CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PRELIMINARY SERIES

SHEET 11 K/2

LEGEND

PALÆOZOIC

CARBONIFEROUS

PENNSYLVANIAN

12 — MORIEN (PICTOU) GROUP
Conglomerate, arkosic sandstone; a few beds of grey siltstone

MISSISSIPPIAN AND/OR (?) PENNSYLVANIAN

10 — CANSO GROUP
Alternating red and grey siltstone; some conglomerate

MISSISSIPPIAN

9 — WINDSOR GROUP
Maroon siltstone; gypsum, limestone, **9A**, *Upper part;* **9B** *Lower part*

8 — HORTON GROUP
Red sandstone, conglomerate, arkose, red siltstone, grey siltstone and sandstone; mainly **8C**.,
8A, *Upper part; red sandstone, siltstone, and conglomerate, grey siltstone, sandstone and thin beds of intraformational conglomerate.*
8B, *Middle part; grey siltstone, sandstone, and shale; a few conglomerate lenses.*
8C, *Lower part; red sandstone and conglomerate arkose; some red siltstone; a few grey beds*

MISSISSIPPIAN
11 — *Red and grey siltstone, conglomerate, gypsum, limestone, arkose*

DEVONIAN(?)

7 — *Red conglomerate and sandstone, vesicular and amygdaloidal lava*

DEVONIAN

6 — *Igneous and sedimentary complex; includes 1, 4, and 5*

5 — *Granite and syenite*

4 — *Granodiorite, quartz diorite, diorite;* **4a**, *biotite gneiss;* **4b**, *granite and syenite;* **4c**, *composite gneiss;* **4d**, *hornblende gneiss;* **4e**, *amphibolite;* **4f**, *gabbro*

CAMBRIAN

3 — *Volcanic rocks, siltstone, shale, quartzite*

PRECAMBRIAN (?) — PRECAMBRIAN (C)

2 — *Volcanic breccia, amygdaloidal lava, metasedimentary rocks, possibly equivalent to Fourchu group but may be in part equivalent to 1*

1 — GEORGE RIVER GROUP
Sericite and chlorite schist, quartzite paragneiss, granitized sedimentary rocks, crystalline limestone; minor amphibolite

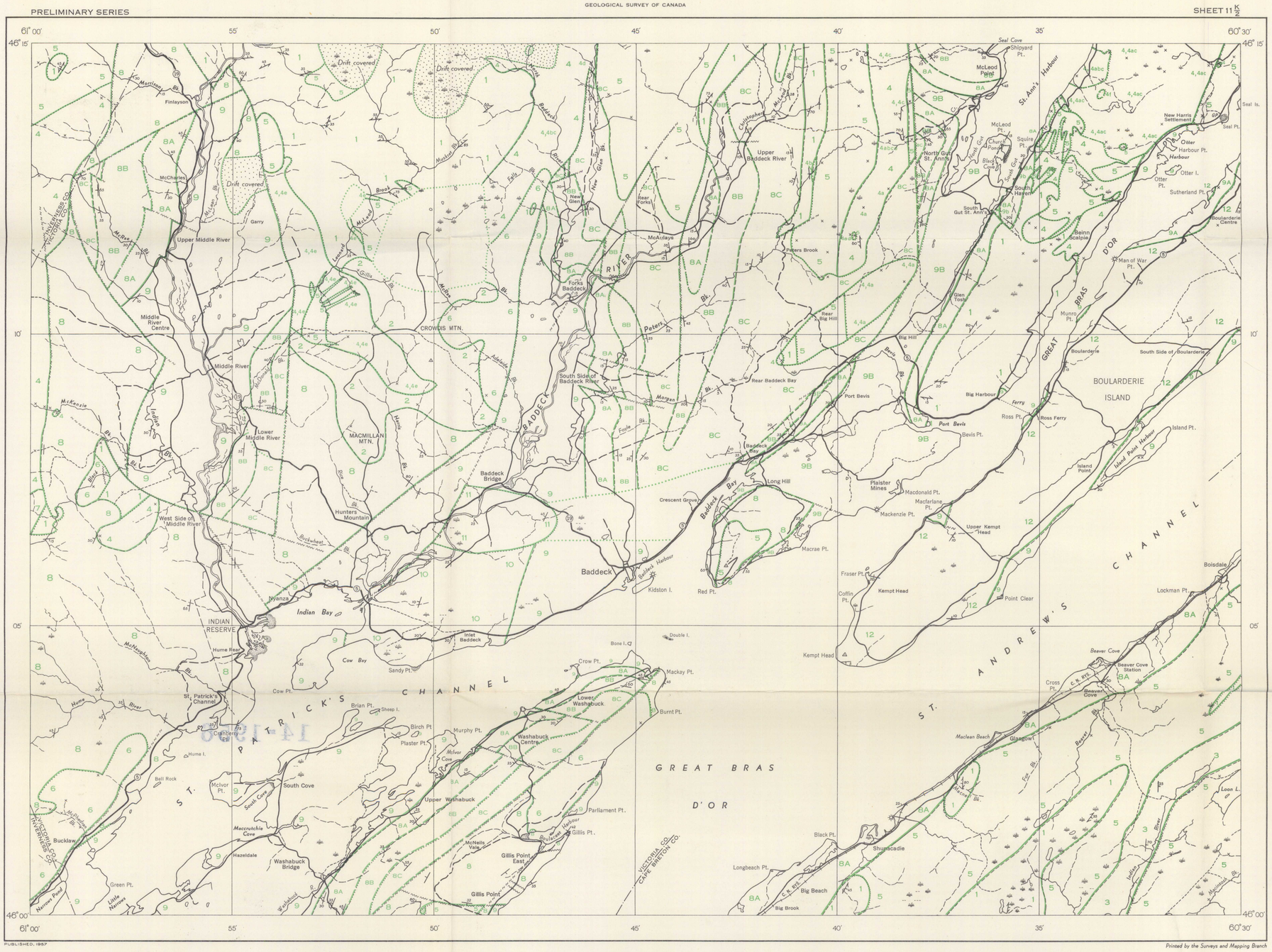
Rock outcrop ..... ×
Geological boundary (defined, approximate, assumed) .....
Bedding (inclined, vertical, overturned, dip unknown) .....
Schistosity, gneissosity (inclined) .....
Fault (defined, approximate, assumed) .....

