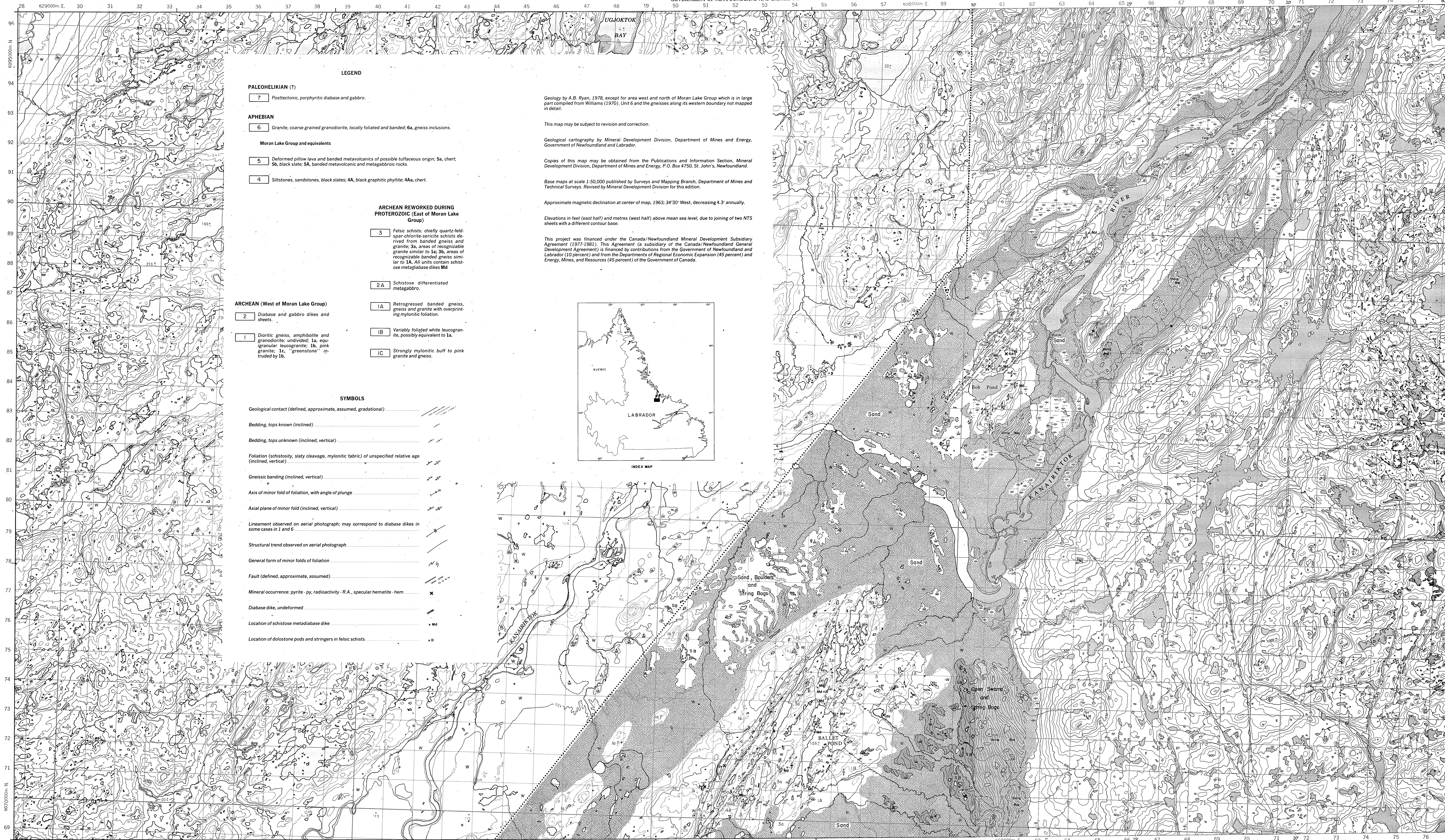
MINERAL DEVELOPMENT DIVISION
DEPARTMENT OF MINES AND ENERGY
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

13K/15, 13K/16W



LEGEND

PALEOHELIKIAN (?)

