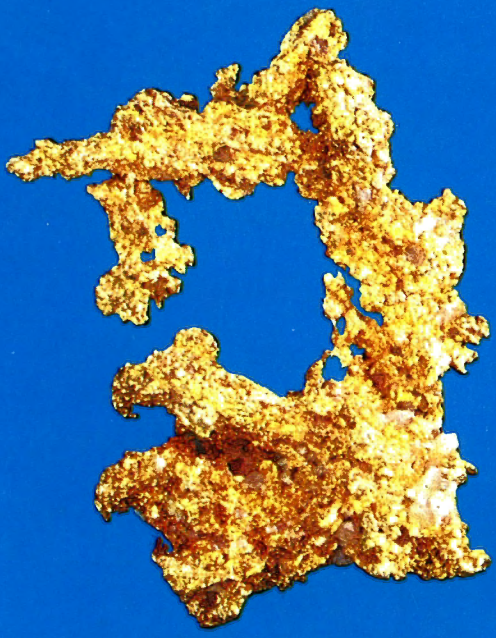
ROCKS AND MINERALS
FOR THE COLLECTOR

Northeastern Nova Scotia, Cape Breton Island, and Prince Edward Island



Ann P. Sabina

1994

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COVER

Left: *Native gold, Goldenville Mine, Sherbrooke, Nova Scotia. Specimen measures 18 mm from top to bottom. National Mineral Collection specimen No. 061958. Photo by H. Gary Ansell.*

Right: *Arsenopyrite crystal, Goldenville Mine, Sherbrooke, Nova Scotia. Crystal measures 16 mm from top to bottom. National Mineral Collection specimen No. 014866. Photo by H. Gary Ansell.*

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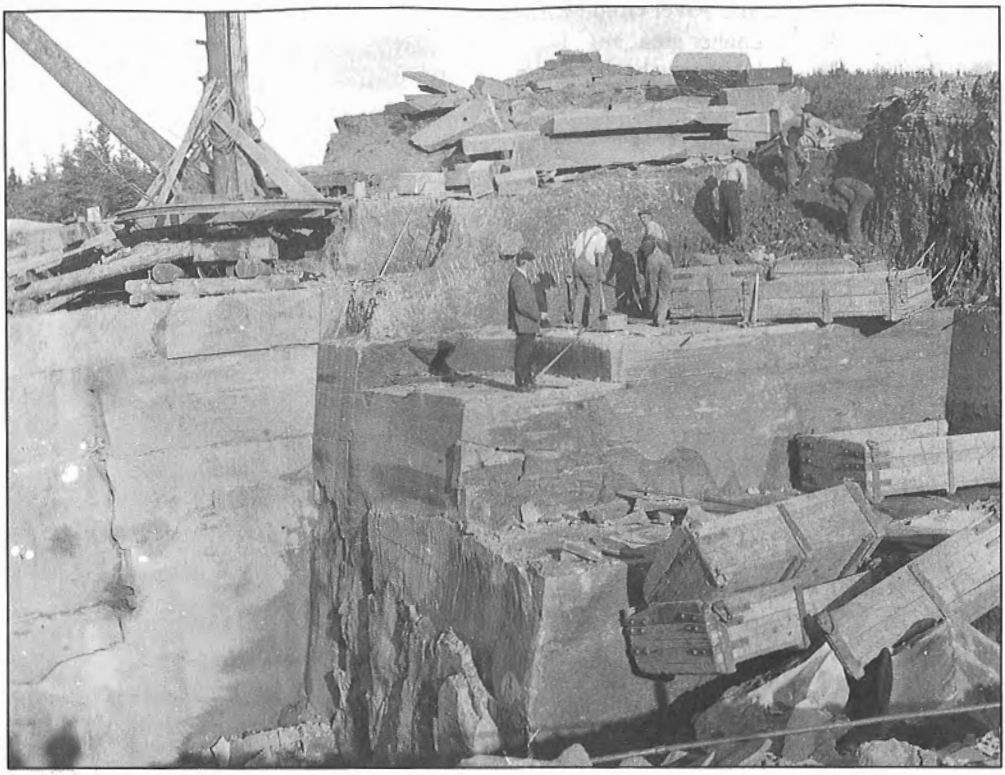


Frontispiece. Operations at sandstone quarry, Wallace, Nova Scotia, 1909. (National Archives of Canada, PA 45265)

Abstract

Occurrences of minerals, rocks, and fossils are described from seventy-five easily accessible localities in northeastern Nova Scotia and Prince Edward Island. A few rocks and minerals are suitable for ornamental purposes, but the majority of the deposits furnish specimen material only.

In the area between Dartmouth and the Strait of Canso, there are numerous old gold mines and a few copper, lead, tungsten, and iron mines. Good specimens of specularite, siderite, arsenopyrite, and andalusite can be collected. In the Antigonish-Amherst region, attractive specimens of copper-bearing plant fossils are found in old copper mines. Other deposits include hematite, barite, celestine, agalmatolite, diatomite, and limestone.

In Cape Breton, there are numerous deposits of gypsum and limestone, including crystalline and shell limestones. Metallic-mineral specimens can be obtained from old lead, zinc, copper, and bismuth mines. Attractive barite-fluorite specimens are found in old mines near Lake Ainslie. Two ornamental-type rocks suitable for the lapidary are described: Mainadieu felsite breccia and Scotch Lake serpentine-bearing crystalline limestone.

Shoreline exposures of sedimentary rocks in Prince Edward Island provide specimens of mineralized fossil plant remains. Good specimens of barite, crystalline quartz, and hematite are found at a locality near Charlottetown, and an uncommon copper mineral – paratacamite – occurs near Summerside.

Résumé

Des gisements de minéraux, de roches et de fossiles sont décrits pour soixante-quinze emplacements faciles d'accès dans le nord-est de la Nouvelle-Écosse et en Île-du-Prince-Édouard. Quelques roches et minéraux se prêtent à des fins ornementales, mais la plupart des gisements ne fournissent que des spécimens.

Dans la région entre Dartmouth et le détroit de Canso, on trouve de nombreuses vieilles mines d'or et quelques mines de cuivre, de plomb, de tungstène et de fer. De beaux spécimens de spécularite, de sidérite, d'arsénopyrite et d'andalousite peuvent être recueillis. Dans la région d'Antigonish-Amherst, on peut trouver, dans de vieilles mines de cuivre, des spécimens attrayants de fossiles végétaux renfermant du cuivre. D'autres gisements englobent l'hématite, la barytine, la célestine, l'agalmatolite, la diatomite et le calcaire.

Au Cap-Breton, il existe de nombreux gisements de gypse et de calcaire, y compris les calcaires cristallins et coquilliers. On trouve des spécimens de minéral métallique dans de vieilles mines de plomb, de zinc, de cuivre et de bismuth. Il existe des spécimens attrayants de barytine-fluorine dans de vieilles mines près du lac Ainslie. Deux roches de type ornemental pouvant intéresser les lapidaires sont décrits : la brèche de felsite de Mainadieu et le calcaire cristallin renfermant de la serpentine du lac Scotch.

Des affleurements littoraux de roches sédimentaires en Île-du-Prince-Édouard fournissent des spécimens de restes fossiles de végétaux minéralisés. Il existe de beaux spécimens de barytine, de quartz cristallin et d'hématite dans un emplacement près de Charlottetown, et on trouve un minerai de cuivre peu commun, la paratacamite, près de Summerside.

ROCKS AND MINERALS FOR THE COLLECTOR: NORTHEASTERN NOVA SCOTIA, CAPE BRETON ISLAND, AND PRINCE EDWARD ISLAND

INTRODUCTION

The Islands of Cape Breton and Prince Edward, well-known to the tourist for their scenic beauty, are known to a lesser degree for the variety of minerals and rocks that they contain. This booklet describes deposits in these areas as well as others found on the mainland of northeastern Nova Scotia.

The localities are easily accessible from the main highways and side roads, and in places may require a hike of about 2 km. There are several shoreline deposits that should be visited at low tide; copies of tide tables can be obtained by writing to the address given on page 70. Directions to reach each of the occurrences are given in the text and can be used with standard road maps. Locality maps are included where deposits may be difficult to find. Additional detailed information can be obtained from the appropriate topographic and geological maps available from the agencies listed on page 69.

Most of the old mines have not been worked for many years so that entering shafts, tunnels, and other workings is dangerous. Many of the localities are on private property and the fact that they are listed in this booklet does not imply permission to visit them. Please respect the rights of property owners at all times. The removal of mineral or rock specimens from National Park areas is contrary to regulations set by the National Parks Branch.

During the summer of 1964 the localities were visited by the author ably assisted by Sandra M. Scholfield. The field investigation was facilitated by information received from F.S. Shea and J. Bingley of the Nova Scotia Department of Mines. The laboratory identification of minerals by X-ray diffraction was performed R.N. Delabio, Geological Survey of Canada. Their assistance is gratefully acknowledged.

A brief geological history

The mineral collecting area described in this booklet is part of a large geological region – the Appalachian Mountain system – extending northeastward from Alabama to Newfoundland. The earliest recorded geologic activity was the accumulation of sedimentary and volcanic rocks in Precambrian times.

Most of the rocks found today, however, were formed during the Palaeozoic Era. Periods of sedimentation were interrupted by mountain building in Ordovician and Devonian times producing intensely folded and faulted rocks. The Acadian (Devonian) orogeny culminated with the emplacement of granite and diorite, producing metallic mineralization in the country rocks. Extensive deposits of gypsum, anhydrite, and salt were formed during Mississippian time. Coalfields originated from the accumulation of plants and plant debris derived from the prolific forest characteristic of Pennsylvanian time.

During the Pleistocene Epoch glaciers covered the area. With their retreat the topography was altered and deposits of gravel, till, and clay were left. Recent geologic processes have produced deposits of diatomite, beach sands, stream detritus, and peat bogs.

The geological history with examples of the rocks formed is summarized in Table 1.

Table 1. Geological history

EON	AGE (millions of years)	ERA	PERIOD	ROCKS FORMED	WHERE TO SEE THEM
PHANEROZOIC		Cenozoic	Recent	Alluvium, sand, gravel Diatomite	In stream beds and lakes throughout the area. New Annan area.
			Pleistocene	Sand, gravel, till, clay	In gravel pits, beaches, on bedrock throughout area.
	63				
		Mesozoic	Triassic	Sandstone, conglomerate, shale, basalt	Bigby Head (Chedabucto Bay near Guysborough).
	240				
		Palaeozoic	Permian	Sandstone, conglomerate, shale, siltstone	Seacliffs, shorelines, river banks, road-cuts in Prince Edward Island
	290				
			Pennsylvanian	Grey sandstone, shale Coal-bearing sandstone, shale, conglomerate Red sandstone, shale	Wentworth, Oliver copper deposits; Knoydart Point shoreline. Point Aconi, Finlay Point shorelines; Stellarton-Westville coal area; Sydney-Glace Bay coalfields. Pugwash area; Port Hawkesbury, Point Tupper shorelines; New Glasgow area; Prince Edward Island
			Mississippian	Gypsum-bearing shale, limestone Shell limestone Oolitic limestone Basalt, diabase Sandstone, shale, conglomerate	Antigonish Harbour; shoreline, road-cuts near Iona; Little Narrows; shoreline at South Gut St. Ann's; Dingwall. Irish Cove shoreline and quarry; Johnstown road-cuts. Point Edward area. Arisaig Point and Doctors Brook shorelines. Road-cuts along Highway 4 at Auld Cove, and along Cabot Trail on Old Smoky Mountain; shoreline at Guysborough and between North River Bridge and St. Ann's.
	360				
			Devonian	Grey granite Granite, diorite, gneiss Sandstone, slate Granite, rhyolite, diorite	Dunbrack mine; Queensport area. Road-cuts on Highway 105 northeast of South Gut St. Ann's. McAras Brook in vicinity of Highway 245 bridge. East side of Loch Lomond; North Mountain; Stirling Mine.
	410				
			Silurian	Shale, limestone Shale, sandstone, limestone	Shoreline at Moydart Point. Gorge of Arisaig Brook; road-cuts along MacDonald Mine.
	435				
			Ordovician	Slate, quartzite Staurolite schist Andalusite schist Rhyolite Conglomerate, grit	Gold mines in Nova Scotia. Cochrane Hill gold mine; Crows Nest area. Doughboy Point; Port Felix; Cole Harbour Head. Along shore at Arisaig Point and Doctors Brook area. Shoreline at Malignant Cove; Pictou area.
	500				
			Cambrian	Conglomerate, shale, sandstone Greywacke, lava, volcanic breccia	Shoreline, road- and railway-cuts between Barachois and Georges River. Grand River-St. Esprit area; Stirling Mine.
	570				
Precambrian		Proterozoic		Volcanic rocks, sandstone, shale, schist Crystalline limestone Crystalline limestone, dolomitic limestone	Gabarouse Bay, Louisbourg Harbour and Maindieu shorelines; Scatarie Island. Marble Mountain. Scotch Lake quarry; Boisdale Hills.
	2500				
		Archean			Not represented in collecting area.
	4500				

COLLECTING ALONG THE ROUTE

The route, as shown in Figure 1, is divided into 4 sections: (1) Dartmouth to Antigonish, via Highway 7; (2) Port Hastings to Sydney, via Highway 105 and the Cabot Trail; (3) Sydney to Amherst, via highways 245 and 6; and (4) Prince Edward Island, via Highways 2 and 6.

Information on each collecting locality is systematically listed in the text as follows: km distance along the highways starting at the beginning of each section; name of the locality or deposit; minerals or rocks of interest to the collector – shown in capital letters; mode of occurrence; brief notes on the locality with specific features of interest to the collector; location and access; references to other publications, indicated by a number and listed at the end of the book; references to maps of the National Topographic series (T), to geological maps (G) of the Geological Survey of Canada, and to special maps (S) showing plan of mine workings published by the Geological Survey of Canada.

Units of measurement obtained from geological reports referred to in the text have been converted from the Imperial to the metric system (SI). The following conversions were used:

1 inch	= 2.54 cm	1 foot	= 0.305 m
1 mile	= 1.609 km	1 acre	= 0.40469 ha
1 ounce (troy)	= 31.103 g	1 pound (avoirdupois)	= 0.453 kg
1 ton (short)	= 0.907 t	1 oz(troy)/ton(short)	= 34.285 g/t

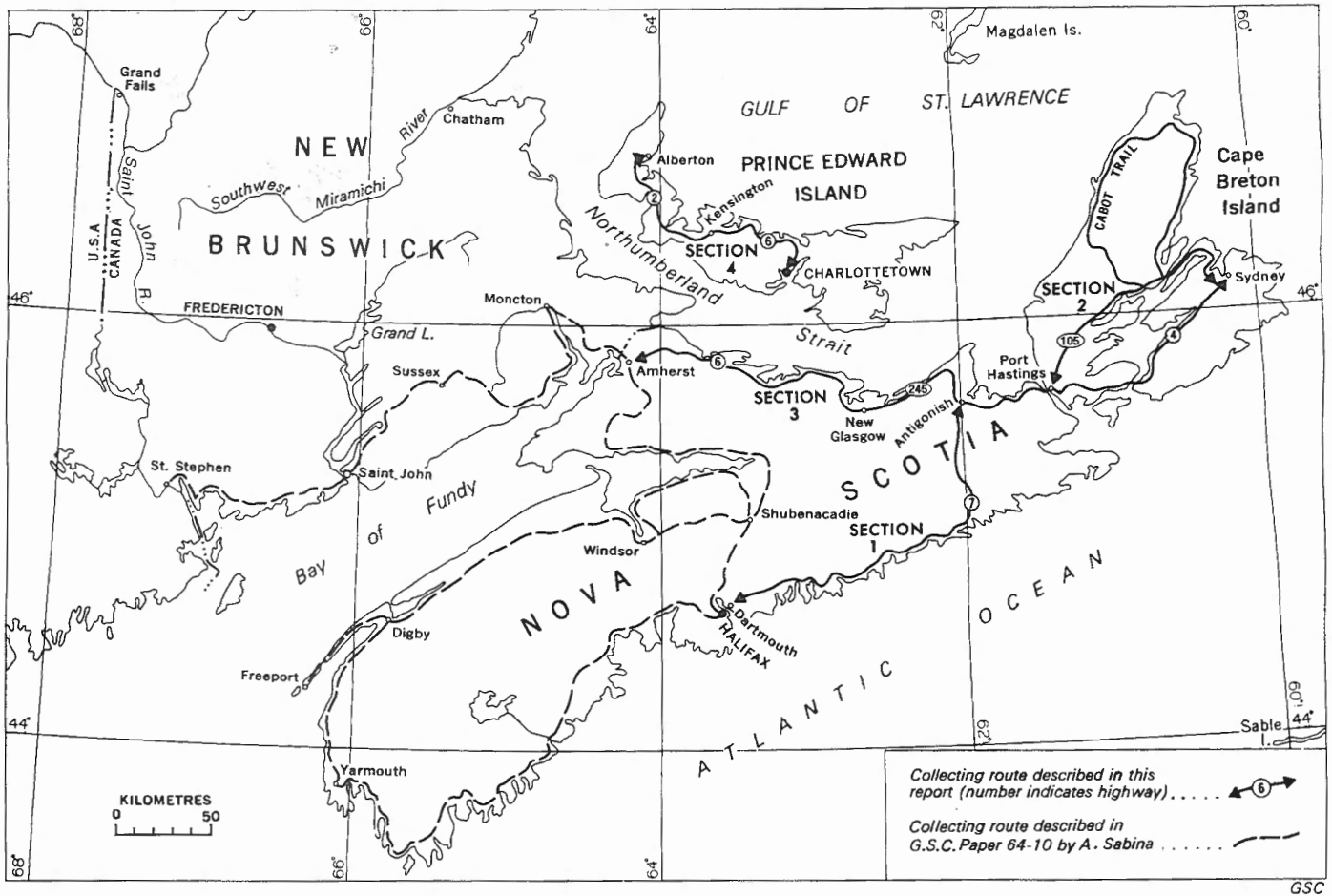


Figure 1. Index map showing collecting routes

DARTMOUTH – ANTIGONISH

km **0.0** Dartmouth, at Micmac Rotary. The main road log follows Highway 7 East.

Montague Gold Mines

PYRITE, ARSENOPYRITE, SPHALERITE, GOLD.

In quartz veins, slate and quartzite.

Pyrite and arsenopyrite occur as crystals and irregular masses, sphalerite as fine-grained black patches, generally in quartz. Large nuggets and flakes of gold, and masses of arsenopyrite weighing over 20 kg were encountered in the early days.

The deposit was worked for gold steadily for 30 years beginning in 1863, and at intervals until 1939. In the early 1920s, arsenic was mined from this deposit and from several other gold mines in the province. The sudden demand for arsenic arose because of its use as an insecticide against the boll weevil which then threatened the U.S. cotton crops. Several small dumps are scattered through the property. The Montague district produced a total of 2 119 342 g of gold from 121 791 t of ore. The workings extended to a depth of 152 m.

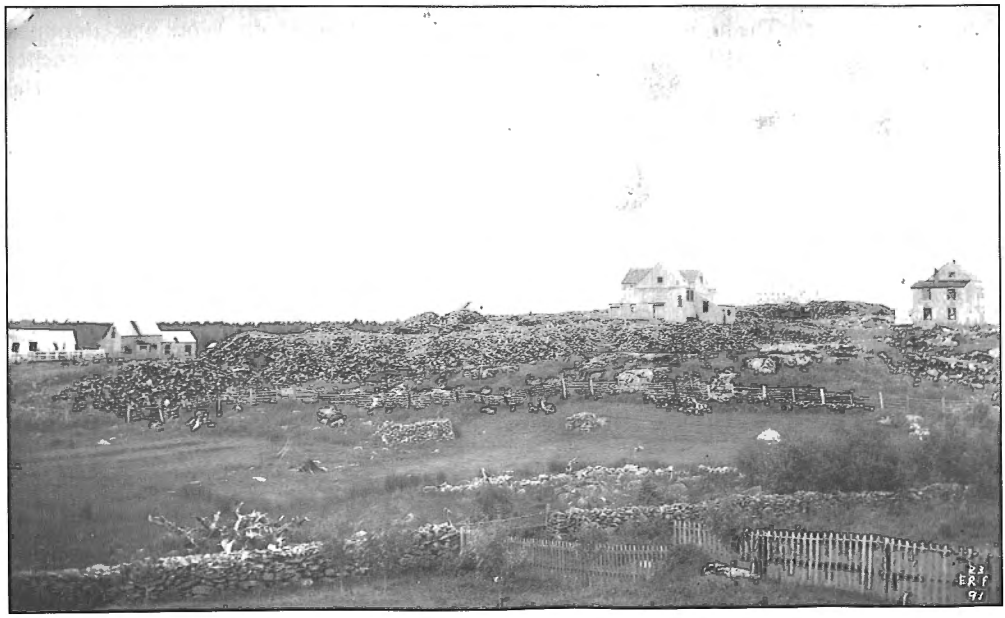


Plate I

Montreal Gold Mining Company, Montague, 1891. (National Archives of Canada, PA 39833)

Road log from Dartmouth:

km		
	0	Micmac Rotary; proceed east along Highway 7.
	4.5	Proceed north onto Montague Road.
	7.6	Junction; proceed west onto road on left.
	8.0	Old shaft, trenches, dumps on left.

Refs.: 17 p. 85-86; 21 p. 49, 124-129; 27 p. 91-93, 108-109.

Maps: (T): 11 D/12 Halifax.
(G): 1019 Halifax (Map-sheet 68, 1:63 360).

km	**8.4**	Proceed onto old Highway 7.
km	**13.1**	Junction, Mineville Road.

Lawrencetown Gold Mines

PYRITE, ARSENOPYRITE, QUARTZ CRYSTALS, CHLORITE, GOLD.

In quartz veins, slate and quartzite.

Small crystals (about 5 mm across) of pyrite and arsenopyrite are disseminated in the quartz and slate. Colourless to white quartz crystals up to 3 cm long and 1 cm across occur in cavities in white massive quartz. Gold was mined from the gravel above bedrock and from the veins.

Mining commenced in 1861, shortly after a local farmer found several gold nuggets near a mill dam on his property. The highest gold values were obtained in the 1860s. Work was continued spasmodically to about 1920. The old workings are now partly overgrown, but new trenches and pits were dug in the 1970s and specimens can readily be obtained from several dumps. The district produced a total of 26 996 g of gold from 1 534 t of ore, most of it in the 1860s.

Road log from Highway 7:

km		
	0	Junction, Mineville road; proceed south onto Mineville Road.
	3.7	Dumps on right (just in front of bridge).
	3.85	Bridge over Partridge River. After crossing the bridge, turn right onto the mine road.
	4.3	Mine dumps on left.

Refs.: 21 p. 110-111; 30 p. 76.

Maps: (T): 11 D/11 Chezzetcook.
(G): 700 Lawrencetown (Map-sheet 53, 1:63 360).
(S): 666 Lawrencetown Gold District, Plan and Section (1:6 000).

km **15.6** Echo Lake, at bridge.

km **15.9** Turn-off (right) to Natural Blue Stone quarry.

