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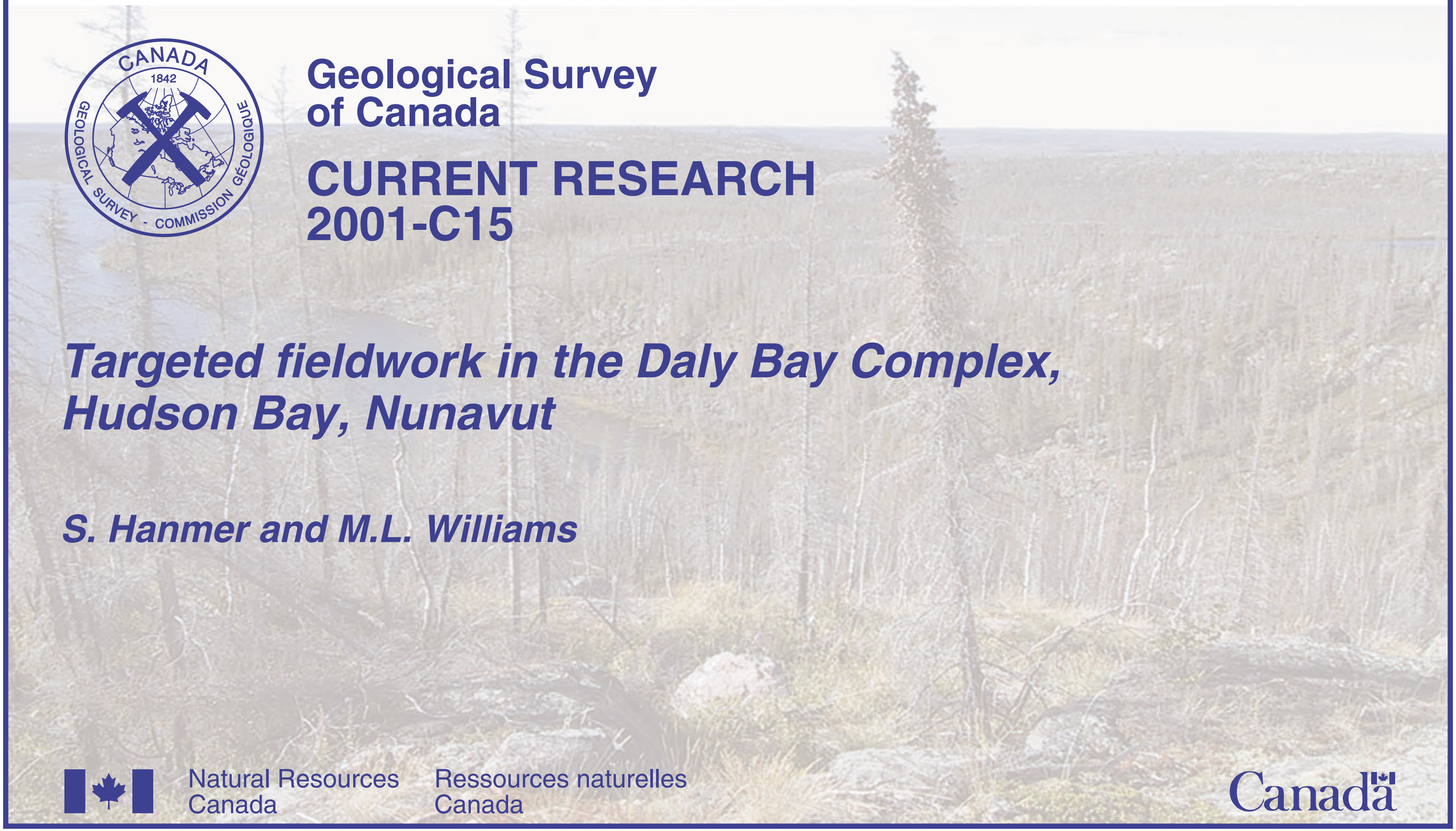

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Targeted fieldwork in the Daly Bay Complex, Hudson Bay, Nunavut[1]

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Abstract

The Daly Bay Complex is a large (2500^2 km in area), sheet-like body of mafic to anorthositic rocks, tonalite, and paragneiss of unknown age that was intruded into the lower crust, possibly during the Paleoproterozoic. Magmatic advection of heat led to granulite-facies metamorphism, localized within the magmatic body and large panels of aluminous country rock included within it. Initial high-temperature granulite-facies orthopyroxene and plagioclase metamorphic assemblages were replaced by garnet- and clinopyroxene-bearing assemblages as the complex cooled isobarically. It is improbable that the Daly Bay Complex was tectonically transported any significant distance while granulite-facies conditions prevailed.

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Résumé

Le Complexe de Daly Bay est un massif magmatique important (2500 km²) en forme de nappe qui comprend des roches mafiques à anorthositiques, de la tonalite et du paragneiss d'âge inconnu, qui a été mis en place dans la croûte inférieure, possiblement au Paléoproterozoïque. L'advection magmatique de la chaleur a provoqué le métamorphisme au faciès des granulites au sein du massif magmatique et des vastes lambeaux de roche encaissante alumineuse qui y sont contenus. Les premières associations minéralogiques à orthopyroxene et à plagioclase du métamorphisme de haute température du faciès des granulites ont été remplacées par des associations à grenat et à clinopyroxene au fur et à mesure du refroidissement isobarique du complexe. Le Complexe de Daly Bay n'a vraisemblablement pas subi de transport tectonique sur une distance importante pendant que persistaient les conditions du métamorphisme du faciès des granulites.

