PETER SNOUT, WEST HALF

by

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INTRODUCTION

Reconnaissance 1:50,000 scale mapping of the west half of the Peter Snout area (11P/13) was completed during the summer. This area is located inland from Newfoundland's southwest coast near Burgeo, and is accessible primarily by float plane and helicopter. The nearly completed Burgeo highway passes through the east half of the Peter Snout sheet but is too far away to provide convenient, direct access to the present map area.

The map area is largely barren. The percentage of bedrock exposure is generally highest on south-facing slopes and along shallow brooks, which provide clean, illustrative outcrop surfaces. In areas covered by drift, the veneer is generally thin and composed mainly of locally derived rock fragments.

The La Poile (110/9) and La Poile River (110/16) map areas, to the west and southwest respectively, were completed during previous summers (Chorlton, 1979a, 1979b). Stratigraphic relations formulated by Cooper (1954), and modified during work on these map sheets, were used as the basis for the current mapping. Regional reconnaissance mapping by Smyth (1979), Riley (1959) and mapping on a 1:63,360 scale by Buchans Mining Co. (unpublished) afforded a geological preview.

GENERAL GEOLOGY

The map area is underlain by highly deformed and metamorphosed gabbroic, sedimentary, volcanic, and subvolcanic rock cut by granitoid rocks at several stages in their tectonic history. The sedimentary, volcanic and subvolcanic rocks belong to the probably Ordovician Bay du Nord and La Poile Groups. The gabbro bodies appear locally to be somewhat older, and may represent either remnants of oceanic crust or relatively old intrusive bodies. The early granite may be related in origin to the Rose Blanche and Port aux Basques Granites (Brown, 1976, 1977) and was intruded during the peak of metamorphism. The younger plutons were emplaced after the early, penetrative regional deformation and metamorphism. They include large bodies of porphyritic monzodiorite to granite and equigranular biotite granite north of the Bay d'Est Fault, and porphyritic, mafic-rich granite and red biotite granite south of the fault. All units were at least locally affected by late movement on the Bay d'Est Fault and contemporaneous shear zones.

Metagabbro (Unit 1)

Remnants of metagabbro bodies underlie several of the Blue Hills of Couteau. Although they generally have tectonic contacts, they have been intruded locally by the Baggs Hill Granite and very fine grained felsic stringers. Angular cobbles of quartz gabbro are included in the nearby mafic volcanic rocks.

The metagabbro forms large, black to dark green weathering outcrops, criss-crossed by numerous east trending, anastamosing shear zones. Displacement on some of these shears has probably disrupted the internal organization of the units. Many of the rocks are metamorphosed to amphibolite facies, but relict igneous textures and mineralogy (?) are found within the largest bodies. Massive medium and coarse grained pyroxene gabbro is the most widely

exposed rock type; patches of layered pyroxene gabbro were observed locally. Diabase irregularly intrudes and engulfs the more coarse grained phases and is abundant in the southeastern parts of the two large pods. Stringers and fracture fillings of pearly white to cream coloured leucogranite containing large actinolite crystals cut the gabbroic rocks, but are sheared with them. Where thoroughly recrystallized, the gabbro consists of an intergrowth of hornblende and plagioclase with increased development of actinolite and talc in the late shear zones. Polycrystalline garnet clots were noted at one locality. An L-fabric, predating the late shearing and defined by the orientation of hornblende and actinolite, was observed locally.

Bay du Nord Group (Units 2-5)

The Bay du Nord Group was originally defined by Cooper (1954) as a series consisting largely of sedimentary rocks containing fossils of Devonian age. Recent work has revealed that the group contains a higher proportion of volcanic and volcaniclastic rocks than originally believed, and that most of the rocks predate the Devonian fossil-bearing strata (Chorlton, 1978; Chorlton 1979a). Field relations in the La Poile River and Peter Snout areas indicate that the Dolman formation, the newly named Piglet Brook Rhyolite (Chorlton, in preparation) and Baggs Hill Granite, all volcanic and subvolcanic units, were emplaced within the depositional cycle of the Bay du Nord volcanic and sedimentary rocks. Therefore, they are informally included in this group.