Natural Blue Stone Quarry

QUARTZITE.

The rock is fine grained, dark to bluish grey, with a conchoidal fracture. It was quarried for use as flagstone, fire-place facing, patio stone, and other building purposes. The quarry is about 100 m south of the highway.

Maps: (T): 11 D/11 Chezzetcook.
(G): 807 Musquodoboit Harbour (Map-sheet 54, 1:63 360).

km **22.5** Porters Lake, at bridge.

km **37.8** Junction, road to West Petpeswick.

Lake Catcha Gold Mines

PYRITE, ARSENOPYRITE, GOLD.

In quartz, slate and quartzite.

Coarse gold was mined from the Battery vein (at the eastern end of the workings) and very rich ore was encountered in other veins and in the drift north of Lake Catcha. The ore was first reported in the mid 1860s, but did not seem to be promising until the early 1880s. At this time, a stamp mill was erected on the site. Previously, the ore was taken to Lawrencetown for milling. Lake Catcha became, for a few years, one of the best producing districts of the province. At the height of mining activity Lake Catcha was partly drained and work was done on its north shore. Production continued almost steadily until World War 1; since then the area has been prospected at various times. Total production from the area amounted to 558 533 g of gold from 23 517.6 t of ore.

Road log from Highway 7:

km 0 Junction, West Petpeswick road; proceed south.

0.3 Fork; turn right.

5.5 Turn right onto rough dry weather road.

7.4 Mine dumps on right. More dumps can be found on both sides of the road for the next 800 m.

Refs.: 21 p. 105-109; 30 p. 76.

Maps: (T): 11 D/11 Chezzetcook.
(G): 807 Musquodoboit Harbour (Map-sheet 54, 1:63 360).
(S): 765 Lake Catcha Gold District, Plan and Section (1:3 000).

Plate II

Oxford Gold Mining Company stamp mill, Lake Catcha, 1895. (National Archives of Canada, PA 40021)

Plate III

J.H. Anderson's gold mine, Lake Catcha, Nova Scotia, 1895. (National Archives of Canada, PA 39867)

km **38.6** Musquodoboit Harbour; junction road to Meaghers Grant (Highway 357).

Dunbrack Mine

GALENA, CHRYSOCOLLA, MALACHITE, CHALCOCITE, CHALCOPYRITE, CERUSSITE, QUARTZ, FELDSPAR, CHALCEDONY.

In vein cutting grey granite.

Both lead and silver were recovered from coarsely crystalline, massive galena. During mining operations, large crystals of quartz and of feldspar were found in the vein, as well as small crystals of quartz with malachite in cavities in the vein. Other varieties of quartz included opalescent quartz, chalcedony, rose and smoky quartz. Massive malachite lenses, about 2 cm by 5 cm, and colourful specimens composed of chrysocolla with colourless quartz and white chalcedony have been found in the dumps. These specimens are suitable for polishing and make attractive ornamental pieces.

The deposit was discovered in 1888 by John Kerk. A few shafts were sunk on the property in 1910 and the mine was explored for about 10 years. A few dumps remain at the side of the road near a garbage dump.

Road log from Musquodoboit Harbour:

km		
	0	Junction, Highway 7 and Meaghers Grant road; proceed north toward Meaghers Grant.
	4.5	Mine on right (at sharp bend).

Ref.: 1 p. 61-63.

Maps: (T): 11 D/14 Musquodoboit.
(G): 807 Musquodoboit Harbour (Map-sheet 54, 1:63 360).

km **53.2** Junction, road to Upper Lakeville.

Lake Charlotte Mines

SCHEELITE, GOLD, GALENA, ARSENOPYRITE, PYRITE.

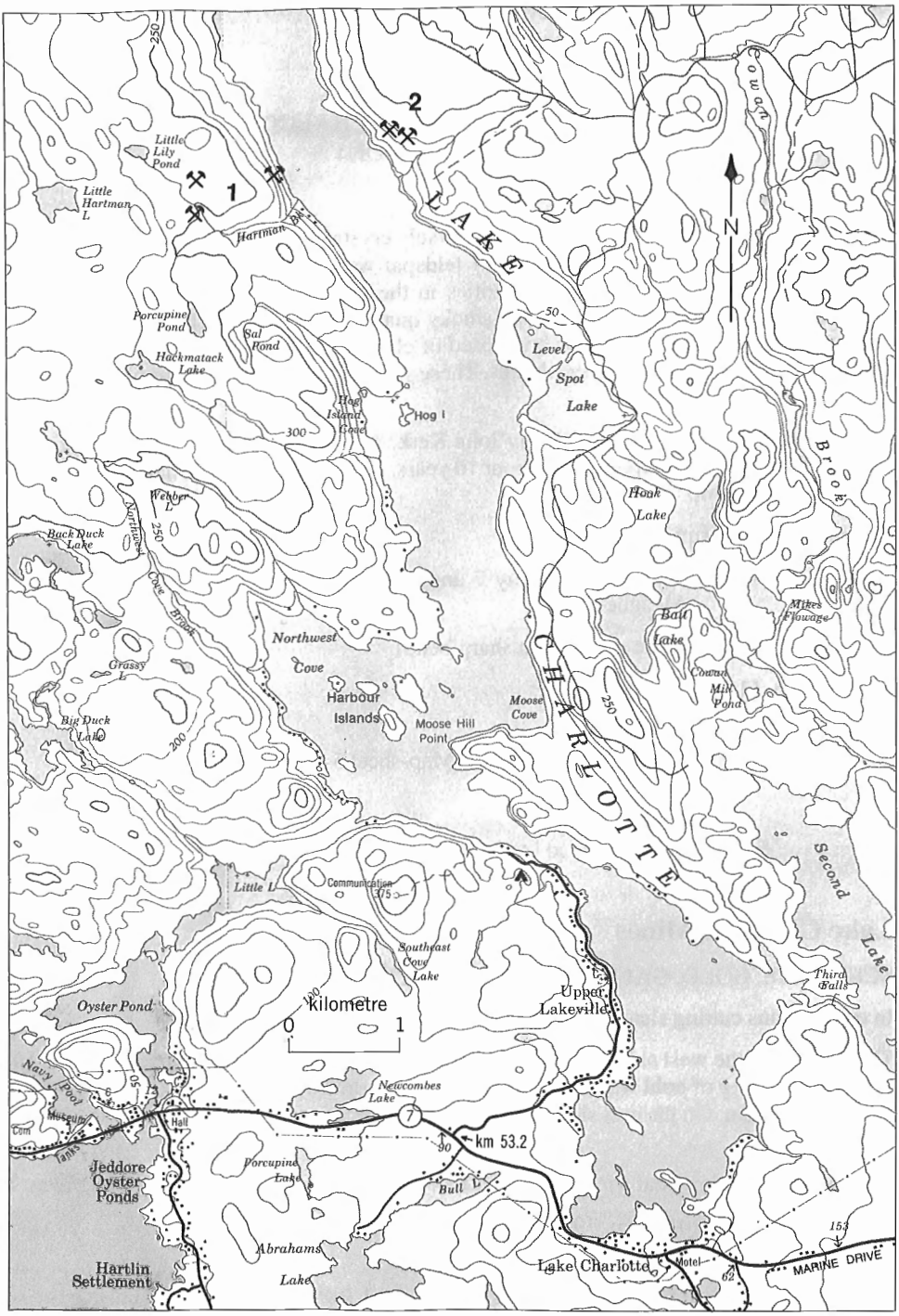
In quartz veins cutting slate and quartzite.

The deposit on the west side of Lake Charlotte was worked for tungsten and gold in the 1930s; in 1963, 1 119.7 g of gold was recovered by Lake Charlotte Mines Limited. Native gold occurs in the quartz vein. On the east side of the lake, scheelite mineralization was exposed by several pits.

Access is by an 8 km boat trip from Upper Lakeville, which is 2.4 km north of Highway 7.

Refs.: 20 p. 200-201; 31 p. 79.

Maps: (T): 11 D/15 Tangier.
(G): 611 Ship Harbour (Map-sheet 51, 1:63 360).



GSC

Map 1. Lake Charlotte mines. 1. Gold mine, 2. Scheelite mine.

km **82.8** Bridge over Tangier River.

km **84.4** Tangier gold mines.

Tangier Gold Mines

GOLD, PYRITE, ARSENOPYRITE, SPHALERITE, GALENA, CALCITE, QUARTZ CRYSTALS, CHALCOPYRITE, MAGNETITE, HEMATITE.

In quartz veins cutting slate and quartzite.

Gold was found as: fine particles and masses disseminated in white quartz, often producing spectacular specimens; crystals (dodecahedrons and octahedrons) including a brilliant, striated rhombic dodecahedron (8 mm in diameter) with slightly bevelled edges; nuggets, one weighing 840 g, which at the time was the largest found in the province and was exhibited at the Dublin Exhibition in the 1860s; as particles in soil and in stream placers. It was remarkably pure – one analysis gave 98.13% gold, 1.76% silver, and some copper and iron.

The accidental discovery of gold in 1860 in the bed of a stream north of Rush Lake by a local fisherman, Peter Mason, resulted in a rush to this and other areas in the following year. Some large and rich specimens were encountered during mining operations. Copper Lake was drained but proved to be a disappointment because only small amounts of nuggets were found. The mine was worked almost steadily until 1919. The mining area extended along the north side of Highway 7 from Copper Lake to the junction of the road to Mooseland. One of the most accessible dumps is that of the old Kent property in Tangier village. Total gold production from the district was 809 379 g from 45 574.9 t of ore. The deposit was worked in 1989 by Coxheath Gold Holdings Limited.

Refs.: 17 p. 34-36; 21 p. 188-193; 22 p. 395-397; 38 p. 140.

Maps: (T): 11 D/15 Tangier.
(G): 565 Tangier (Map-sheet 39, 1:63 360).
(S): 773 Tangier Gold District, Plan and Section (1:3 000).

km **85.5** Junction, road to Mooseland and Moose River mines.

Mooseland Gold Mines

ARSENOPYRITE, PYRITE, GOLD, QUARTZ CRYSTALS, RUTILE.

In quartz veins cutting slate and quartzite.

Gold occurred as nuggets, scales, and crystals. Some rich specimens, including a 360 g piece of quartz containing 249 g of gold, were obtained in the early days of mining. Also found were crystals of rutile in quartz and quartz crystals. Slate containing arsenopyrite crystals measuring up to 3 cm long and 1 cm across, and small pyrite cubes about 5 mm across can readily be found in the dumps.

The province's first discovery of gold-bearing quartz was made here by Captain L'Estrange while moose hunting in the fall of 1858. His report of the discovery was ridiculed, but about two years later auriferous boulders were found at the same locality by John Pulsiver, a farmer and part-time prospector. When he showed the specimens to the Provincial Secretary, the

Hon. Joseph Howe, he was told to go home and mend his shoes! By the next year reports of further gold discoveries led the government to officially survey the district. Mining commenced that year and the province's first stamp mill was erected. The mill was later taken to Tangier, then to Chezzetcook. The mine was worked almost steadily until 1903 and some prospecting has been done since then. Underground investigation was done in 1988-1989 by Hecla Mining Company of Canada Limited. The district produced a total of 120 277 g of gold from 8 215.6 t of ore.

Road log from Highway 7:

km		
	0	Junction, Mooseland, Moose River mines road; proceed north.
	15.0	Bridge over Tangier River.
	18.5	Bridge over Sluice Brook. Most of the dumps are in the woods on the north side of the brook, just east of the road. The original discovery was made at a point 25 m east of the road and 10 m south of the brook.

Refs.: 17 p. 24-28, 31-33; 21 p. 3, 130-132; 38 p. 220.

Maps: (T): 11 D/15 Tangier.
(G): 624 Moose River (Map-sheet 50, 1:63 360).
(S): Mooseland Gold District, Plan and Section (1:3 000).

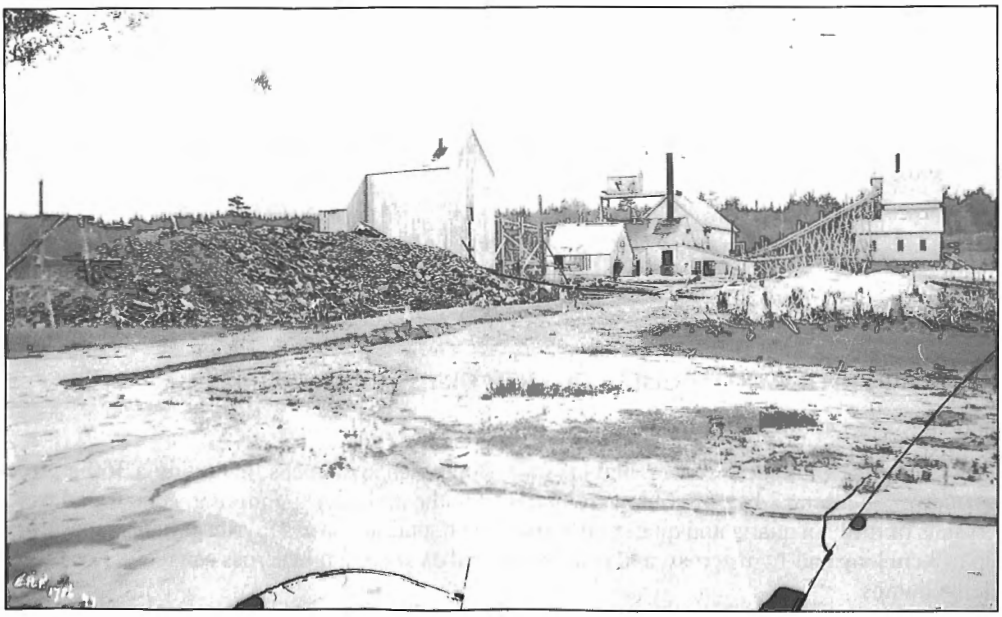


Plate IV

Mooseland Gold Mining Company, 1897. (National Archives of Canada, PA 39899)

Moose River Gold Mines

ARSENOPYRITE, PYRITE, GALENA, SCHEELITE, CHALCOPYRITE, CALCITE, GOLD.

In quartz veins cutting slate and quartzite.

Arsenopyrite, the most abundant sulphide, occurs as prismatic crystals measuring about 1 cm long, and as lens-shaped crystals commonly 4 cm long and 1 cm across. Pyrite and galena are sparsely disseminated in the quartz. Native gold, including a 3 110 g pocket, was recovered during mining operations. Small amounts of yellow scheelite were encountered in some of the veins.

The deposit, discovered in 1866 by John Pulsiver, was worked for gold from 1876 until the 1930s, and for arsenic in 1924. In 1936, one of the underground mines was the scene of a disaster in which three mine inspectors were trapped for eleven days following the collapse of part of the mine. A diamond drill-hole driven to the disaster area served as a conduit for food and as a means of communication with the men until they were rescued.

Numerous dumps and remains of old crushers can be found in Moose River Mines village.

Road log from Highway 7:

km		
	0	Junction, Moose River Mines road; proceed north.
	18.5	Mooseland gold mines.
	34.6	Junction at Moose River Gold Mines; turn left.

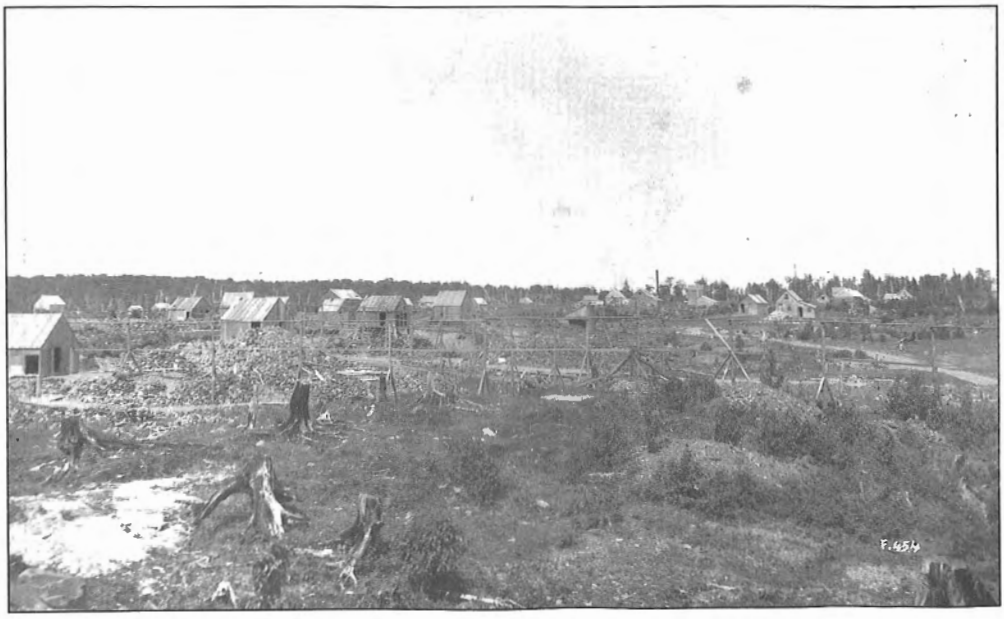


Plate V

Moose River Gold Mine, 1893. (National Archives of Canada, PA 39836)

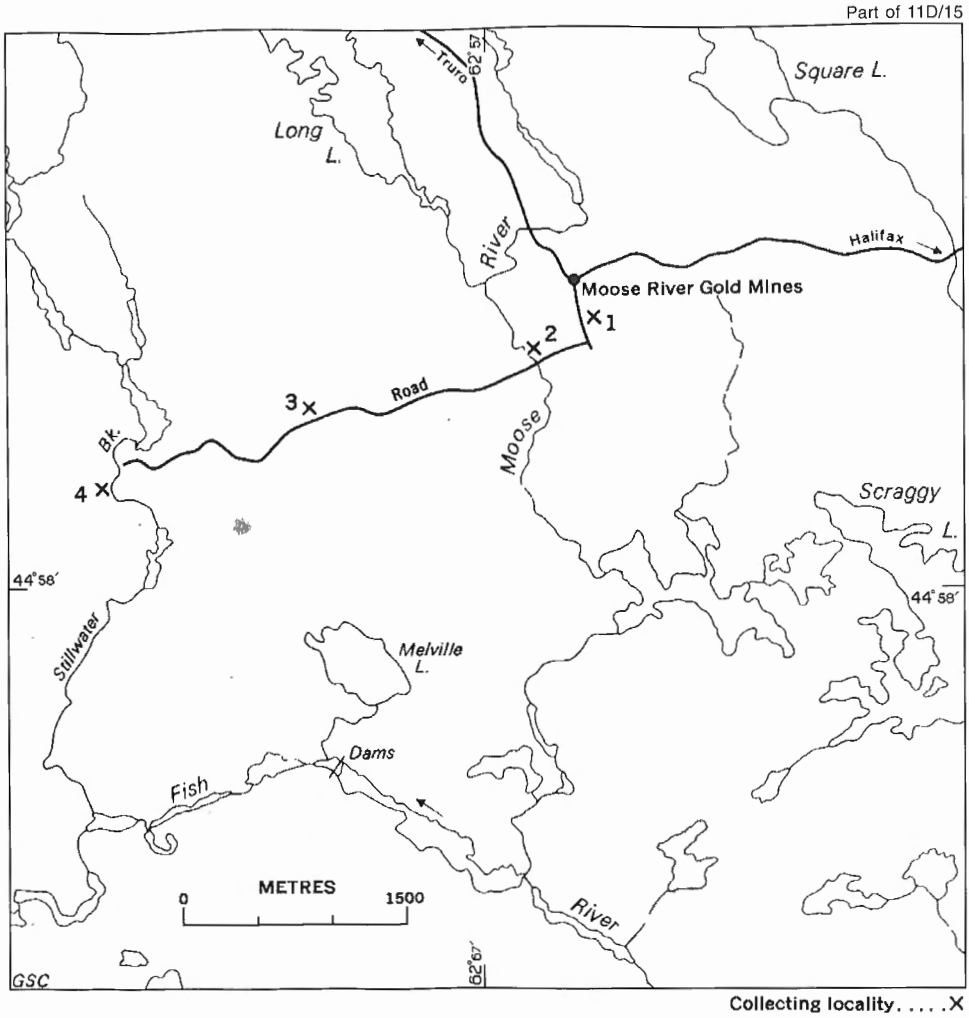
34.8 Moose River gold mines; dumps.

35.1 Junction; turn right.

35.2 Numerous mine dumps and old workings on right.

Refs.: 20 p. 199-200; 21 p. 132-140; 25 p. 122.

Maps: (T): 11 D/15 Tangier.
(G): 624 Moose River (Map-sheet 50, 1:63 360).
(S): 646 Moose River Gold District, Plan (1:3 000).



Map 2. Moose River Gold Mines area: 1, 2, and 3 (gold mines), 4 (tungsten mine).

Moose River Tungsten Mine

SCHEELITE, ARSENOPYRITE, DOLOMITE, MICA, TOURMALINE.

In quartz veins cutting slate and quartzite.

Scheelite was found as pale to orange-yellow coarse grains and masses (up to several cm across) and less commonly as crystals about 1 cm across. The specimens have good cleavage faces and fluoresce bluish white under ultraviolet light (short wave). Closely associated with scheelite are fine-grained patches of arsenopyrite, silvery to pearly white fine scales of mica, and slender greyish black tourmaline crystals measuring up to 3 cm long. Short prismatic crystals of arsenopyrite are common in the slate.

Tungsten ore was discovered here in 1908 and was mined during the first World War and briefly during the second World War. Only a few specimens can now be found in the dumps. Access to the mine is by a 3 km road leading west from km 35.1 at Moose River Mines village (see page 13 for road log).

Ref: 20 p. 198-199.

Maps: (T): 11 D/15 Tangier.
(G): 624 Moose River (Map-sheet 50, 1:63 360).

Plate VI

Scheelite Mines Limited, Moose River, 1912. (National Archives of Canada, PA 45561)

km **123.3** Port Dufferin, at bridge over Salmon River.

km **133.1** Harrigan Cove, at junction of road leading north.

Harrigan Cove Gold Mines

ARSENOPYRITE, PYRITE, GOLD.

In quartz veins cutting slate and quartzite.

Specimens of large individual and twinned arsenopyrite crystals measuring 5 or more cm long are common in the quartzite on the dumps. Both arsenopyrite and pyrite are finely disseminated in the quartz and the host rock. During mining operations gold was found as scales and as very fine crystals (cubes and rhombic dodecahedrons). Very rich ore was obtained from the same vein that produced the crystals.

The mine was worked from 1872 until World War I producing 247 071 g of gold from 12 505.7 t of ore. The district has been prospected at various times since then. Several large dumps from former operations are accessible, but the openings (shafts, trenches) have been filled. Access is by a rough single lane road leading north from Highway 7 at Harrigan Cove. The first dumps reached are about 800 m from the highway. The gold crystals were found in this vicinity.

Ref.: 21 p. 91-94.

Maps: (T): 11 D/16 Ecum Secum.
(G): 551 Moser River (Map-sheet 38, 1:63 360).
(S): 945 Harrigan Cove Gold District, Plan and Sections (1:4 800).
1648A Ecum Secum area, Nova Scotia (1:50 000).

km **142.0** Moser River, at bridge.

km **187.3** Junction, road to Goldenville.

