

26-D-58

Historical File Copy

DOMINION BUREAU  
OF STATISTICS  
JUN 15 1948  
PROPERTY OF THE  
LIBRARY

**A HALF CENTURY**  
  
in  
  
**CANADIAN MINING**  
  
**1898 - 1947**

—  
  
by  
  
**W. H. LOSEE.**

MILLION DOLLARS

# VALUE OF MINERAL PRODUCTION BY CLASSES CANADA, 1898-1947

700

600

500

400

300

200

100

0



50 YEARS OF PROGRESS

TOTAL

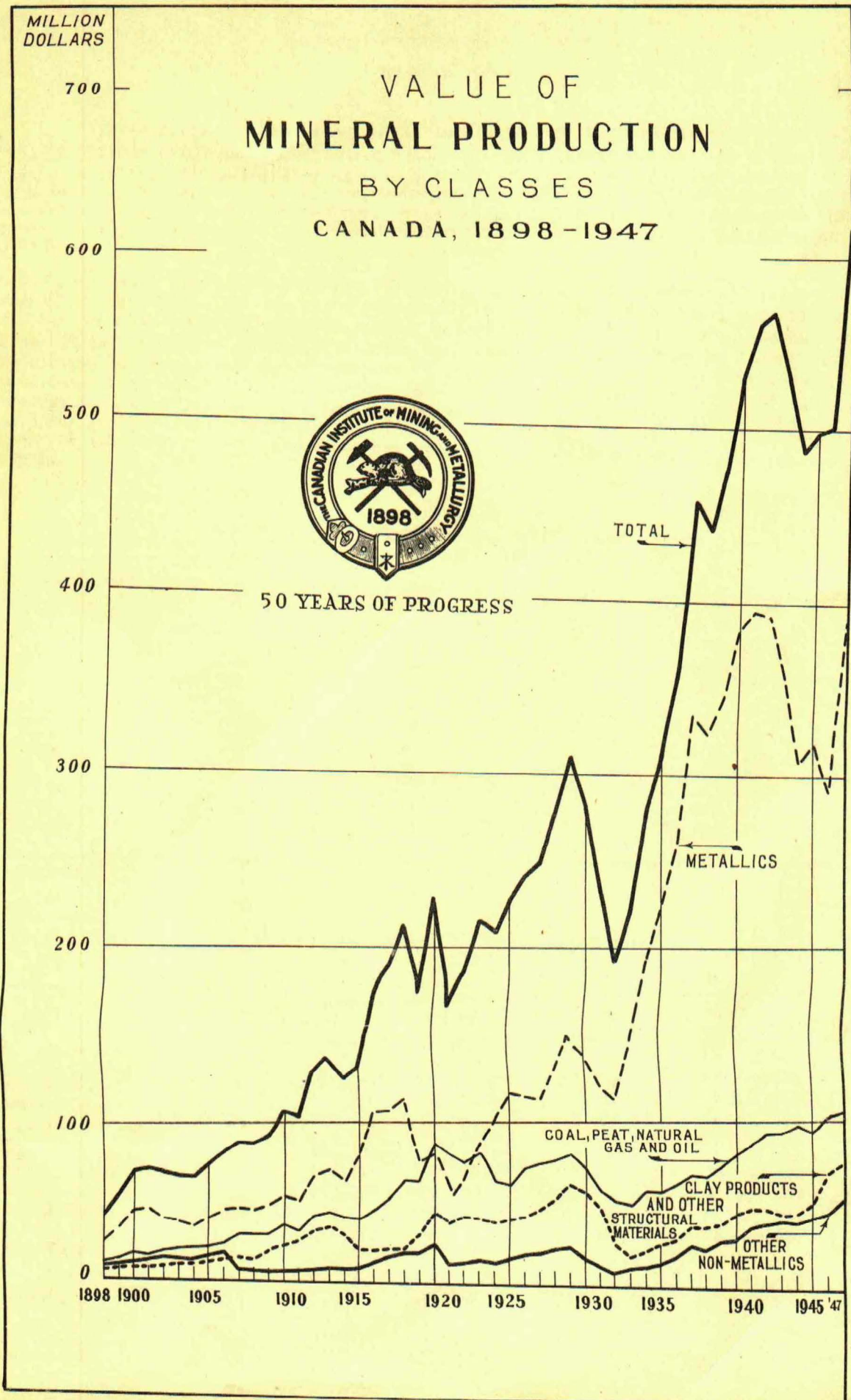
METALLICS

COAL, PEAT, NATURAL GAS AND OIL

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

OTHER NON-METALLICS

1898 1900 1905 1910 1915 1920 1925 1930 1935 1940 1945 '47



A HALF CENTURY IN CANADIAN MINING

by W. H. Losee\*

As we pause at this milestone to look back over the road we have travelled, we can feel pardonable pride in the obstacles which have been surmounted and the progress which has been made in the mining industry of this country. Fifty years is a short period in the life of a nation, yet many of our major discoveries and their successful development into mines occurred during the last half century. Certainly the visions of the founders of this Institute were far-reaching, and their confidence in the future of mining in Canada entirely justified.

During the period 1898 to 1947, large areas have been opened up for development; our mines' production has increased many-fold; we have supplied no small part of the metals and minerals needed by the Empire, and our allies in two world conflicts, and have emerged from the last one in a strategic position both from the point of view of future supply and metallurgical development not comparable to any other country with the same population. The products of our mines, which in the earlier part of the century were exported for treatment, are now refined here in large measure, and form a goodly part of the raw materials used for further advance in manufacturing, thus enabling Canada to get the maximum benefit from the export market and to reduce our imports of those metals which Canadian sources can supply.