The redefined Bay du Nord Group underlies the north and central parts of the map area where it hosts several granitoid intrusions (Unit 8,9,11,13). It is in contact with lateral equivalents of the La Poile Group across the Bay d'Est Fault zone; the continuity of volcanic and sedimentary lithologies across the fault suggests that these two groups are related.

The Bay du Nord Group was deformed during at least four regional tectonic events, and metamorphosed to amphibolite grade between the first and second event. Shear zones and fabrics related to the third deformation caused variable alteration and local retrogression of metamorphic assemblages.

Bay du Nord sedimentary and volcanic rocks (Unit 2)

This unit consists of intermixed sedimentary rocks, volcanic and volcaniclastic rocks, amphibolite, migmatite, and injection gneiss. It is older than the Dolman Formation in this map area and both younger and older than the Baggs Hill Granite. Clasts from the granite and Piglet rhyolite are common in the volcanic conglomerates in the central part of the map area, but granite locally intrudes volcanic and sedimentary rocks in the La Poile River area (Chorlton, 1979a). Clasts from the Dolman formation are absent from the conglomerates in both the Peter Snout (West) and La Poile River areas. The contact with the Dolman Formation is gradational in many places, where thick deposits of intermediate crystal-lithic tuff with a graywacke-like matrix are difficult to distinguish from the more quartzofeldspathic Dolman tuff.

Non-volcanic sedimentary rocks (2a,b) occur in three areas within the map area. An east-trending belt of slate, siltstone, and graywacke (2a) extends along the north side of the Blue Hills of Couteau. To the west, where the belt is thinnest, the predominant rock type is a slaty, gray quartz-muscovite-biotite schist. Boudins of bedded siltstone and graywacke, with sandy lenses rich in quartz and feldspar detritus, display bedding which is chopped up and transposed along the dominant regional foliation. Graywacke and siltstone interbedded with laminated slate are observed to the east, where the belt is wider and deformation is less intense. On the west side of the map area, north of the Bay d'Est Fault,

LEGEND

DEVONIAN

13 Equigranular, medium grained biotite granite, locally leucocratic with minor muscovite and garnet.

12 Chetwynd Granite: 12a, medium to coarse grained pink to red biotite granite; 12b, quartz feldspar porphyry.

11 11a, porphyritic biotite granodiorite and 11b, monzodiorite (Iron-bound Hills area). Unfoliated in the north and northwest, but foliated in the south.

10 Mafic-rich, coarse grained, porphyritic granite.

PRE-DEVONIAN?

9 Foliated porphyritic granite: Otter Point Granite?; orthogneiss with alkali feldspar augen.

8 Rose Blanche Granite: 8a, foliated granodiorite, tonalite; 8b, muscovite-biotite granite, locally garnetiferous; 8c, potassic biotite granite with segregated biotite lenses (Port aux Basques Granite?); 8d, dominantly granitic blastomylonite and mylonite, including screens of injection gneiss and amphibolite, locally characterized by muscovite porphyroblasts on foliation plane.

MIDDLE TO LATE ORDOVICIAN

La Poile Group (6-7)

7 Georges Brook Formation: 7a, rhyolite, rhyolite tuff, lapilli tuff, crystal tuff, agglomerate, minor sedimentary rocks; 7b, mafic volcanic rocks including flows, pyroclastic rocks and dikes; 7c, lithic sandstone and conglomerate with dominantly volcanic clasts.

6 Roti Granite: Equigranular, subvolcanic granodiorite to quartz porphyry.

Bay Du Nord Group (2-5)

