GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 11 E/8

LEGEND

CENOZOIC

13 Sand and gravel

MESOZOIC

POST CARBONIFEROUS?

12 Dark green, fine- to medium-grained diabase and minor gabbro

PALAEOZOIC

LOWER CARBONIFEROUS
WINDSOR GROUP

11 Light grey and greyish red mudstone and siltstone, medium grey calcareous shale and argillaceous limestone, minor red conglomerate

HORTON GROUP (8–10)

10 Greyish red and greenish grey mudstone and siltstone. Greyish red pebble to boulder conglomerate (may be, in part, a facies of 9)

9 Medium to dark grey siltstone, shale, and fine-grained quartz wacke. Minor black carbonaceous shale

8 Light to medium grey, fine- to coarse-grained quartz arenite and quartz feldspar arenite, dark grey siltstone, and minor grit

DEVONIAN AND EARLIER (?)

7 7a, light grey biotite and muscovite granite, minor pink granite; 7b, pale red quartz feldspar granite; 7c, light grey hornblende granite

6 Pale red to light grey, fine- to medium-grained granodiorite

5 KNOYDART FORMATION: greyish red siltstone, fine-grained wacke and shale, greenish grey and greyish purple shale and argillite, minor calcareous mudstone

SILURIAN
ARISAIG GROUP

4 Light to medium grey and greenish grey shale, siltstone, and fine-grained wacke

ORDOVICIAN
BROWN'S MOUNTAIN GROUP (2-3)
JAMES RIVER FORMATION: interbedded dark green to purple andesite, tuff and agglomerate, greenish grey laminated argillite and minor greywacke

3

2 BAXTER'S BROOK FORMATION: interbedded light red rhyolite, greenish to reddish grey tuff and dark red agglomerate. Minor medium grey quartzite and quartz wacke, and dark green andesite

MEGUMA GROUP
GOLDENVILLE FORMATION: greenish grey to medium grey quartzite, quartz wacke, and phyllite, minor greywacke, and andalusite and staurolite schist

1

Rock outcrop
Geological boundary (defined, approximate, assumed)
Bedding, tops known (horizontal, inclined, overturned)
Bedding, tops unknown (inclined, vertical)
Schistosity or cleavage (inclined, vertical)
Drag-fold (arrow indicates plunge)
Fault (approximate, assumed)
Anticline (defined, arrow indicates direction of plunge)
Syncline (defined, arrow indicates direction of plunge)
Glacial striae (direction of ice-movement known, unknown)
Fossil locality
Mineral prospect, abandoned (copper-Cu, gold-Au, lead-Pb) Cu Au
Diamond drill-hole DDH

Geology by D. G. Benson, 1963

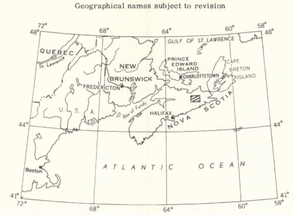
Geological cartography by the Geological Survey of Canada, 1964

Roads, all weather
Other roads
Cart track
Trail
Railway
County boundary
Telephone line
Post office
Intermittent stream
Marsh
Contours (interval 50 feet)

Base-map compiled and drawn by the Surveys and Mapping Branch, 1954, with revision by the Geological Survey of Canada, 1964

Approximate magnetic declination, 23° 42' West, decreasing 2.4' annually

Geographical names subject to revision



INDEX MAP

PUBLISHED, 1964
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PRINTED BY THE SURVEYS AND MAPPING BRANCH

MAP 58-1963
GEOLOGY
LOCHABER
NOVA SCOTIA

Scale: One Inch to One Mile = 1/63,360
Miles
1 ½ 0 1 2 3

DESCRIPTIVE NOTES

Glacial striae and erratics suggest a southward movement of ice that left glacial drift over most of the map-area. Sand and gravel deposits up to 100 feet thick are found in the larger valleys.

Aeromagnetic maps[1] were useful in determining the extent of some rock types, notably the granodiorite and diabase.

The Goldenville Formation (1) is well exposed in most of the streams that flow northward into West River St. Mary's. It is tightly folded, though few folds can be traced from one stream section to the next. Poorly developed andalusite schist is found on Chisholm and McQuarrie Brooks. On St. Mary's River, mica schist with a few small staurolite crystals grades into well-developed staurolite schist just south of the map-area.

The two divisions (2, 3) of the highly folded Brown's Mountain Group are tentatively assigned to the Baxter's Brook and James River Formations[2]. The suggested age relationship between these two formations is questionable owing to scarcity of outcrop. The contact between them is placed above the uppermost rhyolitic bed.

There are insufficient good outcrop sections to permit subdivisions of the highly folded Arisaig Group (4). East of Black Brook, the rock types are similar to those of the upper part of the Arisaig Group. On the west side of Lochaber Lake there are fossils similar to those present in the Stonehouse and McAdam Formations elsewhere. In the west half of the map-area, the rock types are mainly those typical of the lower part of the Arisaig Group. The contact with the underlying Brown's Mountain Group was not observed.

