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TITLE: Britannia Mines and Concentrator

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For almost 70 years the Britannia mines and concentrator were an important producer of copper ore in British Columbia. Although not central to one of a series of booms that characterized the early history of mining in the province nor to the area of concentrated production that subsequently emerged in the southeast sector of the province, the complex on Howe Sound has nonetheless a distinguished history of its own.

In a province whose economic development has been almost exclusively based on the exploitation of natural resources, mining has played a significant role in B.C. history. Although coal was exported from Nanaimo, on Vancouver Island, as early as 1850, the most important early event in B.C. mining history was the Cariboo gold rush of 1858-62. This led to the establishment of the mainland colony of British Columbia, the founding of the town of New Westminster, and the building of the Cariboo Wagon Road.¹ Gold fever led prospectors to stake claims in a number of parts of the province and increasingly, following the building of the Canadian Pacific Railway, in the Kootenay region in the southeast corner of the province. The first Kootenay mine to be successfully exploited was the Silver King, opened in 1886, which produced silver-copper ore.² Then in 1893 another boom began around the town of Rossland in the Kootenay region with the opening of the LeRoi and Josie gold mines.³ Initially part of a second gold rush, these mines led to more permanent development in the area: railway and roads were built, towns were laid out and hydro-electric development planned. The Trail smelter opened in 1896 to treat Rossland ore and Canada's first gold ingot was poured at Trail in 1897.⁴

As was the case generally in Canadian mining history, the search for precious metals led to the exploitation of other metallic ores and during the 1890s copper became an increasingly important commodity until 1901 when it surpassed⁵ gold as the leading mineral mined in the province. At this time copper emerged as one of the most valuable minerals produced in Canada and until 1930 B.C. led the other provinces in the amount of copper ore mined.⁶ Through the 1890s until the First World War, most of the copper mined in B.C. came from the Kootenay region. In 1897, for example, B.C. copper came almost entirely from Rossland and the Hall mines at Nelson. A copper refinery was built at Nelson in 1896 and the Trail smelter also processed copper ores. At the turn of the century the centre of copper production shifted slightly west to the Boundary District. Mines and smelters were opened at Grand Forks and Greenwood which attracted international attention.⁸ After the war most of these West Kootenay mines petered out and were closed while the mines of the Rossland-Trail area turned to mining lead-zinc ores. By the end of the war Trail, supplied with lead-zinc ore from the huge Sullivan mine at Kimberley, had emerged as one of the largest producers of lead and zinc in the world. These metals soon surpassed copper in value of mineral production in the province.

Meanwhile the centre of copper mining had become more diffused in the province although largely situated on the coast. Many mines had been located on the coast during the great boom of the 1890s but unlike those in the Kootenay region they were developed more slowly. In 1896 copper was discovered on Observatory Inlet in the northwest corner of the province.⁹ In 1897 the Marble Bay mine was established on Texada Island¹⁰ and the following year mineral claims were staked at Britannia, on the east shore of Howe Sound. Copper mines were also opened on the Queen Charlotte Islands and on Vancouver Island. By 1902 small copper smelters had been established at Vananda, on Texada Island, and at Crofton and Ladysmith on Vancouver Island.¹¹ Before the war, the coast region still produced only a small fraction of the copper ore mined in the province and the three year average for the Coast-Cassiar Mining District in 1909 was only 2.84 per cent.¹² But production increased dramatically during the war and by 1915 the three year average for the Coast-Cassiar district was 60 per cent.¹³ The mines of this region continued to grow in importance during the 1920s.

The importance of the coast region in B.C. copper production was due to two mining complexes developed in the early years of this century, at Britannia, on Howe Sound, and at Anyox, on Observatory Inlet. Together with a mine at Copper Mountain near Princeton, the Anyox and Britannia operations produced most of the copper ore mined in the province in the interwar years.

Anyox was developed by the Granby Consolidated Mining and Smelting Company after 1910. It enlarged the nearby Hidden Creek mine and built a smelter and company town which opened in 1914.¹⁴ Like the Grand Forks mill, also owned by the Granby company, the plant produced blister copper which was exported for refining. A concentrator with a daily capacity of 1200 tons was built in 1924 and by 1929 this had been enlarged to handle 4,500 tons a day. The operation closed in 1935¹⁵ and in the 1950s Anyox was described as a ghost town. The Granby Company also owned the Copper Mountain mine and nearby concentrator at Allenby which had been built in 1919. This operation flourished from 1925 until 1937. Taken over by Consolidated Mining and Smelting, it reopened after the war and produced copper ore through the 1950s.¹⁶ The Britannia operation was the longest-lived of these 20th Century giants and produced concentrated copper ore almost steadily from 1905 until 1974.