Mineral Production of Canada, by Principal Groups  
10-Year Periods, 1898-1947

Year	Metals	Fuels	Non-metallics Excluding Fuels	Clay Products and Other Structural Materials	Total
	\$	\$	\$	\$	\$
1898 .....	21,741,865	9,606,748	1,778,262	5,570,146	38,697,021
1908 .....	41,774,362	26,954,515	5,188,269	11,339,955	85,557,101
1918 .....	114,549,152	60,428,979	17,192,967	19,130,799	211,301,897
1928 .....	132,012,454	74,413,160	18,826,692	49,737,181	274,989,487
1938 .....	323,075,154	64,803,294	20,066,123	33,878,666	441,823,237
1947 (x) ..	389,510,168	105,162,915	51,744,187	72,716,159	619,133,429

(x) Preliminary.

Mineral Production of Canada, by Decades  
1899-1947

Province	1899	1908	1918	1928	1938	1947(✓)
	\$	\$	\$	\$	\$	\$
Nova Scotia ....	6,817,274	14,487,108	22,317,108	30,524,392	26,253,645	32,745,153
New Brunswick ..	420,227	579,816	2,144,017	2,198,919	3,802,565	4,980,712
Quebec .....	2,585,635	6,372,949	19,605,347	37,037,420	68,965,594	110,627,408
Ontario .....	9,819,557	30,623,812	94,694,093	99,584,718	219,801,994	241,666,479
Manitoba .....		584,374	3,120,600	4,186,853	17,173,002	17,289,315
Saskatchewan ...)	17,108,707	413,212	1,019,781	1,719,461	7,782,847	31,988,049
Alberta .....		5,122,505	23,109,987	32,531,416	28,966,272	62,689,943
British Columbia	12,482,605	23,704,035	42,935,333	64,496,351	64,549,130	113,108,923
Yukon .....	...	3,669,290	2,355,631	2,709,957	3,959,570	1,674,034
Northwest Terri- tories .....	...	...	...	...	568,618	2,363,413
Total .....	49,234,005	85,557,101	211,301,897	274,989,487	441,823,237	619,133,429
Per capita .....	9.27	13.16	25.37	27.96	39.42	49.24

(✓) Preliminary.