7 — *Posttectonic, porphyritic diabase and gabbro.*

APHEBIAN

6 — *Granite, coarse grained granodiorite, locally foliated and banded;* **6a**, *gneiss inclusions.*

Moran Lake Group and equivalents

5 — *Deformed pillow lava and banded metavolcanics of possible tuffaceous origin;* **5a**, *chert;* **5b**, *black slate;* **5A**, *banded metavolcanic and metagabbroic rocks.*

4 — *Siltstones, sandstones, black slates;* **4A**, *black graphitic phyllite;* **4Aa**, *chert.*

ARCHEAN REWORKED DURING PROTEROZOIC (East of Moran Lake Group)

3 — *Felsic schists: chiefly quartz-feldspar-chlorite-sericite schists derived from banded gneiss and granite;* **3a**, *areas of recognizable granite similar to* **1a**; **3b**, *areas of recognizable banded gneiss similar to* **1A**. *All units contain schistose metadiabase dikes* **Md**

2A — *Schistose differentiated metagabbro.*

1A — *Retrogressed banded gneiss, gneiss and granite with overprinting mylonitic foliation.*

1B — *Variably foliated white leucogranite, possibly equivalent to* **1a.**

1C — *Strongly mylonitic buff to pink granite and gneiss.*

ARCHEAN (West of Moran Lake Group)

2 — *Diabase and gabbro dikes and sheets.*

1 — *Dioritic gneiss, amphibolite and granodiorite; undivided;* **1a**, *equigranular leucogranite;* **1b**, *pink granite;* **1c**, *"greenstone" intruded by* **1b.**

SYMBOLS

Geological contact (defined, approximate, assumed, gradational)

Bedding, tops known (inclined)

Bedding, tops unknown (inclined, vertical)

Foliation (schistosity, slaty cleavage, mylonitic fabric) of unspecified relative age (inclined, vertical)

Gneissic banding (inclined, vertical)

Axis of minor fold of foliation, with angle of plunge — 30

Axial plane of minor fold (inclined, vertical)

Lineament observed on aerial photograph; may correspond to diabase dikes in some cases in 1 and 6

Structural trend observed on aerial photograph

General form of minor folds of foliation

Fault (defined, approximate, assumed)

Mineral occurrence: pyrite - py, radioactivity - R.A., specular hematite - hem — ×

Diabase dike, undeformed

Location of schistose metadiabase dike — × Md

Location of dolostone pods and stringers in felsic schists — × D

Geology by A.B. Ryan, 1978, except for area west and north of Moran Lake Group which is in large part compiled from Williams (1970). Unit 6 and the gneisses along its western boundary not mapped in detail.

This map may be subject to revision and correction.

Geological cartography by Mineral Development Division, Department of Mines and Energy, Government of Newfoundland and Labrador.

Copies of this map may be obtained from the Publications and Information Section, Mineral Development Division, Department of Mines and Energy, P.O. Box 4750, St. John's, Newfoundland.

Base maps at scale 1:50,000 published by Surveys and Mapping Branch, Department of Mines and Technical Surveys. Revised by Mineral Development Division for this edition.

Approximate magnetic declination at center of map, 1963; 34°30′ West, decreasing 4.3′ annually.

Elevations in feet (east half) and metres (west half) above mean sea level, due to joining of two NTS sheets with a different contour base.

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ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL

CONTOUR INTERVAL .... 20 METRES

MAP 79-4
NEWFOUNDLAND
KANAIRIKTOK RIVER

SCALE 1:50,000 ÉCHELLE

CONTOUR INTERVAL 50 FEET
Elevations in Feet above Mean Sea Level
North American Datum 1927
Transverse Mercator Projection

MARGINAL NOTES

The area is accessible by float plane or helicopter from Goose Bay 170 km to the south or Hopedale 80 km to the north. The Kanairiktok River is navigable by canoe, but portages are necessary to by-pass rapids and waterfalls.