Situated 28 miles north of Vancouver, three miles from the east shore of Howe Sound, the Britannia mines had been prospected in the late 1880s, but for gold, not copper, and its treasure remained hidden until 1898 when some trappers discovered a zone of mineralized schist containing copper ore. The Britannia group of claims was staked and control passed in quick succession to a firm of Victoria fur buyers, a group of Vancouver businessmen and, by 1908, a New York banking establishment headed by Grant B. Schley. A company was organized called Britannia Mining and Smelting that controlled the Howe Sound enterprise for the next 50 years.

What was known as the Britannia group was a cluster of claims and four adjoining mines known as the Jane, Bluff, Fairview and Empress. Eventually these would be connected by a network of tunnels at a number of different levels in the mountain.¹⁷ Unlike the interior enterprises, the tidewater mines benefited from easy access to cheap transportation and so processing was not as important to the Britannia mines as it was elsewhere. Still, copper existed

in such small proportions in the ore that it was economical to concentrate the material before shipping it to the refinery. Despite the favourable indications of the site, then, considerable development work was necessary before the Britannia could begin producing. This work focused on three areas: opening the mines, constructing a concentrator and building a tramway to transport crushed ore from the mine audit to the concentrator.

Work proceeded slowly at first as the necessary capital was difficult to obtain. In 1899 a tunnel was dug into the mountainside at 3,300 ft. above sea level to open the Jane mine. In 1903 an infusion of capital allowed for the completion of an aerial tramway to bring the ore from the mine entrance to the shore, three miles distant. The following year a gravity concentrator was built on the steep mountainside¹⁸ above the beach with a capacity to process 200 tons a day. The whole operation was powered by water from nearby Britannia Creek. The ore, condensed to a crude concentrate of about ten per cent copper, was shipped to the smelter at Crofton which had been taken over and refurbished by the Britannia interests. The first shipment of Britannia ore was made in December 1905.¹⁹

By 1912 Britannia had developed into a major mining operation. A 5,000 foot tunnel was under construction to provide access to large ore deposits. A company town had been established at the foot of the mountain, called Britannia Beach, with cottages, hospital and store.²⁰ A camp was established near the mine entrance. In all, between six and seven hundred men were employed both in the mines and above ground. That year the concentrator milled 193,000 tons of ore that yielded more than 14 million pounds of copper.²¹

As the high grade copper ore was mined out, larger deposits of low grade ore were discovered. Only a large scale operation would be profitable and the company accordingly made plans to expand. Key to this expansion was a new concentrator with a capacity ten times that of the old one. The No. 2 concentrator comprised two halves, each with a capacity of 1,000 tons of ore a day. Of timber construction, the first unit was completed in 1914, the second in 1915.²² In 1912 a patented flotation process had been introduced to the No. 1 mill and this formed a central part of the new concentrator.²³ The principle behind this system was that metal particles in finely crushed ore soaked

in oil and then moved through a stream of water would float. In this process, ore was initially crushed at the mine then transported to the concentrator where it was crushed to a fine powder. It was covered in an oily solution, then moved by water over long conduits where the slag would sink. The metal bearing concentrate would be collected in tanks where the water would be drawn off and a concentrate of about 25 per cent copper left.²⁴ It was claimed that this was the first time this process, patented by Minerals Separation Ltd., was used in the province.²⁵ This was not the first use of one flotation in the province, however, as in 1902 the Canadian Ore Extraction Company, which owned the rights to the Elmore Oil Process of concentration, set up a small plant²⁶ at Rossland for processing ores from the LeRoi No. 2 mine.

At the same time that the No. 2 mill was being built a new tunnel was being built into the Fairview mine, some 300 feet below the main entrance. By 1917 the mining operation consisted of 12 levels consisting of stopes or large caverns connected by a tunnel system. As well there was an open pit or glory hole at the top of the mountain.²⁷ A new transportation system was built during the war years linking the entrance to the Fairview mine with the concentrator. This became the principal entrance to the mining operation after a disastrous snow slide swept away the old camp, killing 57 miners. In 1916 a new camp was begun at the Fairview entrance called Mount Sheer townsite. Houses, a bunkhouse, recreation centre, school and store were built at the new location. Hydro-electricity was introduced about 1917. There were other changes. In 1913 the Britannia company dispensed with its Crofton smelter and began shipping all of its ore to a smelter in Tacoma, Washington, an association that lasted until 1960.²⁸ The expansion of the Britannia property had the desired effect and in 1920 it was described as²⁹ the most important copper mining property in the province.

