

GEOLOGICAL SURVEY BRANCH
DEPARTMENT OF MINES AND ENERGY
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
**GEOLOGICAL MAP OF THE ANAKTALIK BROOK-İKDLIVIK
BROOK-İGLUVIGALIK BROOK AREA, LABRADOR**

LEGEND
(Numerical listing of gneissic units does not necessarily correspond to relative age)

MIDDLE PROTEROZOIC

10 Medium- to coarse-grained olivine gabbro and leucogabbro

NAIN PLUTONIC SUITE

9 Coarse grained, white, pale grey and yellow-brown weathering quartz monzonite and granite having mineralogical and textural characteristics of rapakivi. This intrusion has yielded a U-Pb zircon age of 1322 ± 1 Ma (dated sample collected on NTS 14DR). Exhibits ovoid to euhedral, locally plagioclase-mantled, potassium-feldspar megacrysts and ovoid, grey to opalescent blue quartz. Hornblende is the dominant mafic mineral occurring both as small inclusions in megacrysts and as oligoclastic patches; the hornblende commonly displays rusty cores of altered olivine or clinopyroxene. Olivine-bearing phase of Unit 9. A chocolate-brown to orange-brown weathering, crumbly rock characteristically disintegrates to a granular in situ gravel; contains fayalite and clinopyroxene.

ARCHAIC AND LOWER PROTEROZOIC

FOLIATED AND GNEISSIC ROCKS OF THE CHURCHILL (RAE) PROVINCE

8 Massive to well-layered, black, dark grey, grey green-weathering, fine- to coarse-grained mafic gneisses of predominantly gabbroic paragneiss. Locally transected by a network of white to grey granitoid sheets giving rise to agmatitic gneisses. Irregular orthopyroxene-bearing 'sweats' are locally present. Compositional layering from melanocratic to leucocratic, ranges on the scale of centimetres to metres, and encompasses rock types from hornblende-bearing gabbro, gabbro-norite, leuconorite to anorthositic; black hornblende forms conspicuous oligoclastic porphyroblasts in some of the leucocratic varieties. Quartz and garnet are locally present. Rusty, sulphide-rich zones characterise some belts; narrow paragneiss and quartzofeldspathic gneiss lenses are also present. Some of the best examples of strict primary compositional layering in these metigneous bodies can be seen in the two broad units shown in the southwest corner of the sheet and in the folded unit 3 km southwest of Ittooyvrb. Zircon from a noritic pegmatite dyke within the latter unit has yielded an age of 1851 ± 2 Ma.

7 Garnetiferous, orthopyroxene-bearing quartzofeldspathic gneiss, containing thin bands of pelitic gneiss and marble. May be orthogneiss-contaminated by assimilated metasedimentary rock.

6 Dominantly grey to pink to orange-weathering, speckled to laminated, diopside and sphene-bearing granitic coronas (calciferous meta-arkose), and grey to white garnet + hornblende and garnet + orthopyroxene-bearing psammitic gneiss. Contains numerous narrow and disrupted marble and calc-silicate units, and lesser sillimanite-bearing quartzite locally migmatized, having a garnet-bearing leucosome. Some of the pink gneiss included in this unit lacks clinopyroxene and any firm field or microscopic indications of metasedimentary origin, and may be of igneous paragneiss. Unit also includes subordinate amount of pelitic and semi-pelitic garnet + sillimanite + biotite + graphite gneiss, locally with pyritic gossan zones.

6c Dark grey to brown-weathering calc-silicate and marble. May be finely layered. Locally rich in diopside and torsterite.

5 Rusty-weathering biotite + garnet + sillimanite + orthopyroxene + cordierite-bearing paragneiss and associated white-weathering anorthite; in the latter, pelitic and psammitic gneiss forms narrow screens and discontinuous whipsy schlieren. Locally includes psammitic, quartzitic and calciferous arkose metasedimentary rocks and layers of mafic gneiss; some of the latter may be detrital basic dykes. Garnet is dark purple to cherry red in the biotite-rich paragneiss, but is commonly lavender to bright pink in the anorthites. Garnet and sillimanite have been variably transformed to hypersthene + cordierite and spinel + cordierite respectively within a 1 km-wide pyroxene hornfels thermal aureole adjacent to the rapakivi granite (Unit 9). Outside the thermal aureole the primary regional assemblages also locally includes hypersthene, spinel and cordierite. The paragneisses contain many rusty pyritic zones; limited assays indicate that there are very low contents of economically interesting elements. Just south of Anaktalik Brook metabasite white granitic sheets occur within the paragneiss.

