GOLD

IN
NOVA SCOTIA

Jennifer L. E. Bates

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Nova Scotia Department of Mines and Energy

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Halifax, Nova Scotia
1987

Designed and Produced by the
Nova Scotia Department of Government Services,
Information Services Division, Publishing Section

Nova Scotia Department of Mines and
Energy, Information Series No. 13

Canadian Cataloguing in Publication Data

Bates , Jennifer L. E.
Gold in Nova Scotia

Bibliography: p.
ISBN 0-88871-091-7

1. Gold mines and mining - Nova Scotia. 2. Gold - Nova Scotia. I. Nova Scotia. Dept. of Mines and Energy. II. Title.

TN424.C22N68 1987 338.2’741’09716

C87-099804-8

Cover: Prospector Matt McGrath of Wine Harbour putting nuggets in his safe.

ACKNOWLEDGMENTS

The author acknowledges the comments and criticisms of Norman Lyttle, Howard Donohoe, Craig Miller, Paul Smith and Mike Grice provided during the preparation of this booklet; their guidance and assistance are appreciated. The gold production figures were compiled by Ann Van Iderstine.

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INTRODUCTION

In recent years, Nova Scotia has witnessed a resurgence in gold exploration. The public has responded with a request for a general information document on gold in Nova Scotia. This booklet has been written as an answer to this request. It contains brief descriptions of the history of gold mining in Nova Scotia, mining methods, occurrences and distribution of gold in the Province, production figures, and the geology and theories of ore formation of the gold deposits. A glossary of terms that may be unfamiliar to the reader is included in the booklet. Anyone wishing to obtain additional information on gold in Nova Scotia is encouraged to do so and may begin by referring to the *Do-It-Yourself* section at the end of the booklet.

THE HISTORY OF GOLD MINING

There are probably not many of us who have firsthand accounts of the gold rushes in Nova Scotia, but maybe we can remember stories told by a grandparent, an older relative or perhaps an old prospector. The gold rushes have played a significant role in the history of many towns and villages in the Province and, for many Nova Scotians, gold mining is a distinct part of their heritage.

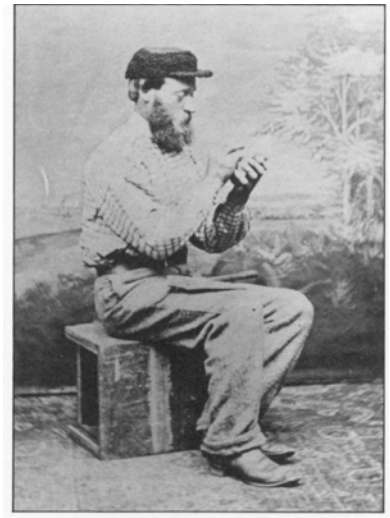
Gold may have been sighted as early as 1578 when the explorer Sir Humphrey Gilbert was given a patent to search for gold and silver in the New World. As well, French settlers may have found gold, as indicated by the village names of Bras d'Or, Cape d'Or or Jeddore (Jet d'Or). However, no ancient workings have been discovered to prove such suspicions.

Gold sightings were not referred to again until the 1830s. Labourers building roads in Nova Scotia spoke of a "bright yellow metal in the stone". These first 'discoverers' did not realize their good fortune and actually whittled the gold with their knives during mealtimes! An unidentified captain of the Royal Welsh Fusiliers was said to have panned gold at Gold River in 1840. In 1849, W. Brooks,[1] a farmer from Lawrencetown, claimed to have found gold in quartz while repairing a dam on his land but his father told him to "drop his nonsense, go on with his work and pitch the rubbish away".[2] Eleven years later, gold was discovered by Brooks who had been encouraged by recent discoveries at Tangiers. The area was declared the Lawrencetown gold district!

In 1857, unofficial discoveries were made by Richard Smith of Maitland who obtained gold from a river in the Musquodoboit settlement and by John Campbell of Dartmouth who 'assayed' the sands at Fort Clarence in Halifax Harbour (where the oil refinery stands today) and obtained a 'good show' of gold.

The first authenticated discovery of gold in quartz was made in 1858 by Captain L'Estrange at Mooseland.[1] However, he received no encouragement to continue his efforts. Within two years a farmer from Musquodoboit, *John Gerrisb Pulsiver,* began

◄ *Miners outfitted for underground work in the mine at the Waverley gold district, Halifax County (ca. 1915).*



John Gerrish Pulsiver.

The discovery of gold in quartz at Tangier (Mooseland), Halifax County, Nova Scotia, May 1860.

From a posed studio photo by W. Case.

Courtesy of the Public Archives of Nova Scotia.

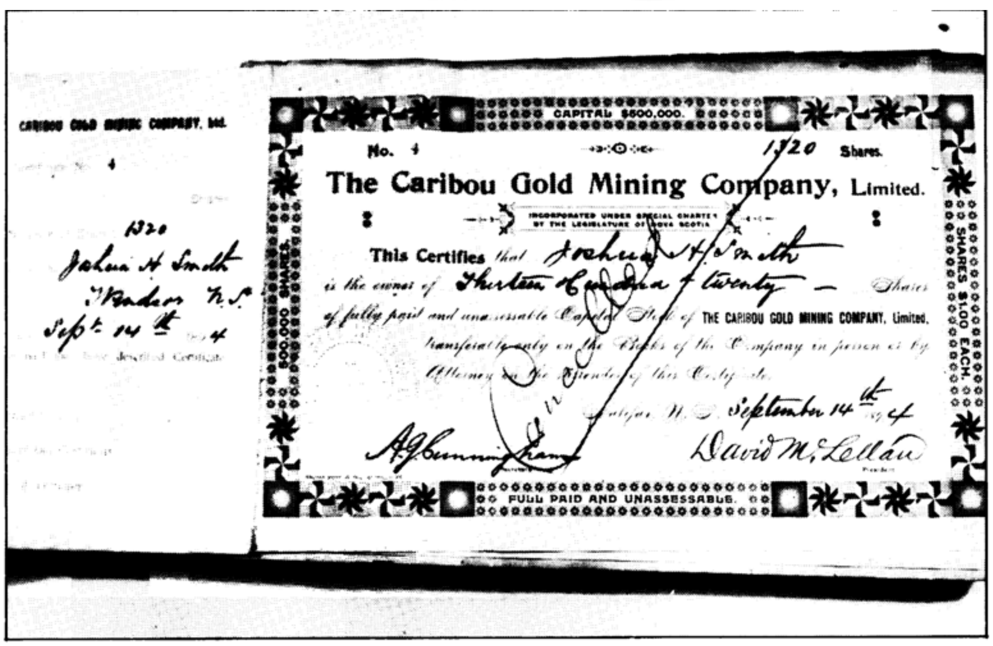
a search in the same area of Mooseland. On the last Thursday or Friday in May 1860, Pulsiver found gold in a quartz boulder and thus initiated the *first gold rush* in Nova Scotia.

After the declaration of the Mooseland gold district in April 1861, other discoveries along the Eastern Shore were quick to follow in the next half year —Tangier, Lawrencetown, The Ovens, Wine Harbour, Sherbrooke (Goldenville), Waverley, Country Harbour, Isaacs Harbour and Gold River. Buildings were erected 'overnight' and the miners and their families moved into the new settlements.

Most of the early claims were staked by people with no knowledge of geology or mining. Those who staked claims in the winter hoped there would be gold nuggets for the picking when the snow had melted. Reality did not meet with their expectations and initial claims were dropped only to be staked by companies that were able, financially and technically, to undertake the work.

John Campbell, who had observed gold on the shores of Fort Clarence, ventured to Lunenburg and worked the beach sands at The Ovens with William Cunard, Esq. of steamship line fame.[3] Campbell believed the sands of Sable Island contained gold but when he applied for a license, the government offered very confining terms and he was forced to abandon any idea of panning the sands.

Underground at the workings of the Dominion gold mines, Waverley, Halifax County.



Share certificate issued from the Caribou Gold Mining Company for Caribou Mines in Halifax County on September 14, 1894.

Gold production increased as a result of the expansion in exploration to new areas located south and west of the Eastern Shore. The highest yield of gold was 27,538 ounces (780 702 g) in 1867. However, poor mining methods, bad management and incompetency led to the decline in production in the early 1870s. By 1874, the output had dwindled to 9,140 ounces (259 119 g).

The miners had no means of predicting where additional ore zones could be found and production decreased once the most accessible and richest zones had been worked. Get-rich-quick schemes had been the order of the day; money earned had been squandered and no funds remained for further exploration.

However, companies that were unable to raise the capital for gold ventures would lease their property for a return payable in gold mined to individuals called tributers. This working relationship between company and the individual tributer was called the tribute system. Although profitable to the single operator, the gold yield remained low.

The *second gold rush* extended from 1896 to 1903 with the highest yield of 31,113 ounces (882 054 g) in 1898. The introduction of dynamite for blasting, the use of cyanide in the concentration process, and more efficient machinery and mills permitted bodies of lower grade ore to be worked. Much attention was given to improving the concentration process and

Interior of the milling house of the Lacey gold mine at Gold River gold district in Lunenburg County, Nova Scotia, 1934. The conveyor (top) brings rock to the surface where it is crushed and then treated in the amalgamation tray with mercury to separate the gold (foreground).

Native Waverley tributers (George, Lawrence and Lewis Sawler) mining at Laidlaws, Waverley in the spring of 1933.

