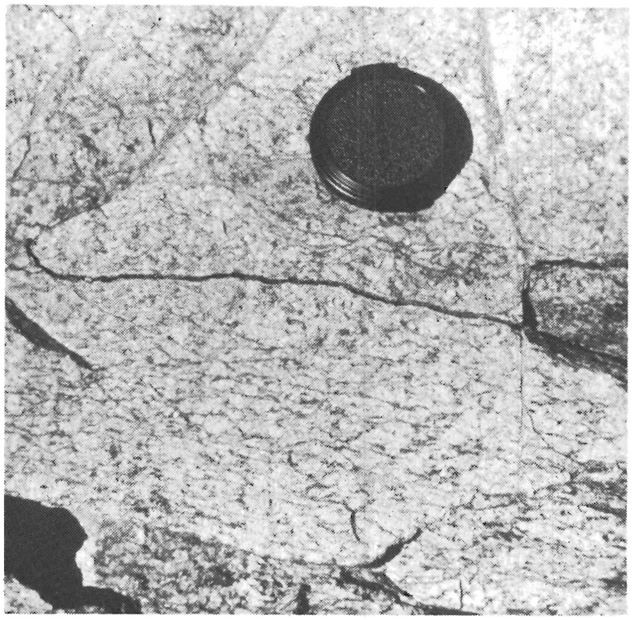

Plate 4: *Foliation in equigranular, biotite granite (Unit 11), Ebbegunbaeg road.*

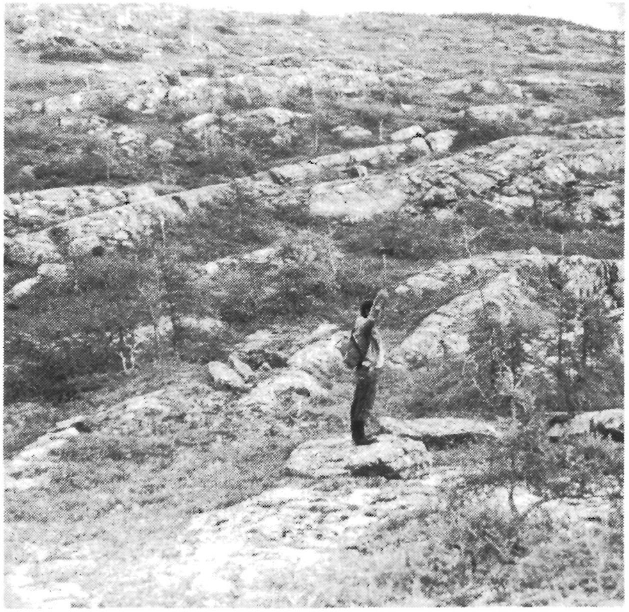

Plate 6: *Foliation-controlled ridges of equigranular biotite granite (Unit 11), west of Ebbegunbaeg road. The ridges define the F_2 fold shown in Plate 7.*