\* Director, Division of Census of Industry and Merchandising, Dominion Bureau of Statistics, Ottawa.

The year the Institute was founded, production from Canadian mines was valued at \$38 millions, or \$7.32 per capita, and during the year just past it reached a total of \$619 millions, or \$49.24 per capita, the highest on record. During the past half century, the products of our mines aggregated over nine and a half billion dollars.

Going back to 1898, let us remember that the Klondyke had been discovered only two years before, and of the \$38 millions produced in that year, gold to the value of \$10 millions came from the alluvial deposits of the Yukon Territory. British Columbia accounted for \$3 millions in gold; coal from various parts of Canada \$8 millions, and the remainder was made up of silver, lead, copper, nickel, oil, and several minor metals, non-metallic minerals, and structural materials. Smelters located at Trail and Nelson in British Columbia were treating the copper-gold ores of the vicinity, all lead concentrates were exported, and the smelter at Copper Cliff, Ontario, produced a copper-nickel matte for export. The vast plants which now stand at Trail and Copper Cliff are truly monuments to those men who lived through this most active mining and metallurgical period and gave their best towards this splendid achievement.

The number of people employed in the mining industry in Canada in 1900 totalled 38,592 who received \$17,849,000 in salaries and wages. In 1921 this number had increased to 60,804 with salaries and wages at \$79,161,640. By 1941 the number employed totalled 113,227 and salaries and wages \$186,423,186. In 1946 employment was recorded at 99,200 and salaries and wages \$196,723,000.

There are many ways in which the effects of the growth of such an industry may be demonstrated; one of the most striking is in the building of towns and cities in parts of Canada that showed little else than logged-over country or the hut of the trapper. The growth in population of some of these places for each census year since 1901 is given below:

	<u>1901</u>	<u>1911</u>	<u>1921</u>	<u>1931</u>	<u>1941</u>	<u>1947</u>
Val d'Or, Quebec .....	...	...	...	...	4,385	7,500
Noranda, Quebec .....	...	...	...	2,246	4,576	6,500
Rouyn, Quebec .....	...	...	...	3,225	8,808	12,000
Tp. of Teck, Ontario ..	...	...	1,170	9,915	20,409	19,734
Timmins, Ontario .....	...	...	3,843	14,200	28,790	27,700
Sudbury, Ontario .....	2,027	4,150	8,621	18,518	32,203	39,781
Red Lake, Ontario .....	...	...	...	444	1,827	2,500
Flin Flon, Manitoba ...	...	...	...	2,374	6,860	9,500
Trail, British Columbia	1,360	1,460	3,020	7,573	9,392	10,500
Yellowknife, Northwest Territories .....	...	...	...	...	1,410	3,500
Copper Cliff, Ontario..	2,500	3,082	2,597	3,173	3,732	3,457