INTRODUCTION

The Daly Bay Complex (**Fig. 1, 2**) was originally defined as an association of quartzofeldspathic gneiss intruded by gabbro and anorthosite, metamorphosed at granulite facies, and underlying an area about 2500 km^2 (Heywood, 1967; Gordon, 1988a, b). From gravity modelling, Gordon and Lawton (1995) suggested that it has an overall, three-dimensional, spoon-like topology, extending down to a maximum depth of about 9 km in its central part. On the basis of field mapping undertaken in 1970–1971, Gordon (1988a, b) described the complex as a synform with a core of "pyroxene granulite", bounded by a "boundary shear zone" (Fig. 2) that accommodated tectonic emplacement of the complex from the lower to the middle crust at sometime between ca. 2067 Ma and 1950 Ma. With the exception of what appears to be a large tectonic "horse" (Boyer and Elliot, 1982) along its northern margin, the Daly Bay Complex is separated from its underlying hornblende-biotite gneissic and amphibolitic wall rocks by an "outer shear zone” of strongly foliated greenschist- to amphibolite-facies gneiss units with local mylonite and cataclasite (**Fig. 2**; Gordon, 1988b). Preliminary U-Pb geochronology on zircon from the core yielded a concordant age of ca. 2067 Ma, interpreted as the time of granulite-facies metamorphism (Gordon, 1988b).

Hoffman (1988) interpreted the Daly Bay Complex as a node in the sinuous trace of the Snowbird tectonic zone that divides the western Churchill Province into the Rae and Hearne domains. Schau and Tella (1993) included the complex as part of their Aqxarneq gneiss, an assemblage of similar lithologies and granulite-facies tectonite that occur as isolated massifs along the north side of Chesterfield Inlet (Kramanituar, Uvauk, Hanbury Island; **Fig. 1**); however, recent detailed studies of the tectonothermal histories of the Kramanituar (Sanborn-Barrie, 1999) and Uvauk complexes (Mills et al., 2000) highlight potentially significant differences in their ages of formation, deformation, metamorphism, and subsequent cooling. It was therefore timely to undertake renewed fieldwork in the Daly Bay Complex, with the explicit intent of investigating the timing and conditions of granulite-facies metamorphism, its cause, and subsequent cooling history.

Three two-person camps were established from June 2–18, 2000: 1) on the northeastern side of the core region (Lake of Islands), 2) within the northern part of the “boundary shear zone”, and 3) in the western part of the “boundary shear zone” adjacent to a large anorthositic pluton (Fig. 2). Traverses were made on foot from each camp to examine critical field relationships, and to strategically sample for geothermobarometry and geochronology (e.g. Williams et al., 1999). The first-order mapping units and boundaries established by Gordon (1988b) appear to be robust. This report will present new field observations, and will point to potential reinterpretation of some of principal elements of the Daly Bay Complex. Unless otherwise stated, observations relate to areas within the three circles in Figure 2.

CENTRAL PART OF THE COMPLEX

Gordon (1988a; Gordon and Lawton, 1995) described the central part of the complex as principally composed of orthopyroxene tonalitic granulite (“enderbite”), plus garnetiferous quartzofeldspathic granulite and associated metasedimentary rocks and migmatite (“diatexite”). He interpreted all of these rocks as the oldest in the complex, and suggested that they represent the volumetrically dominant component in the subsurface.

From our observations, the most abundant lithology in the central part of the complex is a leucocratic, medium-grained (2 mm), equigranular, plagioclase-orthopyroxene rock that is locally well foliated, but commonly preserves no shape fabric (**Fig. 3**). Orthopyroxene grains are evenly dispersed in a plagioclase matrix of similar grain size (cf. Hanmer (2000) and references therein), and the colour index varies from less than 40 to less than 10, with an average of about 25. The general homogeneity of this lithology suggests that it is a deformed, recrystallized (annealed) plutonic rock. The plagioclase-orthopyroxene rock is cut by subconcordant sheets of foliated, orthopyroxene tonalite (**Fig. 4**). Flattened, blade-like aggregates of quartz and feldspar represent a once relatively coarse-grained igneous texture. The strain state of the tonalite is variable from sheet to sheet, and very poorly foliated sheets cut more strongly foliated tonalite. Locally, it becomes the dominant lithology enclosing panels and lenses of plagioclase-orthopyroxene rock. In a few places, foliated plagioclase-orthopyroxene rock is misoriented and folded, with the fold axial plane parallel to the tonalite foliation. Taken together, these observations suggest that the tonalite was intruded into the plagioclase-orthopyroxene rock during deformation.

