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GEOLOGY AND TECTONIC SIGNIFICANCE OF THE RAMEA ISLANDS, NEWFOUNDLAND

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ABSTRACT

Tectonostratigraphic correlations place the Ramea Islands within the Paleozoic Gander Zone of the Appalachian Orogen, whereas correlations based on geophysical studies, and corroborated by the presence of Precambrian rocks at Grey River and Cinq Cerf, place the islands within a Precambrian terrane, i.e., the Avalon Zone or the Bras d'Or Terrane.

The Ramea Islands are underlain entirely by plutonic rocks of unknown age. The earliest major unit is a 1-km-wide belt of mylonitized, feldspar porphyritic, biotite granite that has been intruded by biotite granites, gabbro and diabase. Mylonitization occurs within a dextral shear system. The post-mylonitization granite along the northwest-facing coast is extensively brecciated.

The mylonitic granite is similar to one 60 km to the east, on the south coast of Newfoundland, which has been correlated with the Gaultois Granite, a characteristic rock of the Gander Zone. The latest posttectonic granite and the mafic intrusions on the Ramea Islands are similar to Devonian or younger correlatives along the south coast of Newfoundland. The Ramea Islands lie southwest of the Precambrian Grey River enclave. Their possible correlation with the Gander Zone implies a tectonic contact with the enclave. Easterly trending aeromagnetic anomalies between the Ramea Islands and the south coast may also indicate that they form part of a separate block.

INTRODUCTION

The Ramea Islands are situated 6 km off the south coast of Newfoundland and are about 20 km southeast of Burgeo (Figure 1). The islands are underlain by gabbroic to granitic rocks (Figure 2) that have been correlated with the Siluro-Devonian Burgeo Intrusive Suite on the adjacent south coast of Newfoundland (Dickson *et al.*, 1985; O'Brien *et al.*, 1986).

REGIONAL TECTONIC SETTING

The granitoid rocks of the Ramea Islands and the Siluro-Devonian Burgeo Intrusive Suite are shown by O'Brien *et al.* (1986), Williams *et al.* (1989) and Dickson *et al.* (1989) to lie within the Gander Zone of the Appalachian Orogen on the basis of lithological similarities with typical Gander Zone intrusive rocks in northeastern Newfoundland (Figure 3). Similarly, based upon offshore, deep-seismic data Marillier *et al.* (1989) show that the Burgeo Intrusive Suite and the Ramea Islands lie well north of the Avalon Zone boundary and within the Gander Zone (Figure 3).

Metamorphic rocks in the Grey River area (Grey River enclave of Blackwood, 1985; Figure 1), were shown by Williams (1971) and Howarth and Lefort (1979) to be possible correlatives of the Avalon Zone. Dunning and O'Brien (1989) dated units of the enclave and others at Cinq Cerf (75 km west of Ramea) and obtained Late Precambrian to Early Ordovician dates from gneissic, plutonic and volcanic units (*see* also Stewart and Dunning, 1990); these data indicate a possible affiliation with the Avalon Zone. An east-trending shear zone separates the Grey River enclave from the adjacent Siluro-Devonian Burgeo Intrusive Suite. Precambrian strata at Cinq Cerf are locally unconformably overlain by, but are mainly in fault contact with, Silurian strata (O'Brien and O'Brien, 1990).

TRANS-GULF CORRELATIONS

Southeastern Cape Breton Island is considered by Barr and Raeside (1986) to be composed of two terranes known as the Bras d'Or and Mira terranes, which formed the continuation of the Newfoundland Avalon Zone (Figure 3). More recently, Barr and Raeside (1989) restricted this correlation to the Mira Terrane and proposed that the Late Precambrian history of the Bras d'Or Terrane is distinct from that of the Mira Terrane.

The Bras d'Or Terrane (Figure 3) of Cape Breton Island consists of Late Precambrian to Early Ordovician gneisses, metasedimentary and metavolcanic, and abundant plutonic rocks. This terrane is correlated with the Cinq Cerf and Grey River blocks of southern Newfoundland (Barr and Raeside, 1989). The Ramea Islands and the adjacent Burgeo Intrusive Suite are shown by Loncarevic *et al.* (1989), Barr and Raeside (1989), Dunning *et al.* (1990) to lie within the Bras d'Or Terrane.