The No. 2 concentrator was destroyed by fire in the winter of 1921. This was not too much of a setback as there was a temporary slump in the price of copper and the company took the opportunity to improve the concentrating facility. A San Francisco consultant designed the plant which was to be housed in a concrete and steel structure. Like its predecessor, the new mill took advantage of the steep mountainside to allow for a gravity feed system. Rising 210 feet vertically, the mill received the ore at its uppermost

storey and then fed it down through seven more stories as it passed through successive stages of the concentrating process. The concentrate was piped from the bottom level at the beach directly to the hold of a waiting ship.³⁰ Begun in 1922, No. 3 concentrator was completed the following January. It has been suggested that the No. 3 mill contained equipment for differential flotation for separating other metal concentrators.³¹ But zinc concentrate was not produced until 1933. In its first year of operation the new mill processed 682,511 tons of ore which yielded 22,158,893 pounds of copper plus significant amounts of silver and gold.³²

The whole operation continued to be improved and expanded through the 1920s. In 1924 the concentrator was modified so that it could process 3,000 tons a day and by 1927, its daily capacity had been further expanded to 4,000 tons.³³ A tunnel was completed that connected the mining operation directly to the concentrator and an underground railway replaced the more clumsy aerial tramway. The operation reached its height at the end of the decade when more than a thousand men were on the payroll and the concentrator processed 1,920,339 tons of ore³⁴ in the year which yielded 41,469,339 pounds of copper.

During the Depression the fortunes of the Britannia operation slumped and production was cut to 20 and then 50 per cent of the 1929 peak. Nonetheless the Britannia group survived the decade as one of the five major metal mines in the province. One of the ways it survived the hard years was by diversifying its minerals. Gold, silver and pyrites became important by products and in 1933 high grade zinc concentrates³⁵ were shipped from the Britannia mill for the first time. In 1935 the fortunes of the Britannia operation began to turn around. The following year an increase in the price of copper allowed the plant to resume near normal operation and almost 900 men were on the payroll.³⁶ By 1938 the mill was processing over two million tons of ore per year with a yield of over 33 million pounds of copper. That year the Britannia operation was again described as being "one of the largest producing mines of British Columbia."³⁷

With the advent of the Second World War the demand for copper became acute and prices rose accordingly. Demand remained fairly steady through the early 1950s due to the stimulus of munitions manufacture during the Korean War.

Throughout this period the Britannia operation remained an important source of copper in the province. The B.C. ministry of mines annual report for 1956 noted that "the large copper mines at Copper Mountain and Britannia Beach yielded about 81 per cent of the copper and about 8 per cent of the gold."³⁸ But Copper Mountain and Britannia remained leaders only by default. The production of Britannia had slipped dramatically since 1929. In 1955, for example, when the price of copper had been at an all time high, it shipped only 878,661 tons of ore that yielded 16,624,387 pounds of copper, down about two thirds from its pre-war high.³⁹ Copper Mountain and Britannia were basking in faded glory and when new mines on Vancouver Island and Merritt opened in the late 1950s their production was quickly eclipsed.

When the price of copper fell in 1957 it became difficult for the old operations to make a profit. That year the Copper Mountain mine closed and in December the Britannia company proposed suspending operations.⁴⁰ Federal and provincial government subsidies persuaded it to keep going until March 1958 when the company went into liquidation.⁴¹ The price of copper rose at this juncture and, following a reorganization, the Britannia holding company re-opened the plant on a reduced scale in 1959.⁴² In 1961 the Britannia company ended its long association with the Tacoma smelter and began shipping its concentrates to Japan. The operation continued on a firm economic footing through the early 1960s as the price of copper remained steady. It seemed even more secure after it was sold to Anaconda (Canada) Ltd. in 1963. Still, it was an old mining operation that had seen better days. Its copper production in 1962 was under 13 million pounds and it was no longer regarded as a major mining development in the province.⁴⁴

The Britannia operation continued on this reduced scale through the 1960s and early 1970s, producing under 13 million pounds of copper a year and employing under 400 men. As long as the price of copper remained stable and easily mined ore remained abundant, it remained a viable operation. But its future was at best tenuous, and it could not have come as a surprise when in 1974 Anaconda announced that it was closing down the mines and concentrator and dismantling the operation.

