REGIONAL GEOLOGICAL MAPPING IN THE CENTRAL MINERAL BELT, 1978 (13K/EAST), LABRADOR

by Bruce Ryan

INTRODUCTION

Regional geological mapping of the central portion of the Labrador Central Mineral Belt began in 1974 and has continued since 1976 (Smyth *et al.*, 1975; Ryan, 1977; Smyth, 1977; Ryan and Harris, 1978). Efforts have been mainly concentrated on the Moran Lake and Bruce River supracrustal rocks (Smyth *et al.*, 1978), and the bounding older and younger gneissic and plutonic terranes. In all, complete or partial coverage has been given to nine N.T.S. 1:50,000 map areas; namely, 13K/2, 3, 6, 7, 9, 10, 11, 15, and 16. Map areas 13K/2, 3, 6, 7, and 10 have been mapped sufficiently for complete 1:50,000 publication, with mapping on the others being limited chiefly to where the supracrustal rocks occur. The 1978 season was spent in finishing 1:50,000 coverage of 13K/10, which was previously published at 1:100,000 (Ryan, 1977), and in spot-checking areas of interest on adjacent map areas.

RESULTS OF 1978 FIELD WORK

The results of 1978 field work are summarized below. The geology of the northern Central Mineral Belt is shown in Figure 1, which also includes data from Williams (1970) and Griep (1978).

The area transected by the Kanairiktok River is underlain by variably foliated granites and gneisses of the Archean Nain structural province (1). Banded quartzo-feldspathic gneisses, dioritic gneisses, (garnetiferous) amphibolites, and leucocratic granites underlie most of the Kaipokok Valley. These rocks were considered by Williams (1970) to be Proterozoic in age, but, because of their similarity to rocks of the Nain province to the west are believed to be Archean in age also. However, a greenschist facies retrogressive metamorphism accompanied by a penetrative foliation overprints and partially masks their original character in many places. Elsewhere a mylonitic foliation is present, especially along the western margin of the Aillik Group and north of the "elbow" in the Kanairiktok River. A characteristic feature of the Archean gneisses is the preponderence of thick sheets and dikes of gabbro/diabase. In zones of weak overprinting in the Kaipokok Valley, these display the superimposed foliation, even though this is not penetrative enough to be apparent in the adjacent banded gneisses.

The southern extension of the Ugjoktok metavolcanic belt (2), outcropping west of the Kanairiktok River, consists of schistose mafic and felsic volcanic rocks. This belt was the subject of detailed mapping by I. Ermanovics of the Geological Survey of Canada in 1978.

A zone of quartz-feldspar-sericite schists and chlorite-actinolite schists (3) derived in part from the Archean complex stretches 40 km from the Kaipokok River north to the Kanairiktok River. These greenschist facies rocks display structures which are indicative of at least four periods of deformation, the regional fabric being composite in nature and affected by two later folding episodes. In many areas it can be shown that the schists have been derived from the amphibolite grade banded gneisses of unit 1 and a transition can be traced from gneisses with schistose dikes to felsic schists with concordant chlorite schist bands derived from the dikes. Elsewhere the felsic schists are derived from white leucocratic granites, which may be synkinematic Hudsonian intrusions. However, rocks of similar composition also occur locally as irregular bodies cutting the gneisses and could possibly be Archean in age.

The Aphebian Moran Lake Group (4,5) has been traced from Moran Lake northwards across the

Kanairiktok River. The main lobe north of Moran Lake has been previously described (Ryan, 1977), and consists of a basal black slate unit overlain by pillow breccias and massive to pillowed flows; individual flows are locally separated by chert/dolostone horizons. A slaty cleavage pervades the sediments in many parts of this southern belt, but the lavas are fresh and undeformed except in narrow shear zones.

Deformation of the two lensoid outliers north of the main outcrop area is more pronounced than in the rocks to the south. However, in the more southerly of the two bodies, both the sedimentary and volcanic units can still be recognized. Pillow lava structures are commonly obliterated by an intense flattening, but at two localities the unconformable contact of silty sands with an Archean leucogranite can be observed. In the northern outlier it appears that the sedimentary unit has been tectonically removed by translation along the basement/cover contact, and strongly deformed metavolcanic rocks are in sheared contact with pink granite and amphibolite.

Polydeformed greenschist facies equivalents of the Moran Lake Group (4a, 5a) occur as distinct belts within the felsic schists, and as a snakelike unit in the central Kaipokok Valley, the latter being separated from Archean gneisses by a narrow schist zone. The metasedimentary rocks (4a) are argillites and graphitic, chloritic and sericitic phyllites with lesser chert and dolostone. The metavolcanic rocks are schistose and strongly banded and no primary structures were observed, except in some mafic tuff horizons where the banding appears to represent original bedding. Meta-gabbroic rocks form a substantial portion of the sequence in some areas.