Goldenville (Sherbrooke) Gold Mines

ARSENOPYRITE, PYRITE, GOLD, GALENA, SPHALERITE, PYRRHOTITE.

In quartz veins in slate and quartzite.

Crystals of arsenopyrite measuring up to 7 cm by 2 cm are common in the slate and quartzite. Pyrite, galena, sphalerite and pyrrhotite occur as fine grains. Rich concentrations of gold in the veins produced 62 921 g of gold from 780.4 t of ore in 1862 the first year of production, and a record 294 327 g in 1867.

Gold in this, the most important and productive district in the province, was discovered in 1861 by a farmer, Nelson Nickerson of Sherbrooke, while making hay. For about 2 months he managed to conduct secretly the district's first mining operations by breaking up quartz boulders, but suspicious neighbours, hearing the sound of his hammer in the woods, followed him there and extracted the gold in the same manner. Immediately, the district was officially surveyed so that by 1862 mining operations were in progress, and continued almost steadily until 1942. At one period (1920s) arsenopyrite was recovered. The district produced 6 536 379 g of gold from 540 506.7 t of ore, more than twice the production of any other district in the

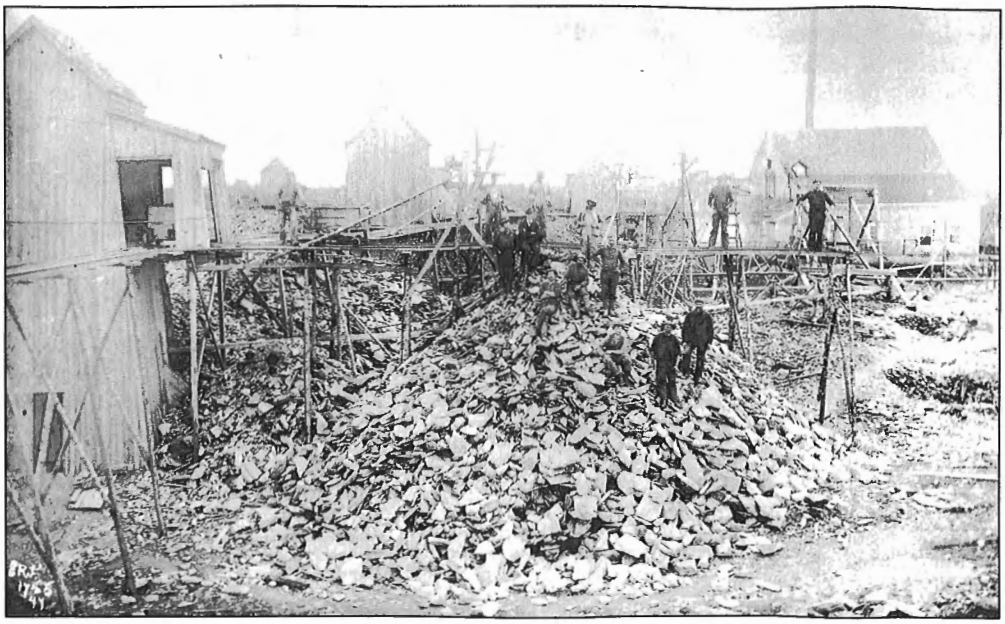


Plate VII

New Glasgow Gold Mining Company, Goldenville, 1897. (National Archives of Canada PA 39880)

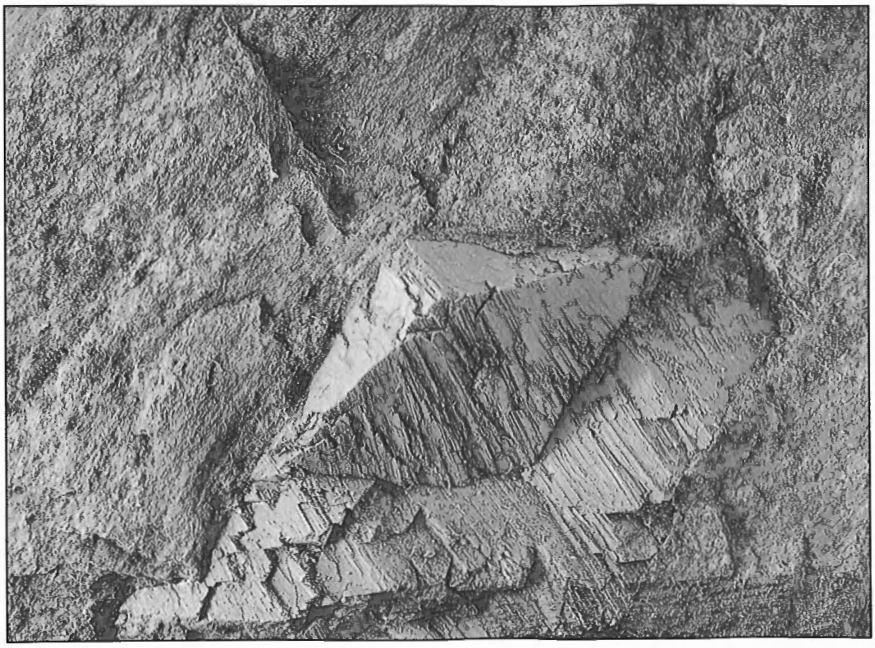


Plate VIII

Arsenopyrite crystal in quartzite, Goldenville gold mine, Goldenville, Nova Scotia. (GSC 113051-G)

province. Numerous large dumps, filled-in shafts and open cuts, and remnants of stamp mills remain in the village of Goldenville. The first dumps reached along the Goldenville road are 400m west of Highway 7. The deposit was explored in 1988 by Northumberland Mines Limited.

Refs.: 17 p. 50-57; 18 p. 142; 21 pp. 170-184.

Maps: (T): 11 E/1 Liscomb.
(G): 550 Liscomb River (Map-sheet 37).
1648A Ecum Secum area, Nova Scotia (1:50 000).
(S): 645 Goldenville Gold District, Plan and Section (1:3 000).

km 195.3 Stillwater; junction, road to Port Bickerton, Wine Harbour.

Wine Harbour Gold Mines

ARSENOPYRITE, PYRITE, GOLD.

In quartz, slate and quartzite.

Well formed crystals of pyrite (5 mm across) and of arsenopyrite (about 2 cm long) are common in slate and quartzite. Gold was recovered from the quartz and from the alluvium.

Gold was discovered in 1860 in the beach sand at Baraswa Cove (Indian Harbour), but the gold recovery from the alluvium was soon exceeded by the yield from the veins where average values of up to 205 g/t were obtained. In 1863, gold production in this district was the highest of any district in the province. Mining continued almost steadily until 1907 and some prospecting has been done since. There are several dumps in the village, but the openings have been filled. The district produced a total of 1 328 925 g of gold from 75 564.9 t of ore.

Road log from Highway 7:

km		
	0	Junction, Port Bickerton, Port Hillford road; proceed east along this road.
	8.8	Junction, at bridge; turn right.
	13.0	Junction, gravel road to Wine Harbour; turn right.
	13.7	Junction; follow road on left.
	16.7	Junction; follow road on left.
	17.7	Wine Harbour. Former mines are on both sides of the road, the dumps on the right, opposite the church, were obtained from the Plough vein, so named because a farmer detected gold in a furrow while he was ploughing.

Ref.: 21 p. 210-216, 222.

Maps: (T): 11 F/4 Country Harbour.
(G): 383 Sherbrooke (Map-sheet 29, 1:63 360).
(S): 867 Wine Harbour Gold District, Plan and Section (1:3 000).

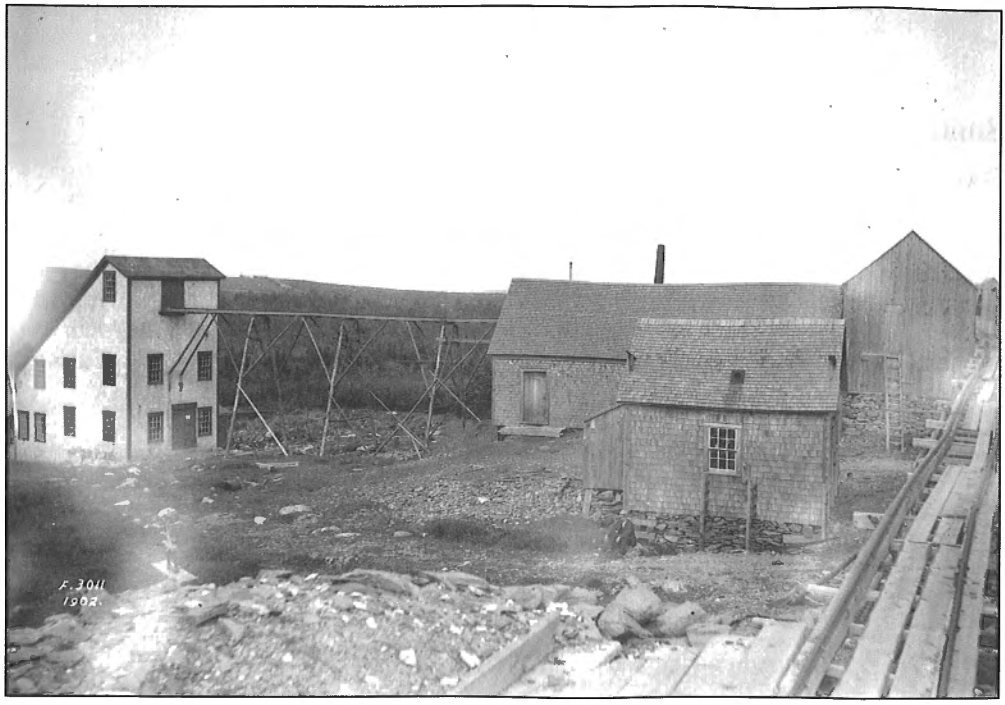


Plate IX

Eureka Mine, Wine Harbour, 1902. (National Archives Canada PA 40011)

km **204.6** Turn off (sharp right) to Cochrane Hill mine.

Cochrane Hill Gold Mine

STAUROLITE, GARNET, ARSENOPYRITE, PYRITE, GOLD.

In mica schist and quartz veins.

Dark brown, partly transparent, staurolite prisms measuring about 2 cm long and 5 to 10 mm across, are associated with transparent pink garnet crystals (about 5 mm across) in schist. Arsenopyrite crystals averaging 1 cm in length occur in schist with finely disseminated pyrite. Gold was mined from the quartz veins.

The deposit was worked by open cut and a shaft beginning in 1868 and continuing at intervals until the 1930s. The mine produced 37 074.8 g of gold. There are a couple of large dumps, a few small ones, and remnants of an old stamp mill on the property. Access is by a 0.4 km single lane road leading east from Highway 7 at **km 204.6** which is 2.3 km south of the Glenelg-Cross Roads Country Harbour intersection).

Refs.: 3 p. 65; 21 p. 73-75.

Maps: (T): 11 E/1 Liscomb.
(G): 390 West River St. Mary's (Map-sheet 36, 1:63 360).
1648A Ecum Secum area, Nova Scotia (1:50 000).
(S): 843 Cochrane Hill Gold District, Plan and Section (1:6 000).

km 206.8 Intersection, Glenelg-Cross Roads Country Harbour road.

Smithfield Galena Occurrence

GALENA, PYRITE, CALCITE.

In slate and quartzite.

Argentiferous galena, which occurred with calcite and quartz in veins in quartzite, can be found sparingly in the dumps at present. Tiny cubes of pyrite occur in slate. The ore was removed in 1873 and in 1904, 1925 and 1930 from two adits driven 213 m and 143 m into the south bank of West River St. Mary's. A small dump on the river bank contains small amounts of galena.

Road log from Highway 7:

km		
	0	Intersection, Glenelg-Cross Roads Country Harbour road; turn left (west) toward Glenelg.
	0.5	Junction; follow road on left.
	3.0	Glenelg; turn left onto Crows Nest road.
	3.7	Junction at bridge; turn right.
	7.2	Adit on left and dump on river bank on right.

Refs.: 1a p. 55-56; 3 p. 66.

Maps: (T): 11 E/8 Lochaber.
(G): 1648A Ecum Secum, Nova Scotia (1:50 000).
1360A Lochaber, Nova Scotia (1:50 000).

km 220.6 South Lochaber; junction, road to College Road.

College Grant Copper Mine

HEMATITE, PYRITE, CHALCOPYRITE, BORNITE, BROCHANTITE.

In quartz veins cutting diorite.

Hematite (specularite), in the form of coarse leafy aggregates, is associated with pyrite, massive chalcopyrite and white quartz. Bright green brochantite coats the quartz, hematite, and chalcopyrite, and patches of bornite coat the chalcopyrite. Vugs containing long quartz crystals with leafy specularite were found in quartz veins when the deposit was being worked. The deposit was worked in 1876. About 36 t of ore averaging 10 percent copper were removed. A small dump and an old shaft can now be seen on the site.

Road log from Highway 7:

km		
	0	South Lochaber; turn left (west) at sign-post "College Road".
	0.15	Junction; follow road on left.
	1.1	Junction; turn right onto road to College Road, New Glasgow.

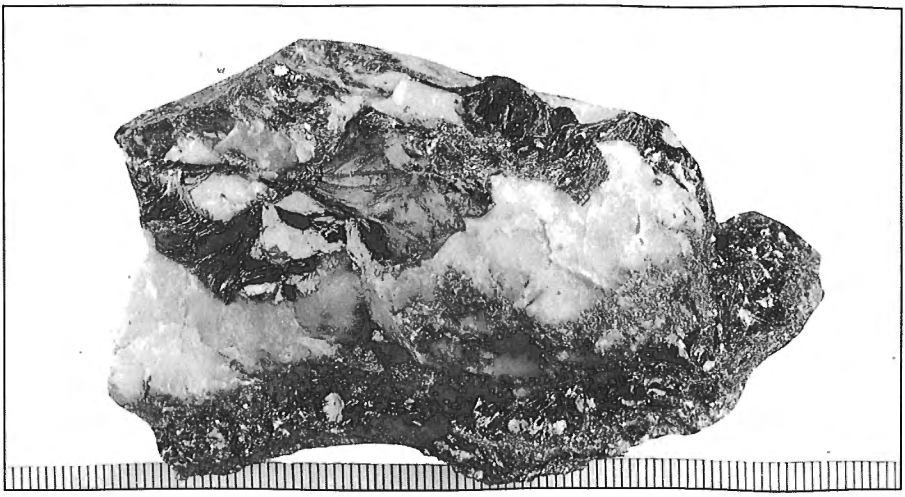


Plate X

Specular hematite in quartz, College Grant copper mine, Nova Scotia. (GSC 113051-J)

km 3.9 Junction, single lane road; turn right.

4.8 Clearing on left. The mine is at the edge of the wooded area, about 100 m west of the road.

Refs.: 3 p. 64; 13 p. 120-121.

Maps: (T): 11 E/8 Lochaber.
(G): 58-1963 Lochaber.
1360A Lochaber, Nova Scotia (1:50 000).

km 221.6 Lochaber; junction, road to Goshen, Copper Lake.

Copper Lake Copper Mine

CHALCOPYRITE, SIDERITE, PYRITE, GOETHITE.

In veins in slate.

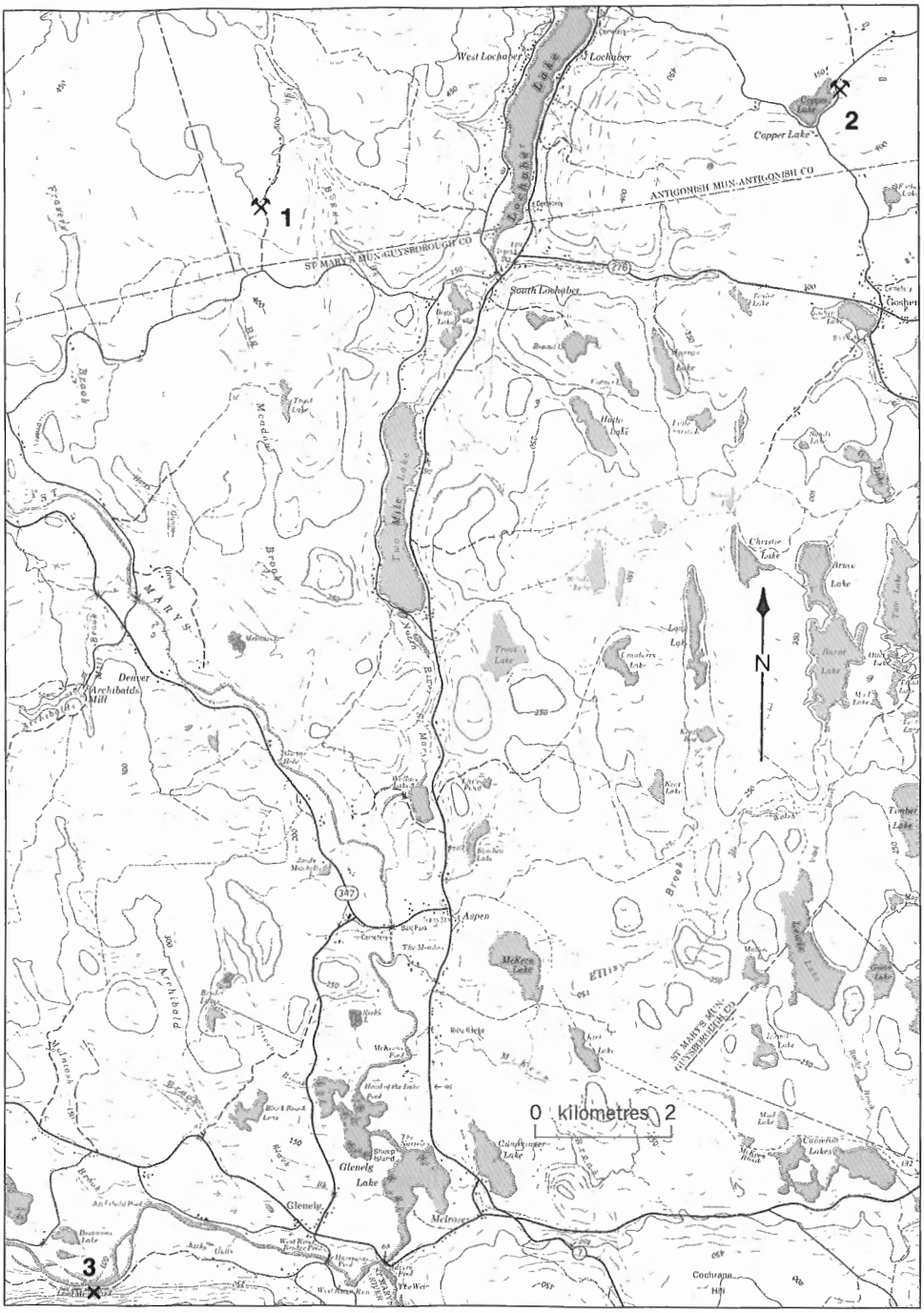
The chief constituents of the deposit are coarsely crystalline white to dark brown siderite intergrown with fine-grained massive to crystalline pyrite. Chalcopyrite and goethite can generally be found but in smaller quantities.

The deposit was worked intermittently between 1876 and 1962. There is no record of production. The dumps furnish good specimen material.

Road log from Highway 7:

km 0 Junction, road to Goshen; turn right (east).

5.5 Goshen crossroads; turn left toward Copper Lake.



Map 3. Lochaber area. 1. College grant copper mine, 2. Copper Lake copper mine, 3. Smithfield galena occurrence.

km	7.7	Junction; follow road on right.
	8.4	Gate and junction of a dirt road on right. Proceed up this road for about 150 m to the dumps and old shafts at the side of a hill.

Ref.: 24 p. 361-364, 390-391.

Maps: (T): 11 F/5 Guysborough.
(G): 27-1961 Guysborough (1:63 360).

km 250.2 Antigonish; junction Highway 104.

PORT HASTINGS – SYDNEY AND CABOT TRAIL

km 0 Port Hastings: junction highways 4 and 105. The main road log follows Highway 105.

km 31 Melford; junction, road to River Denys.

Big Brook Quarry

GYPSUM, ANHYDRITE.

Massive fine-grained mottled white and grey gypsum beds overlie bluish grey anhydrite. The deposit has been worked since 1961, by Bestwall Gypsum Division, Georgia Pacific Corporation. The crushed gypsum is loaded onto railway cars at the quarry and taken to Point Tupper, where it is shipped to points in the U.S.

Road log from Highway 105:

km	0	Melford; proceed south onto River Denys road.
	1.9	Crossroads; turn left.
	8.2	River Denys; junction road to River Denys Station. Turn right and continue beyond station.
	14.0	Junction; follow road on right.
	14.5	Quarry.

Ref.: 1 p. 112-113.

Maps: (T): 11 F/14 Whycocomagh.
(G): 1212A Whycocomagh, Nova Scotia (1:63 360).

km 48 Whycocomagh; junction, road to Lake Ainslie, Mabou.

Finlay Point

GYPSUM, CALCITE, BARITE, GOETHITE, LEPIDOCROCITE, QUARTZ, GLAUCONITE, COAL, CONCRETIONS, FOSSILS.

Mottled white and grey fine-grained gypsum containing grey selenite crystals is exposed along a cliff just north of the wharf. Parts of the cliff have been eroded by wave action and several sea caves have been formed. To the west toward the headland, the cliffs are composed of grey coal-bearing sandstone and shale. A coal seam exposed along the cliff was worked some years ago and the old shaft remains. Pennsylvanian plant fossils and nodular iron-stained concretions measuring 5 to 8 cm across occur in the shale. The concretions, being more resistant than the host rock, are prominent on the weathered surface; their interior is composed of a mixture of iron minerals, including goethite, lepidocrocite and glauconite, with quartz. White calcite, in veins associated with the shale and sandstone, fluoresces pale yellow ('short' ultraviolet rays) and deep yellow ('long' ultraviolet rays). Specimens of pink to orange barite in calcite were found along the beach and are believed to have originated from a vein on the north side of Finlay Point.

Road log from Highway 105:

km 0 Whycocomagh; proceed north along the road to Mabou, Lake Ainslie.

3.4 Junction, Lake Ainslie road; turn left toward Mabou.

Plate XI

Iron-stained concretions in shale, Finlay Point, Cape Breton Island, Nova Scotia. (GSC 138665)

km		
	25.7	Junction, Highway 19; turn left.
	26.9	Mabou; turn right onto road to Northeast Mabou.
	27.2	Junction; follow road on left.
	29.0	Junction at bridge; turn left.
	31.7	Junction, road to Finlay Point; turn right.
	35.2	Junction; follow road on right.
	37.6	Turn-off (left) to wharf.
	38.0	Wharf. Cliffs at Finlay Point are just north of the wharf.

Maps: (T): 11 K/3 Lake Ainslie.
(G): 282A Lake Ainslie (1:63 360).

Lake Ainslie Barite Mines

BARITE, FLUORITE, CALCITE, HYDROCARBON.