5 Dolman Formation: Crystal tuff, lapilli tuff; massive gray, streaky, feldspathic schist.

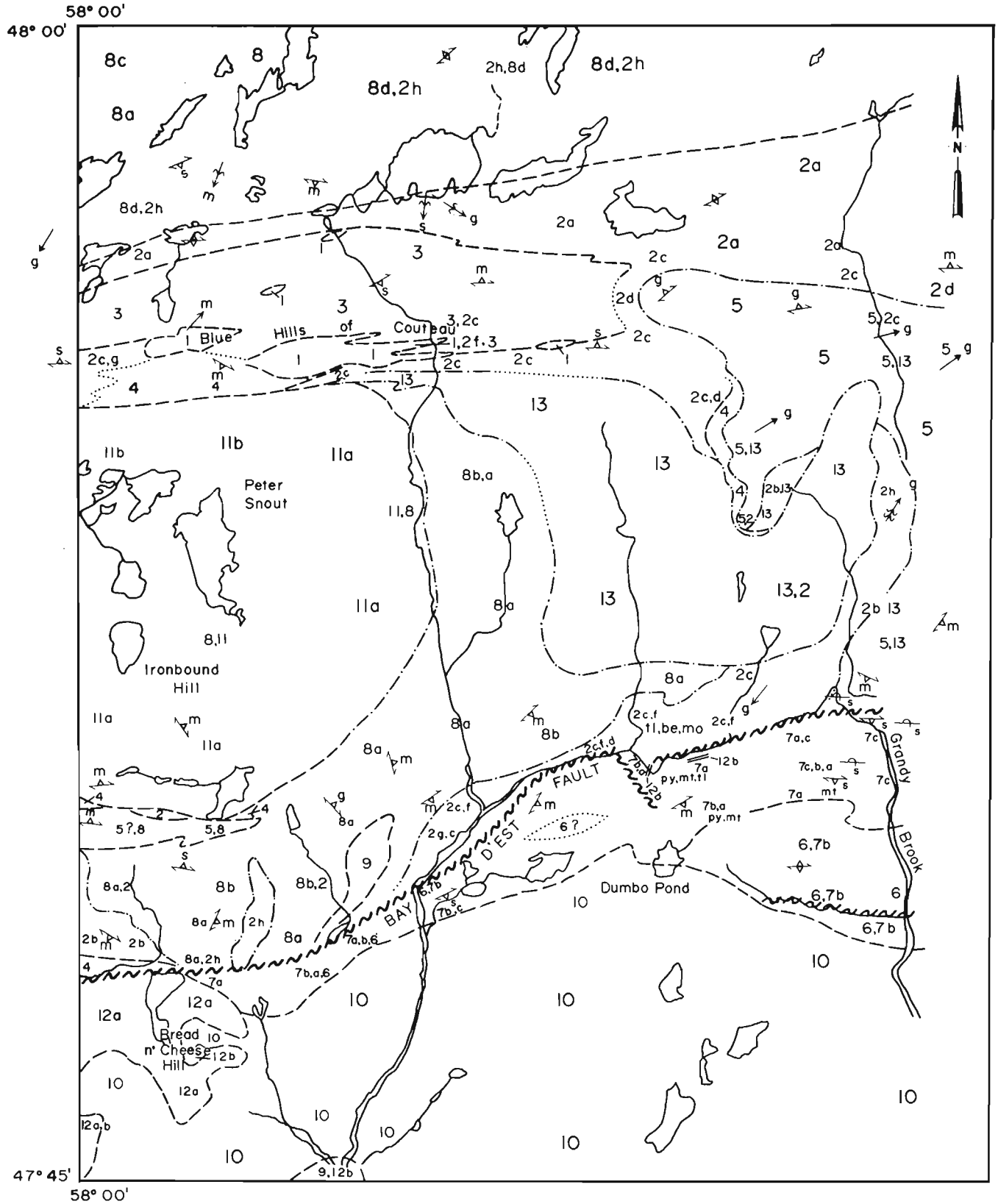
4 Piglet Brook Rhyolite: Pink rhyolite or rhyolite sills.

3 Baggs Hill Granite: Fine grained, subvolcanic granite, granophyre, quartz (feldspar) porphyry.

2 Metasedimentary and metavolcanic rocks: 2a, Dark phyllite with metagraywacke and graphite schist bands; 2b, metagraywacke, metasiltstone; 2c, silicic metavolcanic, including pyroclastic rocks, tuffaceous metagraywacke; 2d, white weathering rhyolite, rhyolite tuff; 2e, polymictic volcanic conglomerate;2f, mafic metavolcanic rocks; 2g, amphibolite; 2h, injection gneiss.

ORDOVICIAN? OR OLDER?