Most of the area is rolling, hilly country with an average elevation of 200 m. The eastern half is a high barren plateau on the order of 300 - 400 m; the northwest extremity is a rugged area with peaks up to 300 m on the coast at Kanairiktok Bay. Outcrop in the Kanairiktok River valley is varied, with areas of burnt-over bedrock exposed through a thick blanket of glaciofluvial deposits and expanses of string bog and swamp.

The area straddles the tectonic boundary between the Archean (Kenoran deformed) Nain structural province and the Proterozoic (Hudsonian deformed) Makkovik sub-province (Taylor 1971; Douglas, 1972). Rocks of the Nain province are well exposed in the northwest corner of the map area, and are chiefly dioritic gneiss, amphibolite and granodiorite (unit 1) (Williams, 1970). Dikes and sheets of gabbro/diabase (unit 2) up to 1 km in width transect the Archean gneisses and granitoids. Though considered by Taylor (1978) to be Neohelikian in age, it is believed they are late Archean or early Proterozoic because no such dikes cut rocks affected by Hudsonian deformation. Most diabase dikes in the latter are strongly schistose (2A; Md) carrying the same foliation as their host rocks.

Weakly foliated to massive undeformed, white weathering, medium grained leucogranite (Unit 1a) of presumed Archean age outcrops west of Ballet Pond. The granite is uncomformably overlain by the Aphebian Moran Lake Group (Units 4, 5) where locally it displays a rusty and dolomitized paleoweathered surface near the nonconformity; several small (<1m²) "outliers" of granite breccia cemented by dolomite occur within the granite near the Moran Lake Group and appear to represent the recently exhumed unconformity plane. Similar granite (Unit 1B) intruding retrogressed amphibolite grade banded gneisses (Unit 1A) of Ballet Pond is foliated, the foliation appearing to be of the same age as the greenschist overprinting in the gneisses; both features are attributed to Hudsonian deformation.

Pink to white, medium grained granite (Unit 1b) intruded into schistose "greenstones" constitute the Archean north of the "elbow" in the Kanairiktok River. Late Archean (?) gabbro-diabase sheets and dikes (Unit 2) cut the granite. The contact with the Moran Lake Group (Unit 5) appears to be tectonic, the basal sedimentary unit of the supracrustals having been removed by Hudsonian (?) translation along the basement-cover interface. Some of the diabase dikes in the granite are variably schistose; narrow, flinty, mylonite zones and epidote-chlorite alteration are common in the granite. These latter features appear to be related to northeast trending Proterozoic (?) faults.

Banded quartzofeldspathic gneiss and amphibolite (Unit 1A) constitute the easternmost Archean unit along the Kanairiktok River. Folded metadiabase dikes also occur in this unit, and although still commonly showing a discordant relationship with the gneissic layering, exhibit an upper greenschist mineral assemblage and carry a foliation which overprints the gneissosity of their hosts. Pink granite sheets, showing both concordant and cross-cutting relationships to the gneissic layering are locally abundant, and commonly carry a strong fabric defined by elongation of quartz and feldspar. Buff to pink weathering mylonitic granite with small areas of banded gneiss (Unit 1C) outcrops along the northern course of the Kanairiktok River. Layering in the gneissic portions is commonly folded and very diffuse in nature because of the overprinting mylonitic fabric, but these gneissic areas appear to have been inclusions in the granite. Strongly schistose metadiabase dikes (Md) are common in this zone; one thick, knobby weathering, schistose diabasic body (Unit 2A) resembling the thick sheets north and west of the Moran Lake Group, still retains vestiges of a primary igneous layering and varies from ultramafic to leucogabbroic in composition. The fabric of unit 1C varies from a pronounced flattening and elongation of mineral constituents to a well defined cleavage or parting; narrow zones of banded mylonite occur locally.