In rhyolite and mica schist

Coarsely crystalline white barite is associated with light blue to light green fluorite and white calcite. A dark brown earthy hydrocarbon fills cavities, and black dendritic manganese oxide coats the barite-fluorite intergrowths. Under the ultraviolet light calcite fluoresces bright pink (short wave), fluorite fluoresces blue (long wave), and some of the fine-bladed aggregates of barite fluoresce yellow (long wave).

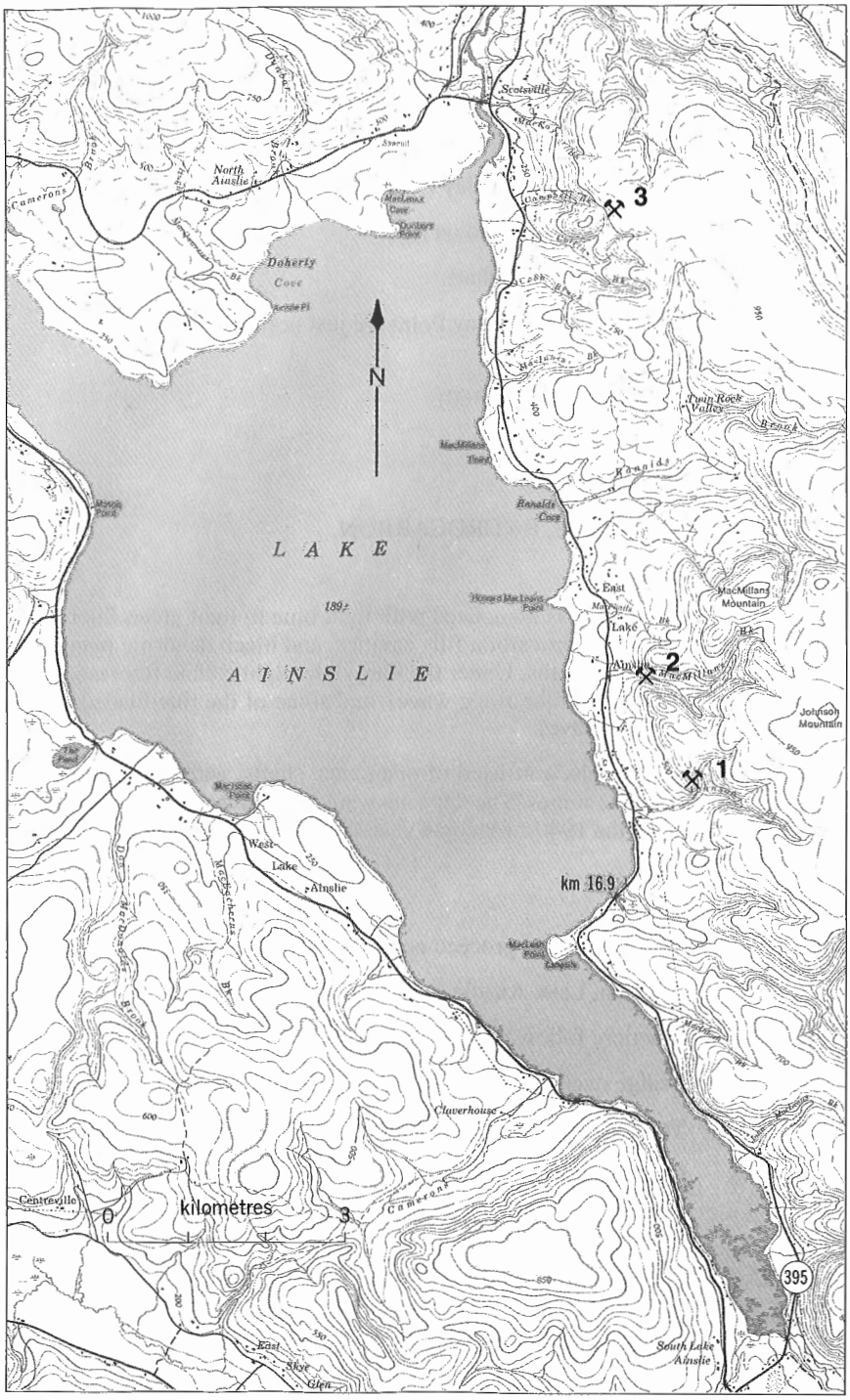
The workings, now inaccessible, consisted of open cuts, shafts, and adits; specimens can be collected from dumps at three mines. The deposits were worked for barite intermittently from 1894 to about 1915, and in the 1940s; for some years they accounted for almost the total barite production in Canada.

Road log from Highway 105:

km		
	0	Whycocomagh; proceed north along Mabou, Lake Ainslie road.
	3.4	Junction, Lake Ainslie road; turn right.
	9.0	Junction; follow road on right.
	16.9	Bridge over Trout Brook.
	18.0	Trail on right leads east 800 m to the Trout River deposit.
	19.8	Gate and trail on right leading 300 m to the East Lake Ainslie deposit at the base of a hill. An old mine building and the dumps are visible from the road.
	25.9	A trail on right leads east about 1500 m up a hill to the Scotsville deposit. Near the top of the hill the trail branches; both forks lead to old dumps.

Refs.: 27 p. 64-67; 32 p. 22-30.

Maps: (T): 11 K/3 Lake Ainslie.
(G): 282A Lake Ainslie (1:63 360).



GSC

Map 4. Lake Ainslie barite mines. 1. Trout River, 2. East Lake Ainslie, 3. Scotsville.

km 59 Junction, Highway 223.

Iona Gypsum

GYPSUM, ANHYDRITE, CALCITE, HOWLITE, DANBURITE.

Limestone along cliffs and railroad cut.

Mottled grey and white gypsum is associated with snow-white to grey anhydrite and yellow to light brown fine-grained massive patches and crystalline aggregates of calcite. Some of the calcite forms transparent yellow spherical aggregates of crystals lining cavities in gypsum. When exposed to ultraviolet rays (long wave is more effective than the short), the crystalline calcite fluoresces yellowish white, the massive yellow. Howlite occurs as transparent colourless to grey slender crystals (up to 3 mm by 10 mm) forming radiating clusters in massive gypsum or in cavities in gypsum. Finely granular, snow-white howlite associated with transparent crystalline gypsum occurs in the centre of the cavities. White nodules resembling unglazed porcelain and botryoidal masses (several cm across) of danburite have previously been found in the anhydrite.

Gypsum was formerly quarried from a deposit located 3 km north of Iona; operations were conducted by Iona Gypsum Products Company from 1914 to 1932.

Road log from Highway 105:

km		
	0	Junction, Highway 23; turn right toward Little Narrows.
	1.9	Little Narrows ferry; turn right (after crossing narrows) toward Iona.
	6.8	Intersection, Iona-Orangedale road; turn left.
	7.7	Junction; follow road on right.
	15.3	Gypsum exposures on both sides of the road.
	18.5	Gypsum, exposed in road cuts on both sides of the road, contains transparent selenite plates.
	21.6	Walk down to the shore (on right) and proceed straight ahead (east) 800 m to the gypsum cliffs and railway cut at the shore. Collect at low tide. If proceeding to the locality from Iona, the descent to the shore is 4.2 km southwest of the Iona ferry landing.

Ref.: 14 p. 28-29.

Maps: (T): 11 F/15 Grand Narrows.
(G): 1040A Grand Narrows (1:63 360).

Plate XII

Howlite crystals in massive gypsum, near Iona, Cape Breton Island, Nova Scotia. (GSC 113051-F)

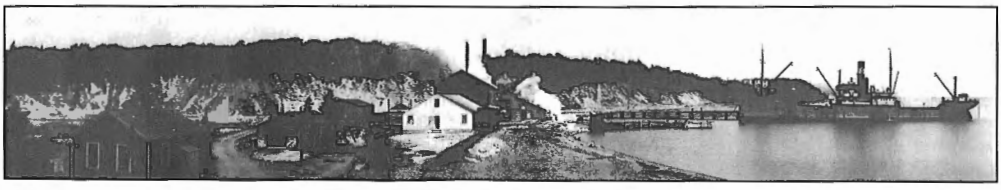


Plate XIII

Iona Gypsum Products Company, 1926. (National Archives of Canada, PA 17862)

km **61** Inverness/Victoria county line.

Bucklaw Salt Spring

The salt is composed principally of sodium chloride, with a small amount of sodium sulphate and traces of magnesium and potassium chlorides. There are reported to be several salt springs in the area and their existence has been known since the 1870s. The strongest spring yielded an estimated 450 to 900 t of brine per minute. Prior to 1873 salt was recovered by evaporation in common iron pots; a plan to put the production on a more elaborate scale was abandoned.

The salt spring is 100 m south of the highway just east of the county line.

Ref.: 7 p. 3-4.

Maps: (T): 11 K/2 Baddeck.
(G): 1211A Baddeck, Nova Scotia (1:63 360).

km **76** Junction, the Cabot Trail. Proceed onto the Cabot Trail.

The Cabot Trail

km **0** Cabot Trail begins.

km **64.4** Margaree Harbour, at west end of the bridge over Margaree River.

km **71.9** Bridge over small brook.

Margaree Rock Exposures

FOSSILS.

In Pennsylvanian sandstone and shale.

Petrified logs (cordioxylon) measuring 30 cm across and several metres long lie horizontally in beds of reddish brown sandstone. The trees and fossil plant remains have been partly converted to coal. Fossil clams occur in the shale beds.

The fossil-bearing rocks are exposed in low cliffs at the mouth of the brook a few metres west of the bridge at **km 71.9**, in road cuts extending north for about 1500 m from the bridge, and along the Gulf of St. Lawrence shore from Margaree Harbour to a point about 8.8 km north.

Ref.: 5 p. 6-7.

Maps: (T): 11 K/6 Margaree.
(G): 48-11A Margaree (1:31 680).
1752A Northern Cape Breton Island (1:100 000).

km **78.7** Grand Etang, at bridge.

km **88.8** Cheticamp, at junction of road leading east.

Belle Marche Quarry

GYPSUM, ANHYDRITE.

In limestone.

Cleavable masses (several cm across) of colourless, transparent selenite are associated with granular, white and grey mottled gypsum and greyish white anhydrite. The deposit was last worked in 1939 by National Gypsum (Canada) Limited.

Road log from Cabot Trail:

km 0 Cheticamp; proceed onto road leading east.

1.1 Junction on right; continue straight ahead.

2.6 Junction; turn left.

3.2 Turn right onto single lane dry weather road (check bridges on this road before crossing).

4.0 Quarry.

Maps: (T): 11 K/10 Cheticamp River.
(G): 55-36 Cheticamp River (1:63 360).
1752A Northern Cape Breton Island (1:100 000).

km **92.3** Entrance to Cape Breton Highlands National Park.

km **131.0** Sign-post on left "Leaving Cape Breton Highlands National Park".

Pleasant Bay Lead Deposit

FLUORITE, GALENA, PYRITE, CHALCOPYRITE, GARNET, CALCITE.

In sandstone.

Purple and green, fine-grained fluorite is associated with finely disseminated sulphides in calcite and in sandstone. Tiny pink grains of garnet occur in the pale green sandstone.

The deposit was worked in the 1880s for lead. The mineral-bearing rock fragments can be found on the east bank of the Mackenzie River just north of the sign-post at **km 131.0.**

Ref.: 1a p. 49.

Maps: (T): 11 K/15 Pleasant Bay.
(G): 1119A Pleasant Bay (1:63 360).
1752A Northern Cape Breton Island (1:100 000).

km **162.2** Junction, road to Bay St. Lawrence.

km **163.3** Turn-off to Dingwall gypsum quarry on left.

Dingwall Gypsum Quarry

GYPSUM, ANHYDRITE, CALCITE, CELESTINE, HOWLITE, ULEXITE.

In limestone.

Gypsum is finely granular, white or white mottled with grey. Associated minerals include: fluorescent calcite (pink under 'short' ultraviolet rays and yellow under the 'long' rays); celestine as light brown, transparent granular aggregates; fine-grained white anhydrite. The borates – howlite and ulexite –have been reported from the northwest end of the quarry. The former occurred as white nodules (1-6 cms across) with yellowish brown calcite in anhydrite, the latter as irregular, shiny white patches along joint planes in anhydrite.

The deposit was worked from 1933 to 1955.

Ref.: 14 p. 13-15, 48.
Maps: (T): 11 K/16 Dingwall.
(G): 1124A Dingwall (1:63 360).
1752A Northern Cape Breton Island (1:100 000).

Plate XIV

Gypsum exposures, Dingwall, Cape Breton Island, Nova Scotia, 1964. (GSC 138675)

km	**206.9**	Ingonish Beach, at gate to Cape Breton Highlands National Park.
km	**207.2**	Ingonish; turn-off (left) to Ingonish gypsum quarry.

Ingonish Gypsum Quarry

GYPSUM, ANHYDRITE.

Pink and white gypsum occurs with anhydrite.

The quarry was operated from 1924 to 1928 by Ingonish Gypsum Company Limited.

To reach the quarry, proceed east 0.3 km from **km 207.2.**

Maps: (T): 11 K/9 Ingonish.
(G): 55-35 Ingonish (1:63 360).
1752A Northern Cape Breton Island (1:100 000).

km	**283.0**	South Gut St. Ann's, at bridge. The shoreline cliffs on left expose white gypsum and anhydrite.
km	**283.3**	Junction, Highway 105; Cabot Trail ends.

The main road log along Highway 105 continues (see page 29).

km	**76**	Junction, Cabot Trail. Proceed along Highway 105.
km	**104**	Junction, Cabot Trail (east end).
km	**137**	Junction, road to Point Aconi.

Point Aconi Cliffs

FOSSILS.

In Pennsylvanian sandstone and shale.

A few fossil trees (about 30 cm across and several metres long) and fossil plant remains occur in the coal-bearing shale and sandstone cliffs on both sides of Point Aconi.

The trees stand vertically in the strata and have been replaced by coal, sandstone, shale with patches of fine-grained pyrite. The tree-bearing strata extend from Point Aconi west to Black Rock Point, and east to Sydney Mines.

Road log from Highway 105:

km	0	Junction, road to Point Aconi; turn left (north).
	9.5	End of road at shore of McLean Cove; Point Aconi is directly north.

Maps: (T): 11 K/8 Bras d'Or.
(G): 359A Bras d'Or (1:63 360).

km 138 Junction, road to Grand Narrows, Georges River.

Scotch Lake Quarry

SERPENTINE, CALCITE, PYROAURITE, TREMOLITE, TALC, MAGNETITE, HEMATITE, PYRITE, GRAPHITE, DOLOMITE.

In crystalline limestone of Precambrian age.

Fine-grained massive serpentine suitable for ornamental purposes occurs in shades of yellow, yellow-green, olive-green, blue, red and brown with a variety of patterns producing banded, spotted, streaked, and mottled effects. It takes an excellent polish. Associated with it are fluorescent calcite (pink under both 'long' and 'short' ultraviolet rays); pyroaurite, as blue translucent coating with fibrous structure; patches of magnetite, pyrite, and graphite; reddish brown hematite as coating on serpentine; white fibrous tremolite and talc.

The quarry was worked for about 50 years until 1951 for dolomite, which was used as a flux at the Dominion Steel and Coal Corporation in Sydney. Serpentine and marble are exposed along the wall of the quarry, which was cut into the side of a ridge forming the Boisdale Hills. Numerous specimens of all sizes can be found on the floor of the quarry.

Road log from Highway 105:

km		
	0	Junction, road to Grand Narrows, Georges River; turn right (southwest).
	7.2	Junction; proceed straight ahead along road to Scotch Lake.
	10.0	Junction, turn right onto quarry road.
	10.3	Quarry.

Ref.: 29 p. 180-183.

Maps: (T): 11 K/1 Sydney.
(G): 360A Sydney (West half, 1:63 360).

Ironville (Ingraham) Iron Mine

HEMATITE.

In slate and limestone.

Fine-grained, massive reddish brown and specular hematite was mined here between 1900 and 1907. It was shipped to the steel plant at Sydney. Old shafts, pits and small dumps are near the crest of a ridge overlooking St. Andrew's Channel.

Road log from Highway 105:

km		
	0	Junction, road to Grand Narrows, Georges River; turn right (southwest).
	7.2	Turn-off to Scotch Lake; continue along road on right.
	18.5	Junction; turn right (west) onto Highway 223.
	20.3	Junction, tractor road on left leading up hill to the mine.

Ref.: 25a p. 145-151.

Maps: (T): 11 K/1 Sydney.
(G): 360A Sydney (West half, 1:63 360).

km	**140**	Junction, Highway 125; proceed onto Highway 125.
km	**149**	Junction, Highway 223; continue along Highway 125.
km	**151**	Junction, road to Frenchvale, Point Edwards.

Coxheath Mine

CHALCOPYRITE, HEMATITE, BORNITE, BROCHANTITE, POSNJAKITE, PYRITE, MICA, CALCITE, TOURMALINE.

In quartz diorite and andesite.

Massive chalcopyrite, its surface partly altered to bornite, is associated with pyrite, specular hematite, fine-grained black tourmaline, pale green mica, quartz, and fluorescent calcite (pink under 'short' waves and yellow under 'long' waves). Copper sulphates–brochantite and posnjakite–coat the quartz and the host rock; the former occurs as bright green aggregates of acicular crystals, the latter as blue fine flaky masses. The deposit was worked by underground methods for copper during three periods: 1878-1891, 1899-1901, and 1928-1930. During the most active period (1878-1891) rich ore with average values of 3 to 10% copper were encountered at certain levels. The property was explored in 1965 by Mariner Mines Limited.

Road log from Highway 125:

km	0	Junction, Frenchvale road; turn right (south).
	0.08	Turn left in front of bridge over Ball Creek.
	1.1	Junction; follow road on right toward Frenchvale.
	7.2	Junction; turn left onto Gillis Lake road.
	9.8	Junction; turn left.
	12.4	Turn-off (sharp right) onto Coxheath mine road.
	13.6	Mine dumps and shaft at crest of ridge.

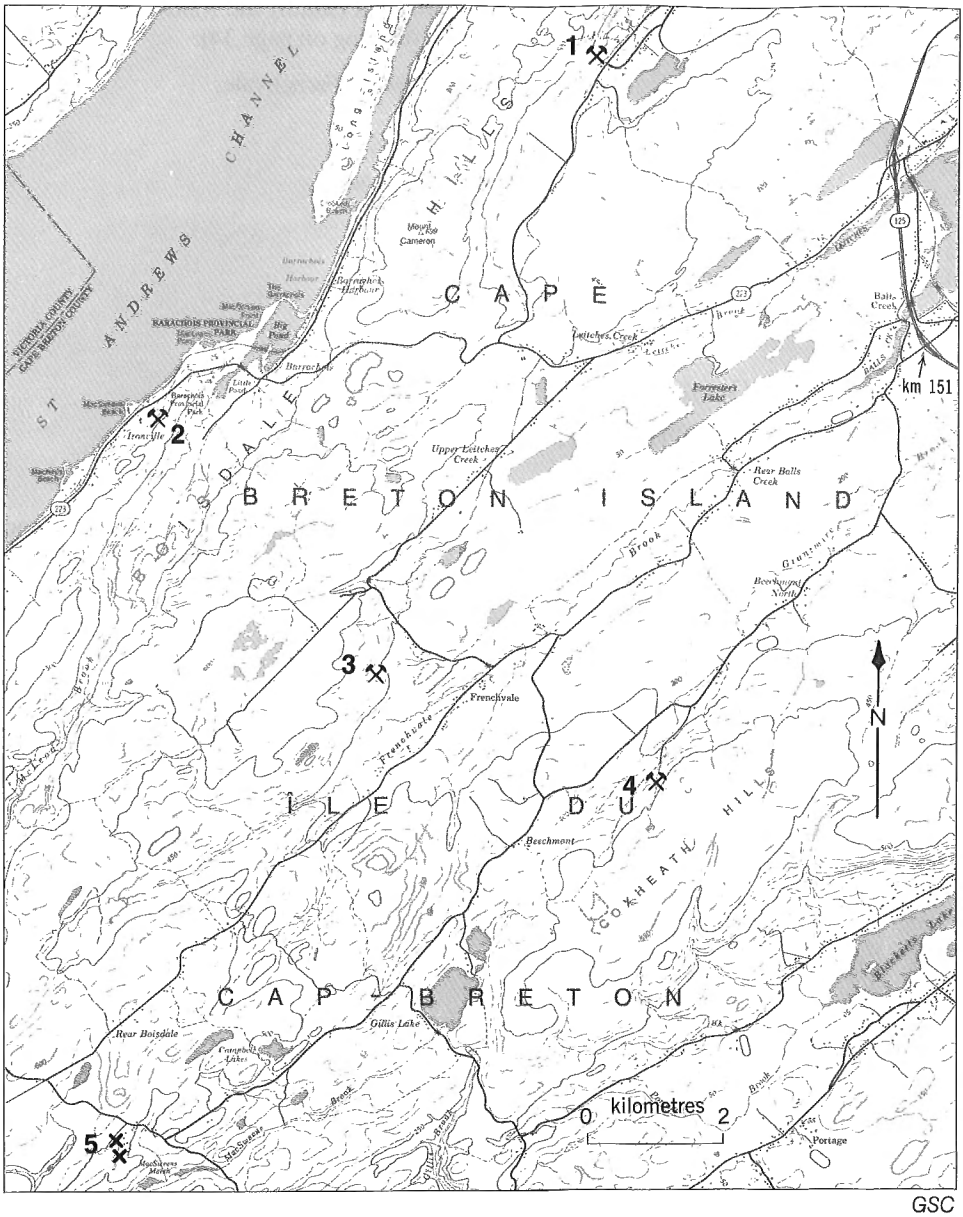
Refs.: 12 p. 95-96; 24 p. 368-379.

Maps: (T): 11 K/1 Sydney.
(G): 360A Sydney (West half, 1:63 360).

Frenchvale Dolomite Quarry

DOLOMITE, PYRITE, ARSENOPYRITE, CHLORITE.

Crystals of pyrite and arsenopyrite, and chlorite flakes occur in greyish blue dolomite. The deposit, owned by Mosher Limestone Company Limited, was operated to supply dolomite to the steel plant at Sydney.



Map 5. Boisdale Hills area. 1. Scotch Lake quarry, 2. Ironville iron mine, 3. Frenchvale dolomite quarry, 4. Coxheath mine, 5. Steele Crossing occurrences.

Road log from Highway 125:

km		
	0	Junction, Frenchvale road; turn right (south) and follow the road log for Coxheath mine to km 7.2 (see road log on page 34):
	7.2	Junction; follow road on right toward Frenchvale.
	8.3	Junction; turn right.
	9.0	Turn-off (left) onto a single lane road.
	9.6	Quarry.

Maps: (T): 11 K/1 Sydney.
(G): 360A Sydney (West half, 1:63 360).

Steele Crossing Occurrences

HEMATITE, GALENA, SPHALERITE, PYRITE, CHALCOPYRITE.

In limestone.

A deposit of massive hematite was opened in the 1870s by a pit (30 m by 4.3 m); it is known as the Curry mine. Adjacent to it is an old shaft (21.3 m deep) which was sunk in 1909 into a lead deposit consisting of galena, brown sphalerite and some chalcopyrite and pyrite; it is known as the Rear Boisdale mine.