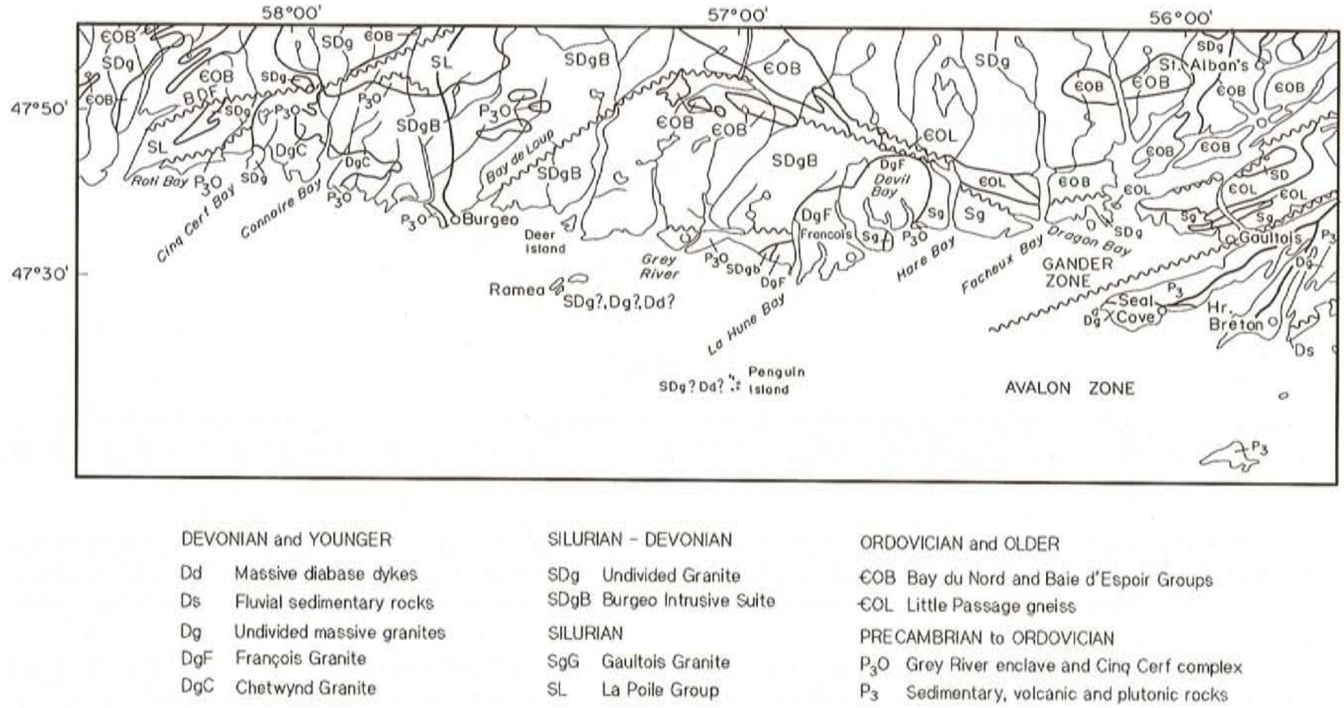


Figure 1. *Regional setting of the Ramea Islands (based on Colman-Sadd et al., 1990). BDF = Bay d'Est Fault.*

The Bras d'Or and Mira terranes are correlated with the Avalon Zone by Marillier *et al.* (1989). The submarine position of the Gander–Avalon Zone contact between Newfoundland and Cape Breton Island is only inferred by Marillier *et al.* (1989; Figure 3). Keppie *et al.* (1990) and Keppie (1990) also prefer to include the Bras d'Or Terrane in their 'Avalon Composite Terrane' arguing that significant correlations of Late Proterozoic to Carboniferous units can be made across the proposed Bras d'Or–Mira terrane boundary of Barr and Raeside (1989). The Ramea units, which in the various Precambrian terrane models apparently lie outside the Gander Zone (Terrane), should show some affinity to the plutonic rocks of either the Avalon (and/or Mira) terrane or the Bras d'Or Terrane.

ROCK TYPES OF THE RAMEA ISLANDS

The Ramea Islands are underlain by a variety of mylonitic, brecciated and massive intrusive rocks (Figure 2). High-grade metamorphic or gneissic metasedimentary units are absent, although biotite-rich, possibly metasedimentary xenoliths occur locally. Foliated and metamorphosed, hornblende–biotite granite (subunit 2b) occurs in the eastern part of the Ramea Islands but this unit is probably related to the Unit 2 mylonitic granite.

The oldest unit is represented by several 1000 m^2 variably deformed or massive metagabbroic inclusions (Plate 1) within granitic Units 2, 3 and 5 (Figure 2). Some inclusions are polydeformed and contain porphyroblasts of actinolite related to contact metamorphism by the enclosing granites.

A northeast-trending, 1-km-wide belt of intensely deformed granite (Unit 2) occurs on both sides of the northeast-trending channel, south of Northwest Island, and continues to the east along the southern edge of Main Island. The granite consists of fractured, 1- to 2-cm-long, perthitic K-feldspar and plagioclase augen in a green-black, fine-grained, granoblastic matrix of quartz, amphibole, titanite and opaques (Plate 2; see also Plates 8 and 9). The most deformed parts of the granite contain black, very fine-grained, parallel mylonite zones (subunit 2a). Near the eastern end of Great Island, the granite of subunit 2b consists K-feldspar porphyroclasts, which have recrystallized to form euhedral subgrains, in a matrix of polygonized quartz, aligned biotite and randomly oriented fresh actinolitic hornblende porphyroblasts.

Massive, medium-grained, equigranular and K-feldspar porphyritic, biotite ± hornblende granite (Unit 3) extends from Ramea Colombier island northeastward to the eastern end of Great Island (Plate 3; Figure 2). The contact of Unit 3 with Unit 2 is intrusive; massive granite dykes of Unit 3 cut the mylonites (Plate 4) and xenoliths of mylonitic Unit 2 occur within Unit 3. The northwestern portion of Unit 3 is highly brecciated and cut by numerous anastomosing, brittle shears (Plate 5). A small intrusion of massive, biotite–hornblende granodiorite (Unit 4) outcrops at the eastern end of Great Island and contains xenoliths of Unit 3.

Massive, pink, fine- to medium-grained, leucocratic biotite granite (Unit 5) has intruded the mylonitic granite (Unit 2), east of Ramea Harbour (Plate 6). A similar granite outcrops at Northwest Head (S.J. O'Brien, personal communication, 1990) and this granite may be the source of the nearby massive granitic dykes that cut the mylonitic granite. Various massive to weakly cleaved felsic dykes (Unit 6) have intruded the earlier granites.

Medium-grained, massive, biotite–hornblende gabbro (Unit 7) outcrops at the southern edge of Ramea Harbour. The gabbro has intruded the mylonitic granite and is probably intrusive into the massive granite (Unit 5). Diabase dykes (Unit 8) occur throughout the area (Plate 7). At the southern entrance to Ramea Harbour, diabase forms a 500-m-wide plug.