5c Quartzite-dominated paragneiss, rusty to ochraceous weathering, having narrow calciferous and mafic granitic units.

4 Hornblende-rich amphibolite-facies grey gneiss, exhibiting liparitic type migmatite structure. A fine grained biotite + hornblende + sphene gneiss having a pink leucosome; predominantly quartz chert in composition. Locally contains amphibolite dykes that post-date the migmatization.

3 Pink, leucocratic, potash feldspar-rich foliated granite and gneiss. Some of these rocks plainly intrude the granulite-facies gneisses of Unit 1, and the mafic rocks of Unit 8, but others may be retrogressed zones of Unit 1. Chloritoid biotite is generally the only mafic mineral present, although some gneiss of this type contains orthopyroxene.

2 Pink to grey-weathering chiefly amphibolite-facies gneiss containing white or pink feldspar augen and/or lenticular feldspar aggregates derived from recrystallized augen. Hornblende-gneiss to granulite in composition; augen structure best displayed in southwest corner of map-sheet. Generally not migmatized, except north of Ikdlivik Brook. Hornblende and biotite are the chief mafic minerals, and define an anastomosing type of foliation in the coarser rocks; garnet is locally present. Contains mafic units that are locally demonstrable to have originally been mafic dykes. May be the lower grade equivalent of subunit 1a.

1 Predominantly buff- to brown- to white-weathering, granulite-facies quartzofeldspathic gneiss, 'lumpy' and white-weathering where retrogressed. Dominant rock-types are enderbitic to charnockitic, but some gneisses in the western part of the area are hypersthene-quartz syenites in composition; locally more mafic variants are present. This is a diverse group of rocks of more than one age and includes well-layered and migmatized gneisses, diffusely layered gneisses, and streaky foliated rocks, in which primary plutonic features are still visible. Deformation fabrics vary from indistinct to strongly mylonitic and a shallowly plunging quartz-rodging lineation is locally characteristic. Narrow units of mafic granulite (Unit 8), paragneiss (Units 5 and 6), and pink granite gneiss (Unit 3) are present, which produce a well-layered complex. In many outcrops, the mafic and metasedimentary gneisses can be shown to have been rats in the granulite protolith in areas where the subsequent deformation is not strong; in some of the granulite rocks the continuous gneiss units may have been basic dykes. Orthopyroxene may be partially or wholly retrogressed to biotite, orthoamphibole and green biotite. Hornblende is widely distributed; clinopyroxene and garnet are locally present. Granoblastic (hornfelsic) textures are well-developed adjacent to the rapakivi granite, but other contact metamorphic effects appear negligible.

1a-Foliated, buff, white and pink-weathering, coarse-grained rocks of plutonic origin displaying augen of feldspar and streaky feldspathic aggregates derived from recrystallized feldspar. Widely dispersed hornblende produces a diffuse foliation and compositional layering; clinopyroxene and garnet may be present, the latter especially where rats of paragneiss occur. Generally these rocks are not migmatized; the presence of discrete rats of older paragneiss (Units 5 and 6) and mafic rocks (Unit 8) attest to the plutonic origin of this unit. The foliation defined by feldspar streaks and elongate quartz is mylonitic locally, and is, in many cases, lobated. The westernmost broad unit north of Ikdlivik Brook is a streaky, non-migmatized, foliated, medium- to coarse-grained rock containing numerous rats of older migmatite, paragneiss and mafic gneiss. Zircon from a noritic pegmatite within an Archaean protolith, producing an upper intercept age of 2597 ± 1715 Ma.

SYMBOLS

Geological contact (defined, approximate, assumed).....

Ground observation station..... x

Aerial or binocular observation..... s

Gneissic layering or foliation (horizontal, inclined, vertical, dip unknown).....

