Energy, Mines and Resources, Canada
Energie, Mines et Ressources, Canada

GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA

DESCRIPTIVE NOTES

This map shows the western half of the bend in the Abloviak shear zone of the Paleoproterozoic Torngat Orogen, in Québec and Newfoundland (Labrador). In the southern part of the map area, heterogeneous, migmatitic Archean orthogneisses of the Southeastern Rae Province (ARtn) are infolded with Paleoproterozoic metasediments (garnet-sillimanite metapelitic gneisses [PLpg, PLrg], quartzites, and marbles [PLmb]) of the Lake Harbour Group, and interlayered with intrusive Paleoproterozoic metaplutonic rocks (Pigd, Pidg) of the Killinek charnockitic suite.

Rae Province gneisses are in sharp contact to the north with the Tasiuyak gneiss, a 10-15 km wide unit of layered paragneiss and diatexite that is interpreted to represent the metamorphosed, deformed remnants of turbiditic sandy and shaley sedimentary rocks that were deposited in a continental slope or accretionary wedge succession on the eastern margin of the Rae Province. The Tasiuyak gneiss grades northward into quartzo-feldspathic paragneisses with thin calc-silicate and marble horizons (Pspg, Pscs). Both the paragneisses and Tasiuyak gneiss were intruded by Paleoproterozoic mafic quartz diorite (Pidq) and felsic granodiorite (Pigd), the former of which was dated by U-Pb on zircon from a locality in the map area, as 1895 ± 2 Ma (D. Scott, pers. comm., 1993). Together these rocks comprise the Tasiuyak gneiss complex (cf. Van Kranendonk and Ermanovics, 1990).

In the northeastern part of the map area, strongly reworked Archean tonalitic orthogneisses of the Nain Province (Argn) are tectonically interlayered with mafic gneisses of interpreted Paleoproterozoic age and supracrustal origin (Psmg), and a suite of intrusive Paleoproterozoic rocks (PIDTG). These rocks are considered to represent a distinct lithotectonic assemblage from the Tasiuyak gneiss complex and the Rae Province.

Deformation in the Torngat Orogen is interpreted to have resulted through continent-continent collision between the Nain and Rae provinces, that evolved in three principal phases after late Archean deformation in both the Nain and Rae provinces (D_{n-}: cf. Van Kranendonk, 1992). In the first phase (D_{n+1}), Nain-Rae collision at ca. 1860 Ma (Bertrand et al., 1993) produced thrusting on either side of the collisional boundary and high-grade metamorphism (cf. Van Kranendonk, 1992). The amalgamation of lithotectonic assemblages in the map area is interpreted to have occurred at this time.

Subsequent deformation (D_{n+2}) under continued high-grade metamorphic conditions resulted in formation of the Abloviak shear zone, a 10-15 km wide zone of sinistral, granulite-facies ribbon mylonite and ultramylonite. U-Pb dating within the map area (D. Scott, pers. comm., 1993), to the north (Scott et al., 1993), and to the south (Bertrand et al., 1993), indicate that deformation within this zone occurred at between ca. 1845-1824 Ma.

In the third phase of deformation (D_{n+3}) folding of the Abloviak shear zone and formation of the Komaktorvik shear zone immediately to the east of the map area occurred. Folding of the Abloviak shear zone was accommodated by flexural slip along its northern margin, and the development of a 0.5-2 km wide zone of amphibolite-facies dextral mylonite, referred to as the Katherine River shear zone (Van Kranendonk et al., 1993). Folding of lithologic units and the Abloviak shear zone (D_{n+2}) fabric elements is clearly shown on the map. D_{n+3} deformation in both the Katherine River and Komaktorvik shear zones has been dated by U-Pb on zircon from syn-kinematic pegmatite veins as between ca. 1798-1780 Ma (Scott et al., 1993; D. Scott, pers. comm., 1993). Faulting at greenschist-facies metamorphic grade (D_{n+4}) was the final deformation in the map area.

REFERENCES

Bertrand, J.-M., Roddick, J.C., Van Kranendonk, M.J. and Ermanovics, I.
(1993): U-Pb geochronology of deformation and metamorphism in the Early Proterozoic Torngat Orogen, North River map area, Labrador; Canadian Journal of Earth Sciences, v.30, p.1470-1489.

Scott, D.J., Machado, N., Van Kranendonk, M., Wardle, R. and Mengel, F.
(1993): U-Pb geochronology of the northern Torngat Orogen, Labrador: A preliminary report; in Current Research, Part C; Geological Survey of Canada, Paper 93-1C, p.341-348.

Van Kranendonk, M.J.
(1992): Geological evolution of the Archean Nain Province and the Early Proterozoic Torngat Orogen as seen along a transect in the North River-Nutak map area, northern Labrador, Canada. Unpublished PhD Thesis, Queen's University, Kingston, Ontario, Canada, 477p.

Van Kranendonk, M.J., and Ermanovics, I.
(1990): Structural evolution of the Hudsonian Torngat Orogen in the North River map area, Labrador: Evidence for east-west transpressive collision of Nain and Rae continental blocks: Geoscience Canada, v. 17, p. 283-288.