Gordon’s (1988a, b) garnetiferous quartzofeldspathic granulite is a leucogranitic gneiss with irregularly distributed mafic and aluminous layers and pods. The principal component is a foliated white leucogranite with pale pink to lilac garnets, which locally contains sillimanite and orthopyroxene (**Fig. 5**). The mafic component is identical to the leucocratic, medium-grained, equigranular, plagioclase-orthopyroxene rock just described. Locally the mafic rocks are intimately distributed in the leucogranitic phase as schlieren-like wisps, whereas elsewhere they are present as laterally continuous sheets, or as round, metre-scale inclusions that appear to be xenoliths in the leucogranite. The most highly aluminous component is a sillimanite-garnet rock, but more commonly it is a sillimanite-rich variant of the leucogranite. Locally, the garnetiferous leucogranitic gneiss is visibly a garnet migmatite wherein large (5 cm) garnet+melt clusters in a quartzofeldspathic sillimanite-bearing matrix appear to have formed by vapour-absent melting of orthopyroxene (**Fig. 6**). Moderately foliated masses of garnet-orthopyroxene leucogranite, with rare xenoliths of foliated garnet-sillimanite leucogranitic gneiss, are large enough to form the light-coloured hills along the northeast shore of Lake of Islands (**Fig. 2**). Homogeneous sheets of nonfoliated garnet leucogranite interlayered with the foliated garnetiferous leucogranite represent late-stage intrusive veins. They also cut the plagioclase-orthopyroxene rock and the orthopyroxene tonalite throughout the complex as a whole. Veins with the least garnet appear to have travelled furthest from their source, and to have lost much of their garnet component during transport. Apart from these intrusive veins, outcrop-scale observations did not permit unequivocal deciphering of original relationships between the components of the leucogranitic gneiss; however, if the late leucogranite veins are genetically related to the foliated leucogranite, it would suggest that garnet leucogranite melts were present throughout the preserved history of gneiss formation. Locally, veins of garnet-orthopyroxene leucogranite are intruded into orthopyroxene tonalite and are folded with the tonalite foliation parallel to their axial planes, indicating that metamorphic conditions deduced from the leucogranite would also pertain to at least the later stages of the tonalite deformation history. These three principal lithologies are everywhere in sheeted relationship with each other. Sheet thickness varies from less than 1 m to tens of metres, and the transition from one map unit to another is by progressive intercalation.

The structural elements of the central part of the complex are geometrically simple: a single, moderately to steeply south-southwest-dipping foliation of variable strength is developed parallel to lithological layering and contacts. It is essentially an S>L fabric with local development of a weak extension lineation that pitches gently to the southeast. Among the quartzofeldspathic lithologies, the garnetiferous leucogranitic gneiss is generally more strongly foliated than the orthopyroxene tonalite. Open to tight minor folds that deform the layer-parallel foliation (**Fig. 7**) are coaxial with the extension lineation and appear to be part of the set of tectonically juxtaposed, subhorizontal, doubly plunging, northeast-verging map-scale synforms, without intervening antiforms (**Fig. 2**) that were mapped by Gordon (1988a, b). The map-scale fold closure immediately southwest of Lake of Islands is cut by a localized array of variously oriented veins of garnet leucogranite, suggesting that these folds are temporally associated with at least the latter part of the development of the leucogranitic gneiss.

BOUNDARY ZONE

Gordon (1988b) mapped a “boundary shear zone”, defined as a broad tectonic map unit containing the mineralogical equivalents to the rocks of the central part of the complex, but in a more strongly deformed state, as well as narrow sheets and a large pluton of “anorthosite” (Fig. 2). He also indicated that garnet-, clinopyroxene-, and hornblende-bearing metamorphic assemblages developed in the boundary zone at the expense of plagioclase-orthopyroxene assemblages of the centre of the complex (Gordon, 1988a).

From our observations, the boundary zone is predominantly composed of leucocratic plagioclase-orthopyroxene rock, very similar to that described from the central part of the complex. It is everywhere associated with subordinate sheets of orthopyroxene tonalite, garnet±graphite leucogranite, and orthopyroxene gabbroic anorthosite. While anhydrous garnet-pyroxene assemblages are well preserved (Fig. 8), any of these lithologies may contain variable amounts of retrograde biotite and hornblende, suggesting that water had privileged access to the boundary zone. Areas mapped by Gordon (1988b) as dominated by felsic rocks show a relatively high proportion of orthopyroxene tonalite sheets in the plagioclase-orthopyroxene rock; however, we would emphasize here the lithological monotony of the boundary zone and, in particular, the high proportion of mafic rocks.

Gordon (1988a) mentions the presence of gabbroic sills in the boundary zone. We noted large lens-like or sheet-like masses of metagabbroic composition, up to hundreds of metres thick, that are present throughout the zone, but could not determine if these are individual intrusions or melanocratic components of the plagioclase-orthopyroxene rock. Gordon, (1988a, b) mapped a large anorthositic pluton in the western part of the boundary zone as a sheet in the core of a map-scale, south-plunging synform, and differentiated a lower “layered anorthosite” from a structurally higher “anorthosite”. Our observations indicate that the “anorthosite" is a sugary gabbroic anorthosite to anorthosite with flaser structure, derived by recrystallization of a coarse plutonic parent rock with plagioclase grains more than 5 cm and euhedral to ophitic orthopyroxene crystals of similar size (Fig. 9). On the east side of the pluton, the “layered anorthosite” is a similar lithology with widely spaced, locally branching sheets of fine- to medium-grained, granoblastic, equigranular metagabbro (colour index >>50) that contain rare inclusions of the sugary anorthositic wall rock. We interpret these as magmatic sills or dykes (Fig. 10) that are petrologically associated with the anorthosite. On the west side of the pluton, 50% or more of Gordon’s “layered anorthosite” map unit is made of similar metagabbro that is clearly intrusive into the anorthositic host, and is locally seen to cut across the deformation fabric of the anorthosite at a high angle. Localization of metagabbroic sheets within an anorthositic pluton is a common petrological association that, when combined with the relationship between intrusion and deformation just described, suggests the anorthositic pluton was emplaced during the regional fabric-forming event. The “anorthosite” core also contains metagabbroic sheets, although they are not as closely spaced as in the eastern margin, but it principally differs from the “layered anorthosite” in containing abundant relics of coarse igneous grain size and textures, suggesting that it is less homogeneously strained than the marginal phase.