STRUCTURAL FEATURES OF THE RAMEA ISLANDS

The dominant structure in the Ramea Islands area is a major northeast-trending, steeply dipping, ductile shear zone restricted to Unit 2. Deformation is most intense along the main channel having 1- to 5-m-wide, parallel, 060°-trending, steeply dipping zones of black, flinty mylonite within porphyroclastic granite, which has a mylonitic matrix. Toward the unit margins, the granite is dominated by porphyroclastic granite having narrow (1 cm), anastomosing bands of black, fine-grained mylonite. Locally, the porphyroclastic granite is folded into open folds (Plate 8).

Asymmetric feldspar porphyroclasts indicate that shearing was mainly dextral. Mafic psammitic xenoliths are elongate having subhorizontal long axis parallel to the foliation (Plate 9). Mineral lineations are rare and plunge gently to the southwest; definitive C-S fabrics were not found.

The shear zone clearly predates intrusion of Units 3 and 5. Xenoliths of mylonitic granite occur within Unit 3 and granite veins crosscut the mylonitic fabric. The veins locally contain a weak fabric that is parallel to the mylonitic fabric and axial planar to open folds of the granite veins. The mylonitic fabric is locally overprinted by an east-trending fracture cleavage.

A 500-m- to 1-km-wide belt of brittle fracturing and shearing occurs along the northwest side of Northwest Island and Great Island (subunit 3a). The fracturing intensity and shearing increases to the northwest and north on Northwest Island and Great Island, respectively. This extensive zone of brecciation indicates that a major, late fault lies to the northwest of the islands. Several massive, post-brecciation diabase dykes have intruded along later, mainly northwest-trending faults.

GEOPHYSICAL EXPRESSION

In the gravity and magnetic compilations of Loncarevic *et al.* (1989), the Ramea Islands lie in an area of high gravity and magnetic anomalies that continue eastward to the western margin of the Avalon Zone. These anomalies define the Bras d'Or Terrane. The northern limit of these anomalies almost coincides with the northern contact of the Burgeo Intrusive Suite, which is also the site of several major shear zones (see O'Brien and Dickson, 1986). The gravity data do not show this boundary, which is presumed by Loncarevic *et al.* (1989) to be masked by the granitic rocks. Howarth and Lefort (1979) tentatively proposed that the northern limit of the Avalon Zone along the south coast of Newfoundland lay within the area of the Burgeo Intrusive Suite. This was based on the extent of magnetic zones similar to those of the Avalon Zone in eastern Newfoundland, the presence of Avalon Zone equivalent rocks at Grey River (from Williams, 1971), and the location of northwest-trending magnetic lows that coincided with presumed tear faults. The Burgeo Intrusive Suite was assumed to have intruded the Avalon–Gander Zone boundary.

The aeromagnetic total-field map for the Ramea map area (GSC 1986; Figure 4; see also Loncarevic *et al.*, 1989) shows that the Ramea Islands lie at the southeastern margin of an eastward-trending series of magnetic lows. The northern margin of these lows could represent the edge of the Burgeo Intrusive Suite and the Grey River enclave. The aeromagnetic low, which extends northwestward from the Ramea Islands, may indicate the extent of a separate Ramea Islands block.

SUMMARY OF SOUTH COAST GEOLOGY

A brief summary of the five main geological elements along the south coast is presented to assess possible correlations with Ramea.

The Grey River enclave comprises a sequence of late Precambrian migmatitic gneisses, pretectonic mafic intrusions and Cambrian metavolcanic and metasedimentary rocks (Unit P_3O; Figure 1) and minor massive leucocratic granite (Blackwood, 1985; Dunning and O'Brien, 1989). The northern contact of the enclave with the Burgeo Intrusive Suite is an east-trending zone of intense mylonitization and later brecciation. The southeastern portion of the enclave is intruded by a massive metagabbro, which is in turn intruded by the François Granite. East of Devil Bay (Figure 1), a thin sliver of strongly foliated volcanic rocks are correlated with the volcanic rocks of the Grey River enclave (see O'Brien *et al.*, 1986).

The Burgeo Intrusive Suite is a composite 3000-km² batholith (O'Brien *et al.*, 1986), from which two foliated units have been dated at 428 and 415 $\pm$ 2 Ma by Dunning *et al.* (1988). Along the south coast, the batholith is dominated by coarse-grained, massive to brecciated, feldspar porphyritic, biotite granites and granodiorites. Massive, K-feldspar megacrystic granite, from 3 to 5 km north of Grey River, is dated at 412 $\pm$ 5 Ma (Rb–Sr whole-rock isochron; initial $^{87}Sr/^{86}Sr$ ratio = 0.7086) by Higgins *et al.* (1990). Metagabbro is relatively abundant on a few islands southwest of Burgeo (O'Brien and Tomlin, 1985) where it is intruded by the granite.