An area of deformed pillow lava overlain(?) by strongly flattened and tightly folded blue-green siliceous schists derived from felsic fragmentals and volcanogenic sediments (5b) forms a prominent hill in the central Kaipokok Valley. Thin gray limestone bands are associated with the siliceous schists and the whole sequence was considered to be Archean in age by Ryan (1977) during a reconnaissance study in 1976. However, this conclusion has been modified as a result of the more detailed mapping in 1978 and the belt is now interpreted to be Aphebian. If the felsic rocks stratigraphically overlie the mafic lavas and the latter are part of the Moran Lake Group, then this represents the first indication of the nature of the Aphebian rocks which postdate the lavas. Such rocks are not seen elsewhere because of erosion prior to deposition of the Helikian Bruce River Group. Felsic rocks form a substantial portion of the Aphebian Aillik Group to the east (Bailey, 1978) and the fragmentals of unit 5c may have stratigraphic equivalents in the Aillik Group.

A week was spent mapping the Aillik Group in the eastern part of the map area (Williams, 1970; Griep, 1978). The rocks are more strongly metamorphosed than the Moran Lake Group to the west.

The structurally, and possibly stratigraphically, lowest unit comprises a belt of white quartzites (6) which have been traced for approximately 12 km along the western boundary of the group. It is in tectonic contact with banded gneiss of presumed Archean age; this contact is commonly mylonitic.

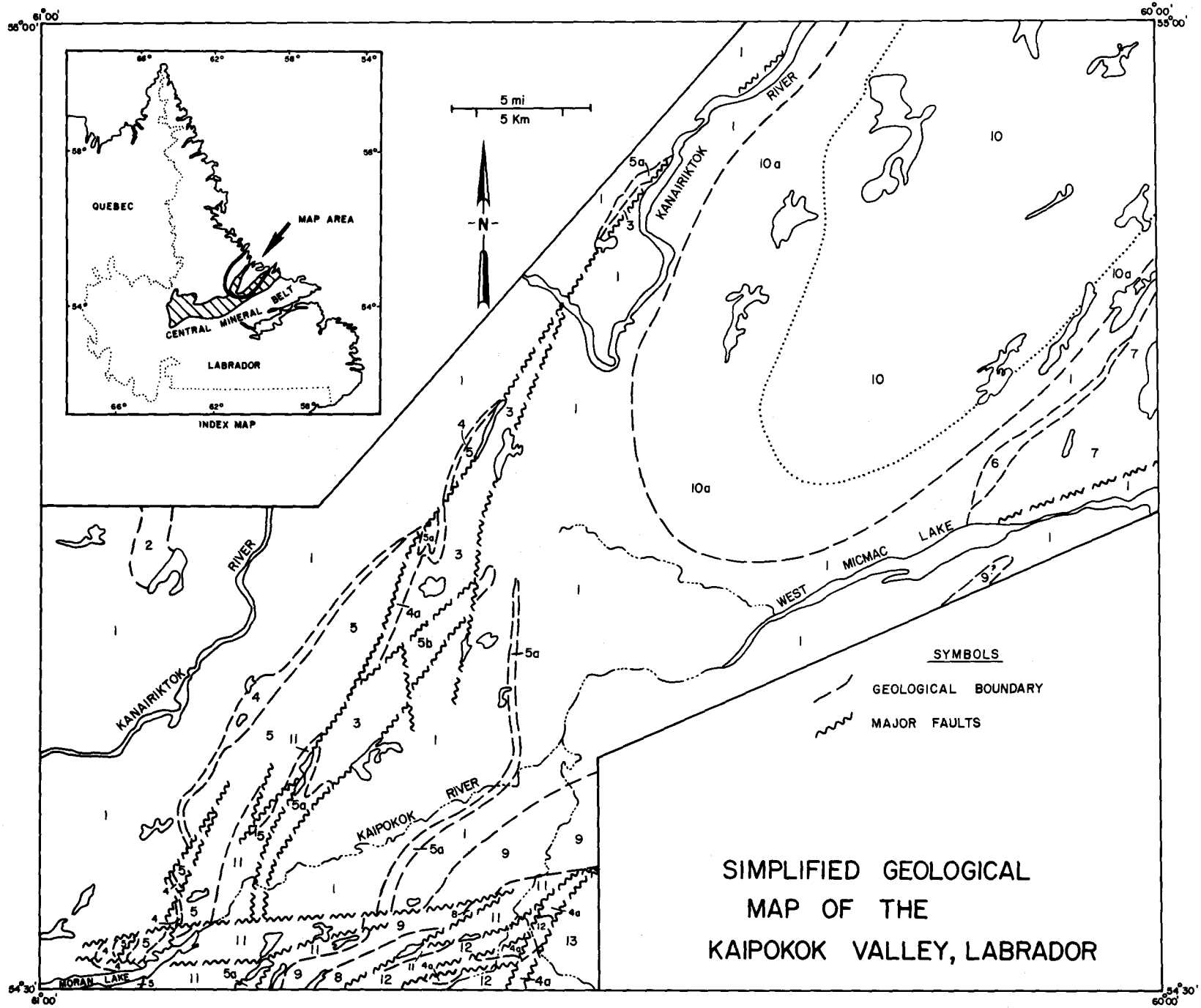
The metavolcanic rocks (7) are dark green actinolite schists in contrast to the green-blue chlorite-epidote rocks present in the Moran Lake Group to the west. Pelitic horizons (slates, mudstones, biotite schists) within the volcanic rocks commonly contain large porphyroblasts of andalusite, a mineral absent from the metamorphosed Moran Lake Group except in contact metamorphic aureoles of adjacent granites (Ryan and Harris, 1978).