Gordon (1988b) mapped several concordant sheets of anorthosite within the northern part of the boundary zone, well removed from the main anorthositic pluton. We have identified several more sheets of similar flaser-textured gabbroic anorthosite to anorthosite, from several metres to 100 m thick, both adjacent to and up to 8 km northeast of the pluton. They are associated with equigranular, leucocratic, plagioclase-orthopyroxene rock that contains small (50 cm) inclusions of flaser-textured leucogabbro to gabbroic anorthosite (Fig. 11). These observations suggest that the equigranular texture is not the product of strong deformation, and that the flaser-textured anorthositic rocks were intruded by the plagioclase-orthopyroxene rock. When combined with the relatively minor volume of anorthositic sheets, most simply interpreted as dykes or sills injected into the host plagioclase-orthopyroxene rock, and the commonly highly leucocratic character of the latter, the overall impression is that these two lithologies grade into one another as parts of a cogenetic, magmatic association.

Deformation is markedly heterogeneous in the boundary zone. The fabric geometry is very similar to that of the central part of the complex, the principal difference being that the pitch of the south- to southeast-plunging extension lineation varies as the foliation strike follows either the trend of the boundary zone on the north side of the complex, or the map-scale anorthosite-cored fold in the west. Where the foliation is strong it may contain isolated, intrafolial folds, and all lithologies are affected by marked internal boudinage (e.g. Hanmer et al. (1996) and references therein) on scales in the range 1–50 m (Fig. 8); however, the development of the foliation and extension lineation is highly variable and lithology dependent. Outside of the anorthositic pluton, grain size in metagabbro may be coarse and foliation is commonly difficult to detect. At the other extreme, tonalite is locally very well foliated with a strongly developed extension lineation marked by elongate, monomineralic, quartz and feldspar aggregates, and outcrops have a flaggy aspect. Within the anorthosite, the common presence of flaser structure, rather than a strong planar fabric, is indicative of relatively modest strain, as is the preservation of branching and cross-cutting metagabbroic sheets. The deformation aspect of the plagioclase-orthopyroxene rock that dominates the boundary zone is commonly very similar to that described from the central part of the complex, although it is locally lineated and flaggy. Gordon (1988a) noted the presence of mylonite, but we found it to be poorly represented. Many outcrops of quartzofeldspathic rocks have flattened, polycrystalline quartz and feldspar aggregates, but those with good ribbon or straight gneiss structure only form local, laterally discontinuous zones, 10–100 m thick, adjacent to large masses of apparently competent mafic rocks. Significantly, tonalite subjacent to the eastern side of the anorthositic pluton is only moderately foliated and preserves C/S composite fabrics, another indicator of relatively low finite strain (Berthé et al., 1979). Along one traverse, across-strike variation in orientation of foliation and dip-parallel extension lineation over a distance of about 1500 m appears to describe a tight, north-northeast-verging antiform with an overturned northeast limb.

Except for localized zones of intense retrogression, mineral assemblages in all lithologies of the boundary zone are subsets of the assemblage orthopyroxene-clinopyroxene-garnet-plagioclase± hornblende±biotite. Matrix assemblages commonly contain plagioclase and two pyroxenes, except in tonalite. Garnet is present either as large porphyroblasts up to several centimetres in diameter, or in coronitic associations around the margins of plagioclase and/or orthopyroxene. The porphyroblasts are either wrapped by the foliation or appear to grow across it. Orthopyroxene may be replaced by garnet and iron oxide which weather to produce large swaths of rusty, friable rock that can be mistaken for gossan from a distance. In some places, garnet porphyroblasts are themselves rimmed by new orthopyroxene that extends along the matrix foliation (**Fig. 12**). Localized zones of flaggy, well lineated, fine-grained, sugary tonalite dominated by biotite and/or horneblende±garnet appear to be annealed, hydrated, retrograde mylonite zones.

STRUCTURE

Throughout the Daly Bay Complex, only a single, penetrative foliation, with a variably developed extension lineation, is present at the outcrop scale. The extension lineation may correspond to an alignment of minerals, but is more commonly expressed as aligned polycrystalline aggregates of feldspar and/or quartz. Continuity of these fabric elements from the central part of the complex into the boundary zone suggests that they represent contemporaneous S_1 and L_1 structures. Folds that deform S_1 and are coaxial with L_1 are designated as F_2. Within the boundary zone, the lower limbs of rare, isolated, inclined to recumbent F_2 folds, up to about 1 km in amplitude, are locally truncated against discrete foliation-parallel faults. Within the anorthosite pluton, well foliated blocks are highly misoriented with respect to each other across discrete, ductile shears. At one locality, the anorthosite foliation lies perpendicular to a discrete discordance, marked by a narrow (25 cm) shear zone between the anorthosite and metagabbro (**Fig. 13**), that could be traced for at least 100 m. Apparently the Daly Bay Complex was subjected to internal shuffling in the latter stages of its deformation history.

