RECONNAISSANCE OF THE BURGEO MAP AREA (11P WEST HALF), NEWFOUNDLAND

by W.R. Smyth

INTRODUCTION

A brief helicopter assisted reconnaissance was made of the Burgeo West Half map area in 1978 to examine the geology and determine whether the Mineral Development Division should initiate a 1:50,000 mapping project in the area. The area is accessible via a new road from Burgeo to Burnt Pond River. This road is planned to connect in 1979 with the Trans-Canada Highway via the Southwest Brook road. The area forms part of the Gander Zone and the only published work on the area is the one inch to four mile regional map of Riley (1959).

The area includes two belts of felsic volcanic, pyroclastic, and sedimentary rocks separated and intruded by large granodiorite plutons. The northern belt is more highly deformed and metamorphosed than the southern belt but there is no evidence to suggest they are of different ages.

No definite basement rocks to the volcano-sedimentary belts were observed. Migmatites and paragneiss commonly bound the sedimentary belts but the contacts can be shown to be transitional. However, a granodiorite intrusion in the southern part of the area that is syn to posttectonic with respect to the deformation of the sediments, locally contains xenoliths of quartzo-feldspathic gneiss, paragneiss, and ultramafic rocks (unit 1) whose ages are unknown.

Three sections are described from the volcano-sedimentary belts.

NORTHERN BELT

White Bear River section

The White Bear River section consists of a sequence of slates and argillites in the north that grade southwards with increasing deformation and metamorphism into schists and migmatites.

In the upper reaches of the river sedimentary structures are preserved, including laminations, cross-bedding and rare ripples. Southwards the beds become thicker bedded, more quartz rich, and more schistose with development of biotite and tremolite.

The northern margin of the belt is a sharp intrusive contact with a granodiorite body. Contacts are exposed on the Granite Lake road and 4 km to the south. A narrow (<0.5 km) biotite-cordierite hornfels is developed in the sediments. The southern margin is a complex zone of granitic intrusions and migmatization with metamorphism up to amphibolite facies. Early (pre D_1) granitic dikes parallel the S_1 fabric in the schists. A late to posttectonic granodiorite intrudes the schists and truncates the early structures.

A belt of andesite and basalt shown by Riley (1959) to occur east of White Bear River consists of slates and argillites. These rocks are bounded to the northeast by a porphyritic granodiorite and intrusive contacts are exposed.

Hills of Couteau section

The Hills of Couteau section comprises felsic volcanic rocks and minor conglomerate intercalations along the southern part, overlain northwards by an assemblage of volcanogenic sediments and minor black slates and phyllites.

The felsic volcanic rocks consist of quartz-feldspar porphyries, fine grained rhyolites, and welded ash-flow tuffs. All possess a strong tectonic fabric and are metamorphosed up to biotite grade. The intercalated conglomerates contain clasts of granite, porphyry,

quartz, sandstone and shale deformed into characteristic cigar shapes.

The sedimentary rocks pass northwards towards the granite contact into schists and migmatites. A sharp intrusive contact is exposed in a quarry west of Buck Lake where psammitic and semi-pelitic schists are cut by a pre D_1 porphyritic granodiorite. Posttectonic garnetiferous aplites cut the granodiorite and the metasediments.

The metasediments show progressive migmatization northwards towards Rocky Ridge Pond with development of up to 70 percent of the leucosome component. Northwest of Rocky Ridge Pond a few outcrops of well banded quartzo-feldspathic gneiss were observed. It is not known if these gneisses are part of the migmatized metasediments or represent an older (basement?) gneiss.

SOUTHERN BELT

Burgeo Road and Grandy Brook sections

The southern belt comprises a well bedded, north facing sequence of tuffaceous sandstones, slates and minor conglomerates in the east that to the west interfinger and overlie felsic volcanic and pyroclastic rocks. The sedimentary rocks are medium to coarse grained, graded, cross-bedded and in places show ripple marks. They are well exposed on the Burgeo road.

A felsic porphyry, with rounded blue quartz phenocrysts, structurally underlies felsic pyroclastic rocks west of Grandy Brook. The extrusive nature of the porphyry was not confirmed but it appears to pass eastwards into quartz-sericite schists, interpreted as rhyolite flows. Schistose lapilli tuffs that structurally overlie the porphyry are extensively mineralized with disseminated pyrite. Boulder conglomerates of rhyolite, porphyry and granite clasts show a spatial relationship to the eastern margin of the porphyry and suggest the presence of a volcanic center in this region.

The northern and southern margins of the southern belt are intrusive contacts with a biotite rich, porphyritic, granodiorite that predate D_2 and may be syntectonic with D_1. Contact metamorphic effects are present with local development of cordierite, biotite, garnet and hornblende.

MINERALIZATION

The volcanic and pyroclastic rocks concentrated in the west of the area offer the best mineral potential. Acid lapilli tuffs of the Southern Belt east of Northwest Brook contain up to 30 percent disseminated pyrite. Assays gave only trace values of gold, silver and copper. Minor pyrite occurs west of Buck Lake in hornfelsed calc-silicate bands and southeast of Granite Lake in hornfelsed black slates.

The granitic rocks were only briefly examined and no mineral showings were observed in them. Posttectonic, red weathering, quartz-feldspar dikes near Burgeo gave 4X background readings on a scintillometer.

CORRELATIONS

The area lies within the Gander Zone (Williams *et al.*, 1974) a tectonic-stratigraphic zone characterized by a basement complex and a sequence of polydeformed metasedimentary and metavolcanic rocks; these are dated in the east as Ordovician. The age of the supracrustal rocks in the southwestern part of the zone is unknown, but most workers favor a Middle Ordovician - Silurian age on regional considerations.