Geology by D. G. Kelley, 1952, 1953, and 1954

Approximate magnetic declination, 26° 06' West

Cartography by the Geological Cartography Unit, 1957

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



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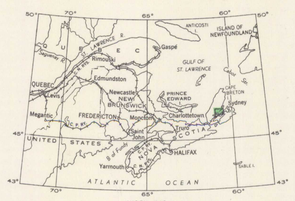

INDEX MAP

MAP 14-1956

BADDECK

VICTORIA, CAPE BRETON, AND INVERNESS COUNTIES

CAPE BRETON ISLAND

NOVA SCOTIA

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles

1 ½ 0 1 2 3

Main highway 8
Other roads .....
Trail .....
Lighthouse .....
Wharf .....
County boundary .....
Sand .....
Marsh .....
Stream (position approximate) .....
Horizontal control point .....

DESCRIPTIVE NOTES

The map-area is characterized by flat-topped highlands, commonly underlain by crystalline rocks, and intervening lowlands, underlain by intruded and downfaulted blocks of Carboniferous sedimentary rocks. The highland area, with a maximum elevation of 1250 feet, forms part of a tilted peneplain that slopes downward to the southeast.

The oldest rocks in the area (1), are correlated with those of the George River group[1] on the basis of lithological similarity, particularly the presence of crystalline limestone. Thin beds of crystalline limestone occur in the valley of Middle River and in the most northerly main branch of Christopher McLeod Brook. Banding and schistosity in the George River group are probably parallel to the bedding.

Metavolcanic and metasedimentary rocks (2) may be less metamorphosed equivalents of the George River group but are more probably younger than this group. The metavolcanic rocks consist of volcanic breccia and amygdaloidal lavas. Chlorite and sericite schists which are interstated with the volcanic rocks are so similar to those of the George River group, that part of the area shown as 1 may be 2.

Cambrian volcanic and sedimentary rocks (3) that outcrop in a small part of the southeast corner of the area have been described by Hutchinson.[2]

Igneous rocks (4, 5, 6), probably of Devonian age, range in composition from diorite to granite and are probably differentiates of the same magma. The contacts within the igneous rocks are gradational to sharp. Late phase granite and syenite dykes cut the dioritic types. A stock of gabbro on Kelly's Mountain is probably a more basic differentiate of the same magma.

Composite or injection gneiss was formed by lit-par-lit injection of red granite into older foliated rocks.

A group of volcanic and sedimentary rocks (7) that outcrop in the west central part of the map-area are tentatively mapped as Devonian. They are overlain by Lower Mississippian rocks whose conglomeratic members contain pebbles of granite and diorite (4, 5). The group is best exposed in the Lake Ainslie area.[3] The contact between the Devonian and the Mississippian is difficult to define because of the scarcity of outcrops and the similarity of the Devonian and Mississippian conglomerates.