Quartz-feldspar-chlorite-sericite schists (Unit 3) derived from strongly deformed leucogranite and retrogressed gneiss are well exposed around Ballet Pond. It is the northward continuation of a more extensive felsic schist zone in the Kaipokok River valley (Ryan, 1979). Areas of schistose granite (Unit 3a) resembling unit 1a and 1B, and partially transposed gneiss (Unit 3b) which appear to be the more highly retrogressed equivalents of unit 1A have been partially delineated within this schist zone. The foliation along which the gneissic banding is transposed parallels the regional foliation (S_m) of the schist zone. Strongly schistose metadiabase dikes (Md) are present throughout the schist zone. The schists appear to represent Archean basement reactivated during the Hudsonian orogeny; some of the granite component could be synkinematic.

The Aphebian Moran Lake Group (Units 4, 5) is variably deformed; primary features are rarely recognizable due to the intensity of the tectonic overprint. Both the sedimentary and volcanic units present in the group to the south (Smyth; *et al*., 1978; Ryan, 1979) occur at Ballet Pond but only the volcanics are preserved in the north. The sedimentary rocks (Unit 4) comprise black pyritiferous slates and well-bedded (2-3 cm) gray-brown fine grained sandstones and siltstones. The nonconformity with the Archean granite is marked by a thin (15 cm) basal conglomerate horizon composed of poorly sorted angular to subrounded pebbles and cobbles of granite in a sandy matrix with a brown dolomite cement. The paleoweathered surface of the granite locally displays a spheroidal weathering pattern with Liesegang rings. The volcanic rocks (Unit 5) are commonly brown-gray weathering, very strongly schistose, and few primary features are preserved. However, some exposures west of Ballet Pond still retain relict flattened pillow forms, and in some outcrops a compositional layering reminiscent of bedding in mafic tuffs is preserved. Narrow gray chert horizons (Unit 5a) occur locally in the metavolcanic belt.

Banded, fine grained, brown weathering, green-blue metavolcanic rocks of uncertain origin (Unit 5) with a few narrow intercalations of chert (Unit 5a) and black slate (Unit 5b) form the northernmost preserved outcrops of the Moran Lake Group along the Kanairiktok River. These metavolcanics superficially resemble the "older greenstones" of unit 1c, but they lack the widespread dikes and disrupted sheets of granite of the latter and are more regularly banded. The banding in the Moran Lake Group rocks is largely of tectonic origin, but portions of the belt appear to have been composed of bedded mafic tuffs being textually similar to areas of bedded mafic to intermediate tuffs found in deformed Moran Lake Group rocks of the Kaipokok River valley (Ryan, 1979). A narrow belt of white-weathering felsic schists (Unit 3) like those at Ballet Pond occurs east of the metavolcanics. Williams' (1970) map shows these as white quartzites, but textural evidence indicates a granitic protolith and thus they are not considered to be part of the supracrustal series.

Black, graphitic phyllites (Unit 4A), mauve pyritiferous chert (Unit 4Aa), and banded metavolcanic and foliated gabbroic rocks (Unit 5A) southwest of Ballet Pond represent the northern extension of a belt of polydeformed Moran Lake Group equivalents infolded with the felsic schists of the Kaipokok River valley (Ryan, 1979). Small, isolated, foliated pods and tightly folded stringers of buff to brown dolostone (D) occur locally within the schists; their similarity to carbonate horizons at the base of the Moran Lake Group to the south (Ryan, 1979) suggests they may be remnants of basal Moran in reworked basement.

Finely banded greenstone intruded by granite dikes on the shore of Ballet Pond may also be deformed Moran Lake, (Unit 5A?) but is probably older since it differs texturally from the Moran Lake rocks, and the granite which intrudes it is considered to be Archean in age, therefore suggesting it is a retrogressed amphibolite unit of Archean gneisses.