Road log from Highway 125:

km		
	0	Junction, Frenchvale road; turn right and proceed toward Coxheath mine.
	7.2	Junction, Gillis Lake road; follow road to Frenchvale.
	8.3	Junction, road to Frenchvale dolomite quarry; continue straight ahead.
	17.6	Crossroad; turn left onto McAdams Lake, East Bay road.
	19.1	Junction, trail leading south. Follow trail 400 m to Curry mine; continue 150 m southeast to Rear Boisdale mine.

Ref.: 1a p. 47; 19 p. 198; 35 p. 101-104.

Maps: (T): 11 K/1 Sydney
(G): 360A Sydney (West half, 1:63 360).

Limestone Point Limestone Quarry

GALENA, CALCITE, CONCRETIONS, FOSSILS.

In limestone of Mississippian age.

Patches of finely crystalline galena and fluorescent calcite (pink under 'short' rays) occur in dark grey limestone. Fossil fragments, weathering to a light grey, and nodular limestone concretions about 3.5 cm across are numerous in some of the beds. The quarry was a small-scale operation and has not been worked for many years.

Road log from Highway 125:

km		
	0	Junction, Frenchvale, Point Edward roads; turn north toward Point Edward.
	1.2	Junction; follow road on left.
	3.8	Junction; continue straight ahead.
	4.1	Limestone quarry on right.

Maps: (T): 11 K/1 Sydney.
(G): 360A Sydney (West half, 1:63 360).

Point Edward Limestone Quarry

CALCITE, FOSSILS.

In limestone of Mississippian age.

White and pink calcite occurs as irregular patches in dark grey limestone. The white calcite fluoresces pink when exposed to shortwave ultraviolet light. Some of the limestone beds are oolitic and contain fossil fragments. The quarry, last worked in 1943, supplied limestone for use as a flux at the steel plant in Sydney.

Road log from Highway 125:

km		
	0	Junction, Frenchvale, Point Edward roads; turn left and follow directions for limestone Point quarry (see above road log).
	3.8	Junction, turn right.
	4.6	Turn left onto quarry road.
	4.8	Quarry.

Ref.: 15 p. 30-33.

Maps: (T): 11 K/1 Sydney.
(G): 360A Sydney (West half, 1:63 360).

km 168 Sydney, at junction of Highway 4.

SYDNEY – AMHERST

The main road log follows Highway 4.

Ashby Clay Pit

FIRECLAY, FOSSILS.

In sandstone and shale of Pennsylvanian age.

White to grey and brown fireclay associated with coal fragments occurs beneath beds of red sandstone and grey shale. Fossil plant fragments are found in the sandstone.

Road log from Highway 4 at Sydney:

km		
	0	Esplanade Street (Highway 4) and Townsend Street; proceed east along Townsend Street.
	1.2	Turn right onto Terrace Street.
	2.2	Clay pit on left.

Maps: (T): 11 K/1 Sydney
(G): 361A Sydney (East half, 1:63 360).

Mainadieu Ornamental Rock

FELSITE BRECCIA, EPIDOTE.

Shoreline exposures.

The breccia is composed of irregular fragments of various colours and sizes in a fine-grained matrix. The most common varieties include: 1) pale to bright green fragments in a deep red, lavender, or purple matrix; 2) pink in a purple matrix; and 3) deep red, dark green to black fragments in a pale to deep green matrix. Much of the rock is cut by veins of white quartz and green epidote. Pebbles of epidote with white quartz and/or pink feldspar are common along the beach. Both the epidote and the breccia are colourful, attractively patterned and, since they take a good polish, could be used as an ornamental stone. The breccia is cut by numerous joints so that large blocks (more than 60 cm square) are not generally available. A polished block of the breccia from Scatari Island is displayed at the Provincial Museum in Halifax.

The breccia is exposed along the north shore of Mainadieu Bay to Moque Head, along the north shore of the peninsula to Neal Cove in Mira Bay, and along the shores of Scatari Island, about 3 km east of Mainadieu.

Road log from Sydney:

km		
	0	Junction, George Street (Highway 22) and Highway 125; proceed south onto Highway 22.
	23.0	Junction, road to Mainadieu; turn left.
	34.7	Mainadieu, at intersection of the shore road; turn left.

km 35.2 End of road; walk down to shore, then turn left. The rock is exposed along low cliffs.

Ref.: 29 p. 203-205.

Maps: (T): 11 J/4 Glace Bay.
(G): 362A Glace Bay (1:63 360).
1088A Louisburg (1:63 360).

Eagle Head Mine

CHALCOPYRITE, BISMUTHINITE, PYRITE, BROCHANTITE, MALACHITE, LANGITE, DEVILLINE, QUARTZ, CALCITE.

In quartz veins cutting volcanic breccia.

Bismuthinite occurs as acicular crystals and as flaky, platy, or fine-grained masses in quartz, generally occupying cavities with quartz crystals (up to 1 cm long). Patches of massive pyrite and chalcopyrite are commonly associated with the bismuthinite. Secondary copper minerals forming coatings on the surface of specimens include: bright green, vitreous brochantite as crystalline aggregates; dull, blue-green to green, botryoidal crusts of malachite; langite, as blue translucent flaky masses; and devilline, as blue transparent platy and fine-grained masses. Each mineral is intimately associated with one or more of the others. Zincian malachite – was identified. The calcite fluoresces pink under 'short' ultraviolet rays and yellow under the 'long' rays.

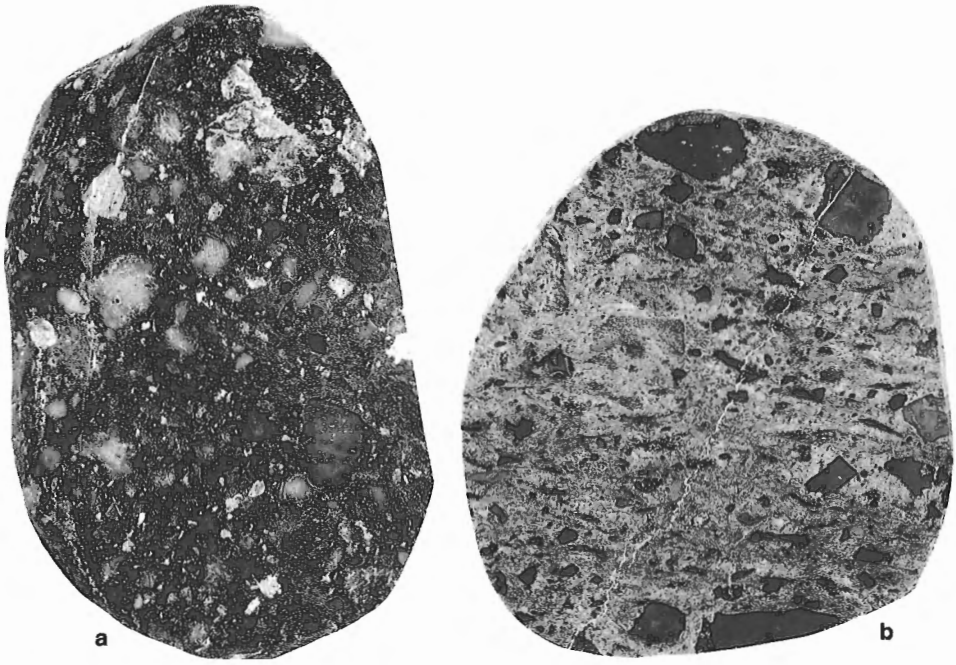
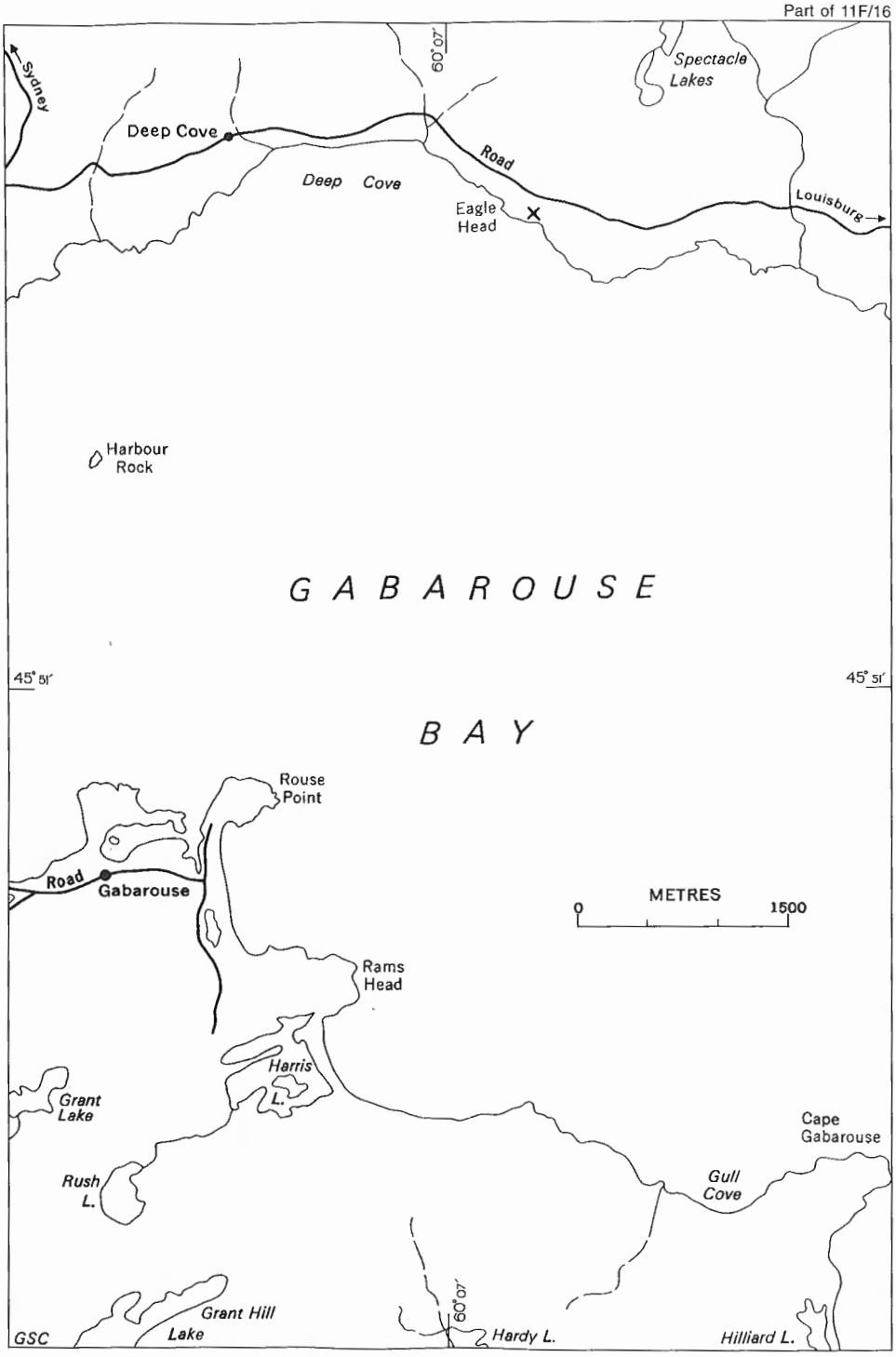


Plate XV

Felsite breccia pebbles, Mainadieu, Cape Breton Island, Nova Scotia. ((**a**) GSC 113051-E, (**b**) GSC 113051-C)



Map 6. Eagle Head copper mine.

The deposit was worked for copper in 1880 and was prospected at various times since that time. A water-filled shaft, 23 m deep, and a dump are on the property now.

Road log from Sydney:

km		
	0	Junction, George Street (Highway 22) and Highway 125; proceed south along Highway 22.
	23.0	Junction, road to Mainadieu; continue along Highway 22.
	32.2	Louisbourg, at bridge.
	35.2	Junction, road to Louisbourg National Historic Park; continue straight ahead.
	45.0	Mine, in woods near shore on left. Walk down about 100 m.

Ref.: 34 p. 104.

Maps: (T): 11 F/16 Mira.
(G): 1026A Southeastern Cape Breton Island (1:126 720).
1056A Mira (1:50 000).

The main road log from Sydney to Amherst begins.

km	**0**	Junction highways 125 and 4; proceed along Highway 4 toward Port Hastings.
km	**32.5**	Big Pond; junction road to Loch Lomond.

McVicar Property

HEMATITE, GOETHITE, HAUSMANNITE, BRAUNITE, QUARTZ, CALCITE.

In limestone.

Hematite, goethite, hausmannite and braunite are intimately associated, producing a fine-grained, dense mass that breaks with an irregular to conchoidal fracture and is cut by tiny quartz and calcite veinlets. Tiny, colourless to yellowish and dark brown quartz crystals occur in small cavities in the specimens.

The deposit was exposed prior to 1914 by pits (now filled). A small dump remains on the property.

Road log from Highway 4:

km		
	0	Big Pond; turn left (south) onto the road to Loch Lomond.
	9.2	Junction; continue straight ahead.
	9.6	Junction; follow road on left toward Loch Lomond.
	13.5	Junction, McVicars road; continue straight ahead.
	13.7	Farm lane on right. The pits are about 150 m north.

Ref.: 34 p. 107.

Maps: (T): 11 F/15 Grand Narrows.
(G): 1040A Grand Narrows (1:63 360).

km **47.8** Irish Cove, at the bridge over MacNeil Brook.

Irish Cove Limestone Quarry

SHELL LIMESTONE.

The rock is porous, light brown to grey, and is composed of marine shells (spire-bearing brachiopods, gastropods, conularids, cephalopods, bryozoans, and corals) cemented by limestone. The interior of the shells is commonly lined with transparent, tiny calcite crystals, which fluoresce pale yellow when exposed to ultraviolet rays. The limestone was deposited during Mississippian time.

The quarry, on the left (south) side of the highway, was opened in 1963 by Mosher Limestone Company Limited to supply limestone to the steel plant in Sydney.

Maps: (T): 11 F/15 Grand Narrows.
(G): 1040A Grand Narrows (1:63 360).

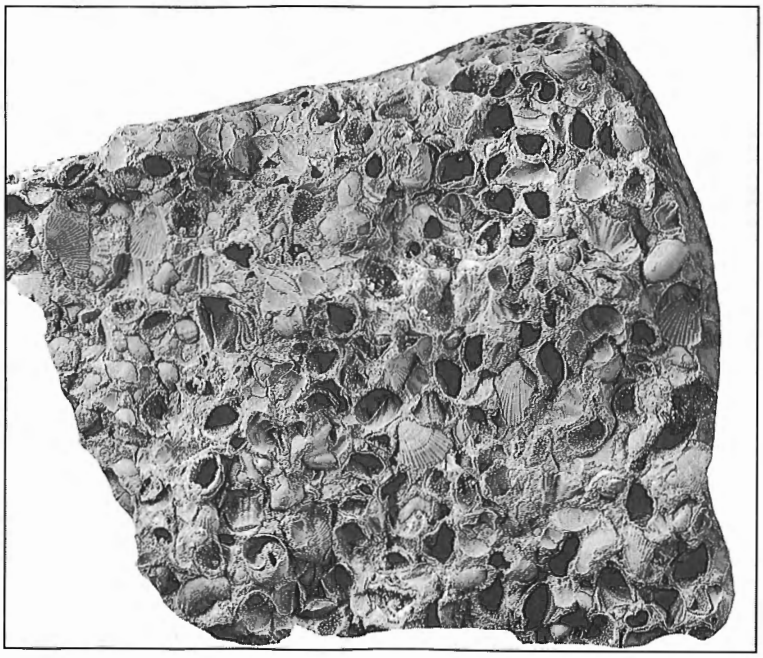


Plate XVI

Shell limestone, Irish Cove, Cape Breton Island, Nova Scotia. (GSC 113051-D)

km **53.6** Road-cuts.

SHELL LIMESTONE.

The rock, similar to the limestone quarried at Irish Cove, is exposed by road-cuts on the left (east) side of the highway.

Maps: (T): 11 F/15 Grand Narrows.
(G): 1040A Grand Narrows (1:63 360).

km **68.2** Soldiers Cove; junction, road to Grand River.

Stirling (Mindamar) Mine

GALENA, PYRITE, CHALCOPYRITE, SPHALERITE, BARITE, CHLORITE, DOLOMITE, CALCITE, GYPSUM, TALC.

In sericite – carbonate rocks.

The sulphides occur as fine-grained patches, streaks, and bands. Pyrite crystals measuring up to 5 mm across are common in pale to deep green translucent chlorite. Fine-grained massive white to light green talc is translucent and has a delicate appearance; it could be used for small sculptured objects. Colourful specimens of chalcopyrite with iridescent tarnish are available on the dumps. Some massive white dolomite contains vugs lined with transparent colourless dolomite crystals, which in some specimens are studded with tiny chalcopyrite crystals. The dolomite fluoresces pink under 'short' rays.

The deposit was worked for lead, zinc and copper by underground methods at intervals between 1925 and 1956. Remnants of old mine buildings and numerous dumps remain on the property.

Road log from Highway 4:

km		
	0	Soldiers Cove; turn left onto the road to Grand River.
	9.5	Grand River in front of bridge; turn left and cross the bridge.
	9.8	Crossroad; continue straight ahead.
	14.8	Crossroad; continue straight ahead.
	34.1	Junction; follow road on left.
	36.8	Crossroad; turn left.
	38.8	Stirling; turn left onto the mine road.
	39.0	Gate to the mine.

Ref.: 34 p. 98-101.

Maps: (T): 11 F/9 Framboise.
(G): 1037A Framboise (1:63 360).

km **97.5** Grand Anse; junction Highway 320.

Lennox Limestone Quarry

CALCITE, MARCASITE.

In limestone.

Calcite crystals (dog-tooth spar), measuring 5 to 10 cm long, form aggregates with grey to yellow metallic marcasite, which has a radiating internal structure and weathers dark brown.

These minerals occur in a gossan zone in limestone.

Barite and arsenopyrite have been reported (personal communication, F.S. Shea). The quarry, abandoned for many years, is now partly overgrown.

Road log from Highway 4 at the junction with Highway 320:

km		
	0	Grand Anse; proceed south along Highway 320.
	1.8	Junction at Louisdale; turn right, continuing along Highway 320.
	7.4	Junction; turn left, continuing along Highway 320.
	10.9	Junction, road to Lochside; continue straight ahead.
	11.1	Turn left onto a single lane road (not recommended for automobiles).
	12.1	Lighthouse. Walk along the shore to the left (west) of the lighthouse for about 100 m to a path leading up a low hill. Quarry is to the left of the clearing at the top of the hill.

Maps: (T): 11 F/11 Port Hawkesbury.
(G): 204 Saint Peter (Map-sheet 21, 1:63 360).

km **112.8** Cleveland; junction, road to West Bay, Marble Mountain.

Marble Mountain Quarry

CALCITE, AMPHIBOLE, PYRITE, PYRRHOTITE, SPHALERITE, CHLORITE, MICA.

In crystalline limestone.

Most of the limestone is white and coarsely crystalline. Less common is limestone banded and streaked with pale green, pink, yellow, and grey; this variety may have possibilities for use as an ornamental stone. Minerals associated with the limestone are: coarsely crystalline fluorescent white and pink calcite (fluoresces bright pink under 'short' rays, paler pink under 'long' rays); yellow chlorite and mica aggregates; green granular amphibole forming tiny veinlets; and tiny grains of pyrite, pyrrhotite, and sphalerite. Olivine and serpentine were previously reported from the deposit. The limestone is of Cambrian age.

The limestone was quarried between 1873 and 1922 for the manufacture of quick lime for building stone and flux.

Plate XVII

Limestone quarry, Marble Mountain, Cape Breton Island, Nova Scotia, 1964.

Road log from Highway 4:

km		
	0	Cleveland, turn right (north) onto the road to West Bay, Marble Mountain.
	6.9	Junction; follow road on left.
	7.6	Junction, road to West Bay Road; continue straight ahead.
	8.0	Junction; follow road on left.
	10.6	Intersection; turn left.
	26.7	Marble Mountain quarry on left.

Refs.: 16 p. 77-80; 18a p. 55.

Maps: (T): 11 F/14 Whycocomagh.
(G): 1212A Whycocomagh, Nova Scotia (1:63 360).

km	**130.0**	Port Hastings; junction, Highway 105.
km	**154.6**	Monastery; junction, Highway 16.

Manchester Iron Deposit

HEMATITE (SPECULARITE), QUARTZ, CALCITE.

In quartzite and sandstone.

Specular hematite occurs as leafy aggregates in white quartz containing cavities lined with small quartz crystals (up to 2 cm long) and flaky specularite. A few specimens are available from a small dump in the woods. Along the cliffs at the shore below the old mine, the sandstone is cut

by vertical veins (up to 30 cm wide) filled with calcite crystals up to 15 cm long. The crystals fluoresce bright pink under 'short' ultraviolet rays. Specularite is associated with the calcite and with quartz veins (about 5 cm wide) cutting the sandstone.

The deposit was discovered in 1881 and worked in 1895. The openings consist of a shaft and some pits.

Road log from Highway 4:

km		
	0	Monastery; proceed south along Highway 16.
	24.1	Boylston; turn left onto road to Glenkeen, South Manchester.
	26.4	Junction; follow road on right.
	29.0	Junction; follow road on left.
	29.6	Junction; follow road on right.
	30.2	Fishing hut on right. Walk down to the shore, then turn left (east) and walk along the beach for about 400 m to the calcite veins. Visit this locality at low tide.
	30.9	Junction of a partly overgrown logging road on left. Follow this road for about 50 m, turn left and proceed up a hill through a partly cleared area for another 50 m. The old mine dump is on top of the hill at the base of evergreen trees.

Ref.: 9 p. 125-126.

Maps: (T): 11 F/6 Chedabucto Bay.
(G): 3-1959 Chedabucto Bay (1:63 360).

Erinville (Burns) Mine

HEMATITE (SPECULARITE), PYRITE, QUARTZ.