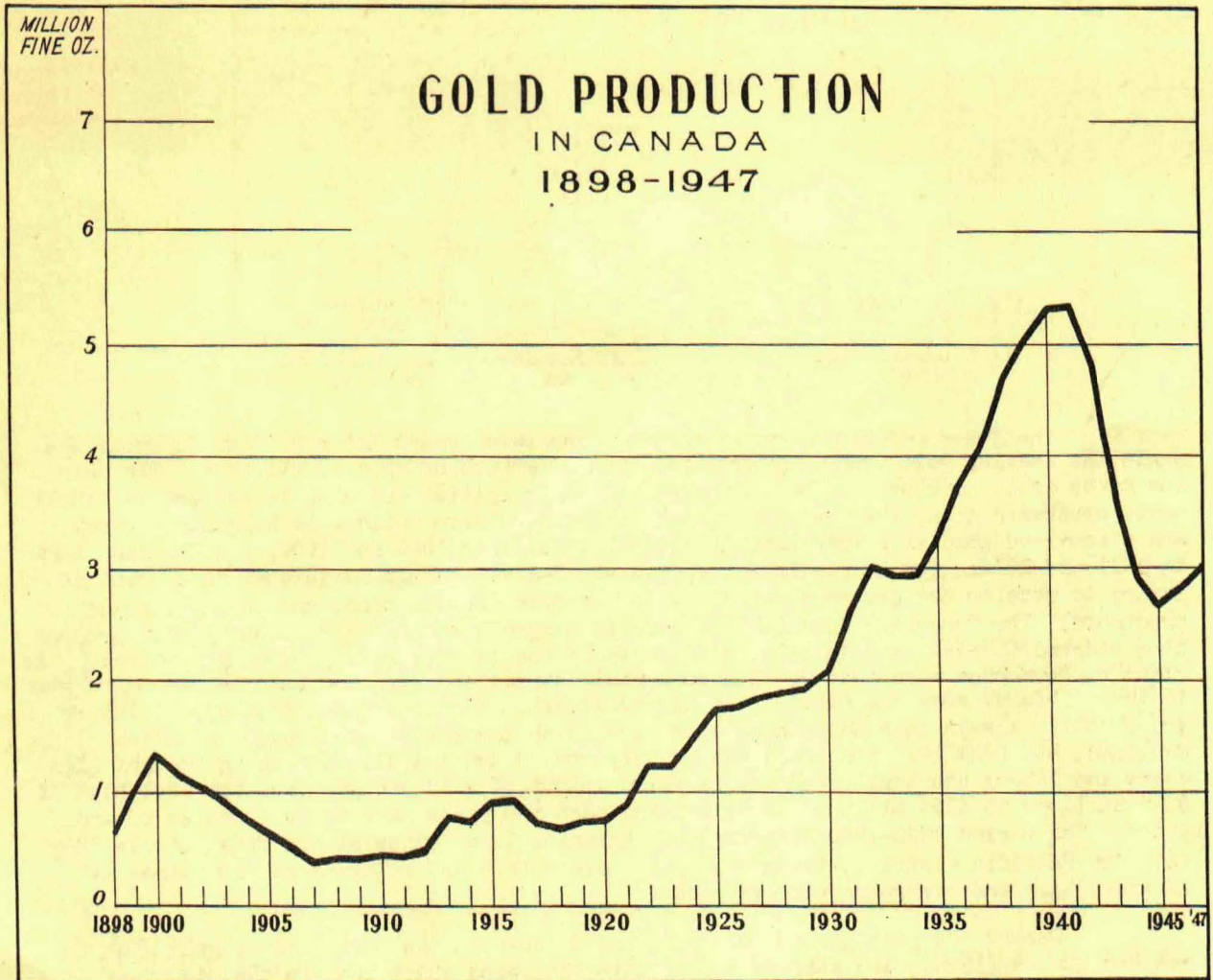
These communities must be supplied with the necessities of life, and the mines and smelters with equipment of all kinds. In 1937 a survey showed that purchases of equipment and supplies required by mining and smelting companies in Canada amounted to \$130 millions. It is very difficult to arrive at the market for consumers' goods in mining towns but it is of considerable importance to transportation companies and to those parts of Canada which must supply them. The standard of living in mining communities is of a high order.

In order to demonstrate the remarkable growth of the mining industry in Canada, I have arranged a series of charts showing the production of the more important metals and minerals during the past fifty years. I will throw these on the screen and endeavour to point out the reasons for the rises and dips. Many here will be familiar with each phase, and as I go along they will realize the part they have played, whether it was discovery, geology, financing, development, improvement in ore dressing or metallurgical treatment, in expanding our mineral empire of which we are all so justly proud.

The first slide gives an over-all picture of the rise and fall of the total value of production broken down as between metals, fuels, industrial minerals, and structural materials. It will be seen that the metals pretty well follow the total curve and are the most important from point of value. Though fuels, which include coal, natural gas and crude petroleum, do not show a rapid rise, they occupy a prominent place in our mineral production, and are destined, as time goes on, to increase in importance, as the Canadian climate demands a sure supply of a heating medium regardless of what it may be.