A white to salmon-pink weathering, medium to coarse grained quartz monzonite to granodiorite (Unit 6) forms a highland area in the eastern part of the map area, and is part of a large oval body occupying most of the area between Kaipokok and Kanairiktok Bays (Williams, 1970; Greene, 1972). This large batholith is locally megacrystic with K-feldspar up to 5 mm X 2 mm, has a nebulous to strongly banded aspect along its margins, and contains numerous xenoliths and broken rafts of quartzofeldspathic gneiss and amphibolite in a border zone up to 5 km in width. It has yielded a K-Ar biotite age of 1685 ± 55 Ma (Wanless *et al*., 1978), supporting Williams' (1970) conclusion that it is a Proterozoic intrusion, probably derived by anatexis of Archean rocks. The curvature of the foliation parallel with the granite margin as seen on aerial photographs and and Williams' (1970) map suggests synkinematic emplacement, possibly as a diapiric or domal intrusion.

One 8 m wide porphyritic diabase dike (Unit 7) was observed to cut cleaved mafic volcanic rocks and gray-black chert near the long pond west of Ballet Pond. It is plainly posttectonic, being fresh and undeformed and cutting the cleavage in its host. An undeformed gabbro plug (Unit 7) also occurs on the shore of Ballet Pond; its age is uncertain.

There is little deformation of the Archean granitic rocks immediately west of the Moran Lake Group; the rocks adjacent to the supracrustals are either massive or very weakly foliated; narrow mylonite zones in the pink granite west of the northern outlier are associated with Proterozoic faulting. The foliation in the Moran Lake Group and the felsic schists is considered to be a Hudsonian feature. This fabric (S_m) is regionally developed, and although in most cases seeming to be a first deformation feature, in many outcrops can be demonstrated to be composite in nature.

The regional foliation has been affected by tight to isoclinal folds (F_{m+1}) which may or may not carry any axial planar fabric. The nature of the folding has produced a coincidence of S_m and S_{m+1}, and therefore the latter, when developed, is only distinguishable from the former in hinge zones of F_{m+1} folds. The fabric in the mylonitic granite and gneiss, and the overprinting foliation in the retrogressed gneisses appear to be related to the regional foliation of the schists. Since pink granite sheets similar to unit 6 occur in unit 1A and exhibit the mylonitic foliation, then the intrusion of the granite pre-dated or was concomitant with the final flattening affecting the gneisses.

The parallel northeast trending faults of the Moran Lake Group appear to be late (?) Hudsonian structures. Faults with the same trend also cut the Archean west of the Moran Lake Group near the Kanairiktok River; narrow mylonite zones and schistose dikes accompany these faults. Pronounced northeast trending linears in the Archean southwest of Kanairiktok Bay may be expressions of these faults as well and suggest that Hudsonian effects may extend well into the Nain Province.

Pyrite occurs as disseminated grains in amphibolite units in retrogressed and mylonitic gneiss (Unit 1A), in narrow quartz veins in mylonitic textured granite and gneiss (Unit 1C), and as scattered grains, in the Moran Lake Group (Units 4, 5); it locally gives rise to rusty zones, especially in the black slates. Platy specular hematite was observed in a white quartz vein cutting a metadiabase dike north of Ballet Pond. A zone of radioactivity (50 x background) occurs in mylonitic granite north of a Bob Pond (60°29′W; 54°53′N). The main zone is approximately 40 x 1 m and the radioactivity is associated with foliated gray translucent quartz veins up to 10 cm wide which parallel the fabric in the host rock; several smaller zones with up to 15X background radioactivity occur in the same area. One grab sample from the main zone yeilded 300 ppm U; the presence of allanite in the rock suggests thorium is the main source of the anamolous radioactivity.

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