1 Metagabbro, layered metagabbro, metapyroxenite, metadiabase and volcanic rocks, genetically related amphibolite.



PETER SNOUT (west half)

11P/13 W

Kilometres 5 0 5 Kilometres

other metasedimentary rocks (2b) consist of garnet-biotite-quartz schist with thin bands of actinolite-epidote-quartz schist. Many outcrops contain thin migmatite stringers, and injections of Rose Blanche Granite and pegmatite. Similar rocks are found just west of Grandy Brook. where they are locally migmatized by the late granite (Unit 13).

Felsic volcaniclastic rocks (2c) are associated with amphibolite (2g) in the western and central parts of the map area, but with rhyolite and/or massive rhyolite tuff (2d) in the northeast. Exposures of polymictic, volcanic boulder conglomerate (2e) occupy an area adjacent to the Bay d'Est Fault, northeast of Dumbo Pond.

The felsic volcaniclastic rocks (2c) consist of interbedded lapilli tuff, agglomerate or conglomerate, and tuffaceous graywacke, with lenses of black laminated argillite. The lapilli tuffs grade into the agglomerate or conglomerate but the black argillite appears as discrete lenses. Clasts in the lapilli tuff consist mainly of rhyolite or fine grained granite with local concentrations of quartz and feldspar crystal fragments, and are enclosed in a gray biotite-rich matrix. The associated agglomerate/conglomerate contains moderately well sorted pebble to cobble sized clasts consisting largely of Baggs Hill Granite and Piglet rhyolite in complementary proportions. Mafic volcanic fragments occur locally with Piglet clasts around the Blue Hills of Couteau.

The massive rhyolite (2d) is a white to pale gray weathering, aphanitic felsite. It forms large outcrops on a hill overlooking the northwest branch of Grandy Brook, and occurs in proximity to felsic lapilli tuff, Piglet rhyolite, and Dolman tuff in a small range of hills to the southeast.

The polymictic conglomerate (2e) contains crudely sorted cobbles and boulders of quartz-feldspar porphyry, fine grained granite (Baggs Hill Granite), white rhyolite, vesicular basalt or andesite, diabase, and minor vein quartz. The fragments are elongated parallel to regional trends.

Mafic volcanic rocks (2f) are recognizable in the Blue Hills of Couteau, and near the Bay d'Est Fault. The Blue Hills exposures consist of basaltic breccias containing a few exotic quartz gabbro blocks, and veined with networks of white felsite. Lapilli tuff of intermediate to mafic composition was noted in this area. Near the Bay d'Est Fault, mafic volcanic boulders are fairly abundant in the polymictic volcanic conglomerate (2e). These boulders are buff to gray in color, and contain small ovoid biotite patches, presumably replacing former vesicle fillings. Several amphibolitized mafic dikes cut the conglomerate in this area.

Amphibolite (2g) occurs in association with the felsic volcanic rocks and as screens or inclusions within the Rose Blanche Granite. In the central part of the map area, amphibolite is interlayered with felsic pyroclastic rocks on a scale of ten centimetres to several metres. The amphibolite is composed mainly of hornblende and plagioclase, with traces of disseminated pyrite. A weak linear fabric is imparted by the hornblende crystals. Amphibolite xenoliths are common in the Rose Blanche granite to the north of these occurrences, and north of the Blue Hills of Couteau. Many of the amphibolitic rocks (2g) may be thoroughly reconstituted mafic volcanic rocks (2f), with original textures preserved only where sheltered from extreme deformation, for instance, within the Blue Hills gabbro boudins or by the presence of neighbouring felsic boulders. However, several amphibolite inliers of extremely basic composition in the northeast corner of the adjacent La Poile River area suggest that at least some of these rocks may represent reconstituted mafic and ultramafic plutonic rocks (1?).

Migmatite and injection gneiss (2h) occur as screens in the Rose Blanche Granite (8d) within a broad shear zone across the north side of the area, and also in the west and central parts. Most of these rocks are semipelitic biotite schist hosting stringers of white leucogranite and injections of Rose Blanche granite or granodiorite. Screens of more silicic rock occur within the northern shear zone, where they are difficult to separate from the enclosing granitoid material.

