GEOLOGICAL SURVEY OF NEWFOUNDLAND
DEPARTMENT OF MINES
GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

14 D/2

LEGEND

ELSONIAN MAGMATIC SUITE (MIDDLE PROTEROZOIC)

16 *White-weathering, hornblende-bearing quartz monzonite, containing ovoidal potassium feldspar megacrysts; locally the megacrysts have a plagioclase feldspar mantle (wiborgite texture)*

15 *Pink-weathering feldspar porphyry*
The extent and affinity of this unit are unknown; it may be related to 13p or 14p.

14 *Medium-grained, white- to rusty-weathering, hornblende quartz monzonite and granite; typically has hypidiomorphic texture but rarely porphyritic; olivine and clinopyroxene usually present as cores to the more abundant hornblende*
Gneissic inclusions (roof pendants?) in this pluton exhibit a pyroxene hornfels thermal overprint on an original, regional granulite facies assemblage. The high-grade aureole extends at least 1 km into the gneisses to the west.

14p *Quartz–feldspar porphyry and 'speckled' fine-grained grey-green monzonite. The porphyry is grey-weathering, has subhedral to ovoidal quartz 'eyes' with a mafic mantle, and euhedral plagioclase and orthoclase. The 'speckled' monzonite is characterized by clots or oikocrystic aggregates of black hornblende, locally surrounded by a halo of white plagioclase*
Both the porphyry and 'speckled' rock contain older gneissic and leucogabbroic rafts, but are themselves present as rafts within the coarser quartz monzonite and granite.

14d *Medium- to coarse-grained grey diorite; randomly oriented prismatic hornblende up to 5 cm in length*

13 *Rusty-brown-weathering, medium-grained, friable, olivine gabbro and monzogabbronorite, in places grading into olivine- and clinopyroxene-bearing monzonite; locally contains ovoidal flesh-coloured feldspar aggregates and dark grey plagioclase xenocrysts; diffusely layered*
This unit is an undulating subhorizontal sheet. It is surrounded by a pyroxene hornfels aureole up to 2 km wide. Numerous xenoliths of country-rock gneisses and 'exotic' inclusions of leuconorite and anorthosite occur within it.

13p *Grey quartz–feldspar porphyry*
This unit occurs at the base of the gabbro sheet. It appears to be roughly contemporaneous with the gabbro since contact relations suggest mingling of the two magmas. It may be temporally related to Unit 14.

12 *Leuconorite, anorthosite*

CHURCHILL PROVINCE (LOWER PROTEROZOIC [AND ARCHEAN?])

11 *Sphene-rich, foliated, dark-grey-weathering, coarse-grained, quartz monzonite to granodiorite*
This unit is a subhorizontal sheet. It postdates the development of the gneissosity in the surrounding granulite facies rocks. The fabric is an anastomosing, mylonitic type, having localized zones of ultramylonite.

10 *Pale-pink- to salmon-pink-weathering foliated granite to granitic gneiss; includes rocks of several ages and textural varieties, some of which may be retrogressed granulites akin to Unit 7. Most of these rocks have a low content of mafic minerals, and generally display a simple anastomosing foliation. The fabric tends to be mylonitic; and in some outcrops finely laminated 'phyllitic' mylonites are present. These gneisses are generally not migmatized. May be temporally related to Unit 9, in part*
The pink granitoid gneisses in the Mistastin River area intrude the associated grey migmatites of Unit 8 and exhibit the same mylonitic fabric which overprints the older rocks. The two form a regional 'sheeted complex' in this area. Some mafic lenses and layers in the pink gneisses may be deformed dykes, but the majority are attenuated inclusions peeled from adjacent mafic gneisses.