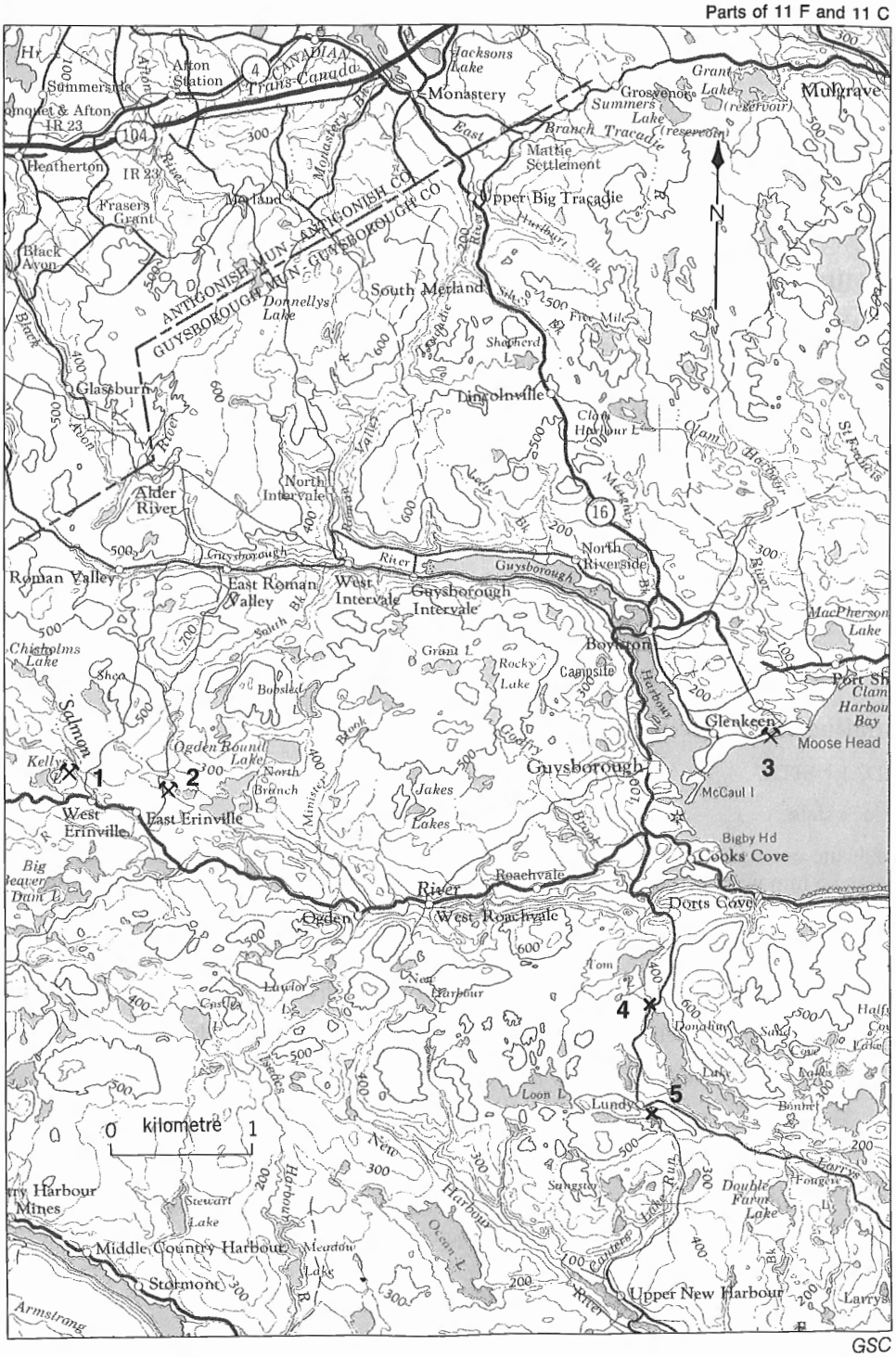
In volcanic rocks.

Spectacular specimens of almost pure specularite can be obtained from the mine dump. Specularite occurs as masses of fine unconsolidated flakes and as flaky to leafy aggregates associated with pyrite, massive white quartz, and drusy quartz crystals. It has a very high metallic lustre.

The deposit was opened by a shaft and pits and worked for iron in the 1870s and in 1900. The workings are now inaccessible.

Road log from Highway 4:

km		
	0	Monastery; proceed south along Highway 16.
	24.1	Boylston; junction, road to Glenkeen. Continue toward Guysborough.
	31.0	Guysborough, at post office; continue along Highway 16 through town.
	34.4	Junction, road leading south toward Erinville and Lundy; turn right.
	34.6	Junction; follow road on right toward Erinville.
	53.9	Junction; follow road on right.
	55.8	Junction; follow road on right.



GSC

Map 7. Guysborough area. 1. Erinville Black granite quarry, 2. Erinville (Burns) mine, 3. Manchester iron deposit, 4. Donahue Lake occurrence, 5. Lundy road-cut.

km		
	57.6	Clearing on right. Walk along the edge of a wooded area for about 50 m from the road; turn right onto an overgrown path leading through the woods for about 100 m to the dump and old shaft among the trees.

Ref.: 9 p. 132; 19 p. 181.

Maps: (T): 11 F/5 Guysborough.
(G): 3-1959 Guysborough (1:63 360).

Erinville 'Black Granite' Quarry

DIABASE.

The rock is black and fine grained. It was quarried for use as a building stone.

Road log from km 55.8 of the log to Erinville Mine (see above road log):

km		
	55.8	Junction; follow road on left.
	58.9	Junction; follow road on right.
	59.7	Junction; turn left onto Sullivan's road.
	60.7	Quarry at the side of a hill on left.

Maps: (T): 11 F/5 Guysborough.
(G): 27-1961 Guysborough (1:63 360).

Donahue Lake Occurrence

ANDALUSITE.

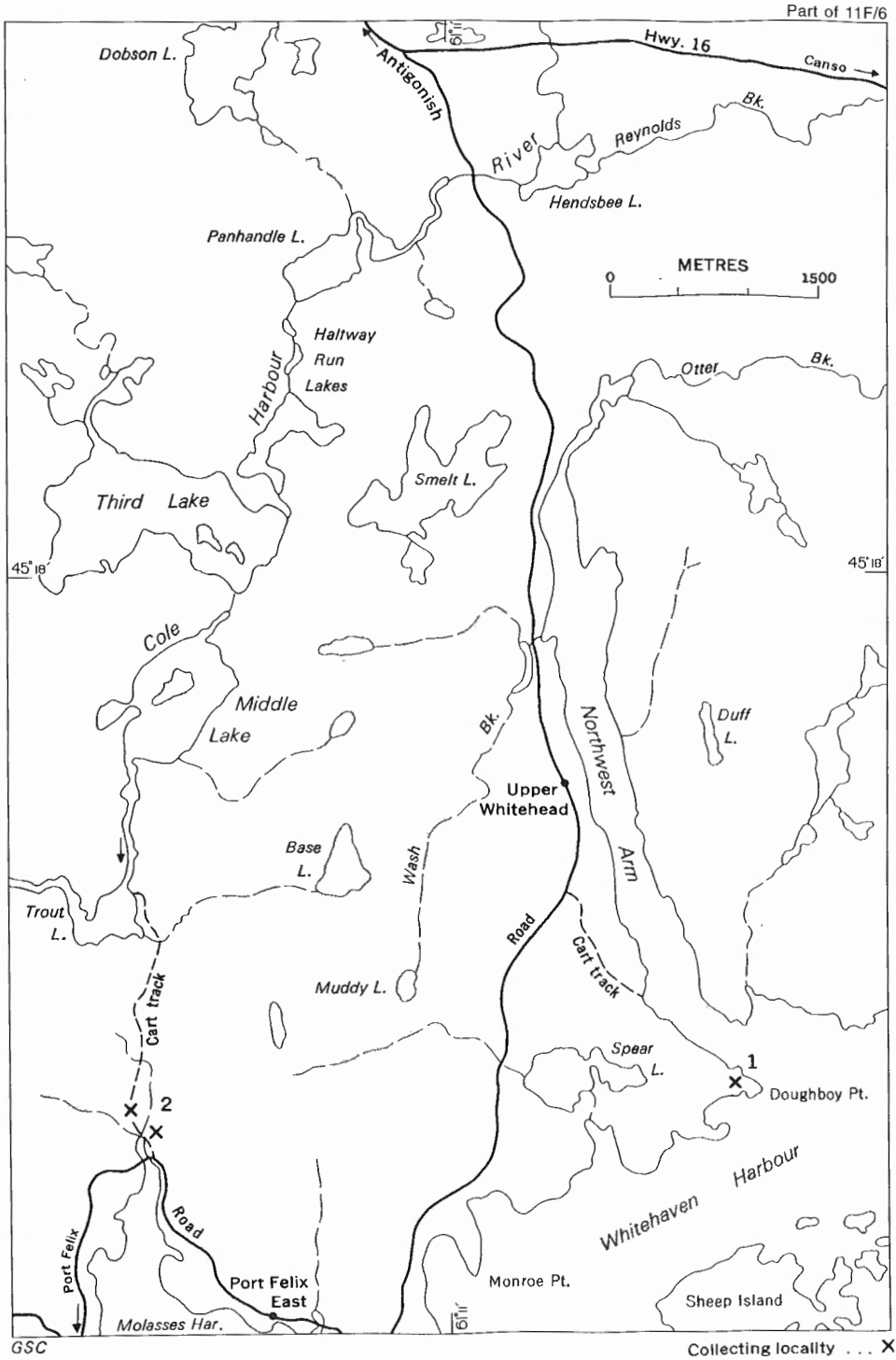
In black slate.

Andalusite occurs as pink to yellowish brown transparent prismatic crystals averaging 4 cm long and 5 mm wide. The largest crystals measure 8 cm by 1 cm. The andalusite-bearing slate is exposed along the east side of the river at the north end of Donahue Lake.

Road log from Guysborough:

km		
	0	Guysborough post office; proceed south through town along Highway 16.
	3.4	Junction, road leading south toward Erinville, Lundy; turn right.
	3.55	Junction; follow road on left toward Lundy.
	5.8	Bridge over Salmon River; turn left after crossing bridge.
	6.8	Junction; follow road on right.
	10.9	Bridge at Donahue Lake. The andalusite-bearing slate is exposed is along the river bank, north of the bridge.

Maps: (T): 11 F/5 Guysborough.
(G): 27-1961 Guysborough (1:63 360).



Map 8. Andalusite occurrences. 1. Doughboy Point; 2. Port Felix.

Lundy Road-cut

ANDALUSITE, GARNET.

In dark grey schist.

Andalusite, partly altered to mica, occurs as opaque, dull black prisms averaging 2 cm long and 3 mm across. Dull red, fine-grained massive patches of garnet mixed with quartz are found in the same rock.

Road log continuing from Donahue Lake (see road log to Donahue Lake deposit, page 48):

km		
	10.9	Bridge at Donahue Lake; continue straight ahead.
	15.1	Junction at Lundy; turn right onto the road to New Harbour.
	15.6	Andalusite-schist road-cuts on both sides of the road.

Maps: (T): 11 F/5 Guysborough.
(G): 27-1961 Guysborough (1:63 360).

Doughboy Point Andalusite

ANDALUSITE, GARNET.

In light grey schist.

The andalusite occurs as stout prisms measuring up to 2 cm long and 1 cm across and, less commonly, as cruciform twins. The crystals are dull black, opaque, and partly altered to mica; they are prominent on the weathered surface of the rock. Garnet mixed with quartz forms pink transparent granular masses in the schist. The rock is exposed along the shore and in prospect pits at Doughboy Point, Whitehead Harbour.

Road log from Guysborough:

km		
	0	Guysborough post office; proceed south through town along Highway 16.
	3.4	Junction, road to Erinville, Lundy; continue along Highway 16.
	31.7	Junction road to Whitehead; turn right (south).
	38.1	Upper Whitehead School on left and junction, road to shore; turn left.
	38.5	End of road. Doughboy Point.

Maps: (T): 11 F/6 Chedabucto Bay.
(G): 3-1959 Chedabucto Bay (1:63 360).

Port Felix Andalusite

ANDALUSITE, GARNET, MAGNETITE, CHLORITE.

In light grey schist.

This occurrence of andalusite and garnet is similar to the deposit at Doughboy Point. Magnetite occurs as tiny, black specks, chlorite as green flaky streaks in the schist. The schist is exposed along a stream near Port Felix.

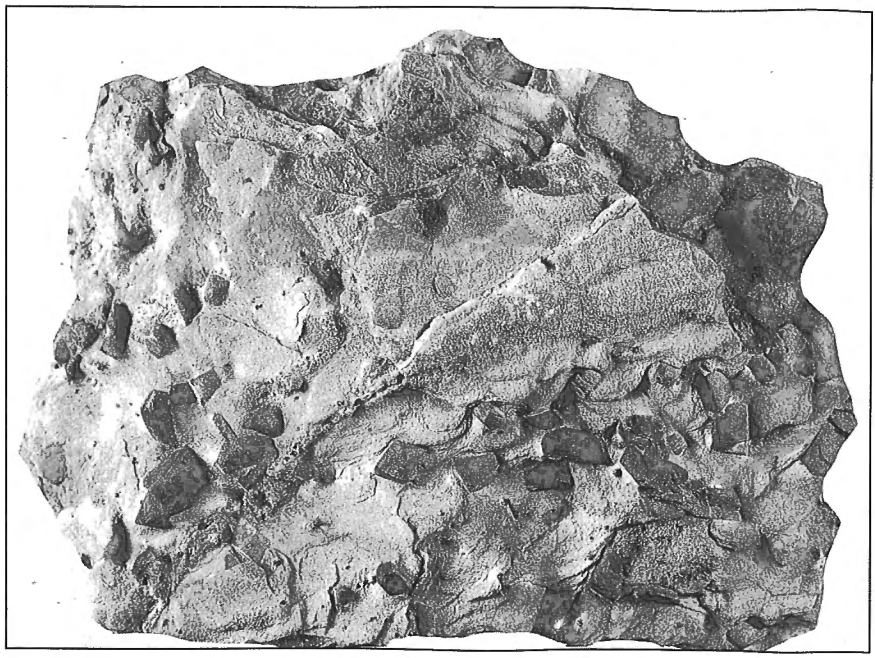


Plate XVIII

Anadalusite crystals in schist, Port Felix, Nova Scotia. (GSC 113051-B)

Road log continuing from the Upper Whitehead school house (see road log on page 50):

km		
	38.1	Continue straight ahead along the road to Whitehead.
	41.7	Junction road to Whitehead; proceed along road leading west.
	44.1	Bridge. Proceed north along the east side of the stream to the first exposures, about 100 m from the bridge.

Maps: (T): 11 F/6 Chedabucto Bay.
(G): 3-1959 Chedabucto Bay (1:63 360).

km	**189.8**	Antigonish, corner of Hawthorne Street (Highway 245) and Main Street (Highway 4). From here to Sutherland River, the road log follows Highway 245.

Cribbons (Crebbing) Point

FOSSILS, BARITE, PYRITE, CALCITE, JAROSITE, COAL, GYPSUM.

In reddish brown sandstone and grey conglomerate.

The cliffs expose fossil tree trunks (the largest measured about 1.2 m by 20 cm) and plant fragments, which have been converted to coal and partly replaced by fine-grained pyrite, calcite, and, less commonly, by platy aggregates of pink barite. Yellow to brown ochreous jarosite coats

some of the plant remains and the surrounding rock. The calcite is faintly fluorescent (pink under the 'short' ultraviolet rays). Gypsum is exposed along road-cuts and shorelines on the way to Cribbons Point. The fossils are of Upper Carboniferous age.

Road log from Antigonish:

km		
	0	Corner of Hawthorne and Main streets; proceed east along Main street.
	1.0	Intersection; continue straight ahead along the road to Cape George.
	7.1	Gypsum cliffs along the shore at right.
	7.25	Road-cut on right exposing gypsum.
	18.0	Junction, road to Cribbons Point; turn right.
	19.8	Wharf at Cribbons Point. The fossil-bearing rocks are exposed along cliffs to the left (east) of the wharf. Collect at low tide.

Maps: (T): 11 F/13 Cape George.
(G): 387 Cape George (Map-sheet 33, 1:63 360).
3-1970 Antigonish and Cape George (1:50 000).

km	**209.7**	Junction, Highway 245 and Highway 337; turn left (west) continuing along Highway 245.
km	**211.8**	Junction, Highway 245 and the road to shore.

Malignant Cove Shore

EPIDOTE, AGALMATOLITE, PSILOMELANE, HEMATITE, CALCITE.

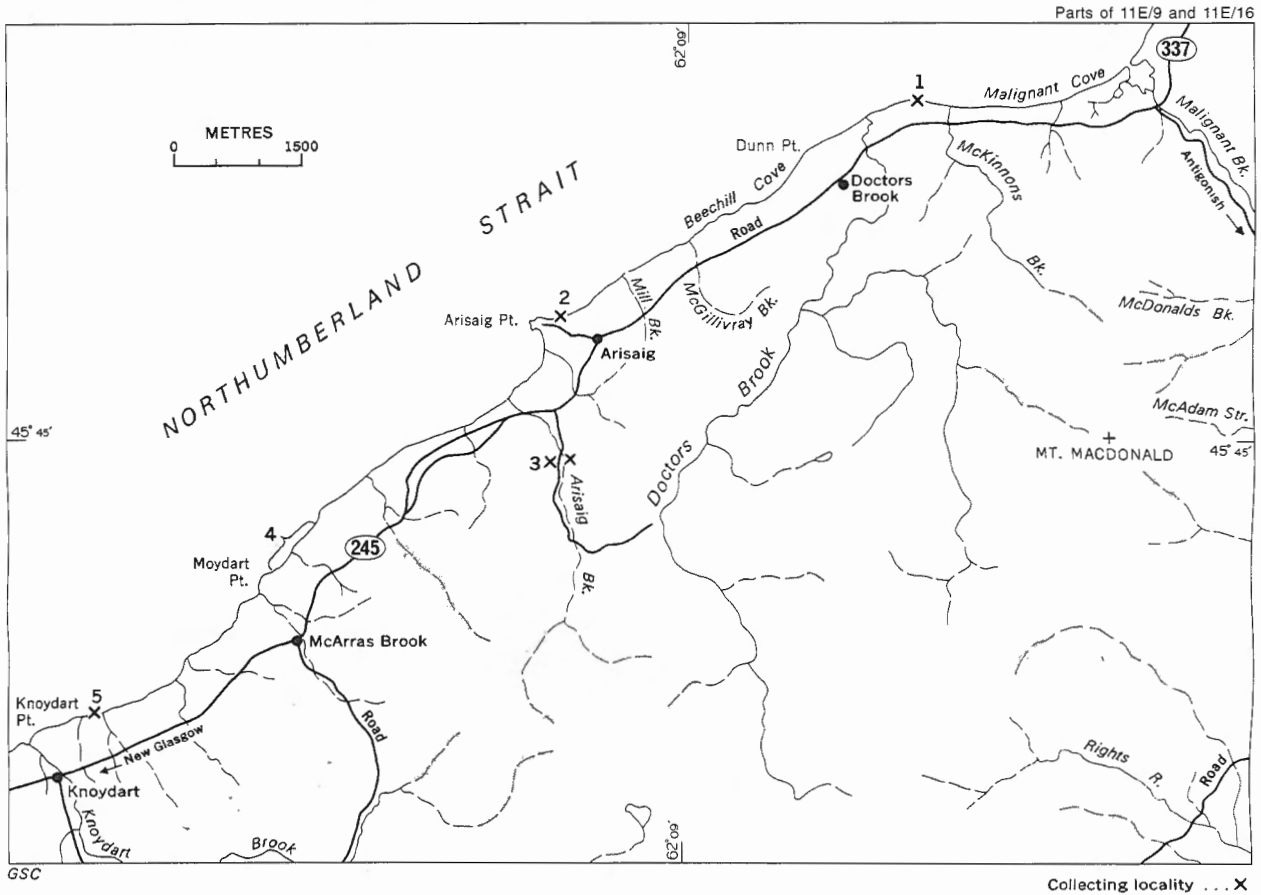
In volcanic rocks.

Crystalline to fine-grained massive epidote occurs as a coating up to 2 cm thick on dark grey volcanic rocks. It is often associated with massive white calcite; it is suitable for cutting into cabochons.

Agalmatolite, a compact, talc-like variety of mica containing quartz and/or feldspar, forms irregular masses and coatings varying in colour from greyish white, yellow, pink, to green; when found in sufficiently large specimens (not available at this locality) it is used for sculptured ornaments. In China it was used for carving into pagodas and other ornaments. Thin films of psilomelane and seams of reddish brown hematite occur in the volcanic rocks. Calcite associated with epidote and in amygdaloidal cavities fluoresces bright pink under 'short' ultraviolet rays.

From the junction at **km 211.8** proceed north 300 m to the shore; turn left (west) and continue 100 m to the rock exposures.

Maps: (T): 11 E/16 Malignant Cove.
(G): 137A Arisaig (1:47 520).
1361A Merigomish and Malignant Cove, Nova Scotia (1:50 000).



Map 9. Arisaig area; 1. Agalmatolite, Malignant Cove; 2. Quarry, Arisaig; 3. Iron, Arisaig Brook; 4. Fossils, Moydart Point; 5. Copper, Knoydart Point.

km **216.9** Arisaig; junction, road to wharf.

Arisaig Agalmatolite Quarry

AGALMATOLITE, QUARTZ, BARITE, HEMATITE.

In felsite.

Agalmatolite, a soft talc-like compact quartz-mica mixture, occurs as irregular patches up to 3 cm thick on grey, greyish-green, and greyish-pink, dense, opaque quartz. The agalmatolite is translucent to opaque in shades of pale to apple and deep green, yellow to greenish yellow, and less commonly, pink. Its attractive appearance makes it suitable for carving or other lapidary processes, but the size of most specimens limits its use for ornamental purposes. Vugs in the quartz and felsite are lined with tiny quartz crystals, which are commonly coated with a film of reddish brown hematite. Transparent, colourless, pink and white platy aggregates of barite, in places coated with fine powdery hematite, occupy cavities measuring up to 10 cm across. Deep brownish red hematite also occurs as earthy patches and as dendritic coatings on quartz and felsite.

The quarry was opened in about 1870 to mine the agalmatolite for ornamental purposes, but it was found that the quality of the material did not warrant production. The quarry is on the right (east) side of the road leading to the Arisaig wharf, at a point 500 m north of Highway 245.

Ref.: 13 p. 128.

Maps: (T): 11 E/16. Malignant Cove.
(G): 137A Arisaig (1:47 520).
1361A Merigomish and Malignant Cove, Nova Scotia (1:50 000).

km **217.9** Junction, MacDonald road.

Arisaig Brook Iron Deposit

HEMATITE, GOETHITE.

In shale of Silurian age.

The hematite has a grey metallic lustre and oolitic texture. Yellowish brown fine-grained massive goethite forms irregular patches on the hematite. Fossils occur in the hematitic rock.

The mine, consisting of two adits on either side of the steep banks of Arisaig Brook, was worked from 1893 to 1895. The adits are about 9 m above the MacDonald road at a point 650 m south of Highway 245. Specimens may be obtained from rock fragments along the slope below the adits.

Ref.: 19 p. 177-180.

Maps: (T): 11 E/9 Merigomish.
(G): 1361A Merigomish and Matignant Cove, Nova Scotia (1:50 000)
1749A Antigonish Highlands, Nova Scotia (1:50 000).

km **221.6** Junction, road to the shore.

Moydart Point Fossils

FOSSILS.

In greenish grey shale and sandstone of Silurian age.

Numerous species of marine fossils including trilobites, brachiopods, pelecypods, cephalopods, gastropods, ostracods, and vermes occur in the cliffs exposed along Northumberland Strait from Moydart Point east for about 550 m.

Access to the shore is a by dry-weather road, 0.6 km long, leading north from Highway 245 (at **km 221.6**) to the wharf at Moydart Point. The fossils are in the rock exposures east of the wharf.

Collect at low tide.

Ref.: 3 p. 34-35; 23 pp. 12-13.