Gordon and Lawton (1995) described the Daly Bay Complex as spoon-shaped, implying that the exposed part has a synformal topology; however, within their gravity model, they define a set of three, volumetrically subordinate bodies that lie along the northern and western margins of the complex. Inspection of the foliation pattern and the distribution of lithologies on the published geological map of the complex (Gordon, 1988b) suggests the presence of a structural discordance between a shallowly south-plunging western F_2 synform cored by anorthositic rocks and located entirely within the western part of the boundary zone, and the central and eastern parts of the complex (**Fig. 2**). From downplunge cross-sections (**Fig. 14**), it appears that the latter corresponds to the core and eastern limb of a shallowly east-southeast-plunging eastern F_2 synform, whose western limb has been cut out by the inferred structural discordance (late D_2 or possibly D_3), apparently a map-scale example of the truncations observed at the outcrop scale. The inferred map-scale discordance may also be responsible for rapid attenuation of the western limb of the western synform, although this may also be attributable to displacements on the outer shear zone (possibly D_4).

METAMORPHISM

Except for the garnet-sillimanite-orthopyroxene leucogranitic gneiss, the central part of the Daly Bay Complex is composed of orthopyroxene-plagioclase±garnet±quartz metamorphic assemblages, indicative of granulite-facies metamorphism. In contrast, all lithologies of the boundary zone are garnetiferous, and may contain clinopyroxene as well as orthopyroxene in suitable compositions. Fabric relationships indicate that pyroxene is a fabric-forming phase, whereas the foliation both encloses and is overprinted by garnet. Garnet and clinopyroxene appear to be derived from orthopyroxene and plagioclase in response to cooling. The localization of omnipresent garnet in the boundary zone suggests a catalytic relationship between deformation and metamorphic reaction cooling in a manner similar to that documented elsewhere along the Snowbird tectonic zone (Williams et al., 2000). The presence of hornblende as a fabric-forming mineral in the garnet-pyroxene assemblage also suggests a relationship between deformation and the access of hydrous fluids into the boundary zone. Our initial interpretation of the field observations is that metamorphic conditions evolved from high-temperature to high-pressure granulite facies during isobaric cooling (cf. Williams et al., 2000).

SUMMARY

The granulite-facies Daly Bay Complex is surrounded by, and likely overlies, regionally extensive amphibolite-facies rocks (Gordon, 1988a, b). As such, it represents a localized thermal anomaly, similar to others described elsewhere along the Snowbird tectonic zone: Striding–Athabasca mylonite zone, Kramanituar Complex, Hanbury Island shear zone, and the Uvauk Complex (Tella and Annesley, 1988; Hanmer 1997a; Sanborn-Barrie, 1999; Mills et al., 2000). In the first two examples, voluminous mantle-derived mafic melts have been identified as the source of advected heat that led to localized granulite-facies conditions in the lower crust (*see also* Hanmer, 1997b; Williams et al., 2000).

In the Daly Bay Complex, field relationships suggest that the plagioclase-orthopyroxene and anorthositic rocks were magmatically related, and that the anorthositic rocks and the orthopyroxene tonalite were emplaced synkinematically with respect to granulite-facies D_1 fabric formation. Accordingly, we suggest that all of these melts were emplaced during a single event and were responsible for advecting the heat for localized granulite-facies metamorphism into the lower crust. The garnetiferous leucogranitic gneiss likely represents wall rock into which the magmatic rocks were intruded, and that melted as a consequence of the advected heat. S_1 fabrics were folded by F_2 folds at all scales. The presence of garnetiferous granite melts in all deformation states throughout D_1 and D_2 suggests that the two structural events occurred during the same thermal event and are temporally related.

The state of deformation within the boundary zone, although somewhat more intense than that in the central part of the complex, does not appear to represent a localized shear zone capable of accommodating emplacement of an exotic, allochthonous sheet; however, after the formation of the regional-scale eastern and western F_2 synforms, tectonic shuffling appears to have occurred within the complex, possibly accommodated, in part, by what are now annealed mylonite units (straight gneiss) in the migmatitic

rocks on the northeast side of Bernheimer Bay (**Fig. 15**; T.M. Gordon, pers. comm., 1992). We speculate that this shuffling may have been related to the north-northeast vergence of the map scale F_2 folds in the central part of the complex.

We suggest that the Daly Bay Complex represents a large volume of mafic to anorthositic magma, derived by partial melting in the upper mantle, that was intruded into the lower continental crust. Tonalite may either represent partial melting of lower crustal mafic rocks (e.g. Williams et al. (1995) and references therein), or the end product of fractional crystallization of the mafic component of the complex itself. Advection of heat by these melts led to granulite-facies metamorphic conditions localized within the Daly Bay Complex. Isobaric cooling of the magmatic rocks resulted a metamorphic transition from high-temperature to cooler granulite-facies conditions. The complex was subsequently shortened in a northeast-southwest direction, leading to internal folding and dislocation. Activity on the post-granulite-facies outer shear zone may have further modified the original geometry of the complex; however, the history of uplift and exposure of these apparently deep crustal rocks remains to be elucidated. Meanwhile, we speculate that it may be related to structures external to the Daly Bay Complex (cf. Sanborn-Barrie, 1999).