Van Kranendonk, M.J., Godin, L., Mengel, F.C., Scott, D.J., Wardle, R.J., Campbell, L. and Bridgwater, D.
(1993): Geology and structural development of the Archean to Paleoproterozoic Burwell domain, northern Torngat Orogen, Labrador and Québec; in Current Research, Part C; Geological Survey of Canada, Paper 93-1C, p.329-340.

Geology by M.J. Van Kranendonk, L. Godin, F. Mengel, L. Campbell, D. Scott, L. Reid and N. Goulet

Digital cartography by M.J. Van Kranendonk and M. Sigouin

Any revisions or additional information known to the user would by welcomed by the Geological Survey of Canada

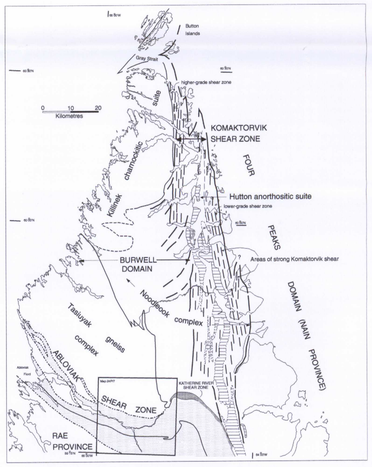
Mean magnetic declination 1993, 33°09' W, increasing 12.6' annually. Readings vary from 32°57' W in the SW corner to 33°20' W in the NE corner of the map

Digital base map from Surveys, Mapping and Remote Sensing published at the same scale. Generalized and modified by the Geological Survey of Canada

Copies of the topographical edition of this map may be obtained from the Canada Map Office, Department of Energy, Mines and Resources, Ottawa, Ontario, K1A 0E9

The Québec-Newfoundland boundary has not been surveyed and monumented on the ground at date of publication

Elevations in feet above mean sea level



Structural (UPPER CASE) and lithological (lower case) subdivisions of the northern part of the Paleoproterozoic Torngat Orogen, Labrador, Québec and Northwest Territories. Location of map area outlined by square box.

Copies of this map may be obtained from the Geological Survey of Canada
601 South Street, Ottawa, Ontario K1A 0E8
3303-33rd Street, N.W., Calgary, Alberta T2L 2A7

LOCATION MAP - LOCALISATION DE LA CARTE

Open File 2738

GEOLOGY

MONT JACQUES-ROUSSEAU

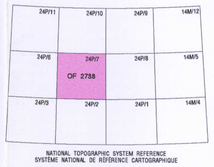
QUÉBEC - NEWFOUNDLAND (LABRADOR)

Scale 1:50 000 - Échelle 1/50 000

Kilometres 1 0 1 2 3 4 Kilometres

Transverse Mercator Projection
CM 64°45', Scale Factor 1

Projection transverse de Mercator
M.C. 64°45', facteur d'échelle 1



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE
SYSTÈME NATIONAL DE RÉFÉRENCE CARTOGRAPHIQUE

LEGEND

Q — *Unconsolidated Quaternary deposits and felsenmeer*

PALEOPROTEROZOIC ROCKS

Pft — *Fault breccia and cataclasite laced with pseudotachylite veins*

Purmy — *Amphibolite- to greenschist-facies mylonite and ultramylonite*

META-PLUTONIC ROCKS

Pitg — *Sugary-textured, fine- to medium-grained, pink and grey granite*

PIDTG — *Polyphase intrusive suite, varying from mafic diorite, through tonalite and granodiorite, to granite and quartz monzodiorite at amphibolite facies. Dominantly (>80%) homogeneous, leucocratic tonalite to quartz diorite (hornblende-biotite +/- epidote), with inclusions of plagioclase-phyric diorite and metagabbro, and layered mafic gneiss (Psmg); cut by porphyritic gabbro sheets and numerous phases of leucocratic veins and pegmatitic granite. Textures vary from weakly-foliated meta-plutonic rocks to migmatitic orthogneisses that locally show complex isoclinal folding*

Pigd — *Grey- to black-weathering melanocratic quartz diorite (colour index = 20-30%) at granulite facies (orthopyroxene-hornblende-biotite); commonly with relict igneous plagioclase megacrysts and cognate xenoliths of fine-grained diorite/quartz diorite. Weakly foliated to massive outside of the Abloviak shear zone, but mylonitized within. Dated by U-Pb on zircon as 1895 +/- 2 Ma (D. Scott, pers. comm., 1993: see map for location)*

Pidg — *Granulite-facies, mafic diorite: occurs as sheets within the Tasiuyak gneiss (PsTg) and Paleoproterozoic paragneisses (Pspg). Interpreted to represent an early phase of the Killinek charnockitic suite (Pigd-Pidq)*

SUPRACRUSTAL ROCKS

Pspg — *Grey- to buff-weathering paragneiss with red garnet and biotite, abundant leucosome, and complex migmatitic character*