The northern limit of the suite is approximately the northwest-trending Dragon Bay Fault and the northeast-trending Bay d'Est Fault, which partly coincide with the intrusive contact of the suite with the Middle Ordovician strata (Figure 1). C-S fabrics in granites from the Dragon Bay Fault indicate dextral movement (see also Piasecki *et al.*, 1990). To the west of the Grey River enclave, the granites are highly faulted, commonly brecciated, locally mylonitized and

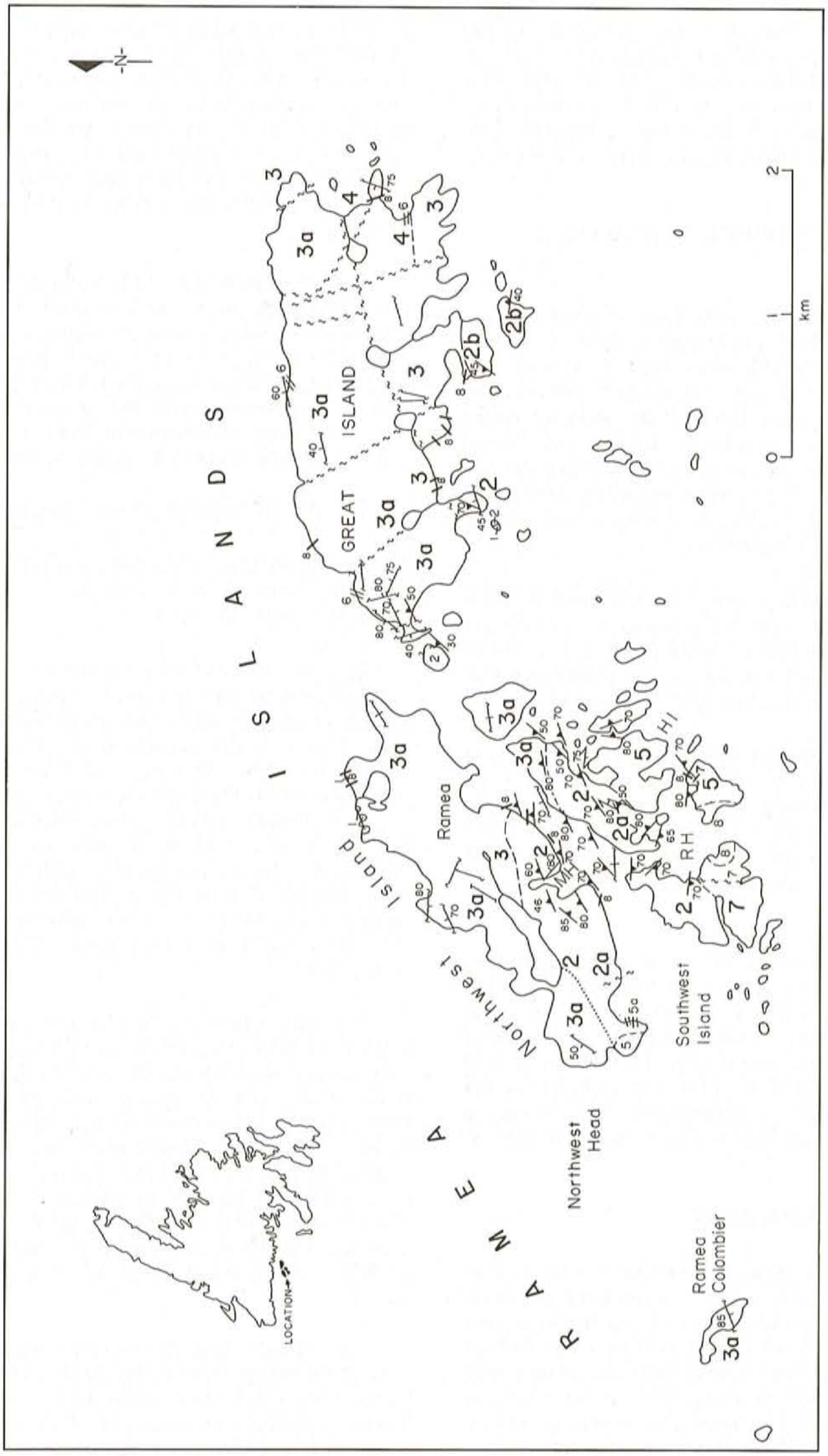


Figure 2. *Geology of the Ramea Islands. HI–Harbour Island, MH–Muddy Harbour, RH–Ramea Harbour.*

LEGEND for Figure 2

?DEVONIAN OR YOUNGER

8 *Massive, medium-grained diabase plug and dykes*

7 *Massive, medium-grained, biotite–hornblende quartz diorite and gabbro*

6 *Felsic dykes of uncertain affiliation*

5 *Massive to weakly cleaved, pink, equigranular, leucocratic, biotite granite;* ***5a****, fine-grained granite dykes*

?SILURIAN · DEVONIAN OR OLDER

4 *Grey, massive to sheared, medium-grained, equigranular biotite–hornblende granodiorite*

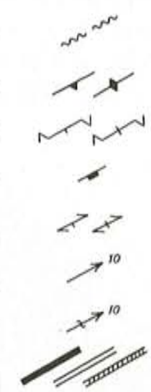
3 *Pink, massive, medium, coarse-grained, K-feldspar-porphyritic, biotite granite;* ***3a****, pink, fractured and sheared, medium to medium-coarse grained, equigranular to K-feldspar-porphyritic, biotite granite*

2 *Black and pink, medium- to coarse-grained, K-feldspar porphyroclastic, strongly foliated to mylonitic biotite granite;* ***2a****, black, fine to very fine grained, feldspar porphyroclastic, mylonitic granite;* ***2b****, black and pink, foliated, medium-grained, metamorphosed, K-feldspar-porphyroclastic, biotite granite*

1 *Medium- to coarse-grained, massive to foliated metagabbro and diabase xenoliths*

Symbols

Fault (approximate)
Mylonitic foliation (inclined, vertical)
Brittle shear fabric (inclined, vertical)
Mineral layering (inclined)
Cleavage (inclined, vertical)
Mineral lineation (with inclination)
Crenulation lineation (with inclination)
Dykes (mafic, felsic, granitic)



contain a weak, east-trending cleavage. These features are restricted to a 3-km-wide zone that parallels the coast and is terminated by the northeast-trending Bay de Loup Fault.

