



LEGEND

- MESOZOIC**
- 14 Basalt
 - 13 ANNAPOLIS FORMATION: red sandstone, conglomerate
- CARBONIFEROUS**
- PENNSYLVANIAN
- 11 CUMBERLAND AND/OR PICTOU GROUP
Mainly red sandstone; conglomerate
 - 10 Mainly grey sandstone; shale
 - 12a, 2b, 2c PENNSYLVANIAN (Undivided)
Conglomerate, sandstone
- MISSISSIPPIAN
- 9 WINDSOR GROUP (Upper part)
Massive and shaly grey limestone
 - 8 WINDSOR GROUP (Lower part)
TENNYCAPE FORMATION: red shale, sandy shale
- PALEOZOIC**
- 7 Anhydrite, gypsum
 - 6 PEMBROKE FORMATION: massive red limestone, limestone conglomerate
 - 5 MACUMBER FORMATION: red to grey shaly limestone
 - 4 HORTON GROUP
Grey and red shales, sandstone, arkose
- PRE-CARBONIFEROUS (?)
- 3 Granitic rocks
- 2a, 2b, 2c
2a, sedimentary and volcanic rocks cut by numerous small bodies of granite;
2b, recrystallized sedimentary and volcanic rocks, with some granitic injections;
2c, granitic rocks altered by assimilation of volcanic material to composition of a diorite
- 1 Tuff, breccia; acid and basic flows; grey shale and sandstone;
1a, grey shale

- Outcrop or outcrop area
- Bedding (horizontal, inclined, vertical)
- Fault (defined, approximate, assumed)
- Syncline
- Areas underlain by extensive mine workings
- Observed Karst topography (used to delimit areas underlain by gypsum where outcrops are lacking)
- Gypsum quarry
- Mineral prospect or abandoned mine

MINERAL PROSPECTS OR ABANDONED MINES

- IRON
- West mines
- Old Mountain mines
- East mines
- Derry prospect
- Sky prospect
- Coolan prospect
- Selma prospect
- MANGANESE
- Densmore Mills
- COPPER
- Portapique River
- LEAD
- Portapique River
- COAL
- Cook Brook
- Selma Brook

Geology by L. J. Weeks, 1940-1943.

DESCRIPTIVE NOTES

The oldest formations in the area, an assemblage of volcanic and sedimentary rocks (1), are divided into two groups whose age, and whose relationships to each other have not been established. These rocks occur only within Cobequid Mountains in this map-area. The south side of the mountains is underlain by a group of mixed volcanic and sedimentary rocks (1) that lacks lithological uniformity for any considerable distance across its strike. Farther north in the mountains, and exposed on Portapique River and Matheson Brook, is a group of grey shales (1a) showing remarkable uniformity throughout. The shales dip at rather low angles toward the mixed rocks and are believed to be separated from them by a fault. The shales appear, in general, to be less deformed than the mixed rocks, and are probably younger. Both groups are earlier than Upper Windsor, and are also older than the granitic intrusive rocks. They are probably pre-Mississippian, and either of Silurian or Devonian age.

Rocks of the earlier groups (1) are intruded by coarse granite (3). North of East Mines it contains abundant accessory biotite; the small body on Portapique River contains both hornblende and a little biotite; and the other exposures carry hornblende only. The age of the granite has not been established.

Bordering the bodies of granite are zones of contact rocks (2) in which three types are indicated. The most common type (2a) is marked by numerous small bodies of granite that cut the older rocks and become more numerous toward the main body. The second type (2b) is that in which the earlier rocks were recrystallized without loss of original structures, and granitic material injected into them. The third type (2c) has resulted from the assimilation of nearby more basic rocks, and has taken on the composition of rocks varying from diorite to gabbro, and even amphibolite.

All the pre-Carboniferous rocks (1, 2, 3) are in places cut by small dykes and bodies of diabase (7) consisting of buff-colored, shaly limestone, and in this map-area believed to exceed 20 to 35 feet in thickness. The formation is unfossiliferous, and is included tentatively in the Horton because of its lime content, no limestones being known in the Horton.

Rocks of the Horton group (4) are fossiliferous, and their age is early Mississippian. Structurally they form part of the so-called Walton anticline, which is bounded on the south by a syncline in Windsor and Pennsylvanian rocks occupying the valleys of Kennetcook and Fivemile Rivers. Locally the Horton beds are compressed into a series of minor folds.

Overlying the Horton rocks with apparent conformity is the Macumber formation (5), consisting of buff-colored, shaly limestone, and in this map-area believed to exceed 20 to 35 feet in thickness. The formation is unfossiliferous, and is included tentatively in the Horton because of its lime content, no limestones being known in the Horton.

The Pembroke formation (6) overlies the Macumber, and consists of red to red-brown, massive limestone and limestone conglomerate, as well as rounded pebbles of pre-Mississippian rocks. The Macumber fragments suggest an interval of erosion, and the possibility that the Macumber formation may represent the top of the Horton.