PsTg — *Tasiuyak gneiss; rusty brown and white weathering paragneiss and diatexite, characterized by lilac-coloured garnets and sillimanite. Well-layered on a 10cm-2m scale, varying from garnet quartzite to semi-pelitic garnet-biotite-feldspar-quartz gneiss, to pelitic sillimanite-biotite-garnet quartzo-feldspathic gneiss; all cut by and/or interlayered with white garnet granite*

Pscs — *Calc-silicate and marble horizons in Pspg; consists of 1-5m wide layers of impure diopside-olivine-calcite marble, and light green, massive calc-silicate units (diopsidite), 1-10m thick, locally with numerous layer-parallel and layer-discordant white quartz veins*

Psmg — *Centimetre-layered mafic gneiss at amphibolite facies, interlayered with plagioclase-phyric and more homogeneous amphibolites: intruded by Paleoproterozoic diorite and tonalite of the PIDTG suite*

Lake Harbour Group

PLpg — *Biotite paragneiss; varying from pesmmitic quartzo-feldspathic gneisses, to semi-pelitic garnet-biotite quartzo-feldspathic gneiss. Leucosome material is rare or absent in these rocks, in contrast to the Tasiuyak gneiss (PsTg) and paragneisses farther north (Pspg)*

PLrg — *Rusty-brown weathering metapelitic gneiss, commonly with graphite*

PLmb — *Pure, white, coarse-grained calcite marble*

ARCHEAN AND/OR PROTEROZOIC ROCKS

APanl — *Granoblastic, recrystallized gabbroic anorthositic gneiss at amphibolite facies with variable amounts of leucocratic veins; characterized by disrupted mafic layers and cm-dm scale layering*

ARCHEAN ROCKS

Nain Province

Argn — *Unsubdivided tonalite-granodiorite orthogneiss and migmatite, with highly variable composition and texture: typically complex, very well-layered and heterogeneous migmatites, with <50% of inclusions of ultramafic to mafic gneiss, anorthositic gneiss, and metasedimentary gneiss. Metamorphosed to Late Archean granulite-facies, cut by Aseyalik mafic dykes and rocks of the PIDTG suite: retrogressed to Paleoproterozoic amphibolite facies*

Rae Province

ARtn — *White to grey tonalite gneiss and migmatite, with inclusions and layers of homogeneous to layered mafic gneiss and anorthositic rocks; at granulite facies. Contains amphibolite dykes. Interlayered with Lake Harbour Group metasedimentary rocks, and cut by Paleoproterozoic charnockitic rocks (Pigd) and granite sheets (Pitg). Distinguished from Archean Nain gneisses (Argn) by a smaller volume of leucosome, abundant (?Proterozoic) granite veins, and a lack of ultramafic intrusions.*

SYMBOLS

Lithological contact (defined, inferred)

Trace of gneissosity from airphoto interpretation

Fault (defined with shear sense where known, inferred)

Limit of visited outcrop

Limit of unconsolidated sedimentary cover + felsenmeer

Lithotectonic assemblage boundary (defined, inferred)

Limit of granulite-facies ribbon ultramylonite in the Abloviak shear zone

Limit of D3 dextral mylonite in Katherine River shear zone

Limit of amphibolite-facies retrogression M_{n+3}

Location and U-Pb age of geochronology sample: z=zircon, m=monazite
1 = 207Pb/206Pb ages of detrital zircons in garnet quartzite
2 = Metamorphic monazite age in garnet quartzite
3 = Post-D_{n+3}, pre-D_{n+2} pegmatite
Uz 1885+/-3 Ma²

Location of graphite-rich sulphide (Ni, Zn) horizon in Tasiuyak gneiss

Paleoproterozoic fabric elements

D_{n+4} fabric elements: Ultramylonites and faults

Brittle fault and ultramylonite, with movement unknown: inclined, vertical

Inclined brittle fault or ultramylonite: dextral

Lineations on brittle faults and ultramylonites: striping

D_{n+3} fabric elements: amphibolite facies

Inclined schistosity: no movement sense, sinistral, dextral

Vertical schistosity: sinistral, dextral

Fold axial plane: inclined, vertical

Fold axis: symmetrical, s-asymmetric, z-asymmetric

Lineation: mineral elongation, striping

D_{n+2} fabric elements: granulite facies

Inclined schistosity: no movement sense, sinistral

Vertical schistosity: no movement sense

Fold axial plane: inclined

Fold axis: symmetrical, s-asymmetric, z-asymmetric

Lineation: mineral elongation, striping

D_{n+1} fabric elements

Inclined schistosity or gneissosity

Archean fabric elements (D_n)

Gneissosity: inclined

Abbreviations: BI = biotite, HB = hornblende, OPX = orthopyroxene, QZ = quartz, SI = sillimanite, PL = plagioclase

OPEN FILE
DOSSIER PUBLIC
2738
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
OTTAWA
1994

Recommended citation:
Van Kranendonk, M.J.
1993: Geology, Mont Jacques-Rousseau, Québec-Newfoundland (Labrador); Geological Survey of Canada, Open File 2738, scale 1:50000

Published 1995

Canada