Mining facilities at the Montague gold district.

the treatment of tailings, with the intention of increasing the gold yield. Unlike the first rush which was a time of frenzy and speculation, this renewed quest for gold was a time of calm, organized exploration[4]

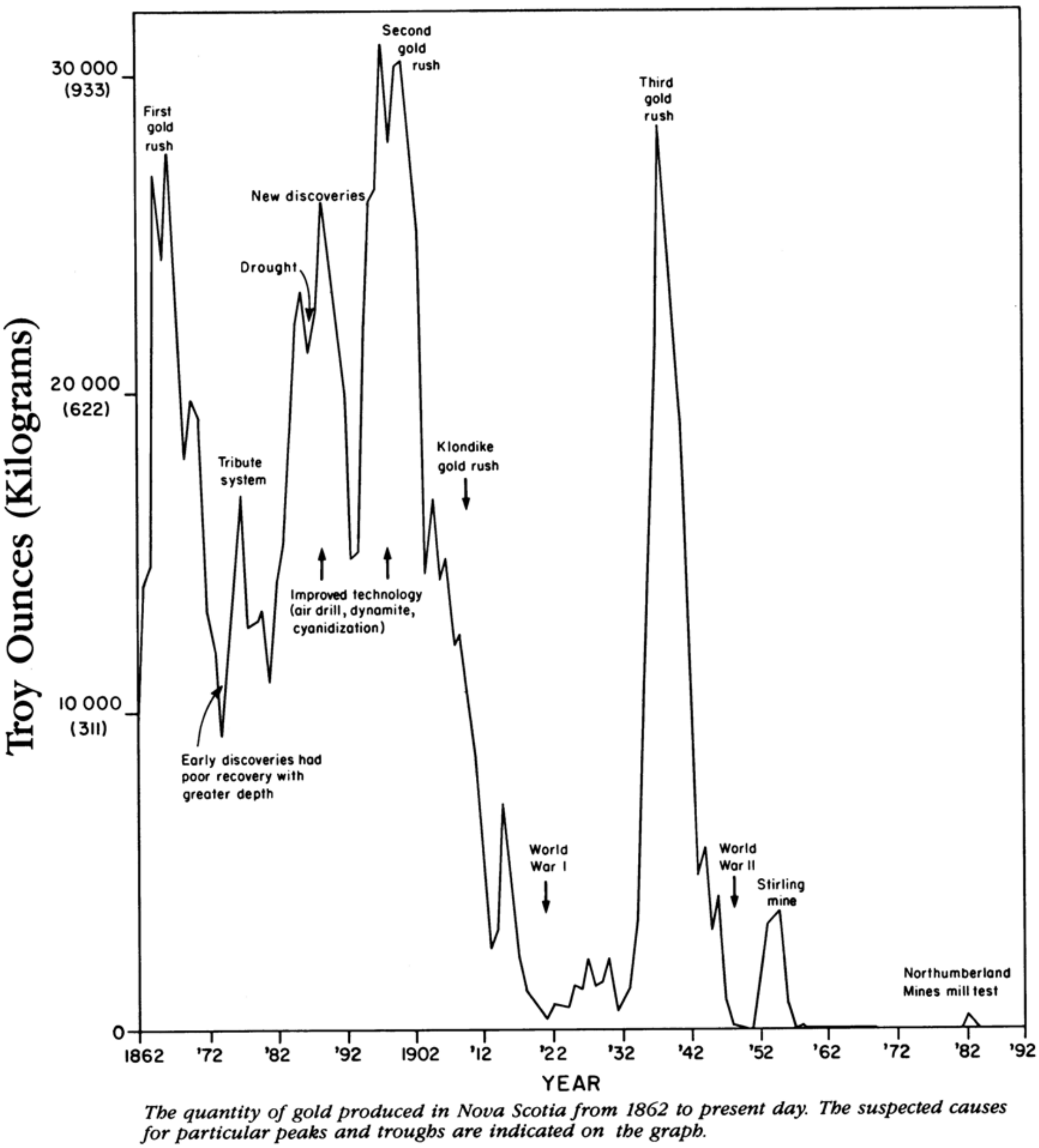
In the late 1890s, the Klondike gold rush, in combination with the opening of the mining camps in Ontario, conjured dreams of 'easy gold' in the minds of the workers. The result was a movement to the west, with a corresponding decline in gold production in Nova Scotia.

The demand for arsenic in the 1920s initiated exploration for arsenopyrite—a mineral associated with the Nova Scotia gold deposits[5]—and thus renewed the search for gold. This fact, along with cheap energy costs and an increase in the price of gold (US$20.67 to US$34 per ounce), created an impetus for Nova Scotia's *third gold rush.* The rush spanned ten years (1932-1942) and 158,000 ounces (4 479 300 g) of gold were produced.

Although classified as a base metal operation and therefore termed a gold producer rather than a gold district, the Stirling Mine on Cape Breton Island produced between 1952 and 1956 the majority of the gold (at least 95%) from Nova Scotia gold mines. The deposit was discovered about 1895, diamond-drilled from 1916 to 1918, developed during the 1920s and 1930s, recorded an initial gold production of 3,401 ounces (96 418 g) from 1936 to 1938, and produced 13,280 ounces (376 488 g) of gold in total from 1952 to 1956.

Mining operations at the Moose River gold district.

What may, in time, be considered the *fourth gold rush* began in 1972. The resurgence of gold exploration was encouraged by the rise in the price of gold (to ~ US$820 per ounce!) in the early 1980s. A number of companies staked claims with the idea of working the tailings or old underground mine sites, or prospecting for new leads. Today, the search for gold continues and the future outlook for Nova Scotia gold is optimistic.



The quantity of gold produced in Nova Scotia from 1862 to present day. The suspected causes for particular peaks and troughs are indicated on the graph.

The Gold Gazette.

Intended to convey useful information on the subject of the Gold Mines of Nova Scotia; and on Mining, Minerals, and Industrial Interests generally.

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Courtesy of the Public Archives of Nova Scotia.

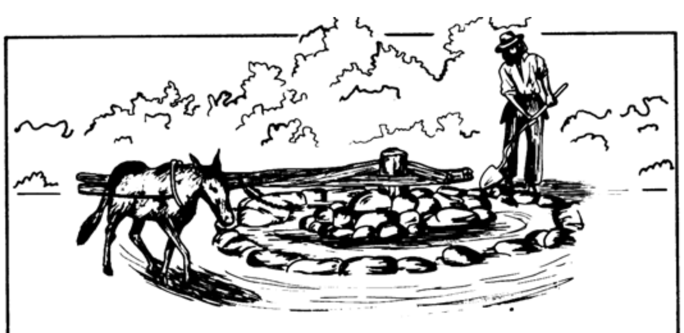
MINING AND EXTRACTION OF GOLD

Early Mining Methods

The early findings of gold were in quartz boulders and quartz veins. The first workings were confined to excavation of surface quartz veins and trenching. Extraction of gold involved the physical separation of the quartz from the surrounding slates and greywackes, and crushing of the quartz to liberate the gold. Picks, shovels and muscle were the only tools.

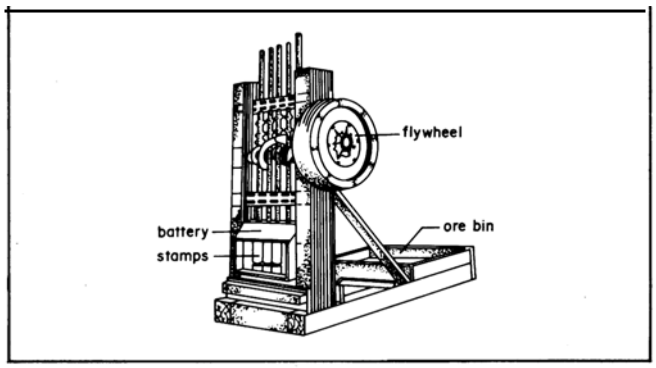
Gold washing at The Ovens, Lunenburg County.

The first underground gold mine was established at Tangier in 1860. The quartz ore was brought to the surface and crushed in an arrastra, which operated on the principle of grinding the quartz with stones and concentrating the gold with mercury.



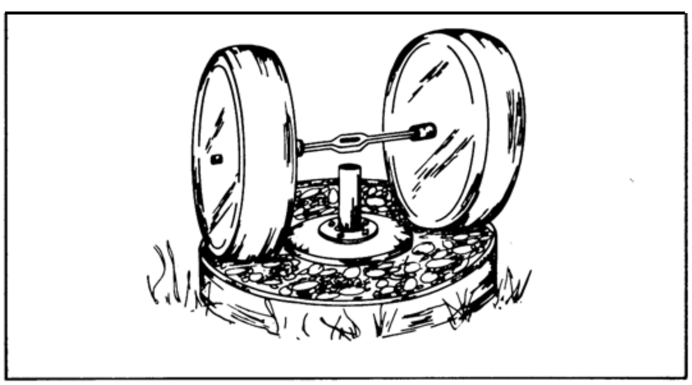
An arrastre: the movement of a large stone attached to a wooden arm crushes the ore.

The use of arrastras gave way to the use of more efficient crushers and stamp mills. The stamp mill consisted of a number of vertically placed iron or steel rods that were lifted 10 to 18 inches (25 to 45 centimetres) and dropped, by mechanical means, on the quartz at a speed of 50 to 80 drops per minute. One stamp was able to crush one ton of quartz in 24 hours.[6] Stamp mills usually were set up in batteries of three to five stamps. Crushing capacity could be increased by adding more batteries.



A five-stamp mill.

Another early apparatus was the Chilean mill. Massive wheels of granite revolved, on edge, in an iron pan crushing the quartz ore to a gritty; watery paste. This type of mill can be seen today at The Ovens Park in Lunenburg County.



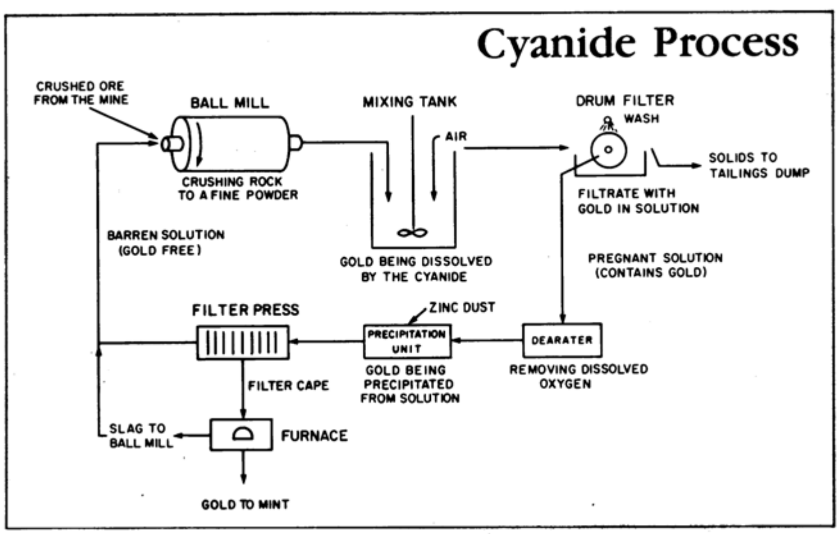
The Chilean mill: wheels of granite move over the crushed ore liberating the gold.