The Gaultois Granite is an elongate body of strongly foliated to mylonitic, coarse-grained, feldspar-porphyritic, biotite ± hornblende granite and granodiorite located 50 km east-northeast of the Ramea Islands. The granite at its type area has been dated at 421 Ma (U–Pb zircon) and 417 Ma (U–Pb titanite; Dunning *et al.*, 1990). The northern margin of the granite is extensively mylonitized along the Dragon Bay Fault. Some of the foliated, biotite-rich granites of the Burgeo Intrusive Suite are similar to the Gaultois Granite and these may be correlatives.

A thin sliver of strongly sheared and foliated volcanic rocks, correlated with the Grey River enclave (see Dickson *et al.*, 1984), separates the main mass of the Gaultois Granite from a similar granite located southwest of Devil Bay. This granite is locally transformed into a black, fine-grained mylonite having a generally northeast-trending, steep-dipping foliation. In comparison, the Gaultois Granite northeast of Devil Bay is generally less deformed, has a moderately north-dipping foliation, is more mafic, coarser grained and more coarsely porphyritic. However, the intensity of deformation within the main mass of the Gaultois Granite and the dip of the foliation increases toward the sliver of volcanic rocks. The two areas of granite are probably equivalent.

A series of highly evolved, posttectonic, Early to Late Devonian granites have intruded across the faulted contacts between the Precambrian sequences and adjacent blocks at Grey River and Cinq Cerf (see Dunning *et al.*, 1990). Other shear zones, such as the Dragon Bay Fault, Bay d'Est Fault and the Hermitage Bay–Dover Fault, are also cut by these granites. The granites are not centred on the shear zones but form a linear belt of intrusions that intrude both terranes along the entire south coast of Newfoundland (Dickson *et al.*, 1988).

Posttectonic diabase dykes are concentrated along the south coast and are particulary abundant in the Grey River

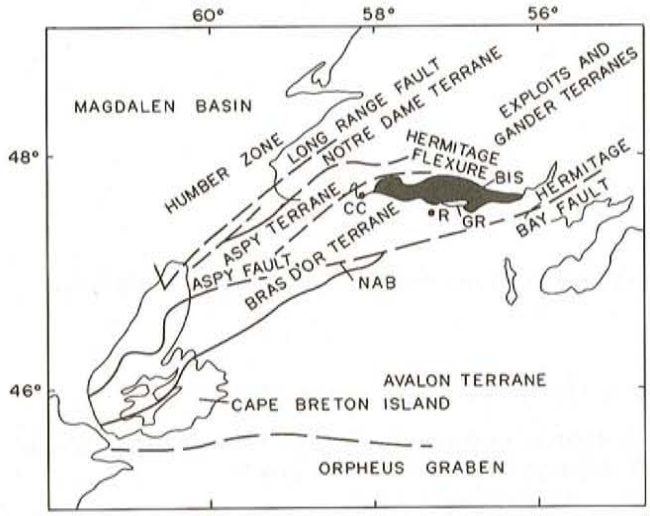


Figure 3. *Tectonostratigraphic correlations between Newfoundland and Cape Breton Island (based on Barr and Raeside, 1989). CC–Cinq Cerf area; R–Ramea Islands; GR–Grey River enclave; BIS–Burgeo Intrusive Suite and other granitic units; NAB–inferred northern Avalon Zone boundary of Marillier et al. (1989); note that according to Marillier et al. (1989), the Bras d'Or Terrane in Cape Breton Island is part of the Avalon Zone, whereas in Newfoundland, it forms part of the Gander Zone.*

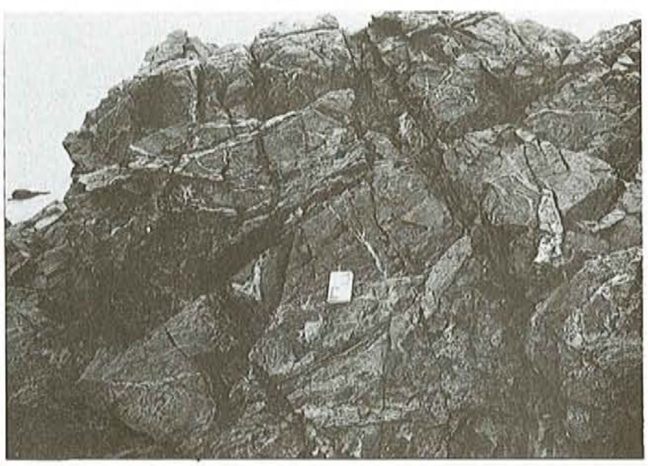


Plate 1. *Metagabbro inclusion (Unit 1) net-veined by granite derived from Unit 3; north shore of Great Island.*

enclave and in the François Granite, west of the entrance to La Hune Bay. The Penguin Islands contain an abundance of diabase dykes that cut the massive Penguin Islands Granite (Figure 1; see also O'Brien *et al.*, 1986). Very few dykes occur inland within the Paleozoic units. Several generations of diabase dykes cut the Grey River enclave and include pre-, syn- and posttectonic dykes (see Bahyrycz, 1957; Higgins and Smyth, 1980; and Blackwood, 1985). At Penguin Islands, the 2- to 5-m-thick, early dykes are extensively back-veined by the host granite and crosscut by 20-cm-wide later dykes.