A robust age for the granulite-facies event has not yet been established; however, if it occurred at ca. 2050 Ma (Gordon, 1988b), it would have developed independently of the ca. 1900 Ma and ca. 1940 Ma Proterozoic events in the otherwise geologically similar Kramanituar and Uvuak complexes, respectively (Sanborn-Barrie, 1999; Mills et al., 2000). If this proves to be the case, we suggest that the Daly Bay Complex is an example of a fundamental process involving crust-mantle interaction, heat advection by magmatic interplating or underplating, and strain localization in thermally softened lower continental crust as an accommodation response to far-field activity at plate boundaries, as opposed to regional orogenesis (*see* Hanmer, 1997b).

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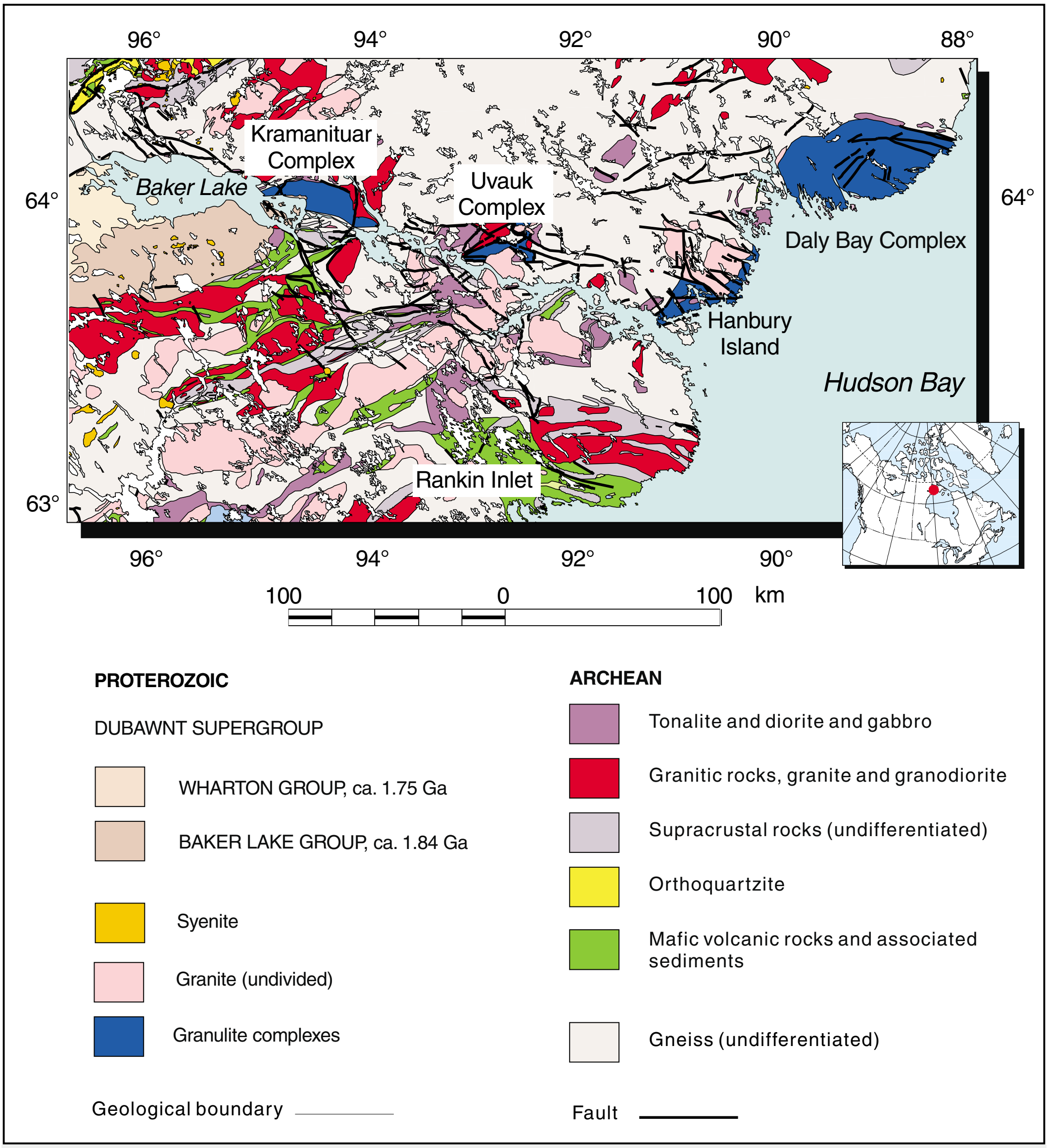

Figure 1. Geological setting of the Daly Bay Complex (extracted from D. Paul, work in progress, 2000). The major waterway between Hudson Bay and Baker Lake is Chesterfield Inlet.