Baggs Hill Granite (Unit 3)

The Baggs Hill Granite (Cooper, 1954) is a subvolcanic granite which occupies a broad band through the Blue Hills of Couteau. The granite encloses and locally intrudes lenses or boudins of metagabbro but the contacts with the metasedimentary and metavolcanic rocks are not exposed in this map area. Fragments of the Baggs Hill Granite are common within the Bay du Nord pyroclastic rocks.

The granite forms hackly, cream colored outcrops, which range from moderately fine grained leucogranite to quartz and/or feldspar porphyry. Fine grained biotite aggregates are the only discernable ferromagnesian mineral phase. Rare, highly reddened patches in the granite contain relatively high concentrations of biotite.

Piglet Brook Rhyolite (Unit 4)

The name Piglet Brook Rhyolite (Chorlton, in preparation) is applied to a distinctive, equigranular, flesh-colored rhyolite, formerly referred to as 'granulite' by Cooper (1954) and pink rhyolite by Chorlton (1979a). Layers of this rhyolite are associated with the Bay du Nord metasedimentary and metavolcanic rocks in several places within the map area, and fragments of the rhyolite occur locally within the Bay du Nord volcanic conglomerate or agglomerate.

The Piglet Brook Rhyolite has a sugary texture, and forms smooth, commonly fractured outcrops. It is composed primarily of a fine grained intergrowth of quartz and feldspar with traces of muscovite, enclosing tiny phenocrysts of reddened plagioclase and rare, altered alkali feldspar. Garnet occurs in the rhyolite next to the Bay d'Est Fault. The matrix generally contains very fine grained brown specks, which probably represent a weathered oxide mineral.

Dolman formation (Unit 5)

The Dolman formation (Chorlton, 1978) consists of deformed and metamorphosed felsic volcanic rocks, mainly crystal-lithic tuff. It is thought to be younger than most of the Bay du Nord rocks in the area, and may possibly be equivalent to parts of the Georges Brook Formation (Chorlton, 1978). A zircon U/Pb radiometric date obtained from the tuff in the La Poile River map area yielded an age of 449 $\pm$ 20 Ma (Dallmeyer, unpublished report).

Primary textures such as thick beds and coarse volcanic clasts are preserved near Dolman Cove in the La Poile River area (Chorlton, in preparation) but were obliterated by deformation and recrystallization eastward toward the present area. The resultant schist is light gray to buff in color and monotonous in outcrop, with a pronounced linear fabric produced by the elongation of coarse biotite and feldspar clots.

La Poile Group (Units 6 and 7)

The La Poile Group originally defined by Cooper (1954) and redefined by Chorlton (1979b), is composed of three formations in the type area: the Roti Granite, the Georges Brook Formation, and the Hawks Nest Pond Porphyry. The latter is not exposed in the present area. The Roti Granite is a subvolcanic granite which was emplaced early in the depositional interval of

the Georges Brook Formation, a thick assemblage of felsic and mafic volcanic rocks and associated sedimentary bands and lenses. The Hawks Nest Pond Porphyry is a porphyritic microgranite, intruded into the youngest deposits of the Georges Brook Formation. A tentative Rb/Sr whole rock isochron derived from mafic and felsic volcanic rocks of the Georges Brook Formation yielded an age of 459 ± 18 Ma (Wanless, personal communication). Another unpublished U/Pb zircon date on the Hawks Nest Pond Porphyry of 410 ± 20 Ma suggests that this phase may be significantly younger (Dallmeyer, unpublished report).

The La Poile Group has been polydeformed and metamorphosed to greenschist facies.

Roti Granite (Unit 6)

The Roti Granite (Cooper, 1954), a subvolcanic granite, occupies a wedge between Dumbo Pond and Grandy Brook and forms small lenses associated with mafic dikes to the west. The granite is intruded by the late, megacrystic granite (10) to the south, and is unconformably overlain by the Georges Brook bedded lapilli tuff, conglomerate, and sandstone to the north. The latter rocks contain clasts of Roti Granite. The granite is highly sheared and silicified near the northern contact and numerous rusty zones contain finely disseminated pyrite. Irregular mafic dikes cut both the Roti Granite and the Georges Brook Formation.