Mineral lineation, with plunge; horizontal.....

Fold axes, with plunge.....

Abundant small-folds in outcrop.....

Trend observed on aerial photographs.....

Arpho - topographic linears.....

Jointing - fracture patterns (from aerial photographs).....

Small raft or lens of one gneiss within another.....

a = mafic gneiss (amphibolite, mafic granulite); ms = rusty, garnetiferous, metasedimentary gneiss; cs = calc-silicate rocks and marble

Generalized form of small-folds in outcrop.....

Zircon age dating sample site (age in Ma).....

Marble and calc-silicate units.....

Quartzite units.....

Uncertainty in extent or designation of unit.....

Diabase dykes, several ages.....

Fault (approximate, assumed).....

Pyritic zones.....

Ilmenite-magnetite zone.....

Radioactive zone.....

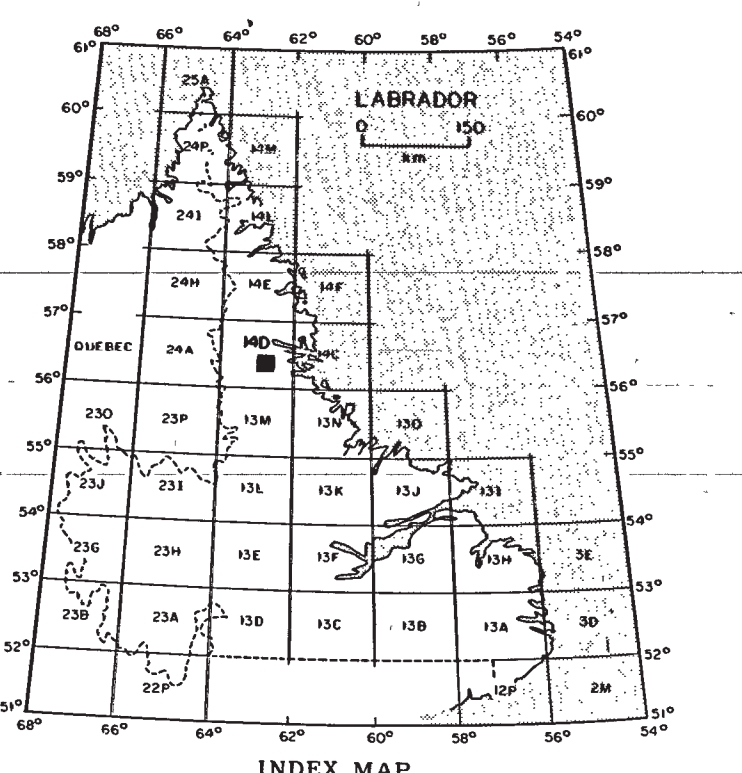
Boundary between orthopyroxene-bearing and orthopyroxene-free rocks (solid squares on pyroxene-bearing side).....

Areas with extensive glacial overburden.....

Crag and tail features.....

Esker (flow direction known, unknown).....

- Notes**
1. High strain (mylonitic) zones parallel to the gneissosity are developed across the area. The gneisses immediately west of the rapakivi granite pluton are overprinted by such a mylonitic zone over one kilometre in width; this zone is characterized by a variably developed mylonitic foliation and associated gently plunging lineation. The development of the mylonitic foliation and lineation predates granite emplacement. Mylonitic and ultramylonitic zones are also present in gneisses of the southwest corner of the map sheet.
 2. There is a regionally developed gently plunging lineation present in the quartzofeldspathic gneisses throughout the area, best defined by lenticular anastomosing quartz. This lineation is present in mylonitic zones, as noted above, and is also associated with recumbent to upright folds. The lobated fabric is locally discordant to gneissosity on horizontal outcrop surface, but more commonly the layering and quartz fabric are parallel.
 3. Names enclosed by parentheses are taken from unpublished geographic data of E.F. Whelan II and his 'List of Labrador Eskimo Place Names' published by the National Museum of Canada (Bulletin No. 131, 1953).
 4. Crag and tail features and eskers are taken from an unpublished air-photo interpreted surficial geology map by M. Balterson, Department of Mines and Energy, File 14D17 (29).



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