The cost of power was high in the 1800s and it probably retarded the mining development. Cordwood or coal was used in highly wasteful steam plants. In some districts, waterwheels were utilized but the amount of energy produced was small.[7]

Extraction Methods

The gold extraction methods used in the early workings were wasteful. At the time, it was believed that in a few districts at least 30 per cent of the gold was left behind in the tailings.[4] The yield of gold from crushed ore depended greatly upon the size and visibility of the gold. When the quartz ore was brought to the surface, water was splashed on it and *only if visible gold showed was the rock sent to the crushers!* Undoubtedly, significant quantities of gold were sent to the tailings piles. Only the larger pieces of gold were extracted and much of the fine gold was lost in the crushing or concentrating process.[4] Consequently, the tributers who worked the tailings in later years often found their efforts well rewarded.

There are three methods of extracting gold from crushed ore which have been in use since the early gold rushes: gravity separation, amalgamation and cyanidization.[8] Chlorination and ore roasting were attempted in early mining days but proved to be less efficient and therefore were not continued.

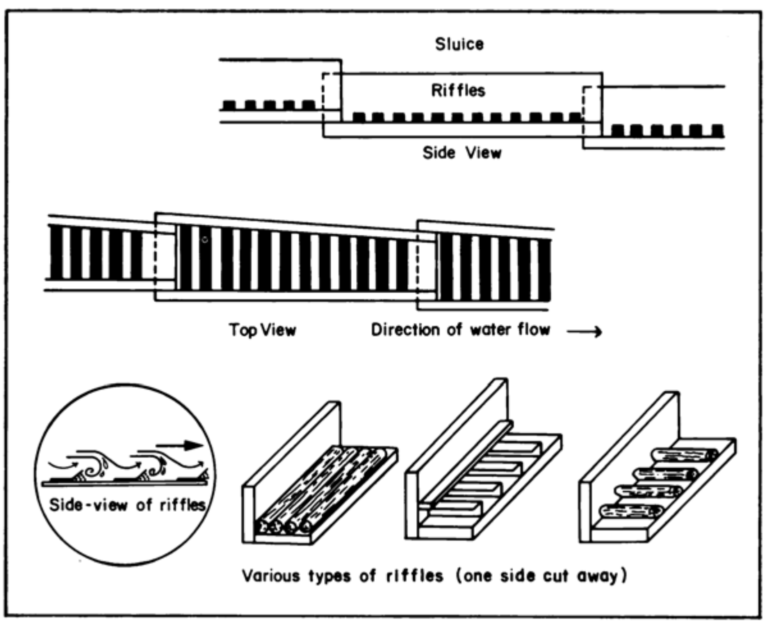


The extraction process of cyanidization.

Left. Gold panning: probably the first of the early mining methods.

Right. Cradle or rocker box: the function is very much like that of the sluice however it uses much less water.

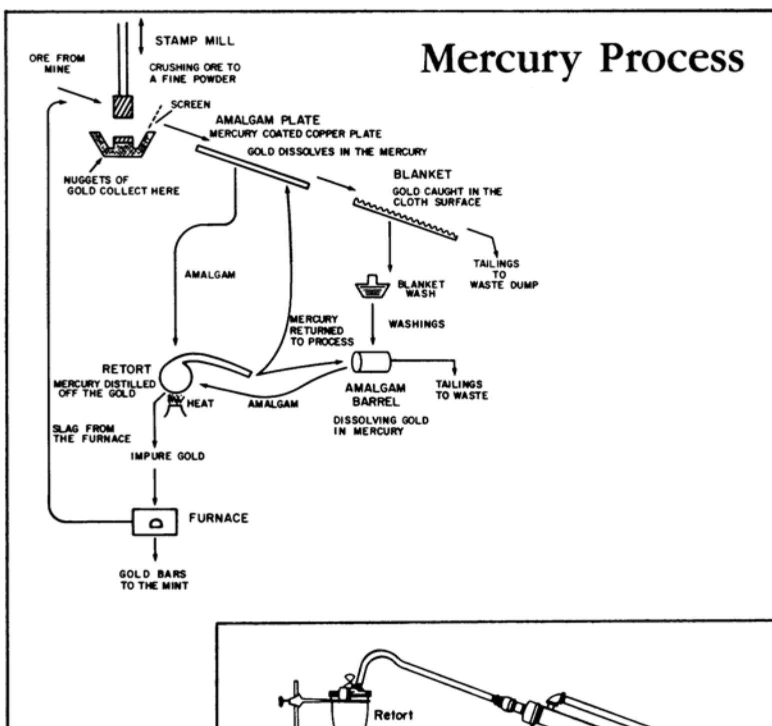
Gravity separation is the physical separation, based on weight differences, of gold from its impurities. Water is added to crushed ore in a gold pan, a sluice box or a jig. The slurry is manipulated in .a manner (i.e. swirled or shook) that causes the heavier gold to collect on the bottom surface of the appartus.

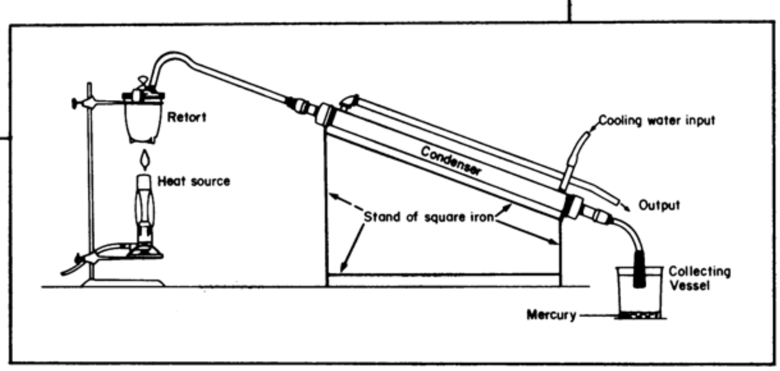


Side and top views of a riffle section of a sluice (upper) and a close-up of the various styles of riffles (lower); a sluice is generally placed directly in the stream for grĕater ease when working the auriferous material.

Amalgamation involves the 'dissolving' of gold in mercury. Mercury is added to the crushed ore and the free gold (gold physically separate from the impurities) is absorbed by the mercury. In one method, the gold-mercury mixture (amalgam) is first placed in a leather bag which is squeezed to remove the excess mercury. The amalgam is then heated in a closed system to evaporate the mercury. Lastly; the gold is melted into a saleable form.

In the 1880s, cyanidization replaced amalgamation as a more efficient means of extraction. In this method, crushed ore is dissolved in a mixture of lime and cyanide. The unwanted solids are removed by filtering. Zinc dust is added to the liquid, which causes gold to settle out of solution. Cyanidization is the most widely used gold recovery technique used in Canada and is the basis of the modern heap leaching process. Leaching solutions are poured over piles of crushed ore, and then collected and refined to extract the dissolved gold.

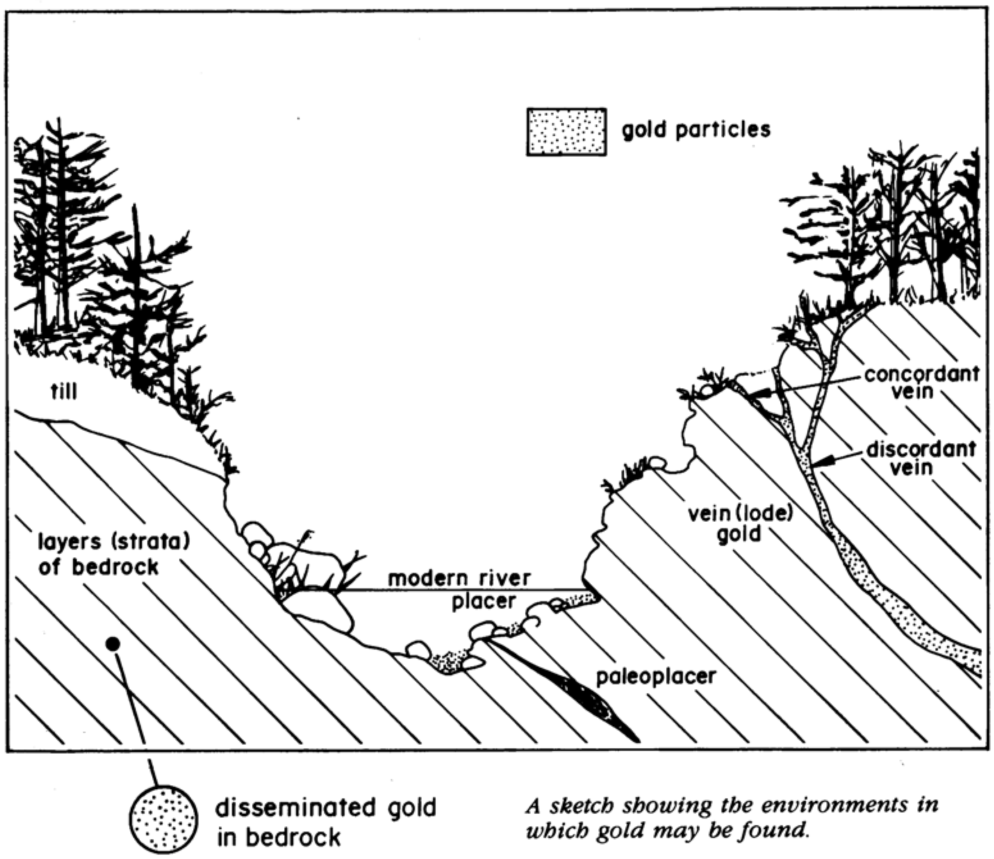




The extraction of gold from unwanted material using the process of amalgamation and a closer look at the final steps of the mercury process of gold extraction where the amalgam is heated in a retort bringing about the separation of gold from mercury.