The granite varies from sugary felsite and sericite schist in highly sheared zones, to penetratively foliated quartz phyric granite. The quartz domains are flattened and the feldspar highly altered. Clots of biotite, epidote, chlorite and sphene constitute the main mafic phase. In the southeast, near the megacrystic granite contact and a prominent late shear zone, the quartz and ferromagnesian clots are elongated to form a steeply plunging linear fabric and the feldspars are pervasively reddened.

Georges Brook Formation (Unit 7)

The name Georges Brook Formation (Chorlton, 1979b) was given to a sequence of mafic and felsic volcanic and sedimentary rocks, which is best exposed in the La Poile area to the southwest. This unit underlies a strip across the present map area adjacent to the Bay d'Est Fault. It is intruded by the late red granite (12) and the megacrystic granite (10), by which it is thermally metamorphosed.

In this area, the Georges Brook Formation is represented by diabase, dominantly mafic agglomerate or conglomerate, and felsic volcanic rocks which pass eastward into massive and bedded lapilli tuff, crystal tuff, conglomerate, and sandstone near Grandy Brook. The mafic rocks west of Spumoni Pond are coarsely recrystallized by the megacrystic granite, contain relatively high proportions of biotite, and are veined with epidote. The associated conglomerate is also coarsely recrystallized; it contains more mafic than felsic fragments and some banded or laminated fragments were observed. The felsic rocks include both crystal tuff and fine grained, sugary felsite, which are cut by mafic dikes; all are very similar to Bay du Nord assemblage on the north side of the fault zone. This association extends to outcrop areas north and immediately northeast of Dumbo Pond, where the mafic and felsic volcanic rocks are locally highly sheared and mineralized with pyrite and magnetite. One small plug of fine grained gabbro was noted in this area.

Farther east, crystal and lapilli tuff, interbedded with conglomerate and sandstone are cut by mafic dikes. The tuffs contain mainly felsic fragments; however, the conglomerates contain pebble to boulder sized fragments of mafic volcanic rock, fine grained granite, quartz porphyry, rhyolite, and vein quartz in varying proportions. The sandstones are coarsely crossbedded

graywacke and contain discontinuous pebble and granule lenses. The beds are steeply overturned and face north. Contact metamorphic effects are also present in this area; they include the development of andalusite in several pelitic lenses and of chlorite poikiloblasts in intermediate rocks on the hill west of Grandy Brook, and reaction rims around mafic cobbles in the conglomerates exposed in Grandy Brook. The felsic pyroclastic rocks host locally intense magnetite mineralization on the hill near the Roti Granite contact.

Rose Blanche Granite (Unit 8)

Rose Blanche Granite is the name applied by Brown (1976, 1977) to intrusions of variably deformed, equigranular biotite granite, granodiorite, and garnetiferous leucogranite which occur as sheets in the reworked Port aux Basques Gneiss. This unit extends across the La Poile River (110/16) map area into the northwestern part of Peter Snout area, and similar rock is exposed south of the Blue Hills of Couteau. The granites intrude amphibolite facies semipelitic and felsic schist, and amphibolite of the Bay du Nord Group, in which leucocratic stringers are common. The granite is itself cut after the main deformation by porphyritic monzodiorite and granodiorite (11), and equigranular granite (13). However, the positions of the contacts require further investigation.

The Rose Blanche Granite includes several texturally distinct phases. In the northwest corner, it is a white weathering, granodiorite or tonalite (8a) with subordinate pink granitic lenses (8c) characterized by segregated biotite lenses. A broad shear belt transects this lithology to the south-southeast, within which the granite and its inclusions are blastomylonitic (8d). Coarse grained and fine grained layers alternate, the micas are coarse grained and confined to discrete foliation planes, and the quartzofeldspathic minerals are flattened. In coarse grained layers, feldspar porphyroclasts form augen in the foliation. Large porphyroblasts of muscovite in the foliation planes are also characteristic of the granitic rocks in this belt. The rocks south of the Blue Hills of Couteau range from white weathering granodiorite (8a) to white or pink muscovite granite, with rare minute garnets (8b). They posses a foliation defined by the flattening of quartzofeldspathic aggregates and the subparallel orientation of the micas, but are not gneissic. Pegmatites with abundant garnet and less abundant tourmaline are common locally.

