GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 20 O,P

LEGEND

POST DEVONIAN
- 8 Gabbro

DEVONIAN
- 7 Biotite granite, muscovite-biotite granite, minor pegmatite; 7a, inclusions of 1 common

ORDOVICIAN OR SILURIAN
- 6 Andesite, tuff, flow breccia, hornblende-plagioclase gneiss; 6a, slate, minor quartzite, may include some 5
- 5 WHITE ROCK FORMATION: quartzite, minor slate

ORDOVICIAN
LOWER ORDOVICIAN
MEGUMA GROUP
- 3 HALIFAX FORMATION: slate, minor argillite, includes minor amounts of 1
- 4 Biotite-quartz-feldspar paragneiss, migmatite; derived mostly from 1, but partly also from 2 and 3
- 2 Staurolite-andalusite schist, cordierite schist, minor garnet-mica schist and biotite quartzite
- 1 GOLDENVILLE FORMATION: biotite quartzite, minor quartzite, conglomerate, subgreywacke, mica schist, argillite; includes some 2

PALAEOZOIC

Geological boundary (defined, approximate)
Bedding, tops known (inclined, vertical, overturned)
Bedding, dip known, tops unknown (inclined, vertical)
Schistosity, gneissosity (inclined, vertical)
Anticline (approximate trace of axial surface)
Syncline (approximate trace of axial surface)
Glacial striae (direction of ice-movement known, unknown)
Quarry
Mineral occurrence — mo

MINERAL SYMBOLS

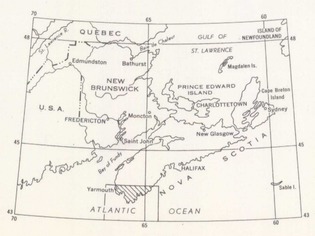
Beryl	- by	Spodumene	- spd.
Molybdenite	- mo	Stone (building)	- B. st.
Silica	- sc		

Geology by F.C. Taylor, 1959-1960

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

PUBLISHED, 1961



INDEX MAP

MAP 44-1960
GEOLOGY
SHELBURNE
NOVA SCOTIA

Scale: One Inch to Four Miles = 1/253,440
Miles
4 2 0 4 8 12

COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA, OTTAWA

LEGEND

- Main highway
- Other roads
- Cart track
- Trail
- Railway
- County boundary
- Lighthouse
- Marsh
- Sand

Cartography by the Geological Survey of Canada, 1961

Approximate magnetic declination, 20° 40' West

PRINTED BY THE SURVEYS AND MAPPING BRANCH

DESCRIPTIVE NOTES

The map-area comprises part of the Atlantic Uplands and was covered by a south-moving ice-sheet in Pleistocene time. This ice-sheet left an extensive cover of glacial debris so that outcrop is limited chiefly to the coast and stream valleys where post-glacial erosion has been effective. Most of the glacial debris is till, but locally eskers, drumlins, and glacio-fluvial deposits are common.

The Meguma group of Lower Ordovician age is divided lithologically into three units. The oldest, the Goldenville formation (1), consists chiefly of fine- to medium-grained, medium to light grey (in part green in the extreme western part of the area), massive to well-bedded biotite quartzite. Small amounts of quartzite, pebble-conglomerate and argillite occur throughout the formation, and locally the feldspar content is sufficient to classify the rock as sub-greywacke. Mica schists form the tops of beds in many places. Pyrite cubes, up to 2 inches, occur sporadically throughout many of the massive biotite quartzite beds. Bedding is well defined and individual beds range from a fraction of an inch to 10 feet thick with most about 1 foot thick. Other primary structures such as grain gradation, crossbedding, and ripple-marks are rare. Inland where exposures are poor, secondary schistosity is commonly the only visible structure.

In many places staurolite-andalusite schists (2) conformably overlie and are interbedded with the Goldenville formation (1). These schists are fine to coarse grained, medium to light grey, and although schistose, they commonly display relict bedding planes and, rarely, crossbedding. Beds range from an inch to several feet thick. Staurolite crystals, up to 3/4 inch long, are relatively free of inclusions. Pale pink weathering andalusite crystals, from 1 inch to 6 inches long, contain abundant inclusions of quartz and biotite. In places andalusite crystals terminate against relict bedding planes and in a few localities tops of beds can be determined because of the location of the largest porphyroblasts at the top of the beds. A few crystals of grey cordierite, up to 1 inch long, occur in the Jordan River valley, and they too contain abundant inclusions of quartz and mica. Garnet, biotite, muscovite, and quartz form the matrix of these schists. Thin biotite quartzite interbeds are common in unit 2.

Slates and small amounts of argillite that lie stratigraphically above the Goldenville formation (1) and/or the staurolite-andalusite schists (2) are assigned to the Halifax formation (3). These rocks are well and thinly bedded, weakly to strongly cleaved, and chiefly light to dark grey, with white and black interbeds. At Chebogue Point green slates overlie grey slates, but in many places only grey slate is present and it lies directly on biotite quartzite (1) or staurolite-andalusite schists (2). Characteristically the contact between the quartzite (1) and slate (3) is gradational, with an increase in the number and thickness of slate beds in the quartzite stratigraphically upwards until slate is predominant. Near Pubnico the quartzite (1) is separated from grey slate (3) by staurolite-andalusite schists (2) and each of these units is conformable, with the contacts gradational over short distances.