OCCURRENCE AND DISTRIBUTION OF GOLD

In Nova Scotia, gold occurs as vein (lode) deposits and occurrences, modern placers, paleoplacers and as disseminated gold in various rock types.

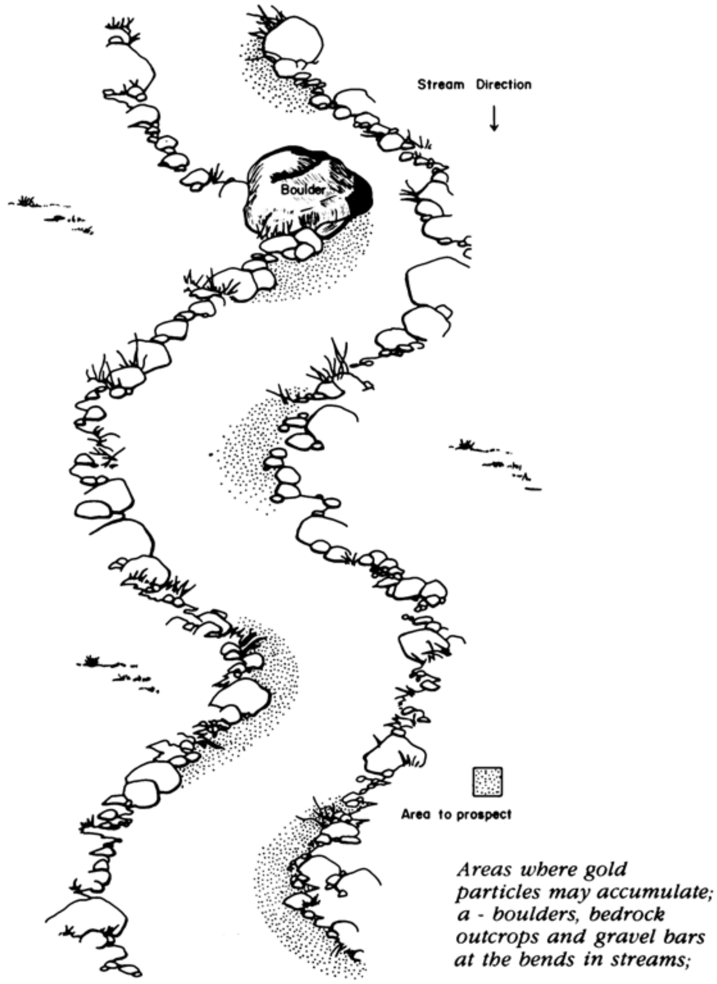


A sketch showing the environments in which gold may be found.

The vein or lode deposits are predominantly associated with the Meguma Group slates and greywackes of the southern mainland although occurrences do exist in Cape Breton Island and the Cobequid Highlands. Virtually all of the established gold districts are vein deposits in the Meguma Group rocks.

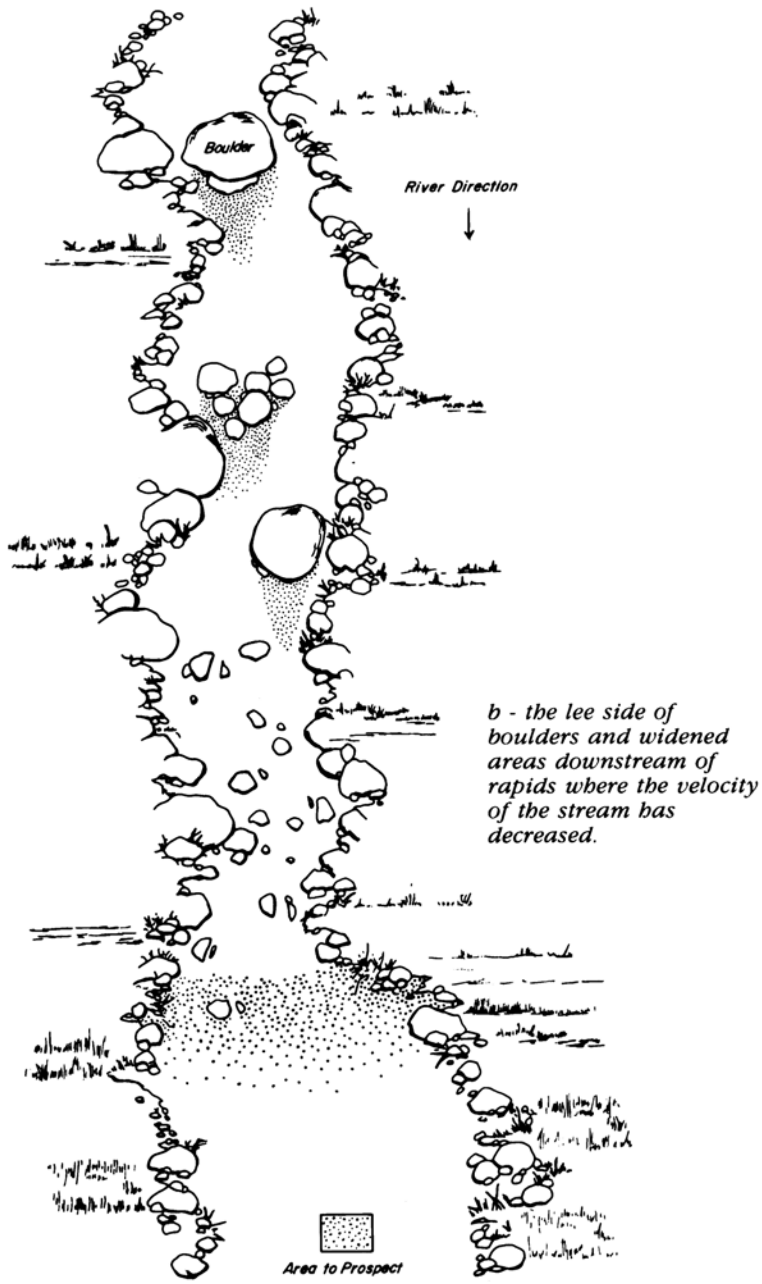
Modern placer gold accumulates in beach or river sediment as a result of the erosion of gold-bearing rocks and accumulation

◀A mining operation at Gold Rivet:

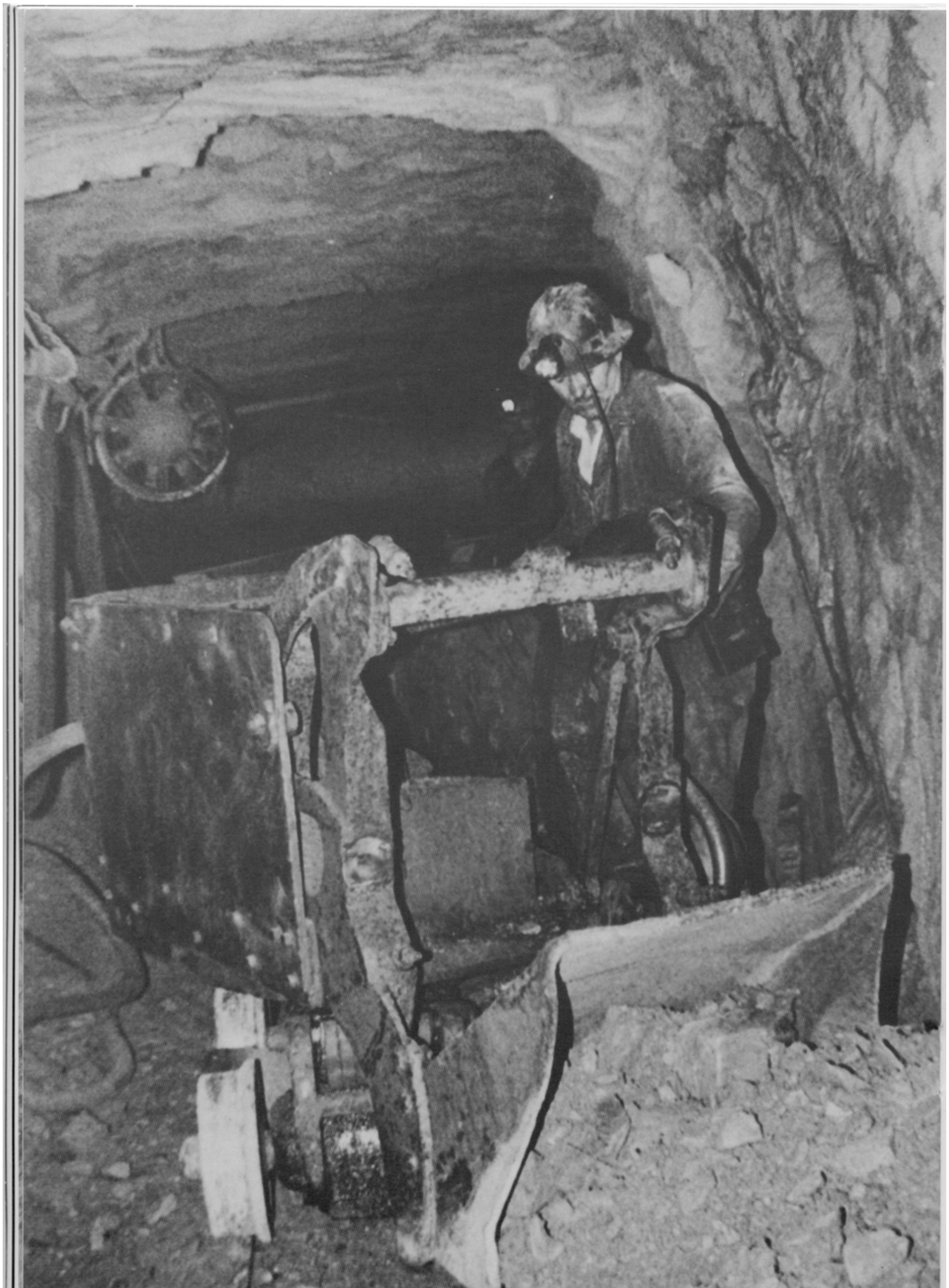


of gold due to wave action or current motion. These deposits were among the first to be worked in the early gold mining days as they were accessible and easy to work. Modern placers are associated with beaches and rivers at numerous locations within the Province.