10a *Undeformed aplitic sheet*

10g *Pink to white, orthopyroxene-bearing gneissose granitoid. May be equivalent to 7p*

9 *Grey, white- and pink-weathering hornblende–biotite augen gneiss derived from porphyritic (megacrystic) granodiorite; intrusive into adjacent grey migmatite gneiss and mafic gneiss; generally not migmatized; predominant foliation is mylonitic, overprints an earlier foliation, and is locally L-biased; polycrystalline felsic streaks denote sites of original feldspar megacrysts in recrystallized rocks ('ex-augen' texture); unit also includes areas of diffusely layered pink granite gneiss and foliated metaplutonic rocks devoid of feldspar phenocrysts*
This unit is transected by the orthopyroxene isograd; hypersthene and brown-green hornblende are characteristic of the higher grade rocks. It is possible that augen gneisses in the granulite terrane to the east are the high grade equivalents of these rocks. The best preserved original textures in these rocks occur in the western part of the unit.

8 *Grey, buff-, pink- and white-weathering, variably migmatitic, hornblende-biotite gneiss, predominantly at amphibolite facies and generally displaying a pervasive mylonitic overprint. Amphibolite units (average 2 m in width) are an integral part of these gneisses, and pink granite sheets are widespread components. These gneisses are locally characterized by conspicuous porphyroblasts of black hornblende*
These rocks have a regular, continuous layering, and display a lit-par-lit array of white-to pink- weathering aplitic to pegmatitic leucosome of more than one generation. Although many of the amphibolite units appear to be derived from mafic dykes, there is no unequivocal evidence for such an origin. The mylonitic overprint has led to pinch-and-swell and boudinage structure of the amphibolite units and the neosome. The mylonitic fabric is axial planar to isoclinal folds of the layering, but not all such folds carry this foliation. A streaky or mineral rodding lineation is widely developed in these mylonitic rocks. The mylonitic foliation is itself locally isoclinally folded, implying a protracted deformational history. Narrow (2 to 50 cm) ultramylonite zones are not uncommon, and later pseudotachylite veins occur locally. This unit is transected by the orthopyroxene isograd west of Konrad Brook lake, northeast of which granulite facies assemblages have been recognized.

8a *Gneisses with augen texture in paleosome; may be equivalent to Unit 9, in part*

8u *Zones of ultramylonite; porphyroclasts of disrupted granitic veins; appear to be selectively developed in paragneiss units*

7 *Buff-, white-, grey- and pink-weathering, granulite-facies, quartzofeldspathic gneisses; white and pink colours are usually associated with severely retrogressed rocks. This is a diverse group of rocks, varying from diffusely layered homogeneous mete-igneous types having a streaky discontinuous foliation to well-layered gneisses; this group probably includes several protolith types and ages. Charnockitic and enderbitic compositions dominate; hornblende and biotite are usually present and best-define the foliation; orthopyroxene lozenges and lenticular grey quartz are the foliation-forming minerals in some areas; clinopyroxene is a volumetrically significant phase, locally; garnet is rare and widely distributed*
Locally, the quartzofeldspathic granulites contain abundant outcrop-continuous layers and fragmented layers, and schlieren of mafic gneiss and paragneiss generally less than 2 m thick. Contacts between these layers (and the larger belts, Units 2 to 5) and the quartzofeldspathic gneiss indicate that, at least in many cases, the latter are younger, but some of the smaller rectiplanar mafic layers may be metamorphosed and deformed diabase dykes intruded into the quartzofeldspathic rocks prior to the last deformation. Migmatization of the quartzo-feldspathic granulites is locally pervasive, with a variety of foliated and non-foliated granitic neosomes. However, there are extensive parts of the terrane where migmatization is negligible. Retrogression of the granulite facies assemblage is erratic and localized; pristine granulites occur in close proximity to rocks in which hypersthene has been completely replaced by bastite and secondary amphibole.

7a *Quartzofeldspathic granulite-facies gneisses containing feldspar augen and/or recrystallized augen ('ex-augen' gneiss)*
These are interpreted as highly deformed and metamorphosed megacrystic plutonic rocks. Where the texture is severely recrystallized and modified the rocks are characterized by streaky, polycrystalline monomineralic domains as the expression of original megacrysts.