Maps: (T): 11 E/9 Merigomish.
(G): 137A Arisaig (1:47 520).
1361A Merigomish and Malignant Cove, Nova Scotia (1:50 000).
1749A Antigonish Highlands, Nova Scotia (1:50 000).

km **224.5** Antigonish/Pictou county line.

Knoydart Point Copper

FOSSILS, COAL, PARATACAMITE, SPHALERITE, CALCITE, PYRITE.

In sandstone of Upper Carboniferous age.

Fossil plant fragments in sandstone have been converted into coal and partly replaced by black sphalerite, pyrite, and calcite (fluoresces bright pink when exposed to 'short' ultraviolet rays). Paratacamite forms a bright green crystalline to powdery coating on the copper-bearing plant fragments and on the sandstone. The largest fossil plant measured about 10 cm by 15 cm.

The rock is exposed along the shore of Northumberland Strait just west of the mouth of the first brook on the west side of the Antigonish/Pictou county line.

Maps: (T): 11 E/9 Merigomish.
(G): 137A Arisaig (1:47 520).
1361A Merigomish and Malignant Cove, Nova Scotia (1:50 000).
1749A Antigonish Highlands, Nova Scotia (1:50 000).

km	**250.9**	Sutherland River; junction, Highway 4. From here to Alma, the road log follows Highway 4.
km	**265.2**	New Glasgow, corner Marsh and Archimedes Streets.

Melmerby Beach

FOSSILS, PYRITE, QUARTZ, BARITE, JAROSITE, COAL.

In sandstone of Carboniferous age.

Coalified fossil plant fragments have been partly replaced by quartz and finely crystalline pyrite. Some tree trunks have been replaced by pink barite (Personal communication, J. Bingley). Fine powdery yellow to yellowish brown jarosite coats the fossils and enclosing rock.

The deposit is exposed along Northumberland Strait on the east side of the headland at the west end of Melmerby Beach. On the shore west of the headland, fossil trees mineralized with white and black calcite with concentric structure have been reported.

Road log from New Glasgow:

km	0	Corner Archimedes and Marsh streets; proceed north along Archimedes Street.
	0.5	Turn right onto George Street.
	0.55	Junction at church; proceed left and follow the signs to Melmerby Beach.
	15.4	Melmerby Beach; turn left (west) onto the road along the sand spit.
	17.2	Walk to the headland on right to reach the fossil-bearing rock exposures.

Ref.: 13 p. 98.

Maps: (T): 11 E/10 New Glasgow.
(G): 600 New Glasgow (1:63 360).

km	**274.4**	Alma; junction, Highway 6. From here to Amherst the road log follows Highway 6.
km	**299.8**	Bridge over Caribou River.
km	**300.0**	Junction, road to Caribou Island.

Caribou Copper Mine

FOSSILS, CHALCOCITE, CHALCOPYRITE, MALACHITE.

In grey sandstone of Carboniferous age.

The copper minerals are associated with the coalified fossil plants. Prospecting for copper was conducted as early as 1828 and more recently in 1916-17. Two very small dumps can now be seen on the property.

Road log from Highway 6:

km		
	0	Turn right (east) onto the road to Caribou Island.
	1.1	Culvert. Continue along the road for about 20 m to a partly overgrown lumber road on the right. Follow this road for 200 m through the woods to the dumps near the bank of Caribou River.

Ref.: 24 p. 365, 390.

Maps: (T): 11 E/15 Pictou Island.
(G): 608 Toney River (Map-sheet 45, 1:63 360).

km 346.0 Tatamagouche; junction, Highway 246.

Oliver Copper Deposit

The deposit is similar to the one at Caribou River; in addition to chalcocite mineralization in fossil plants, the copper ore occurred as cherry-sized nodules. The ore was mined on both banks of the French River by adits, shallow shafts and open cuts between 1857 and 1877, and in 1900. None of the mine workings are visible at present, but a few specimens can be seen in a small dump and in the rocks of the cliffs forming the river bank.

Road log from Highway 6:

km		
	0	Junction at Tatamagouche; proceed south along Highway 246.
	6.3	Oliver, junction road to Central New Annan; continue along Highway 246 toward West New Annan.
	6.5	Bridge over French River.
	6.8	Junction, farm road; turn right.
	6.9	Turn-off (right) to Mr. Lloyd Lepper's farm-house. The mine is on Mr. Lepper's property.

Ref.: 24 p. 365-66, 381.

Maps: (T): 11 E/11 Tatamagouche.
(G): 793 Tatamagouche (Map-sheet 59, 1:63 360).

Central New Annan Deposit

DIATOMITE.

In bottoms of lakes and ponds; in swampy areas.

The diatomite ranges in colour from white to pink, light green, grey, and brown. Drilling has revealed diatomite deposits in: Trout, Whippey, Black, Clear, Gard and Little Snare Lakes; in Silica, Lockerby, and Conkey ponds; and in neighbouring bogs.

Commercial operations to recover the diatomite were conducted between 1927 and 1940. It was used for filters, insulation, abrasives, and for the chemical construction industries. Specimens may be obtained from the surface around shrubs and grass at the site of old calcining plant and near a spring opposite Silica Lake.

Road log from km 6.3 of the road log to Oliver copper deposit (see preceding page):

km		
	6.3	Oliver; proceed to Central New Annan.
	9.4	Central New Annan; continue straight ahead toward East New Annan.
	17.3	Site of old calcining plant on right.
	18.1	Bridge over brook flowing into Silica Lake at left. The spring is just above the road on the right.

Refs.: 2a p. 107-123; 10 p. 57-61.

Maps: (T): 11 E/11 Tatamagouche.
(G): 793 Tatamagouche (Map-sheet 59, 1:63 360).

km 365.1 Wallace; junction, road to Wentworth Centre.

Tratt Property

CHALCOCITE, MALACHITE, PYRITE, FOSSILS.

In sandstone and conglomerate of Carboniferous age.

Chalcocite replaces fossil plant fragments that have been converted to coal; less commonly, it is found associated with nodules of pyrite. Bright green malachite coats the fossil plants and the host rocks, producing very attractive specimens. Some of the copper-bearing plant fragments are radioactive because of a slight uranium content. The ore from several deposits in the area have been stock-piled here on the former site of a copper smelter, now the Tratt farm.

Road log from Highway 6:

km		
	0	Wallace; proceed south along the road to Wentworth Centre (Highway 368).
	18.5	Wentworth Centre; junction, Highway 104. Continue straight ahead.
	18.7	Turn-off (right) onto the lane leading to the Tratt farm-house.

Ref.: 4 p. 309-323.

Maps: (T): 11 E/12 Wentworth.
(G): 796 Wentworth (Map-sheet 62, 1:63 360).

Palmer Mine

CHALCOCITE, MALACHITE, PYRITE, BORNITE, FOSSILS, COAL.

In shale of Carboniferous age.

Chalcocite, with minor amounts of malachite, pyrite, and bornite, occurs in coal-bearing fossil plant fragments and as solid fragments in the shale.

The mine was opened in 1898 on the north bank of the West Branch of Wallace River following the discovery of rich chalcocite float in the bed of the river. It was worked for a short period and is now inaccessible. Specimens are available from a dump on the south bank of the river (opposite the old mine) on the property of Mr. Ralph Tuttle.

Road log from Highway 6:

km		
	0	Wallace; proceed south toward Wentworth Centre.
	18.5	Wentworth Centre, at the junction of Highway 104; continue south.
	19.6	Turn right onto the road to Westchester Station.
	20.4	Tuttle farm-house on right. A 3 km trail leads to the mine.

Ref.: 2 p. 94-102.

Maps: (T): 11 E/12 Wentworth.
(G): 796 Wentworth (Map-sheet 62, 1:63 360).

km 380.7 Pugwash; turn-off (left) to the salt mine.

The Canadian Salt Company, Limited

Rock salt (halite) is crushed underground and brought to the surface where it is stored and refined. The mine has been in operation since 1959.

Maps: (T): 11 E/13 Pugwash.
(G): 795 Pugwash (Map-sheet 61, 1:63 360).

km 385.5 Junction, Conn's Mills road.

Pugwash Limestone Quarry

CALCITE, DOLOMITE, SPHALERITE, HEMATITE, FOSSILS, CONCRETIONS.

In Carboniferous limestone.

Tiny crystals of colourless calcite (dog-tooth spar) occupy cavities (up to 5 cm across) and the interior of concretions averaging 2 cm in diameter. The crystals, generally coated with a thin film or tiny spherules of brownish red hematite, fluoresce pink under 'short' ultraviolet rays and yellow under the 'long' rays. Tiny black sphalerite crystals occur sparingly in massive white calcite. Coarsely crystalline white dolomite and a few fossil shells were also noted. The quarry, now inactive, was worked for limestone, which was used in road building and for agricultural purposes. It is on the left (east) side of the Conn's Mills road at a point 2 km south of its junction with Highway 6.

Ref.: 15 p. 51-55.

Maps: (T): 11 E/13 Pugwash.
(G): 795 Pugwash (Map-sheet 61, 1:63 360).

km **391.1** Port Howe; junction, road to Beckwith, Mansfield.

Dickson Brook Celestine

CELESTINE, GALENA.

In red sandstone and shale.

Coarse crystal aggregates of translucent pale blue celestine occur with minor fine-grained patches of galena. The deposit was exposed by prospect pits (now filled in) on the north side of Dickson Brook on the C. Tower farm. A small dump remains near the pits.

Road log from Highway 6:

km		
	0	Port Howe; turn left onto the road to Beckwith, Mansfield.
	2.6	Junction; follow road on right.
	5.1	Farm lane on left leading to the C. Tower farm-house.

Maps: (T): 11 E/13 Shinimikas.
(G): 842A Shinimikas (1:63 360).

km **431.2** Amherst; junction, Highways 2 and 4.

CHARLOTTETOWN – ALBERTON

km **0** Charlottetown, intersection Grafton and Weymouth streets (junction Highways 1 and 2); the main roadlog follows Highway 2 toward St. Peters.

Gallas Point

FOSSILS, BARITE, QUARTZ, HEMATITE, CALCITE.

In sandstone and conglomerate of Permo-Carboniferous age.

Fossil tree trunks (averaging 10 cm across) replaced by granular and finely crystalline quartz, dull reddish brown to almost black fine-grained hematite, patches of pink platy barite, calcite (fluoresces yellow in ultraviolet light) and fine-grained pyrite, occur in the low sandstone cliffs exposed along the west shore of Gallas Point from the tip northward for about 2.5 km. The tree trunks, whose original structure is not generally well-preserved, are commonly flattened and have an over-all dull reddish to purplish brown colour; some surfaces are black with a high vitreous lustre, owing to a coating of tiny hematite-bearing quartz crystals. The largest trees reported from this locality measured 30 cm in diameter. Barite also occurs as platy aggregates on white crystalline calcite encrustations on grey sandstone. This calcite fluoresces bright pink when exposed to ultraviolet rays ('long' rays are more effective than 'short'). On the east shore of Gallas Point, the red sandstone and conglomerate contain streaks, patches, and nodules (up to 2 cm across) of very fine-grained cinnamon to purplish brown and almost black, dull to submetallic hematite, which in places is associated with carbonized plant remains.

Road log from Charlottetown:

km		
	0	Intersection Weymouth and Grafton streets; proceed along Grafton Street (Highway 1 East).
	18.3	Junction, Highway 3; continue along Highway 1.
	20.0	Junction, road to Earnscliffe; turn right (south).
	21.1	Junction at Cherry Valley church; turn right.
	26.4	End of road at shore. Bear right and walk west about 100 m to hematite-bearing rocks along the low cliff. The tip of Gallas Point is about 500 m south of these exposures. Collect here at low tide.

Ref.: 8 p. 9-10.

Maps: (T): 11 L/2 Montague.
(G): 33-1960 Montague (1:63 360).

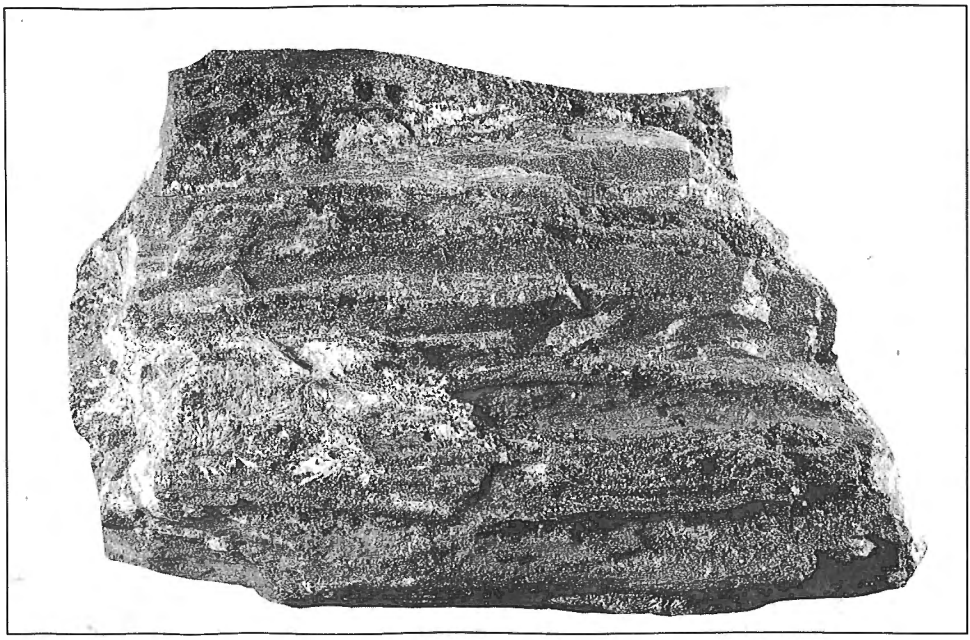
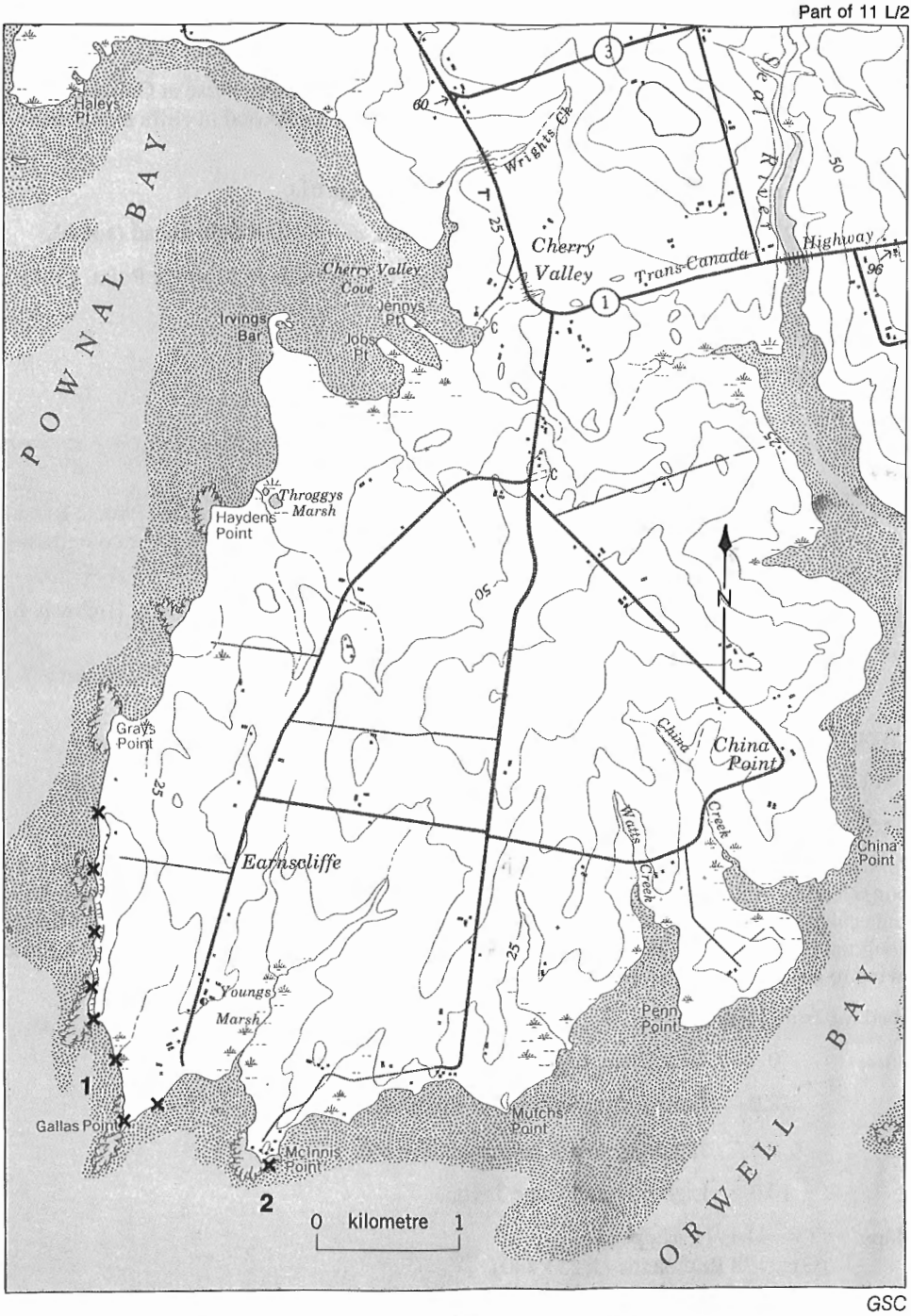


Plate XIX

A. Fossil tree trunk replaced by quartz, hematite, and barite, Gallas Point, Prince Edward Island. (GSC 113051-A)

B. hematite-bearing sandstone and conglomerate, Gallas Point, Prince Edward Island. (GSC 138678)



Map 10. Orwell Bay area. 1. Gallas Point, 2. McInnis Point

McInnis Point

FOSSILS, HEMATITE.

In red sandstone of Permo-Carboniferous age.

Hematite occurs as cinnamon-coloured or brown nodules similar to those at Gallas Point, and as a dull dark brown replacement of fossil plants. The rock is exposed in cliffs along the shore at McInnis Point.

Road log from km 21.1 of the preceding road log (see page 61):

km	21.1	Junction at Cherry Valley church; continue straight ahead (south).
	25.3	End of the road at shore. Trail on left leads to McInnis Point. Collect at low tide.

Maps: (T): 11 L/2 Montague.
(G): 33-1960 Montague (1:63 360).

km	**13.7**	Turn left onto Highway 6.
km	**24.9**	Prince Edward Island National Park. Proceed through the Park to Brackley Beach, then follow highways 15 and 6 to the North Rustico entrance to the Park, then via the Gulf Shore Drive to Cavendish.
km	**63.5**	Cavendish, junction of Highway 13. Continue west along Highway 6.
km	**75.1**	New London; junction, Highway 20.

Cape Tryon

CALCITE

In red sandstone.

Very fine grained white translucent calcite occurs as thin encrustations, as small (up to 2 cm long) slender cylindrical stems, and as veins about 1 cm wide. When exposed to ultraviolet rays some calcite fluoresces yellow and some fluoresces pink. The sandstone is exposed on the cliffs along the shore at the Cape Tryon lighthouse. The cliffs are steep and hazardous to descend owing to sea erosion of the rocks.

Road log from Highway 6:

km	0	New London; turn right (north) onto Highway 20.
	8.0	Junction, gravel road at bend; turn right.
	9.3	Junction, single lane road; turn left.
	10.3	Lighthouse at Cape Tryon.

Maps: (T): 11 L/12 Malpeque.
(G): 178 Buctouche (1:253 440).
6-1971 Malpeque (1:50 000).

km **86.4** Kensington; the main road log continues west along Highway 2.

km **90.4** Junction, road to Clermont.

Mills Point

CALCITE, FOSSILS, CONCRETIONS.

In sandstone and conglomerate of Permo-Carboniferous age.

The calcite is transparent, colourless, and occurs as partial replacement of fossil tree trunks and as irregular patches in concretions measuring up to 22-25cm across. The largest tree trunk was about 90 cm long and 15 cm in diameter; water-worn fragments from 20 cm long can be found on the beach. The original structure of the wood has not been preserved, possibly because the wood was decayed and perforated by burrowing animals before fossilization. The calcite fluoresces pink under 'short' ultraviolet rays and pale yellow under the 'long' rays. The rocks are exposed at low tide along the shore of Malpeque Bay on the west side of Mills Point.

Road log from Highway 2:

km		
	0	Junction, road to Clermont; turn right.
	2.9	Junction, Mills Point road; turn left.
	5.6	End of road. The shore is about 800 m from here; enquire at one of the farms regarding access through the property.

Ref.: 8 p. 18, 48.

Maps: (T): 11 L/5 Summerside.
(G): 178 Buctouche (1:253 440).
7-1971 Summerside (1:50 000).

km **94.3** Junction, road to Sherbrooke.

Malpeque Bay, South Shore

PARATACAMITE, CALCITE

In calc-shale breccia.

Paratacamite occurs as blue-green to bright green finely granular patches up to 2 cm across in red breccia. Fine-grained fluorescent calcite (pink under 'short' ultraviolet rays, pale yellow under 'long' rays) is associated with it. The breccia is exposed at low tide.

Road log from Highway 2:

km		
	0	Proceed west along the road to Sherbrooke.
	2.4	Sherbrooke; turn right onto the road to the shore.
	5.0	End of road at south shore Malpeque Bay. Proceed right (east) about 100 m to rock exposures along tidal flats.

Maps : (T): 11 L/5 Summerside.
(G): 178 Buctouche (1:253 440).
7-1971 Summerside (1:50 000).

km	**95.9**	Read's Corner; junction, Highway 1A; continue along Highway 2 through Summerside.
km	**150.3**	Junction, road to O'Leary.

MacWilliams Cove, Cape Wolfe

CALCITE, FOSSILS.

In sandstone and conglomerate of Permo-Carboniferous age.

Colourless, transparent calcite replaces fossil plant stems measuring a few cm long and about 1 cm wide. The calcite fluoresces pink ('short' ultraviolet rays) and yellow ('long' rays). Gold was reported from the conglomerates and from beach sands; in 1883, gold mining and milling operations were carried out at the Hughes and Peters mine, Cape Wolfe.

The fossil-bearing rocks are exposed between MacWilliams Cove and Cape Wolfe. Collect at low tide.