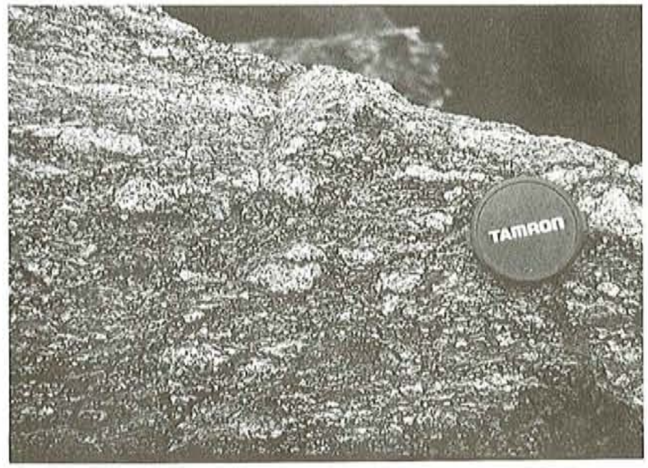


Plate 2. *Intensely foliated, porphyroclastic biotite granite (Unit 2); small island north of Ramea Harbour.*

Plate 3. *Mylonitic granite (Unit 2) cut by massive, light-coloured massive granite dykes (Unit 3); north side of Muddy Harbour.*

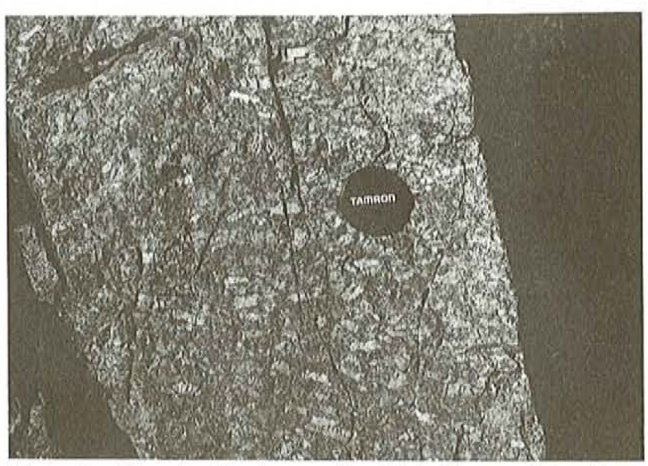


Plate 4. *Massive biotite granite (Unit 3) containing flow-aligned K-feldspar phenocrysts; along coast south of Gull Hill, Great Island.*

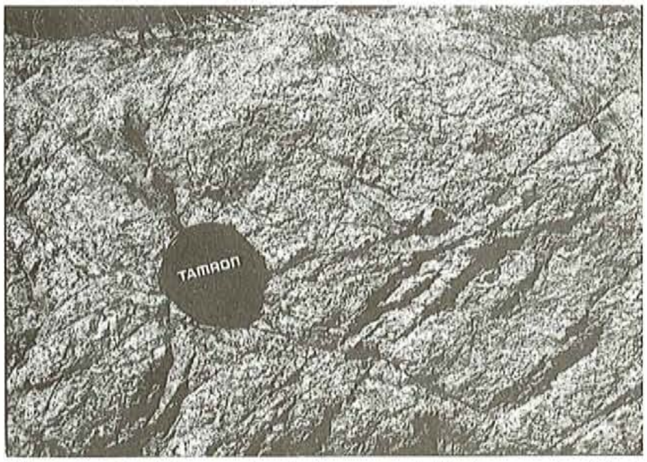


Plate 5. *Medium-grained, brecciated biotite granite (Unit 3e); western end of Great Island.*

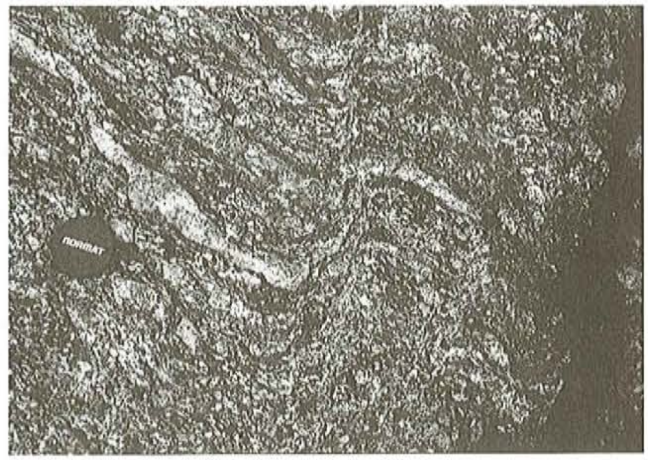


Plate 8. *Foliated mylonitic granite folded into asymmetric open fold; north side of Ramea Harbour.*

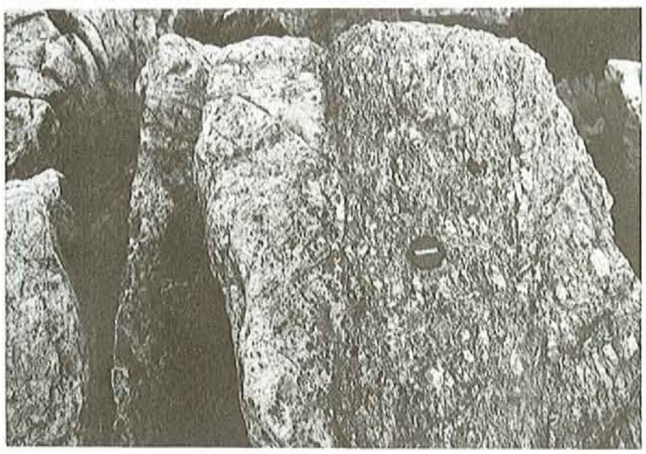


Plate 6. *Mylonitic granite (Unit 2) containing steeply-dipping foliation cut by massive fine-grained granite dyke (Unit 5); northeastern side of Harbour Island.*