A bed of anhydrite, locally altered to gypsum, overlies the Pembroke, apparently conformably. This bed (7) has a thickness of about 100 feet. Although exposures are few, the extent of the bed has been mapped with considerable accuracy by noting the pitted, Karst topography resulting from solution of the sulphate deposit. No exposures of gypsum nor any sign of Karst topography could be observed between the Pembroke and Tennycape formations on the north side of Cobequid Bay.

Overlying the anhydrite bed is the Tennycape formation (8) consisting of well-bedded, extremely uniform, bright red, sandy shale. The rock is quite soft while wet, but dries to a hard, porous mass.

Just south of the map-area, on the farm of Albro Millar of Hennigar, is a limestone quarry yielding abundant fossils of early Upper Windsor age. Some unfossiliferous limestone near the Hennigar church is included tentatively with this group (9). As the Hennigar section exposes no recognizable Lower Windsor rocks, it is assumed that the contact there with the Tennycape formation is along a fault.

Paralleling the south face of Cobequid Mountains is a belt of Pennsylvanian sediments whose group designation is somewhat in doubt. The lower, and southern part of the belt (10) consists of grey beds varying from fine shales to sandstones, the latter being thinly bedded. Fossils from these beds are of either Cumberland or Pictou age. The upper, and northern part of the belt (11) is unfossiliferous, and consists of brownish red, coarse conglomerate, and coarse and fine sandstone. As the Pictou group is known elsewhere to contain members similar to these (11), and as their occurrence overlying the finer shales and sandstones (10) suggests a break in sedimentation, it is possible that the lower members are of Cumberland age, and the upper members of Pictou age.

Across most of the map-area, rocks of supposedly Pictou age (11) are down-faulted against the rocks of Cobequid Mountains. Near the east side of the map-area, however, Pennsylvanian rocks rest unconformably on the older rocks of the mountains, and the unconformity is visible along Folly River. These Pennsylvanian rocks (12) are quite similar lithologically to the supposedly Pictou rocks south of ever, that the Cobequid fault here may have left a remnant of the basal Pennsylvanian series on the south side of the mountains. Small outliers of similar strata are found resting on the older Cobequid rocks a short distance west of Folly River, and on Portapique River. They may form any part of the Pennsylvanian series, but are most probably of Riversdale age.

Unconformably overlying the Pennsylvanian series are rocks of Triassic age, referred to the Annapolis formation (13). They comprise bright red, coarse to fine conglomerate and sandstone, and except near faults dip at low angles. A series of basalt flows of considerable thickness (14) overlies those parts of the Annapolis formation exposed in the area, and may actually be interbedded with it. The rock has everywhere the composition of a basalt, but its texture and appearance vary in different parts of an individual flow.

The rocks of the map-area have all undergone considerable faulting, but, with few exceptions, only those faults of post-Triassic age can be recognized and mapped.

The Londonderry Iron District, extending in Cobequid Mountains from Matheson Brook to beyond the eastern limits of the map-area, has produced over 2,000,000 tons of iron ore. The ore was mostly the result of enrichment by surface waters of large bodies of calcium-magnesium-iron carbonates. In a very few localities the iron tenor of the carbonates was high enough to constitute a low-grade ore, and in places primary specularite was present in sufficient amounts to encourage mining. The largest operations were at West Mines, Old Mountain, and East Mines, most of the mining at East Mines having been conducted just to the east of the map-area. A small body of primary hematite, the Derry body, about one half mile north of Old Mountain, was prospected, but no ore was mined. In 1942 two attempts were made to pick up the continuation of the Londonderry orebodies in the vicinity of Matheson Brook. Some prospecting was done for iron in ferruginous shales near the top of the Horton group, at Selmah.

Manganese occurs as stringers in Horton shales at Densmore's Mills. It is also possible that replacement deposits occur in the Pembroke formation, although none has been reported from this area. Copper has been prospected for at two adjacent localities on Portapique River. On a northeast branch of Portapique River galena occurs as minute crystals in tuff exposed in a small stream valley just below the horizontal contact with overlying Pennsylvanian rocks.

A bed of highly carbonaceous shale about 5 feet thick was prospected on Cook Brook some years ago. It has no value as coal. Similar material, but of lower grade, was reported from Selma Brook.

Gypsum was quarried in the last century on the east side of Noel Lake.



MAP 874A
LONDONDERRY
COLCHESTER AND HANTS COUNTIES
NOVA SCOTIA

Scale, 1/31680 or 1 inch to 1 Mile
Approximate magnetic declination, 23°30' West.

- LEGEND
- Provincial highway
 - Road and buildings
 - Road not well travelled
 - Bush road or trail
 - Church
 - School
 - Post Office
 - Cemetery
 - Lighthouse
 - Wharf
 - Triangulation station
 - County boundary
 - Intermittent stream
 - River
 - Salt marsh
 - Reef or small island
 - Contours (interval 50 feet)
 - Depression contour
 - Height in feet above Mean sea-level

Base map compiled by the Topographical Survey, 1941, from aerial photographs taken by the Royal Canadian Air Force in August, 1933, and May, 1938. Cartography by the Drafting and Reproducing Division, 1946.

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