Paleoplacers are placers that were formed millions of years ago and the once unconsolidated sediments are now solid rocks. The paleoplacers, found on the southern mainland, occur in Horton Group conglomerates of Devono-Carboniferous age. Erosion of paleoplacers and redistribution of the gold by modern rivers and oceans may result in the formation of reworked placers.



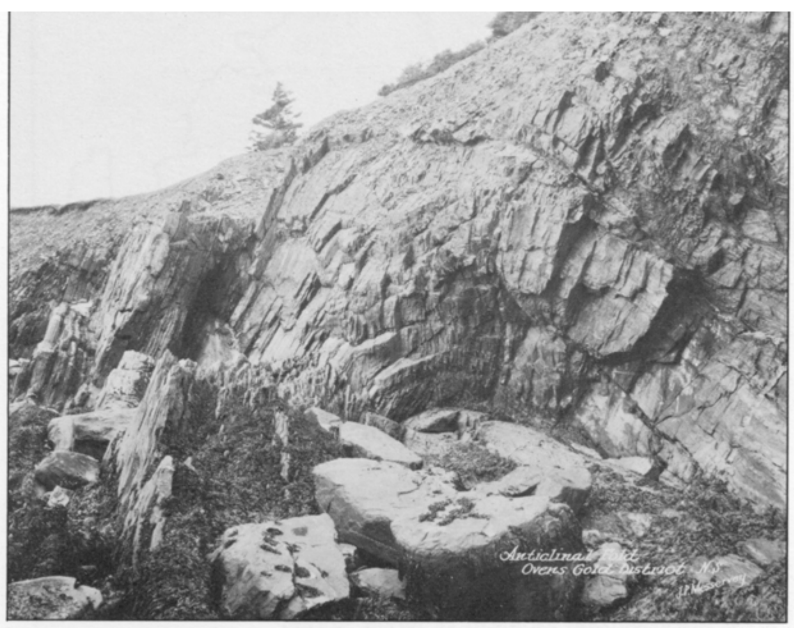
Gold as disseminated particles is present in various types of igneous, sedimentary and metamorphic rocks. Sightings have been noted in slates and greywackes of the Meguma Group, sedimentary rocks of the Horton Group, granites south of the Cobequid-Chedabucto Fault, volcanic rocks of the Cobequid Highlands, and metamorphic and igneous rocks of Cape Breton Island.



GEOLOGY OF THE MEGUMA GROUP

Virtually all the declared gold districts are vein deposits in the Meguma Group rocks of the southern mainland. A brief summary of the geological history of the rocks and the hypotheses concerning the formation of the quartz veins that host the gold will be given in this and the following sections.

The Meguma Group is a six to nine mile (10 to 14 kilometre) thick, folded complex of slates and greywackes. The greywackes were originally sands deposited over 500 million years ago as turbidites (underwater landslides) on an ancient continental rise. The slates were clays deposited predominantly on the ancient continental slope but as far offshore as the deep sea.[9] The gold-bearing veins associated with the Meguma Group are composed of quartz. A number of theories exist concerning the origin of the quartz and the gold.

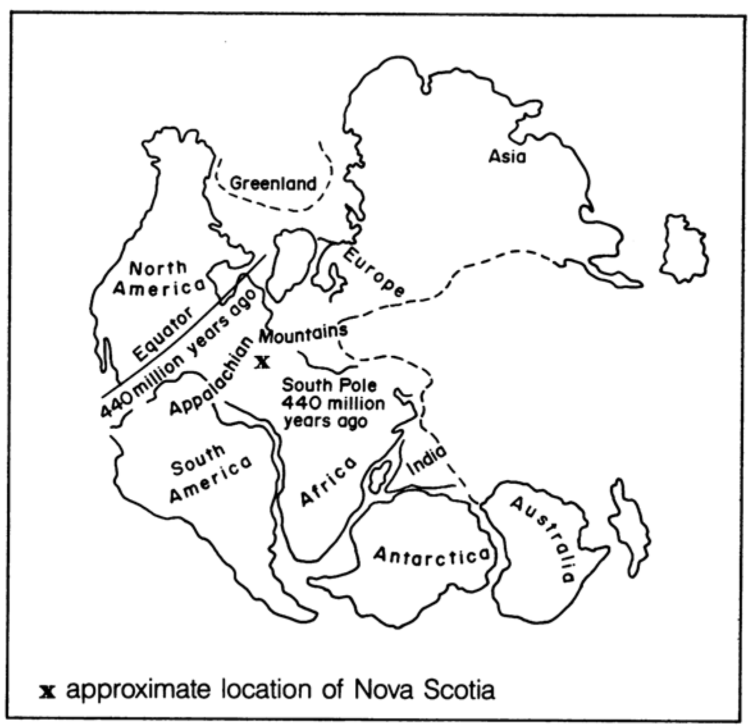


The anticlinal fold structure often observed in the gold-bearing rocks of the Meguma Group.

◄ *A minor cleaning muck from a recent blast in a cross-cut at the Beaver Dam deposit developed by Seabright Resources Incorporated*

The ancient marine environment where the clays and sands were deposited was positioned off the coast of northwestern Africa. It was similar to the present-day Atlantic margin of North America. Due to continental drift, Africa and North America 'collided' approximately 400 million years ago along the line of the Cobequid-Chedabucto Fault. In a general sense, this event resulted in the formation of the Appalachian Mountain range and a new land mass called Pangea.

More specifically, the clays and sands of the Meguma Group were compressed between the colliding continents into tight folds (anticlines and synclines), and metamorphosed to slates and greywackes. Approximately 360 to 370 million years ago granite magmas, produced by the high pressure melting of the metamorphic sediments in the roots of the Appalachian Mountains, intruded the folded rock deep below the Earth's surface. The magmas slowly solidified and, after millions of years of erosion of the Appalachian Mountains, are now exposed on the surface. The South Mountain and Musquodoboit Batholiths are two major granitic bodies formed in this manner.

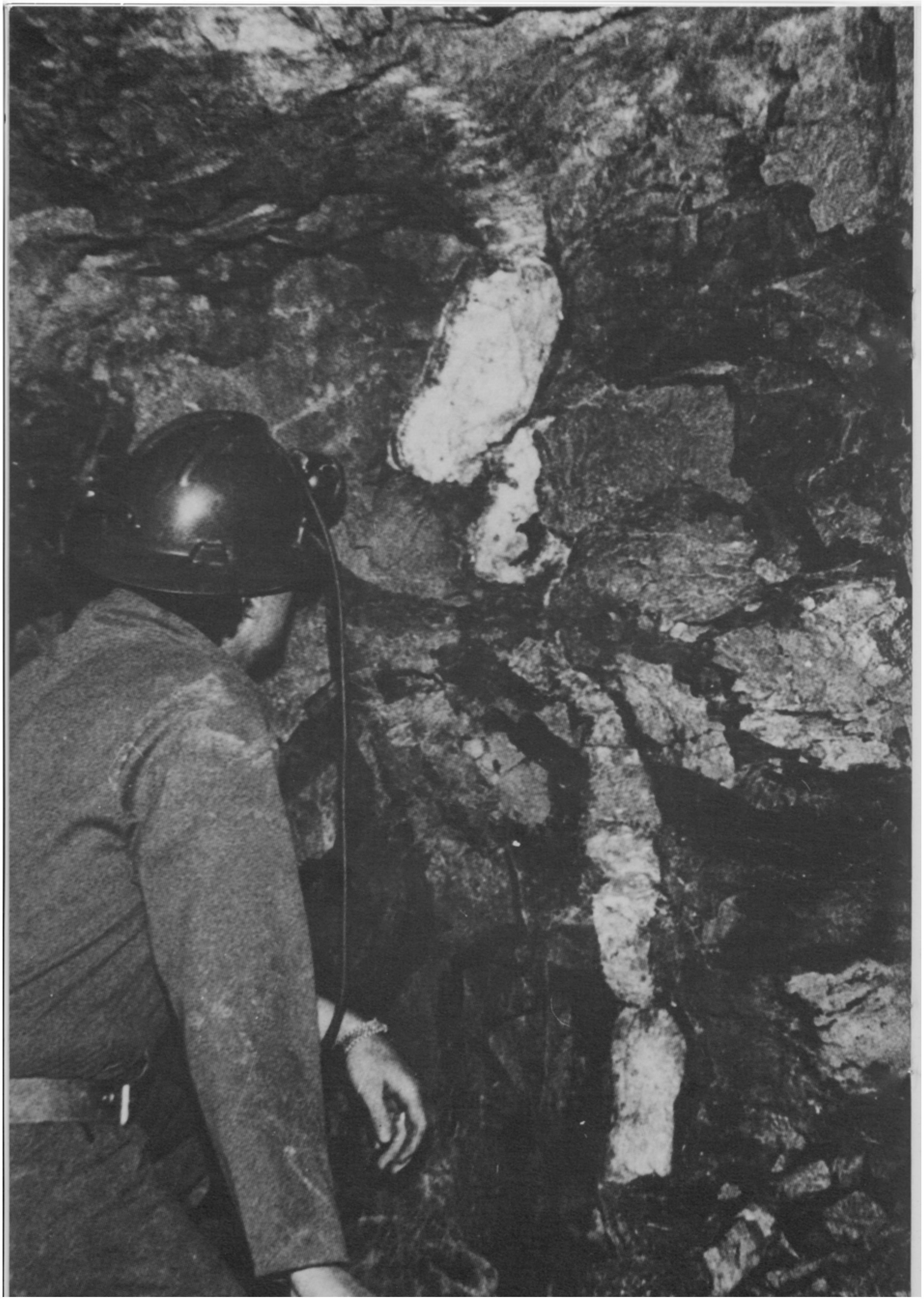


The ancient supercontinent of Pangea; note the location of Nova Scotia.