The Horton group (8) of Lower Mississippian age unconformably overlies all older rocks, except near the western border of the map-area, where its contact with the Devonian (7) may be conformable. The Horton rocks contain few fossils. Where they are well exposed and their structure is relatively undisturbed, they have been divided into three lithological units.

The lowest Horton unit (8C) has two types of interlingering conglomerate. One type is red, calcareous, coarse, and poorly sorted with sandstone and siltstone interbeds and the other type is grey to red, noncalcareous, angular to subrounded, and tough and grades to arkose and greywacke. The latter type is common in the lower beds of the Horton group in the Lake Ainslie area[3] and the former is identical in lithology to the Grantmire conglomerate in southeastern Cape Breton.[1]

The middle Horton unit (8B), which consists mainly of grey siltstone, is used as a marker horizon. Where these grey beds are missing because of faulting, it is difficult to distinguish the lower beds of the Horton group from the upper beds. Farther west the upper beds are finer grained and are not as consistently red as in the Baddeck area.

The lithology of the uppermost unit of the Horton group (8A), in the vicinity of St. Ann's Harbour and on the Iona peninsula, is essentially that of the Grantmire conglomerate. In Peter's Brook area the uppermost unit consists of fine-grained, red siltstone, wedges of 'Grantmire type' conglomerate, and a few beds of intraformational conglomerate. With the exception of the area around Boisdale Hills, where the relationship is unknown, 'Grantmire type' conglomerate belongs to the Horton group because it is overlain by the basal, laminated, sandy limestone of the Lower Windsor.

Where complex faulting within the Horton group precluded lithological division within the time available, the group is mapped as Horton undivided (8). Most of the rocks so mapped belong to the lowest Horton unit. The shore section east of the granite knob at Red Point contains all three Horton units, but they are too thin to be shown as separate units on the map. A lepidodendroid stem, probably *Lepidodendropsis corrugata* (Dawson) which is indicative of the Horton group, was found at this locality. Fish scales, possibly of the Horton group, occur in grey beds along Harris Brook.

The Windsor group (9) overlies the Horton group with conformable to disconformable relationships, except on the east side of Kelly's Mountain, where Windsor gypsum rests on pre-Carboniferous rocks.

The basal limestone, of the Windsor group, is present only where the Windsor is deposited on the Horton group. Small lenses of conglomerate occur in the basal limestone above the wharf at South Haven. The succeeding beds of the Windsor group are maroon siltstones, gypsum, and grey, fossiliferous and unfossiliferous limestones. Fossiliferous Upper Windsor limestones are present in the valleys of Middle River and Baddeck River, but because of the scarcity of outcrops, the Upper and Lower Windsor are undivided at these localities. The Windsor strata, flanking the Boularderie Island syncline, are probably Upper Windsor. Fossils obtained from a dark grey limestone on Man of War Point are Upper Windsor (subzone E).

The relationship of the Canso group (10) to the surrounding strata is unknown. Its age is assured by the presence of *Anthracomya angulata* (Dawson) in grey siltstone members of the group.

The Morien group (12) of Pennsylvanian age unconformably overlies the Windsor group. It corresponds to the Pictou group and contains plentiful plant remains.

The rocks of the area have undergone three periods of deformation. The first resulted in complex folding and metamorphism of the oldest sedimentary and volcanic rocks (1, 2). A second deformation, during the Devonian, involved the Cambrian rocks (3) and was accompanied by widespread intrusion and most of the intrusive rocks of the area were probably emplaced during this period. Widespread folding of the Carboniferous rocks is the result of a third period of deformation.

The majority of the faults are probably high angle reverse and normal faults. A few of the north-trending faults are displaced by later west-trending faults.

Gypsum is present in Windsor strata throughout the area, but the thickest deposits are in the Lower Windsor beds between Little Narrows, where it is being quarried, and St. Ann's Harbour. Traces of chalcopyrite are present in a quartz vein on the bank of a small stream opposite Munro Point lighthouse.

[1]Weeks, L. J.: Southeast Cape Breton Island, Nova Scotia; Geol. Surv., Canada, Mem. 277, 1954.

[2]Hutchinson, R. D.: The Stratigraphy and Trilobite Faunas of the Cambrian Sedimentary Rocks of Cape Breton Island, Nova Scotia; Geol. Surv., Canada, Mem. 263, 1952.

[3]Norman, G. W. H.: Lake Ainslie Map-area, Nova Scotia; Geol. Surv., Canada, Mem. 177, 1935.

MAP 14-1956
BADDECK
NOVA SCOTIA
SHEET 11 K/2