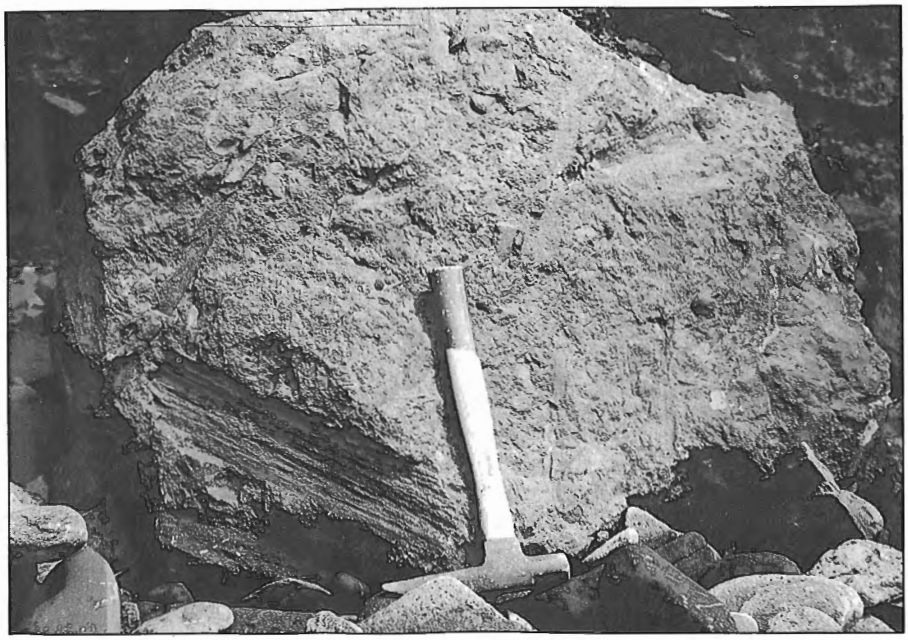
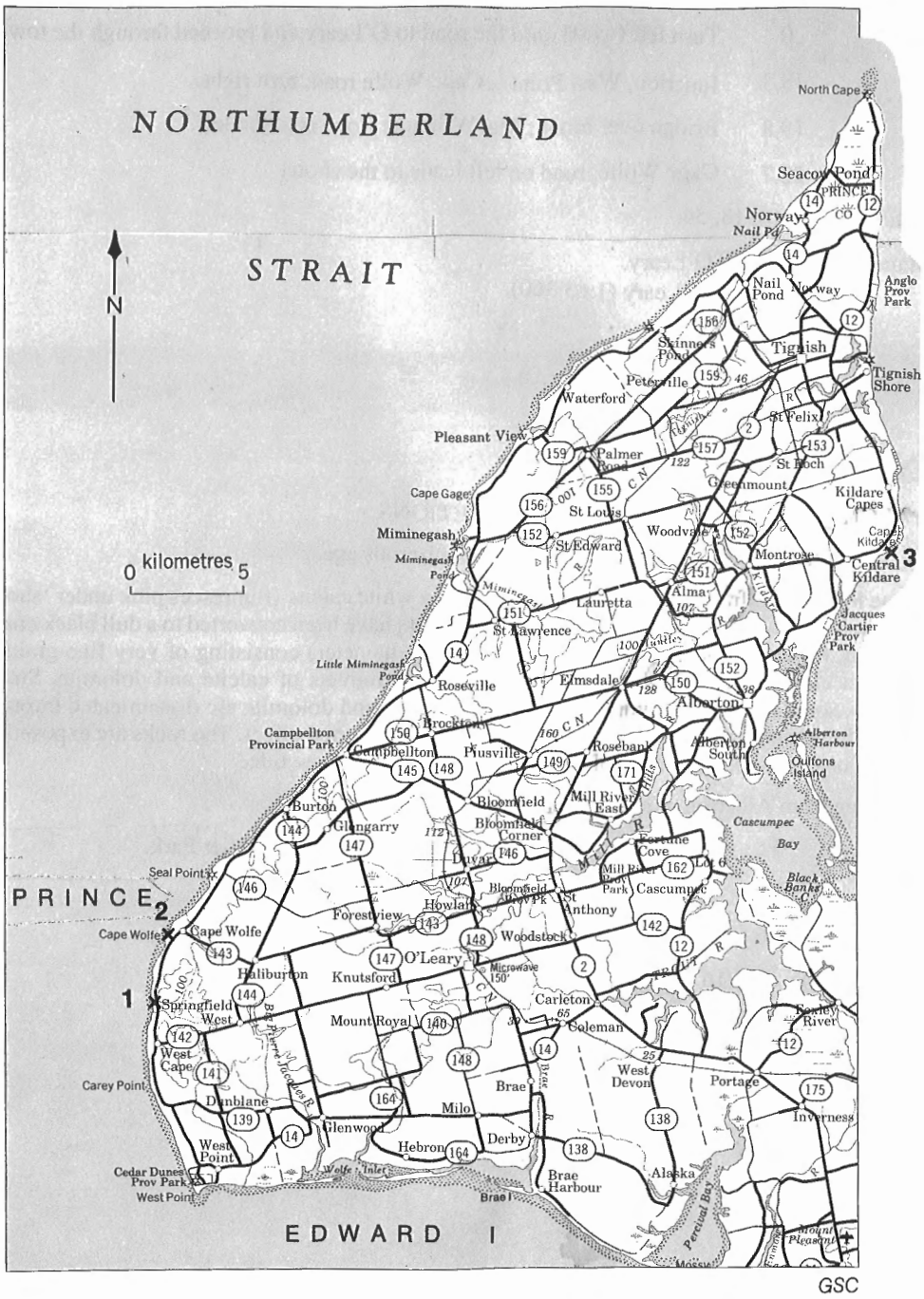


Plate XX

Imprints of fossil tree trunks in conglomerate, MacWilliams Cove, Prince Edward Island. (GSC 138681)



GSC

Map 11. Alberton area. 1. MacWilliams Cove, 2. Cape Wolfe, 3. Cape Kildare.

Road log from Highway 2:

km		
	0	Turn left (west) onto the road to O'Leary and proceed through the town.
	18.3	Junction, West Point – Cape Wolfe road; turn right.
	19.8	Bridge over brook; MacWilliams Cove is to the left.
	22.7	Cape Wolfe; road on left leads to the shore.

Ref.: 11 p. 14, 18, 34.

Maps: (T): 21 I/9 O'Leary.
(G): 49-6A O'Leary (1:63 360).

km 162.6 Junction road to Alberton.

Cape Kildare

CALCITE, DOLOMITE, FOSSILS, CONCRETIONS.

In sandstone and conglomerate of Permo-Carboniferous age.

Some fossil plant fragments have been replaced by white calcite (fluoresces pink under 'short' ultraviolet light, yellow under "long" rays) and others have been converted to a dull black coaly material. Rounded concretions (averaging 2 cm in diameter) consisting of very fine-grained compact clayey material with irregular masses and veinlets of calcite and dolomite. Small patches, some resembling cylindrical stems, of calcite and dolomite are disseminated through some of the sandstone and conglomerate, producing a mottled effect. The rocks are exposed in cliffs along the shore of Cape Kildare. Visit this locality at low tide.

Road log from Alberton at junction of highways 152 and 12:

km		
	0	Proceed along Highway 12 toward Jacques Cartier Park.
	8.8	Junction, road to shore; turn right.
	9.6	End of road. Walk north along shore to the cliffs.

Maps: (T): 21 I/16 Tignish.
(G): 38-1961 Tignish (1:63 360).

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GLOSSARY

Agalmatolite. Hydrous aluminum silicate. H = 2 1/2-3 1/2. The term has been used for a soft, compact, carvable variety of pinite (muscovite group), steatite or pyrophyllite. Also known as pagodite because it was used by the people of China for carving into pagodas and other images.

Andalusite. Al_2SiO_5. H = 7 1/2. Pink, mauve, brown, or green, nearly square prismatic crystals. Vitreous lustre. Usually formed by metamorphism of aluminous shale, slate. Clear, transparent andalusite is used as a gem stone. Also used in ceramic industry.

Andesite. Dark coloured volcanic rock composed of plagioclase feldspar together with amphibole and/or pyroxene.

Anhydrite. $CaSO_4$. H = 3-3 1/2. White, bluish or greyish with vitreous lustre. Usually granular, massive. Alters to gypsum by absorption of water. Distinguished from gypsum by its superior hardness. Used as a soil conditioner and for portland cement.

Arsenopyrite. FeAsS. H = 5 1/2-6. Light to dark grey metallic striated prisms with characteristic wedge-shaped cross-section; also massive. Tarnished to bronze colour. Ore of arsenic; may contain gold or silver.

Barite. $BaSO_4$. H = 3-3 1/2. White, pink, yellowish, blue tabular or platy crystals; granular massive. Vitreous lustre. Characterized by a high specific gravity (4.5) and perfect cleavage. Used in the glass, paint, rubber, and chemical industries, and in oil-drilling technology.

Bismuthinite. Bi_2S_3. H = 2. Dark grey striated prismatic or acicular crystals; also massive. Iridescent on tarnished surface. Ore of bismuth.

'Black Granite'. Commercial term for a variety of dark coloured building stones including diorite, gabbro, diabase.

Bornite. Cu_5FeS_4. H = 3. Reddish brown metallic. Usually massive and tarnished to iridescent blue, purple, etc. Ore of copper.

Braunite. Mn_7SiO_{12}. H = 6-6 1/2. Dark brown to black, dark grey. Massive with submetallic lustre.

Breccia. Rock composed of angular fragments. Breccias often are attractively patterned and coloured; when polished they can be used for ornamental objects.

Brochantite. $Cu_4(SO)_4(OH)_6$. H = 3 1/2-4. Vitreous emerald green acicular crystal aggregates; massive, granular. Secondary mineral formed by the oxidation of copper minerals. Distinguished from malachite by lack of effervescence in HCl.

Cabochon. A polished gemstone having a convex surface; translucent or opaque minerals such as opal, agate, jasper and jade are generally cut in this style.

Celestite. $SrSO_4$. H = 3-3 1/2. Transparent colourless, white or light blue tabular crystals; also fibrous, massive. Vitreous lustre. Perfect cleavage. Resembles barite but is not as heavy. Ore of strontium.

Cerussite. $PbCO_3$. H = 3-3 1/2. Transparent white, grey, or brownish tabular crystals with adamantine lustre; also massive. High specific gravity (6.5) and lustre are distinguishing features. Secondary mineral formed by oxidation of lead minerals. Ore of lead.

Chalcedony. SiO_2. H = 7. Translucent microcrystalline variety of quartz. Colourless, grey, bluish, yellow, brown, reddish. Formed from aqueous silica-rich solutions. Attractively coloured chalcedony is used for ornamental objects and jewelry. Agate is a patterned variety.

Chalcocite. Cu_2S. H = 2 1/2-3. Dark grey to black metallic; massive. Tarnishes to iridescent blue, purple, etc. Ore of copper.

Chalcopyrite. $CuFeS_2$. H = 3 1/2-4. Brass yellow, massive. iridescent tarnish. Brass colour is distinguishing feature. Ore of copper.

Chlorite. Hydrous silicate of Al, Fe, Mg. H = 2-2 1/2. Transparent, green flaky aggregates. Distinguished from mica by its colour and by the fact that its flakes are not elastic.

Chrysocolla. $(Cu,Al)_2H_2Si_2O_5(OH)_4 \cdot nH_2O$. H = 2-4. Blue to blue-green earthy, botryoidal, or fine-grained massive. Conchoidal fracture. Secondary mineral found in oxidized zones of copper-bearing veins. Often associated with quartz or chalcedony, producing attractive patterns suitable for use as jewelry and ornamental objects. Minor ore of copper.

Concretion. Rounded mass formed in sedimentary rocks by accretion of some constituent (iron oxides, silica, etc.) around a nucleus (mineral impurity, fossil fragment, etc.).

Conglomerate. Sedimentary rock formed of rounded pebbles or gravel.

Danburite. $CaB_2(SiO_4)_2$. H = 7. Transparent colourless, light yellow prismatic crystals; white nodules. Clear colourless danburite is used as a gem stone.

Devilline. $CaCu_4(SO_4)_2(OH)_6 \cdot 3H_2O$. H = 2 1/2. Bright green to bluish green transparent platy crystals forming rosettes or tiny masses. Associated with azurite, malachite on copper-bearing rocks; not readily distinguishable from other copper minerals in hand specimen.

Diabase. Dark coloured igneous rock composed mostly of lath-shaped plagioclase crystals and of pyroxene. Used as a building, ornamental and monument stone.

Diatomite. Pulverulent material composed of the siliceous remains of tiny organisms (diatoms), which accumulated at the bottoms of lakes and swamps in recent geological time. It is light weight and resembles chalk. Used for insulation, filtration, abrasives, absorbents, etc.

Diorite. Dark coloured igneous rock composed mostly of plagioclase feldspar with amphiboles or pyroxene. Used as a building and monument stone.

Epidote. $Ca_2(Fe, Al)_3SiO_4)_3(OH)$ H = 6-7. Yellowish green massive or fibrous aggregates. Vitreous lustre. Often associated with quartz and pink feldspar, producing attractive mottled or veined patterns. Takes a good polish and can be used for jewelry and other ornamental objects.

Felsite. Fine-grained, dense, light coloured volcanic rock composed mostly of feldspar. Conchoidal fracture.

Fluorescence. Property of certain substances to glow when exposed to light from an ultraviolet lamp. It is caused by impurities in the substance or by defects in its crystal structure. Two wave lengths are commonly used to produce fluorescence: long wave (3,200 to 4,000 Angstrom units); short wave (2,537 Angstrom units).

Fluorite. CaF_2. H = 4. Transparent, colourless, blue, green, violet, yellow cubic crystals; also granular massive. Vitreous lustre. Good cleavage. Often fluorescent; this property derives its name from this mineral. Used in optics, steel-making, ceramics.

Galena. PbS. H = 2 1/2. Dark grey metallic, cubic crystals; also massive with excellent cubic cleavage. Heavy (S.G.=7.58). Ore of lead; may contain silver.

Garnet. Silicate of Al, Mg, Fe, Mn, Ca.H = 6 1/2-7 1/2. Transparent red dodecahedral crystals or massive; also yellow, brown, green. Clear garnet is used as a gemstone. Also used as an abrasive.

Glauconite. Hydrous silicate of Al, Mg, Fe, K. H = 2. Usually green, earthy. Found in a variety of sedimentary rocks.

Goethite. FeO(OH). H = 5-5 1/2. Dark brown to yellowish brown earthy, botryoidal, bladed or massive. Has characteristic yellowish-brown streak. Weathering product of iron-rich minerals. ore of iron.

Gold. Au. H = 2 1/2-3. Yellow metallic irregular masses, plates, scales, nuggets. Rarely as crystals. Distinguished from other yellow metallic minerals by its softness, malleability, high specific gravity (19.3). Precious metal.

Gossan. Rusty weathered zone in rocks. Characterized by an abundance of alteration products of iron-bearing minerals (goethite).

Graphite. C. H = 1-2. Dark grey to black metallic flaky or foliated masses. Flakes are flexible. Greasy to touch. Black streak and colour distinguish it from molybdenite. Usually occurs in metamorphic rocks. Used as lubricant, 'lead' pencils, refractories.

Gypsum. $CaSO_4.2H_2O$. H = 2. White, grey, light brown; granular massive. Also fibrous (satin spar); colourless, transparent tabular crystals (selenite). Distinguished from anhydrite by its softness. Occurs in sedimentary rocks. Alabaster (fine-grained, translucent massive) and satin spar are used for carving into ornamental objects; the latter is chatoyant on the polished surface.

Halite. NaCl. H = 2 1/2. Colourless, white, grey, yellow or blue transparent to translucent vitreous crystals (cubes) or granular masses. May be fluorescent. Water soluble. Occurs in sedimentary rocks, in springs, seas, and salt lakes, and in dried inland lake basins.

Hausmannite. Mn_3O_4. H = 5 1/2. Brownish black, greasy to submetallic, fine-grained massive. Associated with other manganese minerals and difficult to distinguish from them in the hand specimen. Ore of manganese.

Hematite. Fe_2O_3. H = 5 1/2-6 1/2. Reddish brown to black massive, botryoidal, earthy; also foliated or micaceous with high metallic lustre (specularite). Characteristic red streak. Ore of iron; also used as pigment.

Howlite. $Ca_2B_5SiO_9(OH)_5$. H = 3 1/2. Colourless to white vitreous granular masses; transparent elongated tabular crystals; compact nodular masses. Crystals distinguished from selenite by superior hardness. Occurs in sedimentary rocks. Named after Henry How, a Nova Scotia mineralogist who first described it in 1868.

Hydrocarbon. Organic material composed of hydrogen and carbon. Black, greasy to oily, soft masses. Will burn.

Jarosite. $KFe_3(SO_4)_2(OH)_6$. H = 2 1/2-3 1/2. Yellow to brown pulverulent coating associated with iron-bearing rocks and with coal. Distinguished from iron oxides by giving off SO_2 when heated.

Langite. $Cu_4(SO_4)(OH)_6.2H_2O$. H = 2 1/2-3. Transparent blue, tiny crystals forming aggregates on copper-bearing rocks. Vitreous to silky lustre. Formed by oxidation of copper sulphides. Difficult to distinguish from other copper sulphates in hand specimen.

Lepidocrocite. $FeO(OH)$. H = 5. Reddish brown submetallic scaly or fibrous masses. Characteristic orange streak. Associated with goethite as oxidation product of iron minerals.

Limestone. Soft white or grey sedimentary rock formed by the deposition of calcium carbonate. Dolomitic limestone contains variable proportions of dolomite and is distinguished from the normal limestone by its weaker (or lack of) effervescence in HCl acid. Crystalline limestone (marble) is a limestone that has been metamorphosed and is used as a building and ornamental stone. Shell limestone (coquina) is a porous rock composed mainly of shell fragments.

Malachite. $Cu_2CO_3(OH)_2$. H = 3 1/2-4. Bright green granular, botryoidal, earthy masses; usually forms coating with other secondary copper minerals on copper-bearing rocks. Distinguished from other green copper minerals by effervescence in HCl acid. Ore of copper.

Marcasite. FeS_2. H = 6-6 1/2. Pale bronze to grey metallic radiating, stalactitic, globular or fibrous forms. Yellowish to dark brown tarnish. Transforms to pyrite from which it is difficult to distinguish in the hand specimen.

Paratacamite. $Cu_2(OH)_3Cl$. H = 3. Blue-green to bright green finely granular or fibrous aggregates associated with other secondary copper minerals. Resembles malachite, but does not effervesce in HCl acid.

Posnjakite. $Cu_4(SO_4)(OH)_6.H_2O$. Minute blue flaky and radiating sheaf-like aggregates on copper-bearing rocks. Associated with other secondary copper minerals; not readily distinguished from them in hand specimen.

Psilomelane. $BaMn_9O_{16}(OH)_4$. H = 5-6. Black massive, botryoidal, stalactitic or earthy. Dull to submetallic lustre. Black streak. Associated with other manganese minerals, from which it is distinguished by superior hardness, black streak, and amorphous appearance. Ore of manganese. Renamed romanechite.

Pyroaurite. $Mg_6Fe_2(CO_3)(OH)_{16}.4H_2O$. H = 2 1/2. Colourless, yellowish, bluish green, or white flaky with pearly or waxy lustre. Crushes to talc-like powder. Effervesces in HCl acid.

Pyrrhotite. $Fe_{1-x}S$. H = 4. Brownish bronze massive granular. Black streak. Magnetic; this property distinguishes it from other bronze sulphides.

Quartzite. A quartz-rich rock formed by the metamorphism of sandstone. Used as a building and monument stone, and, if colour is pleasing, as an ornamental stone; high purity quartzite is used in the glass industry.

Rhyolite. Fine-grained volcanic rocks with composition similar to granite.

Rutile. TiO_2. H = 6-6 1/2. Brownish red to black striated prismatic or acicular crystals; massive. Crystals are often twinned, forming elbow-shapes. Adamantine lustre. Resembles cassiterite, but not as heavy and has light brown streak (cassiterite has white streak). Ore of titanium.

Sandstone. Sedimentary rock composed of sand-sized particles (mainly quartz).

Scheelite. $CaWO_4$. H = 4 1/2-5. White, yellow, brownish; transparent to translucent massive. High specific gravity (about 6). Usually fluoresces; this property is used as a method of prospecting for this tungsten ore.

Schist. Metamorphic rock composed mainly of flaky minerals such as mica and chlorite.

Sericite. Very fine-grained muscovite with silky or pearly lustre.

Serpentine. $Mg_6(Si_4O_{10})(OH)_8$. H = 2-5. Usually massive with waxy lustre. Translucent to opaque in shades of yellow-green to deep green; also bluish, red, brown, black. Often mottled, banded, or veined. Asbestos is the fibrous variety. Formed by alteration of olivine, pyroxene, amphibole, or other magnesium silicates. Found in metamorphic and igneous rocks. Used as ornamental building stone (verde antique) and for cutting and/or carving into ornamental objects (ash trays, book-ends, etc.)

Shale. Fine-grained sedimentary rock composed of clay minerals.

Siderite. $FeCO_3$. H = 3 1/2-4. Brown rhombohedral crystals, cleavable masses, earthy, botryoidal. Distinguished from calcite and dolomite by its colour and higher specific gravity, from sphalerite by its cleavage. Ore of iron.

Slate. Fine-grained metamorphic rock characterized by a susceptibility to split into thin sheets.

Sphalerite. ZnS. H = 3 1/2-4. Yellow, brown, or black, granular to cleavable massive; also botryoidal. Resinous to submetallic. Honey-brown streak. Ore of zinc.

Staurolite. $Fe_2Al_9(Si, Al)_4O_{22}(OH)_2$. H = 7-7 1/2. Reddish brown to almost black prismatic crystals, often in cruciform twins. Vitreous and translucent when pure. Occurs mainly in some metamorphic rocks. Cross-shaped crystals are sometimes used as jewellery, amulets.

Talc. $Mg_3Si_4O_{10}(OH)_2$. H = 1. Grey, white, various shades of green. Fine-grained massive, foliated. Translucent with greasy feel. Massive varieties are known as steatite and soapstone, and because of their suitability for carving, are used for ornamental purposes. Formed by alteration of magnesium silicates (olivine, pyroxene, amphibole, etc.) in igneous and metamorphic rocks. Used in cosmetics.

Tourmaline. $Na(Mg,Fe)_3Al_6(BO_3)_3(Si_6O_{18})(OH)_4$. H = 7 1/2. Black, green, blue, pink, brown, yellow, prismatic crystals; also columnar, granular. Prism faces vertically striated. Vitreous lustre. Conchoidal fracture. Distinguished by triangular cross-section in prisms; by striations, fracture. Used in manufacture of pressure gauges; transparent varieties used as gemstone.

Tremolite. $Ca_2Mg_5Si_8O_{22}(OH)_2$. H = 5-6. White, grey, striated prismatic crystals, bladed crystal aggregates, fibrous, perfect cleavage. Usually occurs in metamorphic rocks. Fibrous variety is used for asbestos; clear crystals are sometimes cut and polished as a gemstone.

Ulexite. $NaCaB_5O_6(OH)_6.5H_2O$. H = 1. White with silky lustre. As nodules composed of fine fibres and as compact fibrous veins. Source of borax.

CHEMICAL SYMBOLS FOR CERTAIN ELEMENTS

Ag - silver
Al - aluminum
As - arsenic
Au - gold
B - boron
Ba - barium
Bi - bismuth
C - carbon
Ca - calcium
Cl - chlorine
Cu - copper
F - fluorine
Fe - iron
H - hydrogen
K - potassium
Mg - magnesium
Mn - manganese
Mo - molybdenite
Na - sodium
Ni - nickel
O - oxygen
P - phosphorus
Pb - lead
Sb - antimony
Si - silicon
Sn - tin
Sr - strontium
Ti - titanium
U - uranium
W - tungsten
Zn - zinc
Zr - zirconium

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