When the mines and mill closed the town of Britannia was a fairly well established community. Although still

essentially a company town, as a picturesque village not far from a major metropolis, it had developed a life of its own. A centennial committee had formed to commission a history of the Britannia operation in 1967 and in 1971 this became the Britannia Beach Historical Society. As a consequence there was considerable interest in preserving the site as an outdoor museum and, with the co-operation of Anaconda, the local historical society acquired the concentrator and mine site. Since 1975 it has developed this as the B.C. Museum of Mining, giving tours of the concentrator and main tunnel. The museum benefits from having an array of machinery still in the mill and part of the underground railway to take visitors into the tunnel system. It claims that the No. 3 mill "is the last remaining gravity-fed concentrator in North America that is accessible to the general public. The few other such mills are in remote locations, far from major population centres."⁴⁴ The Britannia museum benefits from being in an attractive setting, not far from a major base for tourist excursions. Considerable development is needed, however, to better preserve the in situ resources and interpret the mining theme. The historical society is considering possibly creating a Britannia Mining Heritage Village on the site and proposes "to create a 'museum within a museum' which would permit special mining related exhibits to be housed within the Mill. The degree of restoration of the building will dictate the amount of space that will be suitable for museum exhibits. In the short term, the Society intends to continue to interpret the actual milling processes that took place inside the building."⁴⁵

The case for the national significance of the Britannia site rests on two points: its connection to the development of provincial and national mineral production and the uniqueness of its in situ resources. Copper production has already been commemorated by a national historic site plaque at Noranda. Even in a national context the Britannia mines were extremely long lived; operating for 70 years and as an important mining development for almost half a century. This longevity gives the site an important context it would not otherwise have. Other mines in the province, such as the famous Sullivan mine in the Kootenay region, benefit from being in areas of concentrated mining activity. Unless we consider the mines of Texada Island also in the southern coast region, there was little other significant mining activity in the vicinity of Britannia.

The significance of the Britannia complex can be also

assessed from the perspective of physical remains. Here one preserved part of an old tunnel system, the foundations of the No. 1 mill (1905), and the No. 2 mill (1916) and the whole of No. 3 mill (1923) along with interior equipment and ancillary buildings. While the concentrator is not strictly part of the extractive process it is part of a related activity so that the mill can be considered an apt resource for the interpretation of mining. Certainly it falls within the criteria set out in the preliminary study of the mining theme for the National Historic Parks and Sites systems plan, which suggests that "refining should be considered together with extraction at least in those operations where the two were located near one another."⁴⁶ The presence of these in situ resources, then, seems to enhance the significance of the Britannia site, especially in comparison with the Rossland mine, which is also operated as a mining museum but which has no historic features except for a tunnel. Research has not been able to prove the assertion of the Britannia association that its concentrator is the only gravity-fed mill in North America accessible to the public. Probably one survives at Anyox but this is indeed remote. None survive at Grand Forks or Greenwood. The fate of the Allenby concentrator is not known and there were concentrators built to process other areas whose later history also remains obscure. A definitive answer to the question of the rarity of the Britannia concentrator could be obtained by a site inventory in the province. The B.C. Heritage Conservation Branch of the Ministry of Tourism, Recreation and Culture is exploring the feasibility of carrying out such a survey in the near future.⁴⁷ But even without such comparative information Britannia's long history and present circumstances suggest that it is an important resource for the interpretation of B.C. mining history.

Endnotes

- 1 Staff report, "Thematic Study: A History of Mining in British Columbia," Historic Sites and Monuments Board of Canada Agenda Papers, October 1964.
- 2 British Columbia, Ministry of Mines, Mining in British Columbia, an Outline of the Development of the Industry (Victoria: Queen's Printer, 1954), p. 12.