In the Yarmouth area the Meguma group is overlain conformably by quartzite, slate, and volcanic rocks. The quartzite (5) is a distinctive unfossiliferous unit, consisting almost entirely of quartz of various colours—chiefly white, light grown, and pale yellow. A few bedding planes are present in this otherwise massive quartzite. This unit is best exposed along the coast at Chegoggin Point where the quartzite is interbedded with some grey slate and amphibolite in a broken section 210 feet thick. This quartzite unit is correlated with the White Rock formation[1] on the basis of lithologic similarity and stratigraphic position.

The youngest layered rocks are volcanic rocks (6) and minor slate and quartzite (6a) within a major syncline that extends from Yarmouth Sound north to Lake George and beyond. Well-bedded basic tuffs, amygdaloidal andesite, and flow breccias (6) that are commonly metamorphosed to medium-grained hornblende-plagioclase gneiss, are all shades of green ranging from pale green tuffs to dark green andesite. In a few places bombs and graded bedding are recognizable in the tuffs, and flow tops are distinguishable in the lavas.

A band of grey slate (6a) north of Yarmouth, and another west of Overton that contains a white quartzite bed, are interbedded with the volcanic rocks. The quartzite is lithologically identical with the White Rock formation quartzite (5) and may be infolded.

Narrow, commonly lens-shaped sills of diorite, present in much of the slate (3) north of Yarmouth and along Chebogue Point, are probably genetically related to the volcanic rocks (6).

Devonian-aged[2] intrusive, grey biotite granites (7) cut all the bedded rocks in the map-area, but are principally exposed in areas underlain by Meguma group rocks. The granite is chiefly massive, but is locally gneissic and ranges from fine to medium grained, and equigranular to porphyritic. Biotite is generally the only mica but some muscovite is present locally. A few narrow, short, muscovite granite dykes and muscovite pegmatites intrude the biotite granite. Inclusions of biotite quartzite (1) are common in places (7a). Near Yarmouth the granite occurs primarily as sills in the volcanic rocks, and contains well-formed potash-feldspar grains up to 1/2 inch long in a white-weathering aphanitic matrix. Contacts are gradational and feldspathization was extensive. The contact between the granite (7) and the Meguma group is of two types. In many places it is abrupt and shows negligible metamorphic effects, but elsewhere, particularly near Quinan and Great Pubnico Lakes, the granite and sedimentary rocks are separated by a zone of paragneiss and migmatite (4). The paragneiss is coarse grained, dark to light grey, well foliated, commonly contorted, and contains lenses, patches, and dykes of granite that compose up to 70 per cent of the rock. Mineralogically it consists of variable amounts of quartz, biotite and feldspar with some garnet and rare sillimanite. Although most of the paragneiss is derived from the Goldenville formation (1), some of the more aluminous facies may be derived from units 2 and 3.

The youngest rock is a 250-foot-thick gabbro dyke (8) that extends from near Great Pubnico Lake east-northeast to the northeast corner of the map-area. Although it outcrops in only a few places, boulders of this rock are present persistently along the strike. This medium- to coarse-grained, massive, dark green gabbro cuts granite (7) north of Shelburne and is presumably post-Devonian.

The map-area was intricately folded during the Acadian orogeny. Only a few of the major folds are known, but numerous small local folds on the limbs of these major flexures have been recognized. Most folds plunge north or south at less than 10 degrees and many are horizontal. Cleavage-bedding relationships show most folds to be upright, but in some places inclined isoclinal folds are probable. Only a few faults of small apparent displacement are known.

Quarrying of stone and silica is the only mineral production in the area. Grey biotite granite (7) is quarried at Hart Point and at Shelburne Harbour, and a hornblende diorite that is marketed as black granite is quarried near Birchtown. Both rocks are processed at a plant in Shelburne. Silica is quarried intermittently at Chegoggin Point from a thick bed of the White Rock formation quartzite (5) and shipped to Sydney for refractory purposes. Muscovite pegmatite dykes in the biotite granite (7) in the Port Mouton area and north of Shelburne along the Roseway River, contain rare grains of beryl, but none of the dykes are continuous or wide[3].

A 4-foot quartz vein in biotite quartzite (1), 3.3 miles north of Jordan Falls, contains a few clots of molybdenite up to 1 inch in diameter. This vein strikes N55°E. At its northeast end it contains beryl crystals up to 2 inches in diameter; most of these are within 3 inches of the wall.

Only two pegmatite dykes are known to be associated with the granite northeast of Yarmouth. One—in granite 2.7 miles northeast of Brooklyn—is 7 feet wide, but contains only muscovite in addition to quartz and feldspar. The other—in meta-volcanic rocks 2,500 feet southeast of Brazil Lake cross-roads—is at least 16 feet wide, and contains spodumene, beryl, and muscovite in addition to quartz and feldspar. A Rosiwal analysis of the outcrop at 1-foot intervals shows 10.7% spodumene and less than 0.5% beryl. The dyke is exposed for only 70 feet but may extend at least 1,000 feet northward. Although gold-quartz veins are present in the Meguma group rocks north of the area, no significant amount of gold has been found in the Shelburne map-area.

[1] Smitheringale, W.G.: Geology of Nictaux-Torbrook Map-area; Geol. Surv., Canada, Paper 60-13 (1960).
[2] Fairbairn, H.W., et al.: Age of The Granitic Rocks of Nova Scotia; Bull. Geol. Soc. Amer., vol.71, pp.399-414 (1960).
[3] Mulligan, Robert: Beryllium Occurrences in Canada (Preliminary Account); Geol. Surv., Canada, Paper 60-21, pp.37-38 (1960).