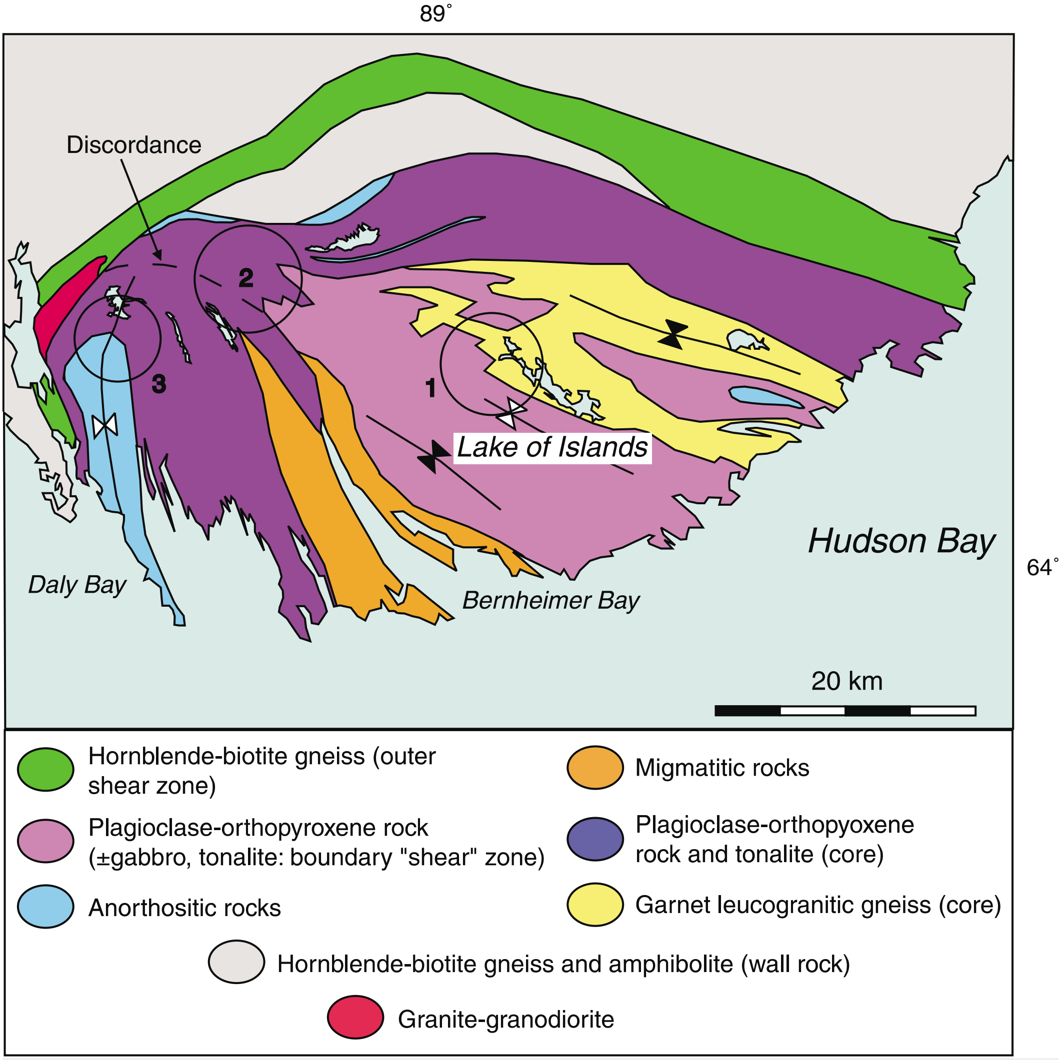

Figure 2. Generalized geology of the Daly Bay Complex (*after* Gordon, 1988a). Numbered circles represent approximate areas investigated during this study. White synform symbols represent upright F_2 folds. Black synform symbols represent northeast-verging F_2 folds. The approximate location of the inferred structural break between the western and central-eastern parts of the complex is indicated.

Figure 3. Detail of equigranular plagioclase-orthopyroxene rock, central part of the Daly Bay Complex.

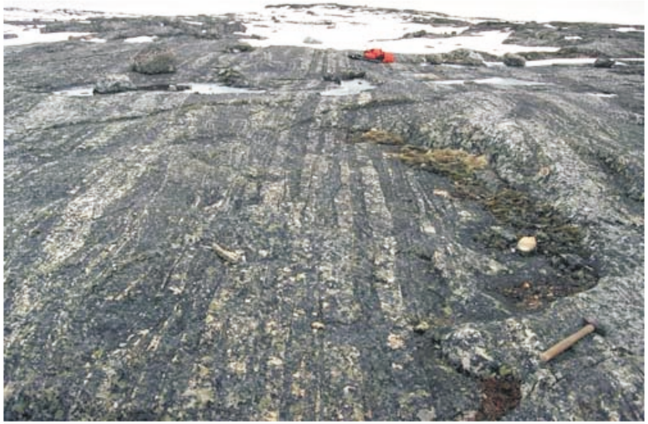

Figure 4. Subconcordant, foliated sheets of orthopyroxene tonalite (light) injected into plagioclase-orthopyroxene rock (dark), central part of the Daly Bay Complex.

Figure 5. Detail of garnetiferous leucogranitic gneiss, central part of the Daly Bay Complex.

Figure 6. Detail of garnet migmatite. Melt contains seams of residual sillimanite and garnet clusters (to right of coin), central part of the Daly Bay Complex.

Figure 7. F_2 folding in layers composed of plagioclase-orthopyroxene rock (dark) and orthopyroxene tonalite (light), central part of the Daly Bay Complex.