Erosion of the land mass resulted in the accumulation of thick sediment sequences, as the Horton and Windsor Group rocks. The basal conglomerates, that host the paleoplacers, were formed at this time.

During the Triassic Age (160 million years later) Pangea rifted apart and the Atlantic Ocean began to form. When the land mass split, the Meguma Group rocks separated from the African continent, remained attached to North America along the Cobequid-Chedabucto Fault and formed the southern half of Nova Scotia. In the Appalachian Mountain range, the Meguma Group is unique as it is "the only outcropping remnant of Africa left in North America."[10]

The final event in the geological history was the deposition of glacial till during the Pleistocene glaciation. The blanket of till, which covers much of the bedrock, was produced by the grinding action of ice as it moved over the surface of the rocks. The ice sheets retreated from this region approximately 10,000 years ago, leaving behind the topography observed today in Nova Scotia.



MEGUMA GROUP QUARTZ VEINS AND THE HYPOTHESES OF FORMATION

Quartz Veins

Lode gold is found in quartz veins that are largely associated with the complicated fold structures of the Meguma Group rocks. The gold-bearing (auriferous) veins most often lie within the slate beds. These beds are comparable to the original sediment layers, with no one particular bed containing all the productive veins. Most veins are parallel to the beds, although cross-cutting veins in the slates and grey-wackes have been observed and mined. The veins that run parallel to the beds are often folded or corrugated. The vein orientation, which resembles a series of casks laid side by side and end to end, was called "barrel quartz"—a term first used by the miners at Waverley.

The length of the veins can be thousands of feet (100s to 1000s of metres) and the vertical extension below the Earth's surface as much as 700 feet (213 metres). The thickness varies from one inch to 15 feet (2.5 centimetres to 5 metres). The colour and texture of the quartz veins varies from a white crystalline to a blue-grey greasy appearance. Historically, the latter type of quartz was the most productive.

Hypotheses of Formation

Hypotheses on the formation of the veins and the source of the gold date back to the early mining days of the 1860s. There are two principles that categorize the hypotheses.

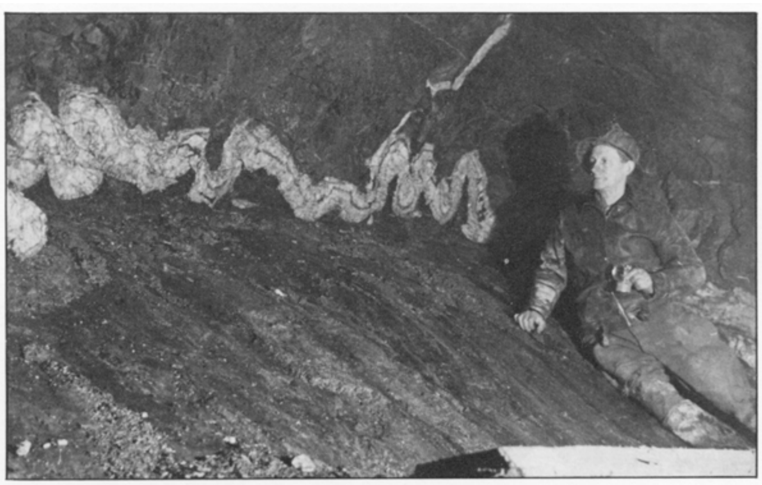
The first principle is based on the simultaneous deposition of sediment and gold (i.e. syngenetic hypotheses). While the clays and sands were settling to the bottom of the ancient sea, gold particles were doing so at the same time. With further deposition of the sediments, the gold particles were trapped. Over the millions of years to follow, the sediments were compacted, lithified (hardened) and turned to rock. Today the entrapped gold is contained within the strata (layers) of the rock. Depending upon the relative quantity of gold to clay, sand and

◄ *Deformed quartz vein cutting Meguma Group metasediments. This is a typical auriferous quartz vein observed in many of the gold deposits. The gold is generally found near the margins of the vein.*

quartz at the time of deposition, a layer of gold or disseminated gold (individual particles) was formed in the rock. According to this principle, the gold veins formed parallel to the sediment layers (i.e. concordant veins). Subsequent deformation folded and fractured the host rock slates and greywackes as well as the auriferous quartz veins.

The second principle involves formation of veins by the injection of gold-rich quartz solutions into fractures in the Meguma Group slates and greywackes (i.e. epigenetic hypotheses). The clay and sands were deposited in layers on the sea floor, lithified to form slates and greywackes, and these rocks folded, fractured and faulted. It was during these deformation events that openings in tile rocks developed. Molten quartz, rich in gold, filled the openings, cooled and solidified to form auriferous quartz veins. Since the fractures or openings developed with no one preferred orientation with respect to the slates and greywackes, crosscutting (i.e. discordant) as well as parallel veins formed.

In summary, all geological events (i.e. deposition of sediments, lithification and deformation) did occur. However, it is the *timing* of the formation of the gold-bearing quartz veins that distinguishes the syngenetic and epigenetic hypotheses.



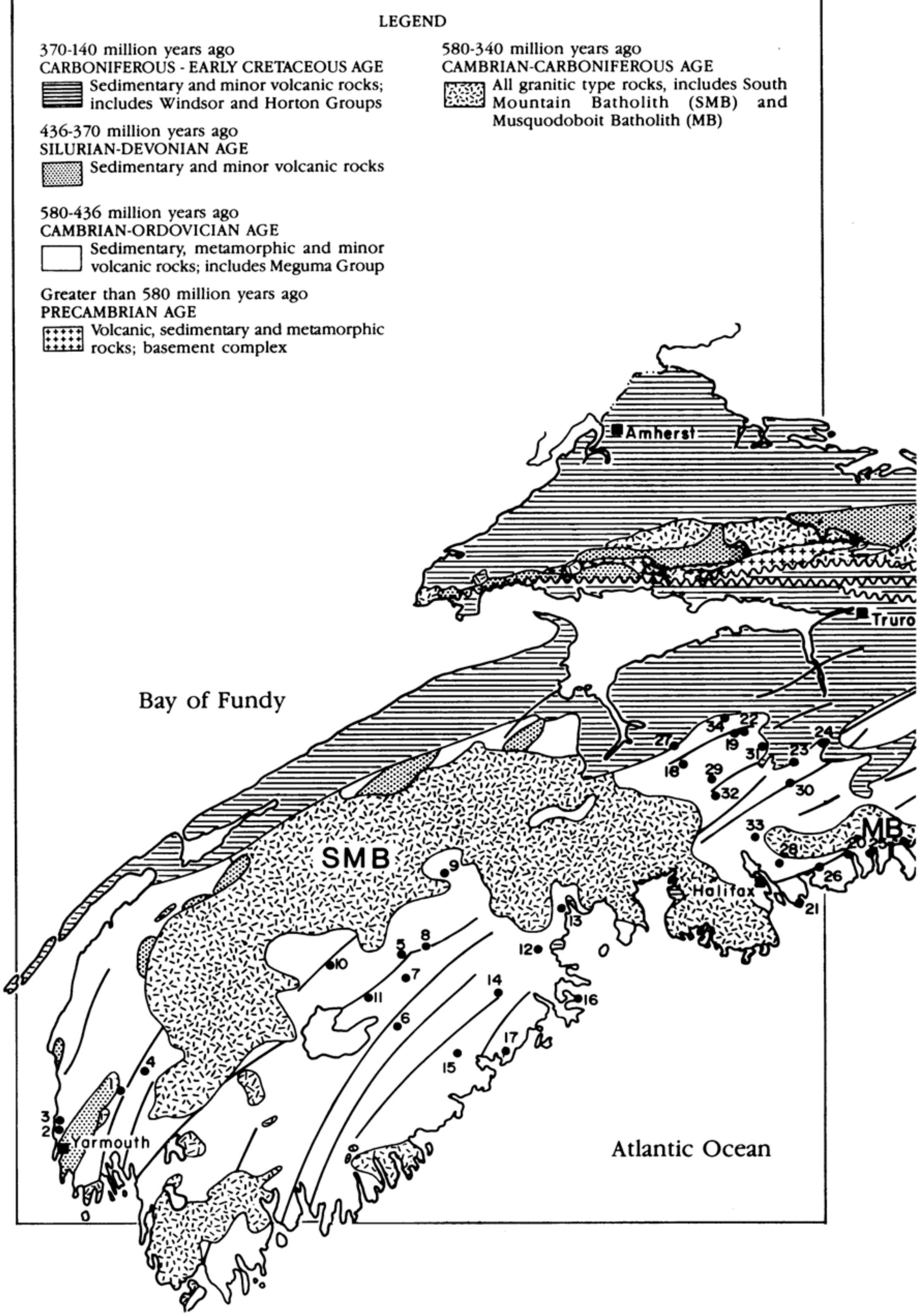
A quartz vein at the Fifteen Mile Brook gold district; note the intense folding of the vein.