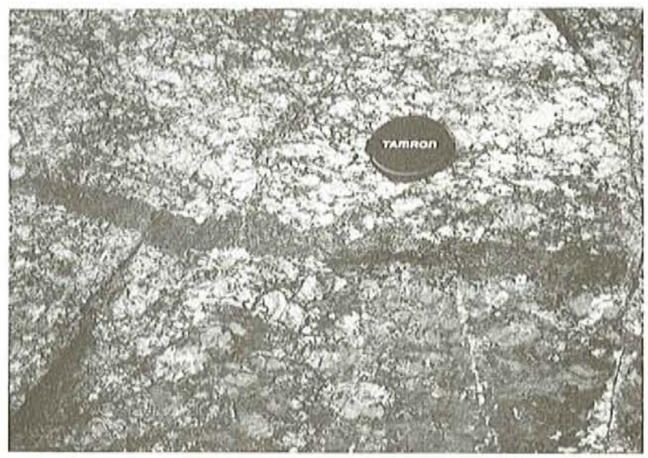


Plate 9. *Mafic psammitic xenolith elongated parallel to the mylonitic foliation in porphyroclastic biotite granite (Unit 2); road-cut north of Muddy Harbour.*

Plate 7. *Massive diabase dykes (Unit 8) cuts massive granite (Unit 3); along coast south of Gull Hill, Great Island.*

POSSIBLE LITHOLOGICAL AND STRUCTURAL CORRELATIONS

Metagabbroic and diabasic inclusions occur in the Ramea Islands and throughout the Burgeo Intrusive Suite (O'Brien *et al.*, 1986). The mylonitic porphyritic granite at Ramea is virtually identical to the presumed Gaultois Granite southwest of Devil Bay. The posttectonic leucocratic granites occur throughout the south coast region and have similar structural settings. The diabase dykes found throughout the coastal zone are probably correlatives.

The brecciated granite (Unit 3), minor granodioritic and gabbroic units (Units 4 and 7) at Ramea have no obvious correlatives. It must be emphasized that the pre- and syntectonic plutonic rocks of the Grey River enclave and Cinq Cerf area have no correlatives in Ramea. Similarly, the pre-François Granite and pre-massive diabase components of the enclave are not found on the Ramea Islands.

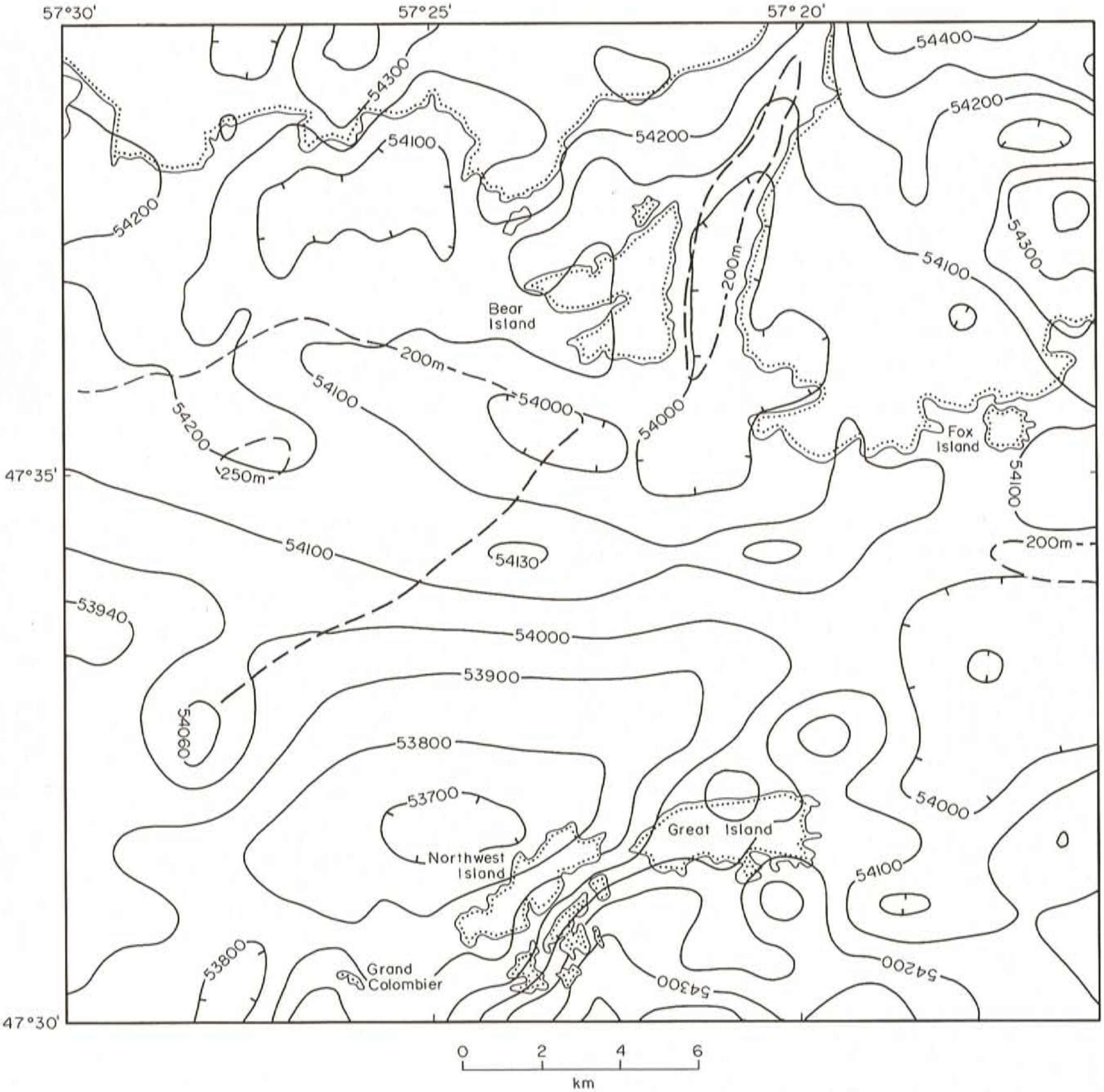


Figure 4. *Aeromagnetic total field map of the Ramea area (simplified from GSC Map 9649G, 1986). Isomagnetic lines in gammas—solid lines; submarine contours in metres—dashed lines.*

