GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 11 K/7

LEGEND

PALAEOZOIC

MISSISSIPPIAN

WINDSOR GROUP

9 — Red siltstone and sandstone, grey, thinly laminated siltstone and shale, gypsum and limestone; 9a, conglomerate, sandstone, siltstone, minor limestone

HORTON GROUP

8 — Red and grey conglomerate, sandstone, and siltstone

PRE-MISSISSIPPIAN

7 — 7a, andesite, amygdaloidal basalt, agglomerate, rhyolite, tuffaceous siltstone; 7b, conglomerate, sandstone, siltstone, amygdaloidal basalt and andesite; 7c, rhyolite and andesite

6 — Gabbro and diorite dykes

PRECAMBRIAN (?)

5 — Mixed rocks (includes 1, 2, 3, and 4)

4 — 4a, granite; 4b, granite and porphyroblastic granite; 4c, pegmatite; 4d, granite gneiss

3 — Hornblende- and biotite-quartz-feldspar gneiss, hornblende- and biotite-feldspar gneiss, diorite, quartz diorite, granodiorite, minor granite

2 — Diorite and quartz diorite, numerous granite dykes

1 — 1a, quartzite, quartz-feldspar gneiss, sericite, biotite, and chlorite schist, commonly garnetiferous, minor limestone and amphibolite; 1b, metasedimentary rocks and minor meta-volcanic rocks; 1c, andesite

Geological boundary (defined, approximate, assumed)

Bedding (inclined, vertical, overturned)

Bedding (inclined, tops not known)

Secondary foliation (inclined, vertical)

Fault (defined, approximate, assumed)

Mineral locality × Pb

SYMBOLS FOR METALS

Copper	Cu	Iron	Fe
Lead	Pb	Nickel	Ni
Pyrite	py	Silver	Ag
Zinc	Zn		

Geology by D.G. Kelley, 1958-1959

Main highway

Other roads

Trail

County boundary

Post Office P

Intermittent stream

Falls and rapids

Sand

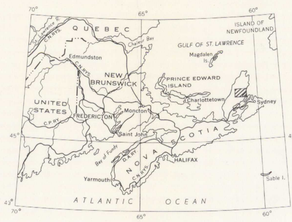
Marsh

Cartography by the Geological Survey of Canada, 1960

Approximate magnetic declination, 25° 30' West

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa

In response to public demand for earlier publication, Preliminary Series maps are issued in this simplified form and will be clearer to read if all or some of the map-units are hand-coloured



INDEX MAP

Adjoins Map 55-36, "Chéticamp River"

Adjoins Map 14-1956, "Baddeck"

Adjoins Map 39-54, "Bras d'Or"

Drift covered

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MAP 38-1960
GEOLOGY
ST. ANN'S
VICTORIA and INVERNESS COUNTIES
CAPE BRETON ISLAND
NOVA SCOTIA

Scale: One Inch to One Mile = 1/63,360

1 ½ 0 1 2 3 Miles

DESCRIPTIVE NOTES

Picturesque valleys of the Northeast Margaree and North Rivers extend into the uplifted peneplain known as Cape Breton Highlands. These highlands constitute most of the map-area. The valleys are underlain by Mississippian sedimentary rocks, and the highlands, which rise to a maximum elevation in the map-area of 1,600 feet are underlain by pre-Mississippian igneous and metamorphic rocks.

The oldest rocks in the map-area are quartzite, quartz-feldspar gneiss, sericite, biotite, and chlorite schists, which are commonly garnetiferous, and minor limestone and amphibolite (1a). These rocks are possibly correlative with the George River group and, if so, are Precambrian. Metasedimentary and meta-volcanic rocks (1b) are chiefly well-banded silicic rocks and may be correlative with 1a. Andesite (1c) is less metamorphosed than the other rocks in unit 1, but is included in it because it is apparently intercalated with metasedimentary rocks (1b) in the map-area to the north[1].

Diorite and quartz diorite (2) are the oldest known igneous rocks in the map-area. They are medium to coarse grained, dark grey, and consist of hornblende, plagioclase (An_{35}), biotite, and various amounts of quartz. The diorite is cut by numerous dykes of pink granite (4).

The gneisses of unit 3 are, at least in part, foliated equivalents of the dioritic rocks (2). In general, however, they are more silicic than the dioritic rocks; this may be due to contamination by metasedimentary inclusions and intrusive granite. In some areas feldspathization has converted diorite to rock of hornblende-syenite composition. Massive plutonic rocks included in unit 3 were too intimately associated with the gneisses to be mapped separately.

Rocks of unit 4, probably Devonian, include phases of a pink microcline-rich granite that is both massive (4a-4c) and foliated (4d). The porphyroblastic granite (4b) within the map-area is identical to the granite (4a) except that individual crystals of feldspar are up to several inches long. In northern Cape Breton these large feldspar crystals have been attributed to feldspathization of the country rock, but in the St. Ann's map-area there is evidence that they are normal phenocrysts. The single area mapped as partly porphyroblastic granite (4b) is part of an outcrop belt of porphyroblastic granite that extends approximately 20 miles farther north[1,2]. The granite-gneiss (4d) appears to have approximately the same composition as the massive granite; it contains outcrops of massive granite and inclusions of metasedimentary rocks too small to map separately. The granite-gneiss - granite contact is gradational, although dykes of syenite to granite cut the granite-gneiss.