Otter Point Granite (Unit 9)

The Otter Point Granite (Chorlton, 1979b) is a large body of coarse grained porphyritic granite exposed along the south coast in the La Poile area. The intrusion extends into the southwest corner of the map area, where it is truncated by the late porphyritic granite (10). Small lenses of granitic augen schist are exposed within the Rose Blanche Granite terrane north of the Bay d'Est Fault and are only very tentatively correlated with this granite.

The granite contains large, twinned orthoclase/microcline and smaller plagioclase phenocrysts in a coarse grained matrix of quartz, biotite, and hornblende. The Otter Point Granite is distinct from the younger porphyritic granite in that it contains less ferromagnesian constituents, and that the biotite marks a weak schistosity that locally augen the feldspar phenocrysts. An abundance of sugary, pink to red aplite is associated with the Otter Point Granite.

Porphyritic, mafic-rich granite (Unit 10)

This large, unnamed granite body occupies the south part of the map area,

and extends to the southeast at least as far as Burgeo. It cuts the Otter Point Granite and the La Poile Group, and is cut by the equigranular red granite and related dikes (12). Except for late shearing, the body is essentially undeformed, though it possesses a penetrative fabric near Burgeo.

Outcrops of this granite are large and rounded. Feldspar phenocrysts from 2 to 4 cm in diameter are visible from a distance. The phenocrysts consist of euhedral pink to white, patchy orthoclase and/or microcline with perthitic cores and tiny, zonally arranged plagioclase inclusions near the rims. The ferromagnesian minerals, mainly biotite, constitute about 15 to 20 per cent of the modal composition, and occur with plagioclase, microcline, quartz, and abundant accessory sphene in the matrix.

Porphyritic monzodiorite, granodiorite, and granite (Unit 11)

This suite underlies a roughly circular area around Ironbound Hill. It is intruded by the late, equigranular leucogranite (13), however, its relationship with the other units is still uncertain.

At least three phases of this body have been identified, but no contacts among them have been observed. The most mafic phase is a porphyritic monzodiorite to quartz monzonite, which weathers dark gray in outcrop. Gray, visibly zoned plagioclase tablets, some partly altered to microcline, are embedded in a coarse grained matrix of biotite, hornblende, augite, microcline, and quartz. It is apparently unfoliated. The most widely exposed phase is a porphyritic granodiorite, of which the chief distinguishing feature is the presence of plagioclase and smaller prismatic hornblende phenocrysts in a matrix of feldspar, quartz, biotite and amphibole. The ferromagnesian minerals define a foliation which is especially strong in the shear zone south of Ironbound Hill, and decreases in intensity northwards. The granitic phase is confined to a small area at the western margin of the map area. It is composed of large, ragged microcline phenocrysts or porphyroblasts which poikilitically enclose small grains of plagioclase, quartz and biotite set in a coarse grained granitic matrix.

Chetwynd Granite (Unit 12)

The Chetwynd Granite (Cooper, 1954) is a semicircular intrusion of medium grained pink biotite granite and associated porphyry dikes largely exposed in the La Poile (110/9) and La Poile River (110/16) map areas (Chorlton, 1979a, 1979b). It cuts the porphyritic, mafic-rich granite (10), the Otter Point Granite (9), and the La Poile Group (6,7). Several fine grained porphyritic apophyses attached to the main intrusion are identical to dikes (12b) which occur 10 km to the east-northeast. The presence of abundant pink aplite in the Bay d'Est Fault zone may possibly be linked to the emplacement of the Chetwynd Granite.

The granite is composed of red to pink perthitic microcline, plagioclase, quartz, and biotite, with accessory sphene, zircon, and iron oxide commonly visible in hand specimen. It varies widely in texture. Medium grained equigranular granite predominates, and grades internally into pockets of coarse grained microcline porphyritic granite, and into quartz and feldspar phyric microgranite near the eastern margin. The dikes contain phenocrysts of quartz and feldspar in a pink, granophyric matrix.