Tectonic similarities include the major shear zone within Unit 2 at Ramea, which may be associated with the mylonitization in the presumed Gaultois Granite, southwest of Devil Bay. The brecciation of Unit 3 in Ramea may be related to that along the southern edge of the Burgeo Intrusive Suite. The dextral movement of faults along the south coast is comparable with the probable dextral movement within the mylonites at Ramea. The Ramea shear zone may form part of the major shear system described by Piasecki *et al.* (1990) as having developed in this region during the Ordovician and Silurian.

DISCUSSION

The correlation of the Ramea Islands plutonic rocks with the Silurian Burgeo Intrusive Suite by Dickson *et al.* (1985) implied that the island's plutonic rocks lie within the later proposed Gander—Dunnage terranes (zones) of Williams *et al.* (1989). The radiometric age-dates obtained from the Grey River and Cinq Cerf units led to the assignment of these units to a Precambrian terrane affiliated with either the late Precambrian Avalon Zone of eastern Newfoundland (Dunning and O'Brien, 1989; Keppie and Dallmeyer, 1989) or with the

Bras d'Or Terrane of Cape Breton Island (Loncarevic *et al.*, 1989; Barr and Raeside, 1989; Dunning *et al.*, 1990; Figure 3). Consequently, the Ramea Islands would lie within one of these two Precambrian terranes.

Lithological correlations between the island of Ramea and the Bras d'Or and Mira terranes of Cape Breton Island are apparently lacking. Mylonitic granite cut by massive biotite granites are unknown within either the Bras d'Or and Mira terranes or in the Avalon Zone in Newfoundland. The only apparent lithological correlative in the Cape Breton Island terranes is the Neils Harbour Gneiss, which has an assigned age of 403 ± 3 Ma (Dunning *et al.*, 1990). This unit is correlated with the coarsely porphyritic Cameron Brook Granodiorite, dated at 402 ± 3 Ma, (Dunning *et al.*, 1990). However, unlike the Ramea mylonite, these units are not cut by massive granites. The Neils Harbour Gneiss and the Cameron Brook Granodiorite more closely resemble parts of the Burgeo Intrusive Suite.

The mylonitic granite in Ramea (Unit 2, Figure 2) is a possible affiliate with mylonitic granite southwest of Devil Bay (Figure 1). Correlation of these two units implies 60 km of movement along an assumed shear zone south of the enclave to restore these components to their inferred original positions. The relatively old, mylonitic, porphyritic biotite granites are a characteristic of the eastern margin of the Gander Zone, e.g., the Lockers Bay and Cape Freels granites of northeastern Newfoundland. As in Ramea, these mylonitic granites are cut by a variety of massive granites. Correlation of these sequences of intrusion would imply that a component of the Gander Zone lies south of the Precambrian Avalon or Bras d'Or terranes and that a significant tectonic boundary may separate the Ramea Islands from these terranes.

The presence of a terrane boundary is also supported by the position of the highly evolved, posttectonic Devonian granites such as the François, Chetwynd and Ackley granites of southern Newfoundland and the posttectonic, leucocratic biotite granite of Ramea. These granites are not zone specific but they are concentrated near the boundaries of the Avalon Zone with the Gander and Dunnage zones. Carboniferous granites of this type (e.g., Pé-Piper *et al.*, 1989) are common at the southern edge of the Avalon Terrane in northern Nova Scotia. Similar granites in southern New Brunswick lie just to the north of the exposed limit of the Avalon Zone and north of the Belleisle Fault (e.g., McLeod *et al.*, 1988). It appears that this type of granite is a characteristic of major tectonic boundaries.

The emplacement of massive gabbro and diabase intrusions in the Ramea Islands, along the south coast and at Penguin Islands, may have been focused by a significant shear zone. The east-trending aeromagnetic anomalies, which are interpreted to indicate the southern margin of the Burgeo Intrusive Suite, may also mark the position of a shear zone between the Grey River enclave and the Ramea Islands.

CONCLUSIONS

The foliated to mylonitic biotite granites cut by massive granites found in Ramea are also a characteristic feature of the eastern margin of the Gander Zone. The Ramea Islands possibly represent a fragment of Gander terrane separated from the main Gander Zone by the Grey River enclave. There are no definitive correlations of the early Ramea granitoids (Units 1 to 4) with the enclave, Cinq Cerf units, the Newfoundland Avalon Zone or with the Cape Breton Island Bras d'Or or Mira terranes.

Possible dextral shear indicators in the mylonitic granite at Ramea and its tentative correlation with a similar unit to the east-northeast, near Devil Bay, implies 60 km of dextral movement. Radiometric dating of the main units in Ramea could resolve the problems of correlation. This brief survey has indicated that the geology of the Ramea Islands is more complex than previously reported and should be considered when defining the boundaries of tectonostratigraphic zones.

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