- 3 Staff report, "Thematic Study: A History of Mining in British Columbia."
- 4 Loc. cit.
- 5 British Columbia, Ministry of Mines, Annual Report, 1923, p. A10.
- 6 Canada Year Book, 1916-17, p. 272; Canada Year Book, 1939, p. 335.
- 7 British Columbia, Ministry of Mines, Annual Report, 1897, p. 463.
- 8 C.J. Taylor, "Greenwood British Columbia Smelter," Historic Sites and Monuments Board of Canada Agenda Papers, Nov. 1981.
- 9 Bruce Ramsey. The Saga of Mining in British Columbia (Vancouver: C.M. Oliver, 1957), p. 27; the Hidden Creek mine was not established until 1901, B.C. Ministry of Mines, Annual Report, 1914, p. K 145.
- 10 Victor Dolmage, "The Marble Bay Mine, Texada Island, British Columbia," Economic Geology, vol. xvi, no 6 (Sept.-Oct. 1921), p. 373.
- 11 B.C. Ministry of Mines, Annual Report, 1901, pp. 1110 and 1122.
- 12 B.C. Ministry of Mines, Annual Report, 1909, p. K 23.
- 13 B.C. Ministry of Mines, Annual Report, 1915, p. K 24.
- 14 B.C. Ministry of Mines, Annual Report, 1914, p. K 145.
- 15 A.F. Flucke, "A History of Mining in British Columbia," unpublished manuscript on file, Energy, Mines and Resources Canada, library.
- 16 Loc. cit.
- 17 Later these would include the Victoria and Homestake divisions.
- 18 B.C. Bureau of Mines, Annual Report, 1899, p. 811; Annual Report, 1901, p. 1120; Annual Report, 1904,

- p. G 27; A.F. Flucke, "A History of Mining in British Columbia, p. 15.
- 19 B.C. Bureau of Mines, Annual Report, 1905, p. J. 26; Another source gives 1904 for the first shipment and 1905 for regular production: Marilyn Mullen and Dianne Newell, "Britannia Mines Concentrator: Canada's Largest Museum Artifact," Bulletin of the Canadian Institute of Mining and Metallurgy, 77,868 (Aug. 1984), p. 74.
 - 20 B.C. Bureau of Mines, Annual Report, 1912, p. K 200.
 - 21 Ibid., p. K 201.
 - 22 B.C. Bureau of Mines, Annual Report, 1913, p. K 306; Annual Report, 1915, p. K 294.
 - 23 B.C. Bureau of Mines, Annual Report, 1912, p. K 201.
 - 24 Encyclopedia Canadiana, vol. 7, "Metallurgy."
 - 25 Appendix I, B.C. Museum of Mining, "Proposal For Designation of Britannia Concentrating Mill Complex As A National Historic Site," Feb. 1987, p. 4.
 - 26 Christopher Curtis, "The Rossland Gold Mines," Historic Sites and Monuments Board of Canada, Agenda Papers, June 1984.
 - 27 B.C. Bureau of Mines, Annual Report, 1917, pp. F 272-274.
 - 28 B.C. Bureau of Mines, Annual Report, 1913, p. K 301; Marilyn Mullen and Dianne Newell, "Britannia Mines Concentrator: Canada's largest museum artifact," p. 74.
 - 29 B.C. Bureau of Mines, Annual Report, 1920, p. N 217.
 - 30 B.C. Bureau of Mines, Annual Report, 1921, p. G 227.
 - 31 Marilyn Mullen and Dianne Newell, "Britannia Mines concentrator: Canada's largest museum artifact," p. 75.
 - 32 B.C. Bureau of Mines, Annual Report, 1923, p. A 264.
 - 33 B.C. Bureau of Mines, Annual Report, 1924, p. B 237; Annual Report, 1927, p. C 362.

- 34 B.C. Bureau of Mines, Annual Report, 1929, p. C 396.
- 35 B.C. Bureau of Mines, Annual Report, 1933, p. A 258.
- 36 B.C. Bureau of Mines, Annual Report, 1936, p. F 64.
- 37 B.C. Bureau of Mines, Annual Report, 1938, p. F 69.
- 38 B.C. Bureau of Mines, Annual Report, 1956, p. A 10.
- 39 B.C. Bureau of Mines, Annual Report, 1955, p. A 9.
- 40 B.C. Bureau of Mines, Annual Report, 1958, p. 56.
- 41 Loc. cit.
- 42 B.C. Bureau of Mines, Annual Report, 1959, p. 4.
- 43 B.C. Bureau of Mines, Annual Report, 1962, p. A 47.
Copper production set a new record of 109 million pounds this year. Seventy-two per cent of this was produced by the Craigmount mine at Merritt.
- 44 See Appendix, B.C. Museum of Mining, "Proposal For Designation of Britannia Concentrating Mill Complex as a National Historic Sites," Feb. 1987, p. 3.
- 45 Ibid., p. 5.
- 46 William N.T. Wylie, "Exploring Mining History: A Preliminary Study," Historic Sites and Monuments Board of Canada, Agenda Papers, November 1986.
- 47 Personal communication, Alistair Kerr, B.C. Heritage Conservation Branch, 12 August 1987.