Mixed rocks (5) in the west half of the map-area consist predominantly of a sedimentary component (1). Some of the rock types in unit 1 are also present in the mixed sedimentary and igneous rocks of unit 5 along Middle River. They are commonly garnetiferous. Near its contact with unit 5, granite (4) has cut the country rocks parallel to their foliation and formed pink and grey banded composite gneiss. The mixed rocks in the east half of the map-area are more basic, because the intrusive component is diorite rather than granite.

Gabbro and diorite dykes (6) are very common, but few are indicated on the map as most are less than 50 feet wide. They cut all the rock units described above and may also cut 7c.

Unit 7 includes relatively unmetamorphosed rocks that may all be of the same age. They overlie the older rocks (1-6) unconformably[1]. The separation of the predominantly sedimentary part of this unit (7b) from the Horton group (8) is based on the greater degree of induration of 7b sediments and the general absence of volcanic rocks in known Horton group rocks of this area. However, some rocks mapped as 7b could be Horton, and the rocks mapped as Horton along Forest Glen Brook could belong to 7b.

The rhyolite and andesite (7c) near St. Ann's Bay is interpreted as part of the same volcanic-sedimentary sequence as 7a and 7b. Dykes of this andesite and rhyolite cut the granitic rocks (4).

The Horton group (8) is best exposed in the St. Ann's - North River region. There, members of three Horton units[3] can be recognized, although they are not separately delineated on this map. The Horton group is conformably overlain west of North River and in the Northeast Margaree River valley by basal (A_1) Windsor limestone.

Outcrops of the Windsor group (9) are scarce. Lower Windsor (subzone B) limestone occurs near the northern boundary of the map-area along Northeast Margaree River and also northeast of Englishtown. At the latter locality the limestone overlaps onto igneous rocks. Upper Windsor fossils (subzone D) were found in thinly laminated grey siltstone and shale along Northeast Margaree River where Ingram Brook joins the river.

The clastic sediments (9a) on the west side of St. Ann's Bay are probably correlative with the Windsor group as indicated in the map-area to the east[4].

Rocks in the map-area have undergone at least two periods of deformation. The first resulted in folding, metamorphism, and intrusion, probably during Devonian time; the second involved folding of the volcanic rocks (7) and the Mississippian (8, 9). Most of the faults are probably high-angle reverse faults or normal faults.

Small amounts of galena and chalcopyrite are present in a narrow vein in the granitic rocks on the first south-flowing branch of Barachois River. Small amounts of lead and silver sulphides have been reported on a branch of Elders Brook on St. Ann's Mountain. These deposits were unsuccessfully explored 85 years ago[5]. Disseminated galena is present in the Windsor limestone northeast of Englishtown, and galena associated with the metasedimentary rocks was found in two minor occurrences on the northwest side of Sugarloaf Mountain.

Disseminated pyrite is common in the metasedimentary rocks on the north-flowing branch of McDonald Brook. Small amounts of sulphides, mainly pyrite, are fairly common in the rocks around Sarach and South Sarach Brooks.

Minor nickeliferous pyrrhotite was noted in gabbro west of Lake O'Law.

Massive specularite is common in the mixed rocks (5) west of the main branch of North River. One-foot blocks occur in drift close to what is probably a northerly trending, faulted contact between metasedimentary rocks and granite. The specularite is in places accompanied by small amounts of sulphides.

Copper, lead, zinc, and silver sulphides are associated with the contacts of a small inclusion in granitic rocks along Nile Brook, and a close examination of some of the larger inclusions (5) in this area might be worthwhile.

Gypsum was quarried west of St. Ann's, but production was discontinued in 1916. Gypsum and anhydrite probably underlie most of the Northeast Margaree valley, as shown by outcrops and numerous sink holes.

[1] MacLaren, A.S.: Cheticamp River, Inverness, and Victoria Counties, Nova Scotia; Geol. Surv., Canada, Paper 55-36 (1956).
(1956).
[2] Neale, E.R.W.: Pleasant Bay, Inverness, and Victoria Counties Nova Scotia; Geol. Surv., Canada, Paper 55-24 (1956).
[3] Kelley, D.G.: Baddeck, Nova Scotia; Geol. Surv., Canada, Map 14-1956 (1957).
[4] Bell, W.A.: Bras d'Or Sheet; Geol. Surv., Canada, Map 359A (1938).
[5] Fletcher, Hugh: Report on the Geology of Part of the Counties of Victoria, Cape Breton and Richmond, Nova Scotia; Geol. Surv., Canada, Rept. Prog. 1876-77 (1878).

MAP 38-1960
ST. ANN'S
NOVA SCOTIA
SHEET 11 K/7