Late, equigranular biotite granite (Unit 13)

This granite forms another semicircular body in the east-central part of the map area, but appears to have extensive offshoots to the west. It cuts the Rose Blanche Granite and Bay du Nord Group after the second phase of regional deformation and creates local

migmatite zones in the latter. A similar granite, the Spoon Brook Granite (Chorlton, in preparation), is exposed in the La Poile River (110/16) map area.

The granite weathers white to pale pink, but is locally mottled red and white. It consists of a medium to fine grained intergrowth of microcline, plagioclase, quartz, and biotite with minor muscovite and garnet.

Pegmatites and Veins

Pegmatite and tourmaline veins are concentrated around the Bay d'Est Fault zone. Pegmatites are also abundant in the shear zone south of Ironbound Hill.

The fault zone pegmatites and veins are hosted in sheared La Poile and Bay du Nord Group volcanic rocks. The pegmatites consists of graphic granite, quartz, tourmaline, accessory magnetite, and rare beryl. Tourmaline-quartz veins are ubiquitous in this zone, and contain minor sulphides. One network of tourmaline and graphic granite veins on the north side of the fault contains beryl, molybdenite, pyrite, chalcopyrite, and malachite. Purple and green fluorite occurs along the schistosity nearby.

The pegmatites south of Ironbound Hill are hosted by the Rose Blanche Granite and very deformed Dolman tuff. These pegmatites consist of microcline, albite, quartz, muscovite, garnet, and local tourmaline.

DEFORMATION AND METAMORPHISM

Units 1 through 7 have been subjected to four regional tectonic events, units 8 through 9 by three, and the units 10 through 13 by two.

The first event was followed by a regional metamorphic peak in the amphibolite facies for the terrane north of the Bay d'Est Fault, and greenschist facies south of the fault. Consequently the main evidence for the first deformation is a remnant early schistosity preserved in the cores of porphyroblasts and inclined to the external foliation in the semipelitic schists.

The second deformation resulted in tight to isoclinal folding and the formation of an intense regional schistosity and lineation. In this map area, second generation fold hinges were observed in the Bay d'Est Fault and to the north on hills overlooking Grandy Brook. Steeply plunging isoclines also occur within the northern shear zone.

The third deformation resulted in refolding, shearing, and faulting, thought to be related in part to the uplift of the Bay du Nord terrane on the Bay d'Est and related faults. Open refolding of the second schistosity and fold hinges in the southeast contrast with fairly tight, third phase folding about generally east trending axial planes and east-northeast trending shears found in the northern shear zone. Transposition of early schistosity and the development of thin shear zones are common over most of the area. Severe boudinaging of post second deformation pegmatites in the shear zone south of Ironbound Hill, and the development of the foliation in the southeast part of the porphyritic monzodiorite-granodiorite (Unit 11) were also probably due to this event.

The fourth event is less significant than the earlier ones. It gave rise to upright, open chevron and kink folds at high angles to the regional grain, and local, roughly north striking block or strike-slip faults. Widely spaced crenulation cleavage is well developed in some areas.

MINERALIZATION

The most promising metallic mineralization is hosted in the La Poile and Bay du Nord Group volcanic rocks, and is concentrated within the Bay d'Est Fault and along offshoots and

synchronous shear zones to the southeast. Pyrite and magnetite are the main metallic minerals. Disseminated pyrite and pyrite segregations along shear surfaces occur in both the felsic volcanic rocks and the mafic dikes which cut them. Chalcopyrite, in addition, was noted in the dikes towards the west part of the main mineralized zone. Magnetite occurs mainly in the felsic rocks, accompanied by disseminated pyrite.

A notable occurrence of massive and disseminated magnetite is located on the hill to the southeast of these showings overlooking Grandy Brook. The magnetite is hosted by ashflow tuff of the Georges Brook Formation and appears to be replacing parts of the matrix. The magnetite occurs a few metres north of the sheared contact with the Roti Granite, which itself contains several rusty zones caused by local disseminations of fine grained pyrite.

Tourmaline veins are abundant within the fault zone, and are present, but less numerous to the southeast. One tourmaline vein, which cuts mafic and felsic volcanic rocks on a waterfall north of the main mineralized zone, contains beryl, molybdenite, malachite, pyrite and chalcopyrite. In the same outcrop, green and purple fluorite were noted in fractures along the schistosity.

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