7m *Quartzofeldspathic granulite-facies gneisses with mylonitic fabrics*

7p *Pink-weathering, medium- to coarse-grained, orthopyroxene-bearing granite. Some rocks grouped with Unit 10 may be of this type*

6 *White-weathering, recrystallized and foliated anorthosite and leucogabbro; narrow mafic bands may be metamorphosed dykes*
The unit may be part of, or related to, the nearby mafic granulite (metagabbro), Unit 5.

5 *Dark grey, green-, and black-weathering, generally medium-grained, mafic gneisses (amphibolite, mafic granulite); field character varies from massive ('salt-and-pepper' texture) to compositionally layered; lenticular to ovoidal porphyroblastic clots of black hornblende locally produce a blotchy texture*
The mafic gneisses appear, for the most part, to have been derived from intrusive igneous protoliths (e.g., gabbro, diorite), but some of the finely layered types may be of supracrustal origin (i.e., tuffs, lavas). They are variably migmatized by several generations of aplitic to pegmatoidal granitoid veins and dykes, locally forming agmatite structure. In the granulite facies there are irregular hypersthene-bearing 'sweats' and the granitoid sheets are similarly orthopyroxene-bearing. Small lenses of rusty biotite-garnet ± sillimanite paragneiss and marble and/or calc-silicate are present, locally. Garnet is widely developed but rarely abundant in these rocks. A conspicuous gossan zone on the north shore of Cabot Lake is associated with pyritic zones in the mafic gneiss and in a granitic pegmatite cutting it; the gossan is devoid of economic mineralization. Elsewhere, sulphide-rich zones appear to be related to disseminated pyrite and pyrite veins in the mafic gneisses.

5n *Granoblastic to weakly foliated, olivine-bearing gabbronorite of uncertain affinity; mineralogically resembles Unit 13 but is deformed*

4 *Brown-, light-grey to dark-grey, and grey-green-weathering, commonly friable, marble and well-banded calc-silicate rocks; rootless folds and interference patterns intrafolial to the layering, and mesoscopic folds of the layering are not uncommon*
The marbles commonly have a nodular character due to the disruption of pre-or syntectonic quartzofeldspathic veins and original quartzitic and cherty bands. The calc-silicate rocks are well-banded and have compositional variations accentuated by differential weathering. The best examples of the overall character of these rocks can be found in the belts around the 1022-ft pond. A diagnostic botanical species in areas underlain by these calcareous rocks is an Alpoon saxifrage viz., *Saxifraga paniculata*.

3 *Pink-to grey-weathering, garnet-hornblende-biotite ± clinopyroxene ± hypersthene quartzofeldspathic gneiss; variably migmatized; locally contains layers of quartzite and marble; finely-laminated locally and tends to display a smooth, glacially-polished surface*