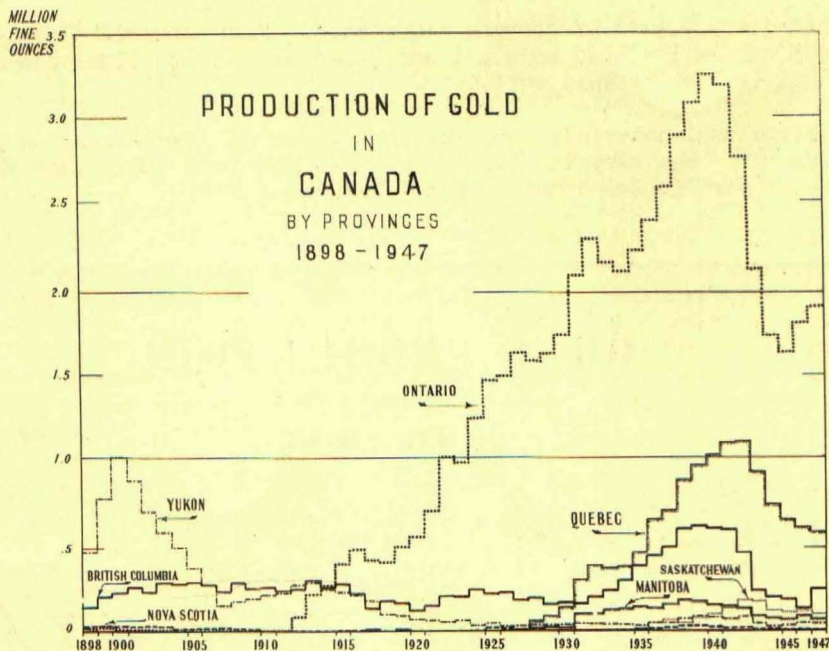
The industrial minerals are also of growing importance. Such minerals as salt, gypsum and asbestos enter into our daily lives more and more, and many of the other non-metallics are absolutely essential to our physical well-being.

Of the structural materials, such as cement, brick, lime, sand and gravel and stone, it is necessary to say very little. We are familiar with their importance as they play such a prominent part in our construction activities.



G O L D

Gold is the glamour metal of the prospector and its occurrence is fairly widespread across Canada. Placer gold was found in the Klondyke, Yukon Territory, in 1896. Two years after the announcement of this find, and the year the Institute was founded, production from the Yukon reached the 10 million dollar mark. By this time, British Columbia's lode mines had surpassed the placer output of the province, production from both sources being valued at \$3 millions; Nova Scotia's production is reported at \$500,000 and Ontario and Quebec sources yielded only minor amounts.



The Yukon reached its peak in 1900, and seven years later British Columbia was again the leading gold producing province with an output of over \$5 millions. The scene now moves east. Prospectors who had received their initial training in and around Cobalt moved northward along the Temiskaming and Northern Ontario railway looking for mineral, and discovered gold at Larder Lake in 1906, Porcupine in 1908 and 1909, and Kirkland Lake in 1911 and 1912. The Larder Lake camp was short-lived though large sums were spent in trying to develop the ground which today is the Kerr Addison mine, one of our largest producers. The Porcupine fire in 1911 delayed progress in that camp, but by 1912 production started to rise, and in 1914 Ontario became the leading gold producing province. The mines of Porcupine were just getting into their stride and Kirkland Lake developments were in their infancy when the first great war broke out. High costs and shortage of labour and supplies always go hand in hand with wars, with the result that gold production declined, but from 1919 the trend was sharply upward until 1941. War again brought high costs and labour shortages, and the Canadian output of gold dropped from the 1941 high of \$206 millions to \$104 millions in 1945. The past two years have again shown an upward trend. The period 1920-1940 witnessed the bringing in of mines at Red Lake, Little Long Lac, the Patricia district, the old camp at Larder Lake was rejuvenated, and mines at Kirkland Lake and Porcupine were expanded.