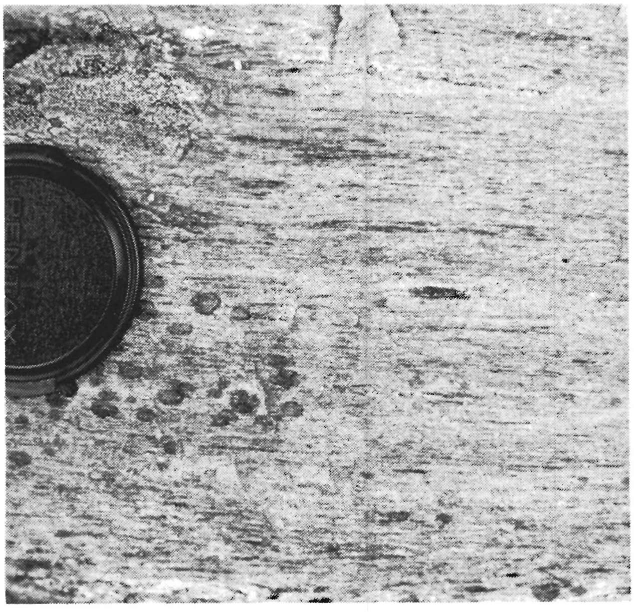

Plate 5: *Mylonitized granite (Unit 11), Granite Lake road.*

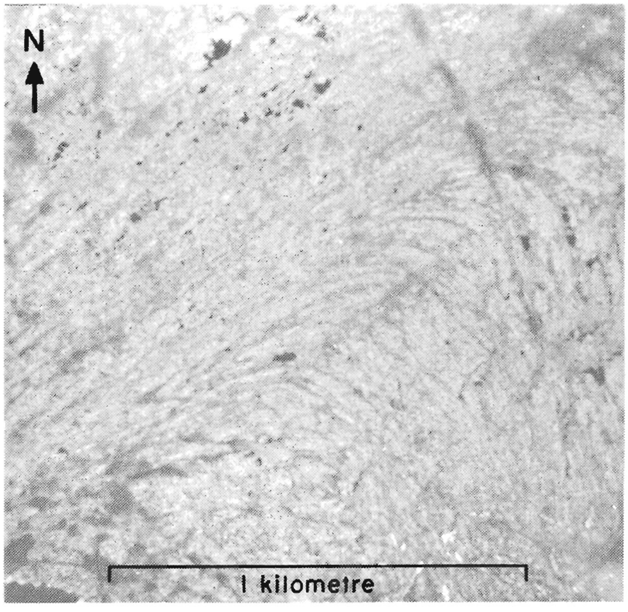

Plate 7: *Aerial photograph showing major F_2 fold, plunging gently to the northeast, in foliated, equigranular, biotite granite (Unit 11), west of Ebbegunbaeg road.*

1985), and the southern one continues southward into the Wolf Mountain (12A/2) map area (Dickson, 1982; Dickson and Delaney, 1984). The principal rock type in the Snowshoe Pond area is medium to coarse grained, gray to pink, porphyritic, biotite granodiorite (Unit 13). The potassium feldspar phenocrysts are locally absent in the interior parts of the granodiorite and are not developed where the granodiorite grades into migmatite (Unit 12). In some localities on the north and east shores of Meelpaeg Lake, the phenocrysts are concentrated in crude layers, which are associated with concentrations of xenoliths. The xenoliths consist mainly of quartzite, psammite and biotite-sillimanite schist similar to rock types in Unit 1. They are generally planar and aligned (Plate 8), and are accompanied by round to elliptical inclusions of either biotite-hornblende microgranitoid or diorite.

Plate 8: *Foliated metasedimentary xenoliths, probably derived from Unit 1, in porphyritic biotite granodiorite of the North Bay Granite (Unit 13), southeast Meelpaeg Lake.*

Unit 14 is exposed on the Granite Lake road and is interpreted, from boulder distribution, to underlie the southern part of the map area between the road and the west shore of Meelpaeg Lake. It consists of gray to buff, medium grained, equigranular, biotite-muscovite granite. It contains the same types of xenoliths as the granodiorite, but its relationship to the granodiorite is uncertain.

Unit 15 is not exposed in the Snowshoe Pond area, but its presence is indicated by a concentration of boulders just west of Meelpaeg Lake. It consists of medium-fine grained, equigranular, garnet-muscovite granite, and is similar to a phase of the North Bay Granite exposed on the Ebbegunbaeg road in the Great Burnt Lake (12A/8) map area (Colman-Sadd, 1985).

All three units of the North Bay Granite are cut by garnet-tourmaline-muscovite granite pegmatites and aplites. All three are also essentially posttectonic. Although a weak fabric defined by stretched quartz and aligned biotite occurs at the northwestern edge of the granodiorite outcrop area, the intrusion appears to transect one limb of the fold in the foliated granite of Unit 11 and so was probably emplaced in the terminal stages of the second deformation. Foliated xenoliths of Unit 11 occur in the granodiorite at the contact on the Ebbegunbaeg road, and foliated xenoliths of Unit 1 metasedimentary rocks are ubiquitous.