Strata assigned to the Knoydart Formation (5) have the same lithology and a conformable contact with the underlying Arisaig Group as the type Knoydart. No fossils were found in the map-area. A diamond-drill hole, about a mile east of College Grant, yielded 437 feet of drill core of grey limestone[3]. No thick limestone beds outcrop in this part of the map-area, though thin calcareous mudstones occur nearby.

The granodioritic rocks (6) are unaltered and have not been seen in contact with the surrounding rocks. Their outcrop pattern suggests that they were emplaced after the deposition of the Silurian rocks, but they may be in fact related to the Ordovician volcanic rocks. Parts of the pluton near Smith Lake range in composition from granodiorite to monzonite and syenite porphyry. Near Bros Lake the outcrops are diorite and granite.

The granite (7a) at Chisholm Lake is continuous with granite regarded as Devonian[4] to the west. All granites south of St. Mary's River intrude Goldenville rocks and have the same lithology. The development of the andalusite and staurolite schists is related to the intrusion of these bodies. The granite (7b) in the Pictou-Antigonish Highland is generally composed entirely of quartz and feldspar. Little metamorphism of the older rocks is evident. It may be genetically related to the granodioritic rocks (6).

The relative ages of the lithological subdivisions of the Horton Group (8, 9, 10) are supported by evidence from the spores they contain. Conglomerate of unit 10 is found only adjacent to the south contact with unit 1, and contains boulders of granite and quartzite. The Goldenville-Horton contact east of McDonald Mill Brook coincides with a pre-existing fault that may extend farther west than the present escarpment. There is no evidence of movement along this fault after deposition of the conglomerate.

Rocks on the East River of Pictou are contiguous with fossiliferous Windsor Group rocks in Hopewell map-area[5]. The red conglomerate northeast of Eden Lake contains recognizable Brown's Mountain Group rocks and granite fragments, and is similar to Windsor conglomerate in Hopewell map-area[5]. The Windsor calcareous shale and limestone north of Lochaber Lake are in conformable contact with probable Horton red shale.

Narrow diabase dykes and related dioritic to diabasic plutons cut most of the rocks found in the Pictou-Antigonish Highland and therefore are probably post-Devonian. Similar intrusive rocks in Hopewell map-area intrude Canso Group (lower part of the Upper Carboniferous) rocks[5]. Minor alteration of the intruded rocks was noted at most locations. Where measured, these dykes strike eastward and dip from 45° to vertical.

The existence of most faults is indicated by considerable shearing in adjacent outcrops. Movement of 2 or 3 feet can be measured in many small faults near the major fault zones.

The Goldenville Formation is the most intensely folded rock unit of the map-area. Ordovician, Silurian, and Devonian rocks of the Pictou-Antigonish Highlands are slightly less deformed than the Goldenville rocks and the Horton Group has been deformed into open folds, which display a few drag-folds. The Windsor rocks are only slightly deformed.

The earliest recognizable deformation in the map-area probably occurred during the late Devonian (Acadian) orogeny, and was accompanied by intrusion of the granitic plutons. The Horton and Windsor rocks were deformed later in the Palaeozoic Era.

There are numerous small gravel deposits in the map-area. Galena was seen in fractured Goldenville quartzite west of Glenelg. Between 1873 (when it was found) and 1930, two adits were driven to examine this deposit. Near College Grant, chalcopyrite associated with siderite, hematite, and calcite occurs in a diorite plug that intrudes red and black shale. In 1876 a 71-foot shaft was dug on this property, and between then and 1954 another shaft was dug and some diamond-drilling was done. Disseminated pyrite was noted in a calcareous rock on Boggs Brook east of the old workings. Several trenches and at least one shaft was dug prior to 1900 in the search for gold near Little Lizzomb Lake. The Cochrane Hill gold district, east of St. Mary's River, ½ mile south of the map-area, produced about 1,000 ounces of gold.

[1] Nova Scotia Department of Mines, Aeromagnetic Maps 11-E-8-A,B,C,D.
[2] Fletcher, Hugh: Report on geological surveys and explorations in the counties of Guysborough, Antigonish and Pictou, Nova Scotia; Geol. Surv. Can., Ann. Rept. 1886, vol. II, pt. P (1887).
[3] Nova Scotia Department of Mines, Ann. Rept. 1952, p. 54 (1953).
[4] Fairbairn, H. W., Hurley, P. M., Pinson, W. H., and Cormier, R. F.: Age of the granitic rocks of Nova Scotia; Bull. Geol. Soc. Amer., vol. 71, pp. 399–414 (1960).
[5] Benson, D. G.: Hopewell map-area, Nova Scotia; Geol. Surv. Can., Map 3-1962 (1962).

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NOVA SCOTIA
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