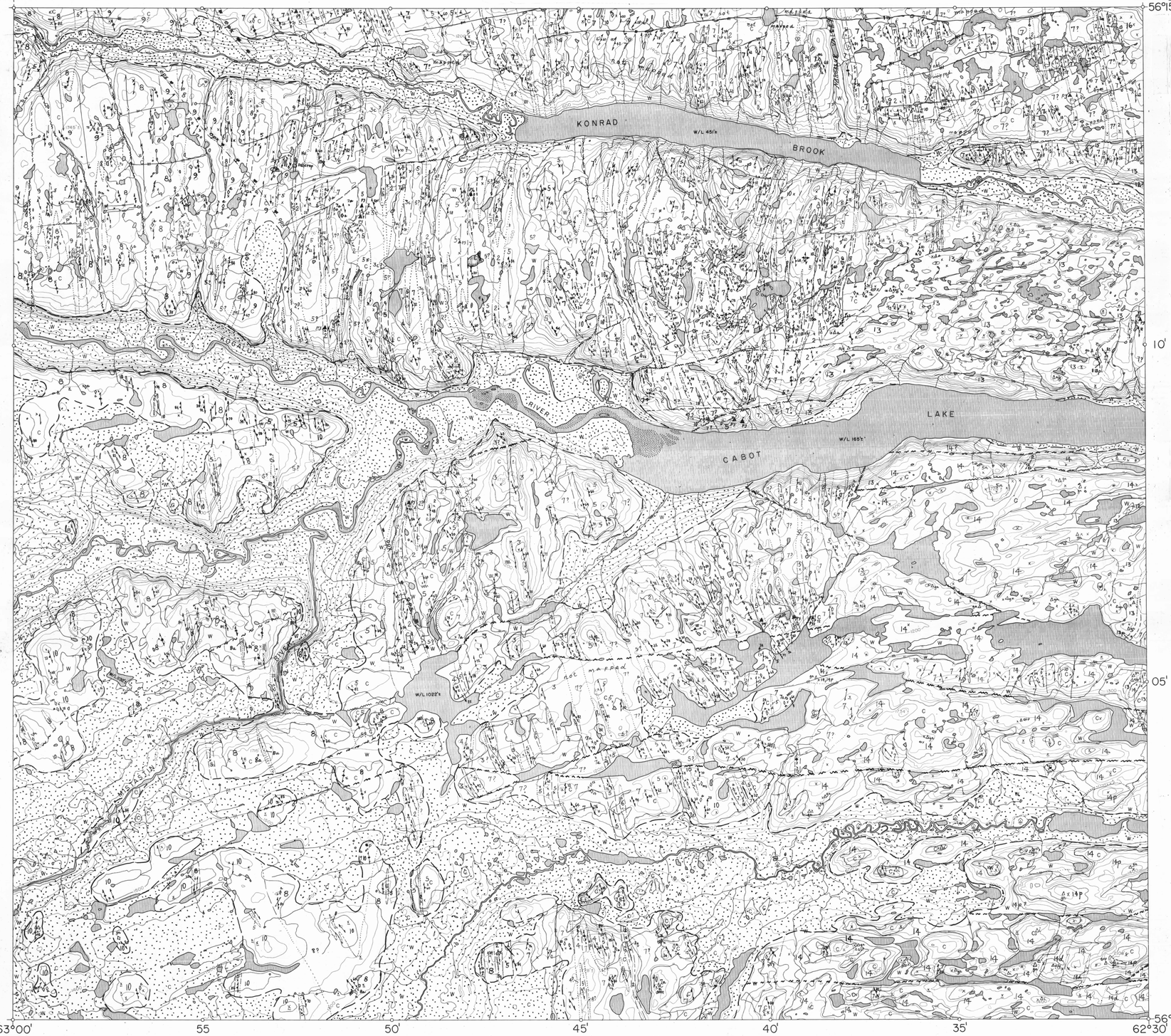
3c *Finely-laminated, pink- to green-grey-weathering, clinopyroxene-rich quartzofeldspathic gneiss; clinopyroxene locally forms knots and lensoid aggregates; pink granitic veins, locally parallel to the foliation; includes streaky, pink, granitic gneiss of indeterminate affinity*
Both of these gneiss types, 3 and 3c, show few diagnostic features of metasedimentary origin. However, the presence of garnet and clinopyroxene, the finely layered and siliceous character of these rocks, and the presence of marble and quartzite layers suggest a calcareous arkosic protolith. Parts of the unit resemble the pink granitic gneisses of Unit 10, so it may include rocks of plutonic as well as sedimentary origin.