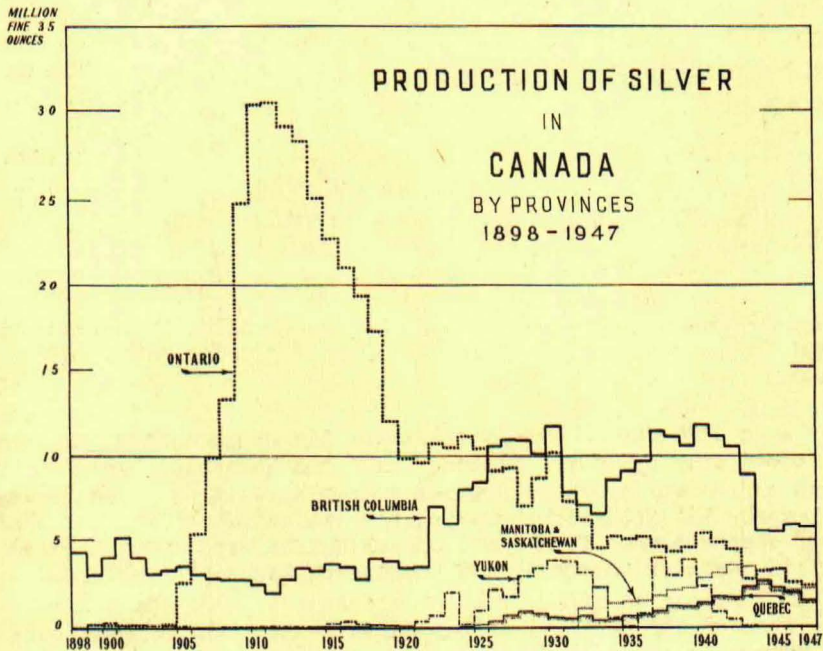
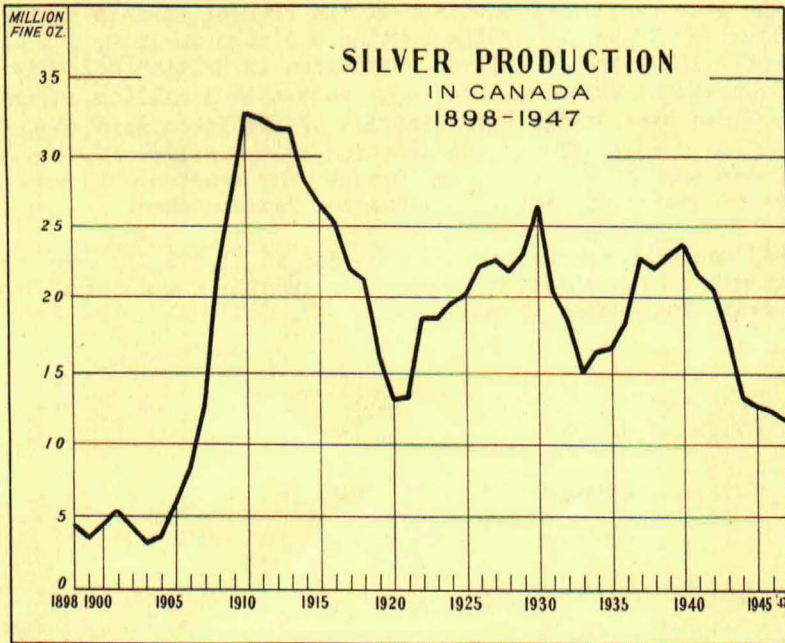
During the same period, Ed Horne had discovered the Horne copper-gold mine in western Quebec (1920), and started a rush into that area which led to the discovery of many important producers in the townships east of Rouyn and brought Quebec to the position of being the second largest gold-producing province in the Dominion.