Figure 8. Detail of garnet-orthopyroxene gabbroic anorthosite, boundary zone.

Figure 9. Detail of coarse-grained, weakly deformed, orthopyroxene gabbroic anorthosite pluton, western part of the boundary zone.

Figure 10. Metagabbroic dyke cutting gabbroic anorthosite. Note the thin panels of anorthosite included by the dyke near its margins. Gabbroic anorthosite pluton, western part of the boundary zone

Figure 11. Weakly deformed inclusions of flaser-textured gabbroic anorthosite (left) in equigranular plagioclase-orthopyroxene rock (right), boundary zone.

Figure 12. Garnet porphyroblasts with rims of deformed orthopyroxene in gabbroic anorthosite sheet, boundary zone.

Figure 13. Ductile discordance between metagabbroic sheet and foliation in anorthosite (parallel to hammer), boundary zone.

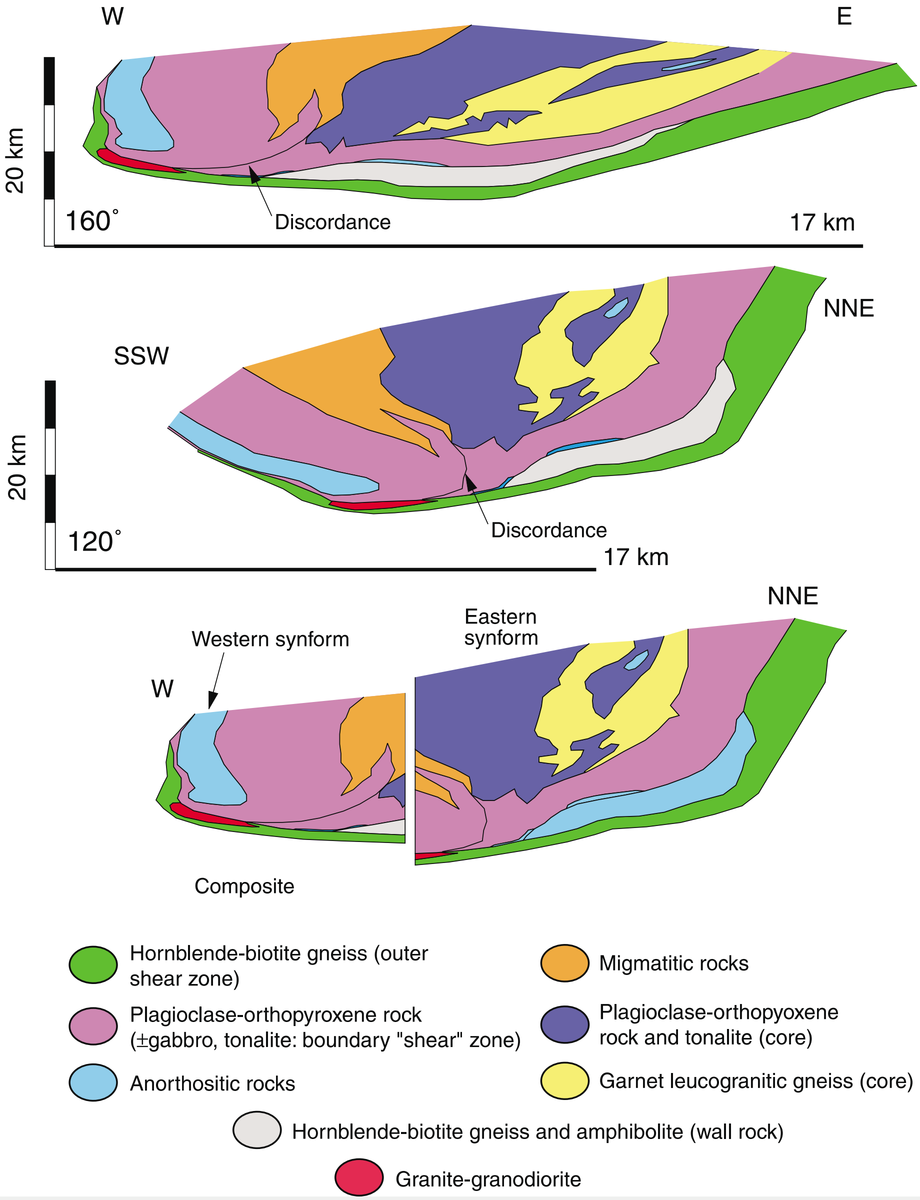

Figure 14. Down-plunge cross-sections constructed for the Daly Bay Complex. The upper section was constructed using a plunge of 25° toward 160°, as determined from the structure of the western part of the complex (Gordon, 1988a; *see* Fig. 2 for legend). This projection renders a reasonable approximation of the western F_2 synform that is centred about the anorthosite pluton on the left. The central section was constructed using a plunge of 25° toward 120°, as determined from the structure of the central and eastern parts of the complex (Gordon, 1988a). This projection renders a reasonable approximation of the eastern F_2 synform that is centred about the central part of the complex. The lower section is a ‘cut-and-paste’ composite of the two sections that yields a good approximation of the true structure of the Daly Bay Complex. Note the horizontal scale distortion due to the different projection azimuths.

Figure 15. Straight gneiss (annealed mylonite), Bernheimer Bay, boundary zone. Geologist at water's edge for scale.