Several granite bodies occur in the area. South of the Kaipokok River a pink, cleaved, medium grained leucogranite (8) intruded by a massive to foliated hornblende granite (9) forms a reentrant within the sediments. It is fault bounded on the southern margin, but is unconformably overlain by the Bruce River Group on its northern margin. The hornblende granite, known as the Junior Lake granite, also intrudes reconstituted gneiss in the Kaipokok Valley. It is therefore suggested that both granites are late to post-Hudsonian in age.

An oval body of massive to foliated, medium to fine grained, locally megacrystic, pink-red biotite granodiorite (10) occurs in the northeast corner of the map area. In intrudes the Archean gneisses and is characterized by a wide border zone with abundant gneissic rafts (10a). Its absolute age is unknown, but because of its similarity to middle Proterozoic granites in Labrador, is assumed to be 1600-1700 Ma. This granite was sampled in 1978 for isotopic dating by C. Brooks at the University of Montreal.

The Bruce River Group (11, 12) is a Paleohelikian sedimentary-volcanic rock assemblage which shows an unconformable contact with the Moran Lake Group, the leucocratic granite and the Junior Lake granite. Within the map area it includes the conglomerates and arkosic sandstones of the Heggart Lake Formation and the sandstones of the Brown Lake Formation. Detailed descriptions of these units can be found in Ryan (1977), Smyth *et al.* (1978) and Chaulk (this volume).

The youngest major rock unit in the area is a coarse grained weakly foliated to massive granodiorite (13). It is in fault contact with the older rocks in the map area, but a few kilometres to the south shows an intrusive contact with the Brown Lake Formation (Ryan and Harris, 1978)



LEGEND

13 *Coarse grained granodiorite.*

PALEOHELIKIAN

Bruce River Group

12 **Brown Lake Formation:** *Tuffaceous sandstone.*

11 **Heggart Lake Formation:** *Conglomerate, sandstone.*

PALEOHELIKIAN AND EARLIER

10 *Coarse pink granodiorite;* **10a,** *border zone with gneissic inclusions.*

9 **Junior Lake Granite:** *Hornblende granodiorite.*

8 *Pink medium-grained equigranular granite.*

APHEBIAN

Aillik Group

7 *Schistose metavolcanic, lesser pelitic sediments.*

6 *White quartzite.*

Moran Lake Group

5 *Pillow lava:* **5a,** *schistose metavolcanic-deformed equivalent of 5, contains some 4a:* **5b,** *undivided deformed pillow lava and felsic fragmentals.*

4 *Siltstone, slate, chert, dolostone:* **4a,** *graphitic schist, phyllite, slate, pelitic schist-deformed equivalent of 4.*

ARCHEAN

3 *Quartz-feldspar-sericite schists derived by refoliation of 1.*

2 *Metavolcanic rocks (Ugjoktok greenstone belt).*

1 *Banded gneiss, granite; narrow zones of 3 especially adjacent to 5a, 5b.*

MINERALIZATION

Numerous base metal showings are known (Ryan, 1977; Douglas and Hsu, 1976). They are primarily small occurrences represented by disseminated grains or isolated veins. In addition to the known uranium occurrences (Ryan, 1977), a lensoid radioactive zone (40 m by 1 m) was discovered in 1978 just east of the northern Moran outlier. The zone occurs in mylonitic granite of unit 1, associated with strongly sheared gray quartz veins, and gave a reading 50 times background on a Scintrex BGS-IL "total count" scintillometer. A grab sample yielded 0.03 percent uranium; petrographic examination of the host indicates the presence of allanite, suggesting thorium as the source of the radioactivity.

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