Prospectors had also been working westward from the Ontario boundary, and for a time Manitoba had five regular producers. The San Antonio is the only producing mine at present, though there is much activity in the Snow Lake area where the Howe Sound Company has a promising property under development. In July, 1939 the Box mine in Saskatchewan began production, but operations ceased there in 1942.

Following along the same range of rocks which had accounted for so many producers in Quebec, Ontario, and so much activity in Manitoba and Saskatchewan, the latest major development is in the Yellowknife district of the Northwest Territories. Many square miles have been staked. Production in 1947 came from the operating plants of the Con, Rycon, Negus and Thompson Lundmark. The Giant Yellowknife is under development and is destined to be one of the major producers in this area.

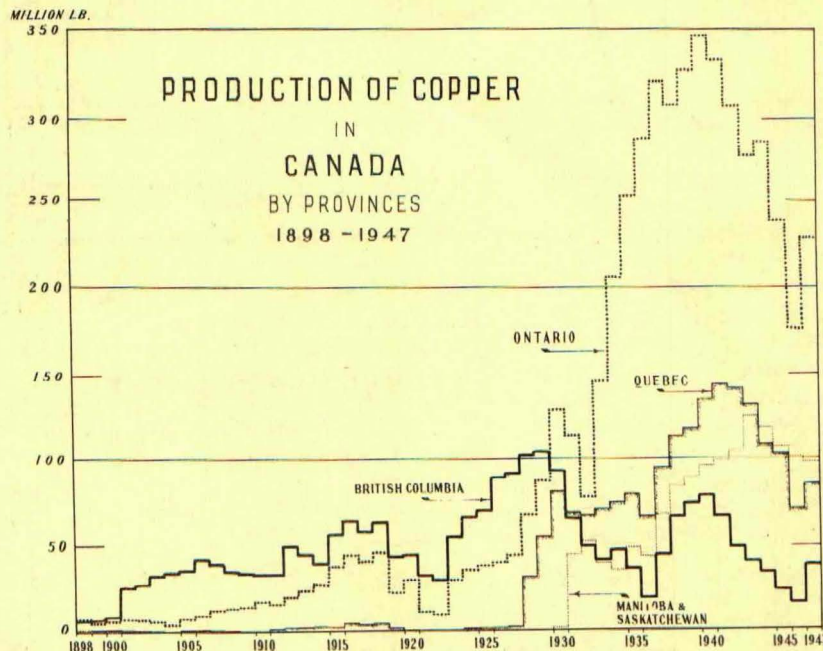
During the period 1920-1940, British Columbia gold production rose to new heights. The Cariboo Gold Quartz Mining Company commenced production near Barkerville (1933), the Bridge River country, in which there was much early interest, was again investigated and brought forth the Bralorne and Pioneer. The Zeballos area on the west coast of Vancouver

Island experienced a rush which resulted in several producers, and some older mines in the province were re-opened. From an output of \$2½ millions in 1920, British Columbia's production of gold reached \$23,755,000 in 1940, the highest ever recorded.



**Silver** - In 1898 the Canadian production of silver totalled 4,452,333 fine ounces, of which British Columbia mines accounted for 4,292,401, the source being principally the silver-lead ores of the West Kootenay district. In 1903 silver was discovered at Long Lake in Ontario, later to be known as Cobalt, and in 1906 production from this area totalled 5,401,000 fine ounces as against 3 million for British Columbia. Silver mines in Gowganda and South Lorrain augmented the output from the Cobalt camp, and Canadian production reached its peak in 1910 with an output of 33 million ounces, of which over thirty million came from Ontario mines. Following the successful metallurgical treatment of the Sullivan silver-lead-zinc ores and the peak years of production of the Premier mine in British Columbia, which was discovered by "Scotty" Dilworth and the Bunting brothers in 1910, but did not reach the production stage until 1918, in 1926 silver production in British Columbia was nearly half of the total for Canada, and exceeded Ontario by more than a million ounces. About this time also, the silver-lead ores of the Mayo district of the Yukon were contributing from two to three million ounces a year. Today, in addition to the silver which comes from Sullivan ores, nearly 40 per cent of the total for Canada, the remainder is mostly obtained from the base metal mines of Quebec, Ontario, Manitoba and Saskatchewan.