Pegmatite (Unit 16)

Very coarse grained, garnet-muscovite granite pegmatite, containing feldspar crystals up to 30 cm long, occurs in a string of exposures southwest of the Ebbegunbaeg road. They are interpreted to form a single intrusion. A similar pegmatite intrusion, but also containing tourmaline, occurs on the road 1 km to the north, and is probably a separate intrusion. Both intrusions are posttectonic and may be related to the North Bay Granite.

Syenite(?) (Unit 17)

Syenite(?) of Unit 17 occurs in a single exposure on the west shore of Meelpaeg Lake in an area that is generally poorly exposed, but is thought to be underlain mostly by granite and granodiorite of Units 13 and 14. The syenite is pink, medium-fine grained, and equigranular, except for a few feldspar phenocrysts. It is composed of pink and white feldspar, green chlorite and/or hornblende, and accessory pyrite. It contains scattered, pink, aphanitic rock fragments. Its relationship to other units is unknown.

Leucogranite (Unit 18)

Unit 18 consists of white, medium grained, equigranular leucogranite. It consists of quartz, white feldspar and minor amounts of biotite, chlorite and muscovite, and is cut by quartz and quartz-tourmaline veins.

The granite appears from its outcrop pattern to be intrusive into the polydeformed schists of Unit 3, but no contacts are exposed. Its contact with the foliated granite of Unit 11 consists of a zone about 1 km wide in which sills of leucogranite have intruded parallel to the cleavage surfaces in the foliated granite. The leucogranite is brecciated and has a fracture cleavage, but it is no more deformed where it intrudes mylonite than where it intrudes moderately foliated granite. It is therefore considered to postdate the first mylonitic deformation, but it may have been involved in at least part of the second deformation. Its age relationship relative to the North Bay Granite is uncertain.

MINERAL POTENTIAL

Three types of mineralization are likely to occur in the rocks of the eastern part of the Snowshoe Pond area.

Tungsten Mineralization

Wolframite, scheelite, molybdenite and pyrite are present in quartz veins and as disseminations on joint surfaces in the granitoid rocks of the North Bay Granite in the Wolf Mountain (12A/2) map area (Dickson, 1982). Although no occurrences have been found in the Snowshoe Pond area, the nearest showings are only 1 km to the south, and lake sediment anomalies in Cu, Pb, Zn, Mo, Ag, U and F extend across the southern edge of the map area (Butler and Davenport, 1978; Davenport and Butler, 1981). The lack of exposure makes it unlikely that any mineralization would be apparent at the surface in the area examined so far.

Volcanogenic Base and Precious Metal Mineralization

Felsic volcanic rocks of Units 3 to 8 and mafic volcanic rocks in Unit 9 are characteristic of the Central Volcanic Belt of the Dunnage Zone (Kean *et al.*, 1981). They are probably of Lower to Middle Ordovician age and equivalent to the Victoria Lake Group (Kean, 1977) and the pre-Caradocian island arc sequences of Dean (1978). Such correlations suggest the possibility of massive sulfide deposits such as those occurring in the Tally Pond and Tulks Hill volcanic belts (Swinden and Thorpe, 1984). Disseminations and thin layers of pyrite and pyrrhotite were found in Unit 3 and a chalcopyrite occurrence was reported along strike to the northeast by Kean and Jayasinghe (1980).

Lineament-related Gold Mineralization

Two major lineaments pass through the northwestern part of the area. The first is Noel Paul's Line where the Central Volcanic Belt abuts against foliated granite of Unit 11, and the second is the assumed fault contact between the Rogerson Lake Conglomerate (Unit 10) and the volcanic and sedimentary rocks to the southeast of it (Kean and Jayasinghe, 1980). Northeastward along the strike of the second lineament is the Pine Falls Formation, which may be ophiolitic. Tuach and French, (*this volume*) discuss the association of gold mineralization with ophiolite-lined lineaments (Albers, 1981) and include the Noel Paul's Line/Pine Falls Formation lineaments on their Figure 1. So far, no indications of gold mineralization have yet been found and reconnaissance sampling along the Ebbegunbaeg road has failed to produce significant assay values. The geological setting does, however, suggest above average potential and more detailed work may be worthwhile.

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