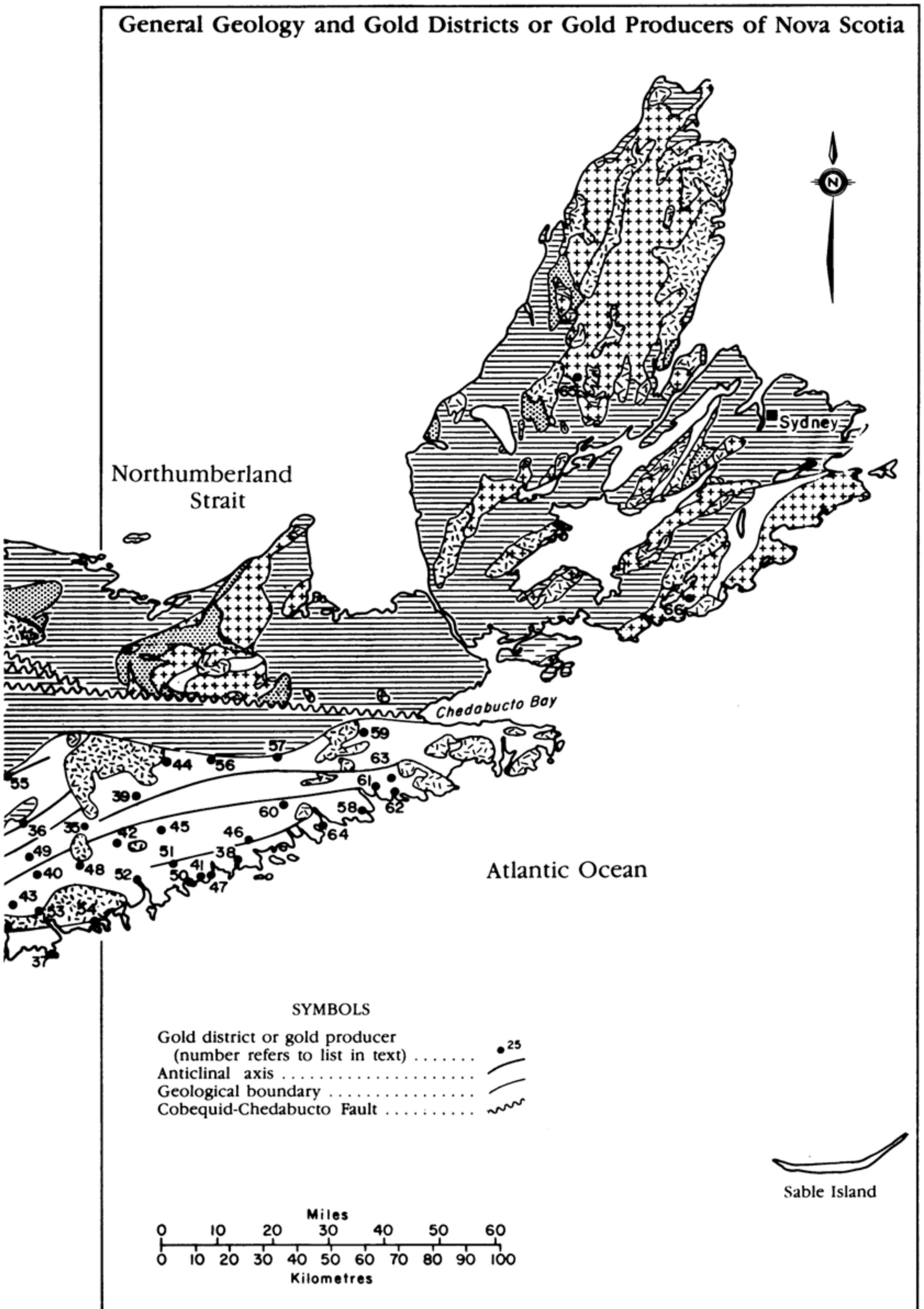
Troy Ounces of Gold Produced

GOLD DISTRICT*	YEARS OF PRODUCTION	GOLD PRODUCED (Troy Ounces)
Yarmouth Region		
1. Carleton	1879-1940	190.2
2. Chegoggin	ca. 1883	NA**
3. Cranberry Head	1870-1900	249.3
4. Kemptville	1885-1939	2,487.9
Kejimkujik Region		
5. Brookfield	1887-1936	43,147.5
6. Fifteen Mile Brook	1902-1934	880.6
7. Molega (Malaga)	1888-1950	33,460.2
8. Pleasant River Barrens	1890-1913	111.8
9. Stanburn	1933-1936	12.7
10. West Caledonia	1925	1.7
11. Whiteburn	1887-1955	11,906.7
South Shore Region		
12. Blockhouse	1896-1938	3,588.5
13. Gold River	1889-1940	7,610.4
14. Leipsigate (Millipsigate)	1884-1946	13,563.2
15. Mill Village	1901-1951	909.8
16. The Ovens	1862-1958	550.4
17. Voglers Cove	1905	43.4
Central Region		
18. Ardoise	1890-1904	6.8
19. Central Rawdon	1888-1939	6,920.5
20. Chezzetcook	1883-1944	5,528.1
21. Cow Bay	1896-1937	1,483.5
22. East Rawdon	1884-1932	13,501.0
23. Elmsdale	1890	1.4
24. Gays River	1870-1968	2,268.2
25. Lake Catcha	1887-1961	17,961.5
26. Lawrencetown	1862-1912	866.7
27. McKay Settlement	1904-1910	13.5
28. Montague	1863-1940	65,196.9
29. Mount Uniacke	1867-1941	27,737.0
30. Oldham	1862-1946	85,177.5
31. Renfrew	1862-1958	51,595.5
32. South Uniacke	1888-1948	20,762.1
33. Waverley	1862-1940	72,566.6
34. West Gore	1905-1939	7,148.8
Eastern Shore Region		
35. Beaver Dam	1889-1949	966.7
36. Caribou	1869-1968	91,335.8
37. Clam Harbour	1904	53.9
38. Ecum Secum	1893-1935	1,300.0
39. Fifteen Mile Stream	1878-1941	21,291.6
40. Gold Lake (Scraggy Lake)	1890-1899	38.6
41. Harrigan Cove	1874-1961	8,071.3
42. Killag	1889-1951	3,583.6
43. Lake Charlotte	1938-1964	77.5
44. Little Liscomb Lake	1893-1935	51.9
45. Lochaber	1883	2.3
46. Miller Lake	1902-1951	538.8
47. Moosehead (Shiers Point)	1899-1935	431.1
48. Mooseland	1863-1934	3,865.1
49. Moose River***	1888-1939	25,917.2
50. Quoddy	1906	1.0
51. Salmon River (Darrs Hill)	1881-1939	41,805.4
52. Sheet Harbour	1898-1935	3.9
53. Ship Harbour	1935-1937	7.4
54. Tangier	1862-1919	26,286.5
55. Upper Stewiacke	1906-1907	43.9
Stormont Region		
56. Caledonia	1934-1956	3.6
57. Cochrane Hill	1877-1982	2,081.3
58. Country Harbour	1871-1951	9,959.7
59. Forest Hill	1895-1957	25,102.4
60. Goldenville (Sherbrooke)	1862-1941	209,383.3
61. Isaacs Harbour	1862-1958	39,694.3
62. Lower Seal Harbour	1894-1949	34,188.2
63. Upper Seal Harbour	1893-1958	57,845.7
64. Wine Harbour	1862-1939	42,346.5
Cape Breton		
65. Wagmatacook (Middle River)	1864-1943	1,729.4
Gold Producer		
66. Stirling	1936-1956	16,681.1
Unproclaimed	1864-1932	36,480.4
Total Production		1,198,618.9

*Locations of the gold districts and gold producer are indicated by number on the map.
**NA = not available.
***Production before 1888 included with Caribou.

General Geology and Gold Districts or Gold Producers of Nova Scotia





Simplified geological map of Nova Scotia depicting the basic geological units and the locations of the gold districts or producers; note that many of the gold districts coincide with the anticlinal fold axes of the Meguma Group rocks.

A mining vehicle transporting some of the several dozen miners employed in the underground workings of the Beaver Dam deposit. The ventilation system is seen to the left side of the photo. The mine is operated by Seabright Resources Incorporated.

PRESENT EXPLORATION AND FUTURE TRENDS

With the high price of gold in recent years, the investment in gold exploration in Nova Scotia has escalated. Since 1979, exploration expenditures have increased steadily. With respect to the other commodities, gold accounted for 85% of the total exploration dollars spent in 1987—a substantial increase over the previous years.[11]

Current exploration programs for gold are not confined by the traditional theories or methods of exploration and mining. New theories, developed from recent studies on the origin of gold, have influenced exploration. Exploration programs are no longer restricted to the quartz veins of the Meguma Group rocks. Nowadays, programs have expanded to include not only the host rock slates and greywackes but also glacial tills, granitic rocks, and the rock units of the Cobequid Highlands and Cape Breton Island.

Feasibility studies have been done on the extraction of gold by heap leaching from the tailings and concentrates of old workings, and on the reopening of the old underground mines. At this time, gold properties at Forest Hill and Beaver Dam are in the final stages of development and nearing the production stage, with the Tangier property not far behind. Cochrane Hill, Harrigan Cove and Goldenville may be considered advanced development properties, while Fifteen Mile Stream, Mooseland, Moose River, Leipsigate and Molega are in the advanced exploration stage.

Shaft (background) which provides vertical access to the Forest Hill gold deposit operated by Seabright Resources Incorporated. Underground development presently goes to the 200 m level.

Dredging offshore sediments for gold recovery has also been investigated. Gold in glacial tills is of interest to geologists, as it may indicate if gold exists in the underlying bedrock. Lake, stream and rock geochemistry, geophysical surveys and remote sensing techniques—none of which existed at the time of the initial gold discoveries—aid in the detection and delineation of gold occurrences.

Today, gold exploration is taking a new direction. The gold discovery potential has never been better. Geological research, modern technology and the high market price of gold all point confidently to a bright future for *Nova Scotia gold*.

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ADDITIONAL READING

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CIM geology division excursion guidebook—gold deposits in the Meguma terrane of Nova Scotia; The Canadian Institute of Mining and Metallurgy, Montreal, Quebec, 104 p.

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GLOSSARY

Anticline a fold in rock that appears convex up when viewed in cross-section.

Assay to test or analyze for the quantity of metals (e.g. gold) in an ore or mineral; also refers to the test or analysis.

Auriferous a term used to describe a gold-bearing substance.

Carboniferous Period a division within the geological time scale spanning 80 million years, from 290 to 370 million years ago.

Conglomerate a sedimentary rock composed of rounded pebbles and boulders; a lithified gravel; a basal conglomerate forms the first layer of a succession of sedimentary rock layers and therefore lies on an erosional surface.