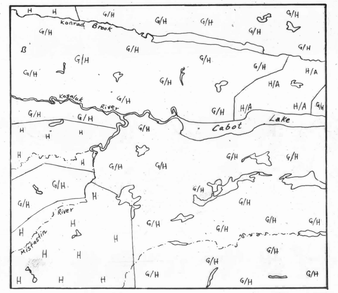
2 *Rusty-weathering, garnet-biotite-quartz-feldspar ± graphite-bearing pelitic to semi-pelitic paragneiss and associated white-weathering garnetiferous anatexite; the latter is a migmatizing agent and in some cases may predominate in outcrop with the restite of paragneiss as whispy schlieren; commonly sillimanite-bearing, but may contain hypersthene; pyrite and pyrrhotite are not uncommon and give rise to ochreous gossan zones locally*
The paragneisses display contact metamorphic transformations of regional metamorphic minerals in the thermal aureole of the post-tectonic plutonic rocks (Units 13, 14 and 16), i.a., garnet is replaced by cordierite + hypersthene ± olivine ± biotite, and sillimanite is replaced by cordierite + spinel. Cordierite and spinel also occur as widely distributed regional metamorphic phases. The rare bonsillicate grandidierite has been identified in one belt of paragneiss north of Cabot Lake. Most outcrops of paragneiss also have narrow (1 to 5 m) units of mafic gneiss. Several generations of granitic dykes and veins may be present. Assays of pyritic zones have indicated negligible quantities of economic commodities.

2p *Grey, garnetiferous, psammitic gneiss*

2q *Grey and white garnet-and/or clinopyroxene-bearing quartzite; locally contains muscovite*

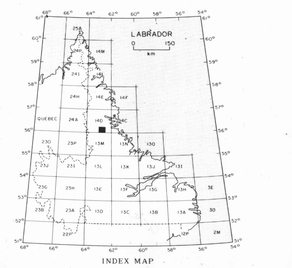
1 *White- to brown-weathering, garnet-biotite-quartz-feldspar ± sillimanite gneiss; elongate, grey, quartz and knots of sillimanite are moulded around red to lavender garnet porphyroblasts; contains narrow (10cm to 1m), rusty schlieren of graphitic paragneiss*
In the contact aureole of the post-tectonic plutonic rocks (Units 13 and 16) the garnet is replaced by cordierite + hypersthene ± biotite, and sillimanite is replaced by cordierite + spinel.





RELIABILITY DIAGRAM

G/H – ground traversing and helicopter mapping
H – helicopter mapping
H/A – helicopter mapping and airphoto interpretation



SYMBOLS

- *Geological contact (defined, approximate, assumed)*
- *Ground observation station*
- *Aerial or binocular observation*
- *Gneissic layering or foliation (horizontal, inclined, vertical, dip unknown)*
- *Igneous layering (tops unknown: inclined, dip unknown)*
- *Mineral lineation, with plunge*
- *Fold axes, with plunge*
- *Abundant small-folds in outcrop*
- *Trend observed on aerial photographs*
- *Airphoto–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; gn = migmatitic grey gneiss; um = ultramafic rock
- *Inclusions in post-tectonic plutonic rocks*
  gn = gneisses of various types; aig = anorthositic and/or leucogabbroic rocks; i = intermediate (dioritic) rocks; QFP = quartz–feldspar porphyry
- *Marble and calc-silicate units*
- *Quartzitic units*
- *Uncertainty in extent or designation of unit*
- *Diabase dykes, several ages*
- *Areas with extensive glacial overburden*
- *Fault (approximate, assumed)*
- *Pyritic zones*
- *Pseudotachylite localities*
- *Grandidierite locality*
- *Boundary between orthopyroxene-bearing and orthopyroxene-free rocks (solid squares on pyroxene-bearing side)*

Geological mapping by Bruce Ryan and Louise Corriveau, 1986.

GEOLOGY OF THE CABOT LAKE–MISTASTIN RIVER–KONRAD BROOK AREA, LABRADOR.

SCALE 1:50,000 ÉCHELLE
1.25 inches to 1 mile approximately

BASE MAP BY SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA, 1972, FROM PHOTOGRAPHS TAKEN IN 1964 AND 1966

CONTOUR INTERVAL ---------- 100 FEET

MAP 89-37

532000

14 D/2