The volcano-sedimentary rocks of the Burgeo area can be traced westwards into similar rocks of the Bay du Nord Group (Cooper, 1954; Chorlton, 1978). The rocks to the west have been metamorphosed to higher grade, locally to upper amphibolite facies (Chorlton, 1978, and this volume), and are more highly deformed than those in the Burgeo area. Felsic volcanic rocks are volumetrically more important west of Grandy Brook, and the La Poile Bay region appears to have been an area of active volcanic centres (see also Riley, 1959).

Felsic volcanic rocks have not been found in the east half of the Burgeo area. The rocks can be followed eastwards towards the Ordovician Baie d'Espoir Group (Jewell, 1939; Anderson, 1967; Colman-Sadd, 1976), in which felsic volcanic rocks reappear and in which two volcanic centres have been suggested (Colman-Sadd, 1976, and personal communication).

Most of the Cu, Pb and Zn occurrences (Douglas and Hsu, 1974) known from the La Poile-Burgeo region and the Baie d'Espoir region are associated with felsic volcanic rocks. In mapping the poorly known intervening ground, emphasis should be placed on determining the presence and extent of volcanic rocks.

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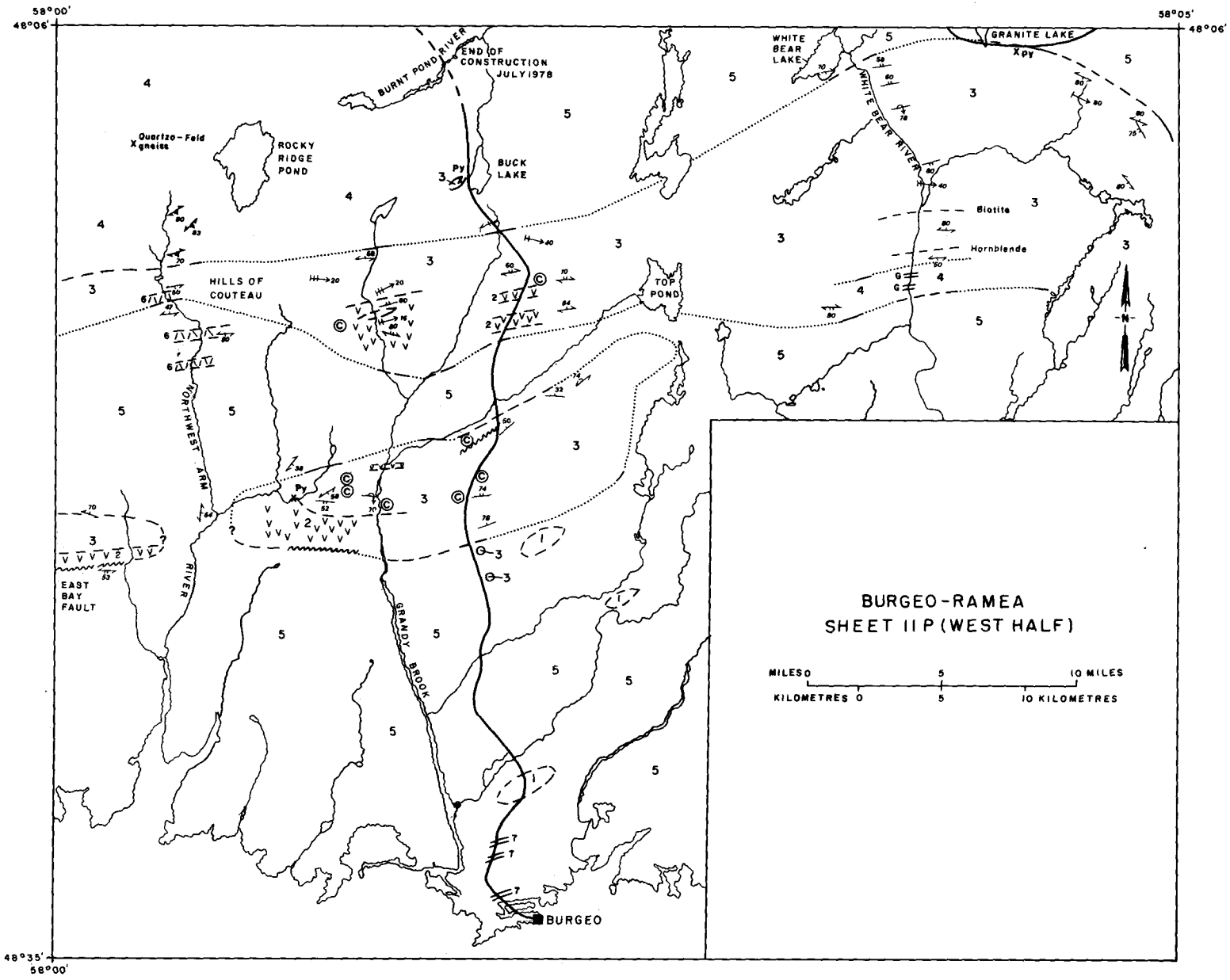

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LEGEND

POST-DEVONIAN ?

7 *Feldsparphyric granitic dikes.*

DEVONIAN (?)

6 *Gabbro.*

5 *Undivided granitic rocks, dominantly biotite-rich porphyritic granodiorite.*

DEVONIAN OR OLDER

4 *Paragneiss, migmatite.*

3 *Acidic pyroclastic rocks, argillite, slate; (c), conglomerate.*

2 *Silicic volcanic rocks; quartz-feldspar porphyry, rhyolite, ash-flow tuff.*

PRE-APPALACHIAN (?)

1 *Xenoliths of gneiss and ultramafic rocks in Devonian(?) granodiorite.*