Free gold gold physically separate from other substances.

Glacial till nonsorted, nonstratified sediment deposited from glaciers scouring the surface of the Earth.

Glaciation ("Ice Age") the covering of large areas of the Earth's surface by glaciers and ice sheets; the process involves the formation, movement (including erosion of the land and deposition of the glacial sediment) and recession of the ice masses; the Pleistocene glaciation occurred approximately two million years ago.

Greywacke a medium to dark coloured, fine grained metamorphic rock; metamorphosed silty sand.

Group package of rock types.

Horton Group a unit of sedimentary rocks of Carboniferous age (approximately 365 million years old) consisting of sandstone, siltstone, shale, conglomerate, dolostone and coal; the Group is generally confined to the middle and northern areas of the Province.

Igneous rock rock formed by the cooling of a magma; one of the three main classes of rock types (i.e. igneous, sedimentary and metamorphic); example: granite.

Lithification hardening of deposited sediment into rock by the intense pressure caused by the weight of overlying sediment.

Magma molten (fluid) material that is generated deep below the Earth's crust and upon cooling forms igneous rock; if the magma cools before reaching the Earth's surface intrusive (granite-type) rocks are formed; if the magma is extruded on the Earth's surface, extrusive (lava) rocks are formed.

Meguma Group a unique package of rocks, including slate, greywacke and quartzite, significant by the abundance of gold-bearing quartz veins.

Metamorphism a geological process by which unconsolidated material or rock is subjected to intense heat and pressure, and subsequently converted to rock (e.g. clay to slate) or changed to a different rock type (e.g. sandstone to quartzite), respectively; a rock formed by this process is termed metamorphic.

Overburden unconsolidated material (i.e. soil, gravel, sand or silt) overlying bedrock; it may have been deposited from glaciers scouring the surface of the Earth or may have formed in place by weathering of the underlying bedrock.

Pangea according to some theories, Pangea was an ancient landmass or supercontinent formed 200 million years ago by the combination of all continental crust; the present-day continents were formed when Pangea fragmented into smaller continental sections and moved apart by continental drift; means "all lands".

Quartzite a light coloured, fine grained, massive metamorphic rock; metamorphosed quartz.

Sedimentary rock rock formed by the accumulation and subsequent lithification of sediment (i.e. sand, silt or clay) in layers.

Slate a dark coloured, fine grained metamorphic rock which splits easily along flat, smooth surfaces; metamorphosed clay.

Stratum a distinct layer of sedimentary rock of any thickness; bed; pl. strata.

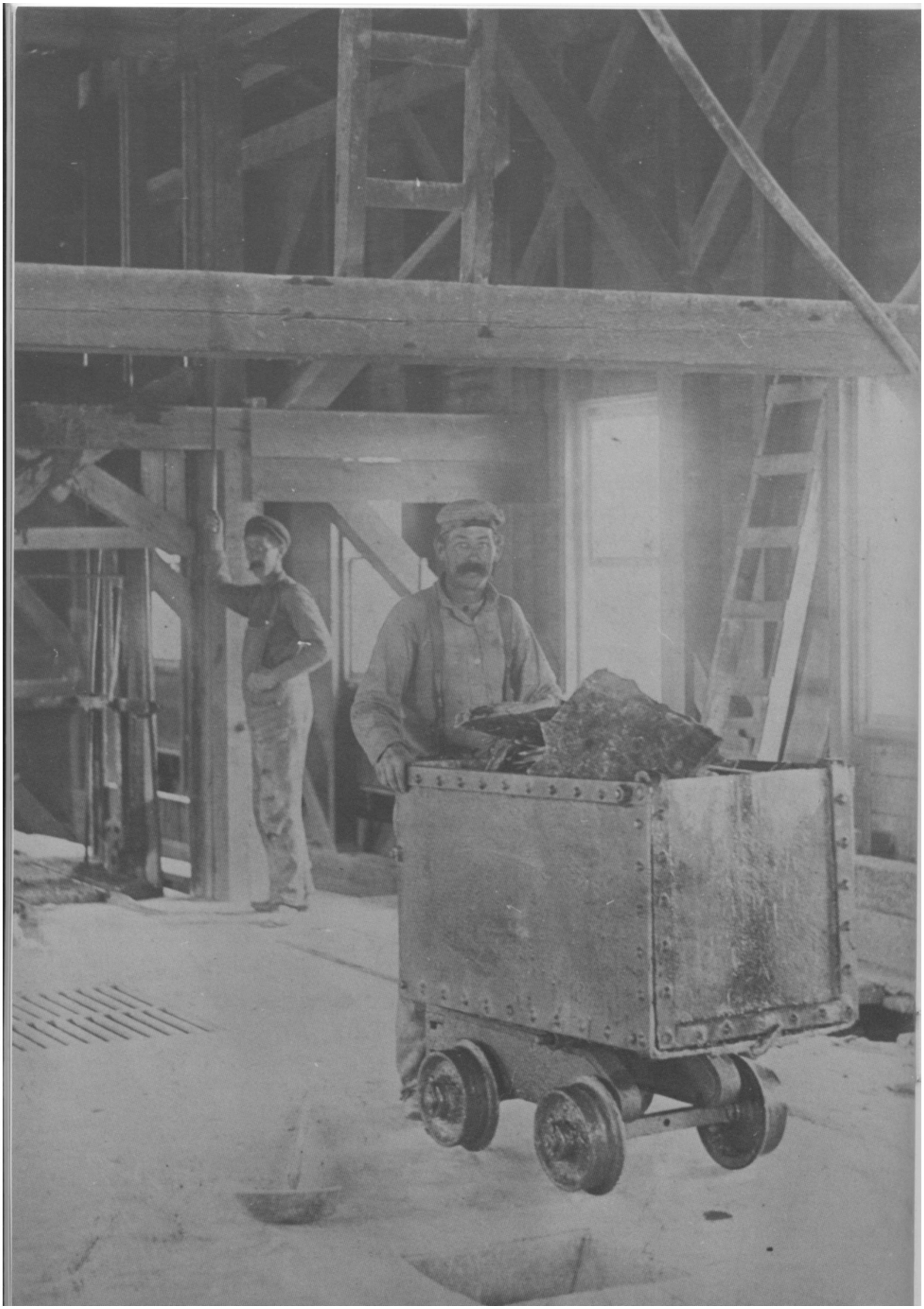
Syncline a fold in rock that appears concave up when viewed in cross-section.

Tailings the discarded residue that remains after the valuable ore (e.g. gold) has been extracted from rock.

Trenching the removal of overburden and bedrock to expose a specific area of interest in the bedrock (e.g. auriferous quartz veins).

Troy ounce a unit of weight measurement used for precious metals (e.g. gold) and gems; 1 troy ounce = 31.103 grams = 1.099 imperial ounce.

Windsor Group a unit of sedimentary rocks including sandstone, siltstone, limestone, dolostone, anhydrite, gypsum and salt; the Group is of Carbdniferous age (approximately 355 million years old) and like the Horton Group is mostly confined to the middle and northern sections of the Province.



APPENDIX

Do-It-Yourself

The following agencies, museums, courses and events may be able to assist those interested in gathering additional information on gold in Nova Scotia as well as on the general geology and mining history of Nova Scotia.

AGENCIES

Nova Scotia Department
of Mines and Energy
1701 Hollis Street
Halifax, Nova Scotia
(902) 424-4161, 424-8633
and
32 Bridge Street
Stellarton, Nova Scotia
(902) 752-8429

Geological Survey of Canada
601 Booth Street
Ottawa, Ontario
(613) 995-4946

Public Archives of Nova Scotia
6016 University Avenue
Halifax, Nova Scotia
(902) 423-9115

Nova Scotia Mineral and Gem Society
PO Box 8361, Station A
Halifax, Nova Scotia
(for information on meetings held once a month from September to June contact the Nova Scotia Museum)

Universities and colleges (Departments of Geology) and public libraries throughout Nova Scotia.

MUSEUMS AND PARKS

Nova Scotia Museum
1747 Summer Street
Halifax, Nova Scotia
(902) 429-4610

The Ovens Park Museum
The Ovens Natural Park
Lunenburg County,
Nova Scotia

Stellarton Mining Museum
and Library
Stellarton, Nova Scotia
(902) 755-4646

Geological, Mineral and Gem
Museum
Parrsboro, Nova Scotia
(902) 254-3266

Colchester Historical Society Museum
29 Young Street
Truro, Nova Scotia
(902) 895-6284

Marble Mountain Library and Museum
Marble Mountain
Inverness County, Nova Scotia

◀ *Interior of the shaft house of the Baltimore and Nova Scotia Mining Company's gold mine at Caribou, Halifax County, 1904.*

Miners Museum
Birkley Street,
Quarry Point,
Cape Breton County,
Nova Scotia

Moose River Gold Mines
Provincial Park
Moose River Gold Mines
Halifax County, Nova Scotia
(902) 384-2290

Miners Museum
Black River Road, Springhill
Cumberland County,
Nova Scotia
(902) 597-3449

Inverness Miners Museum
Inverness
Inverness County, Nova Scotia

Pugwash Museum
Pugwash
Colchester County, Nova Scotia

Miners Museum
Londonderry
Colchester County, Nova Scotia

FESTIVALS AND EVENTS

Waverley Gold Rush Days
Waverley, Nova Scotia
(September, each year)

Annual "Rockhound Roundup"
Parrsboro, Nova Scotia
(August, each year)

COURSES

Prospecting and Geology
of Nova Scotia
(offered every fall)
Continuing Education
Department of Colchester,
Cumberland, East Hants
and Halifax East Counties
Truro, Nova Scotia
(902) 893-7200

and

Department of Part-Time
Studies and Extension
Dalhousie University
Halifax, Nova Scotia
(902) 424-2375

Panning for Gold
Department of Parks and Recreation
PO Box 817
Dartmouth, Nova Scotia
B2Y 3Z3
(902) 464-2121
(spring, each year)

Evening and summer courses in
introductory geology at local
universities and colleges
throughout Nova Scotia.