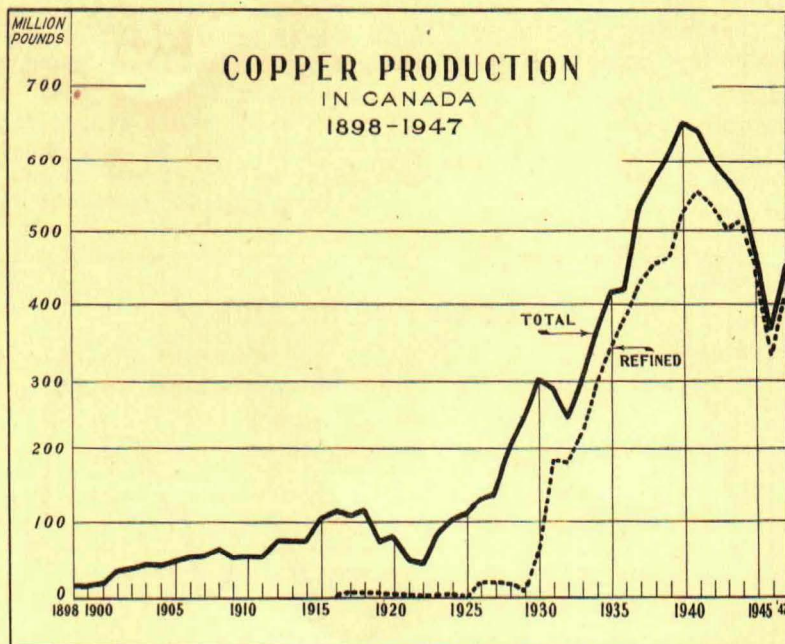
In 1947 Canadian production was recorded at 11,773,619 fine ounces, of which British Columbia mines accounted for 50 per cent, Manitoba and Saskatchewan 13 per cent, Ontario 20 per cent, and Quebec 18 per cent.



**Copper** - In 1946 Canada was fourth among the copper-producing countries of the world, being exceeded only by United States, Chile and Rhodesia. In 1898 copper production from the Rossland and Nelson areas in British Columbia about equalled the output from Ontario mines, but for the following 30 years British Columbia led all other provinces in the production of copper. Ores from Rossland and Nelson were treated at smelters located at Trail and Nelson, British Columbia, and Northport, Washington, U.S.A.

At the turn of the century, copper mines in British Columbia were opened up in the vicinity of Greenwood, where a smelter was built and operated until 1918. About the same time the Granby Consolidated began to operate the Phoenix mine and erected a smelter at Grand Forks. This smelter was closed down in 1919. In 1912 the Granby Consolidated Mining, Smelting and Power Company, Limited began the development of the Hidden Creek mine in the Nass River Mining Division in the northerly part of the province, and operated a smelter at Anyox from 1914 to 1935. This company then assumed control of the copper mine at Copper Mountain, near Princeton, and is regularly producing at present, the ore being exported. The Britannia mine on Howe Sound was staked in 1898 and began shipping concentrates to Tacoma in 1901. This mine has proved to be a consistent producer and is now responsible for 37 per cent of the province's production of copper.





In the meantime, operations of the nickel-copper mines of Ontario were expanding, and in 1930 Ontario became the leading copper-producing province.

Although there had been a steady though small output of copper ores from the Eustis mine in the Eastern Townships of Quebec, the discovery of the Horne mine in 1920 and the subsequent developments brought Quebec into the picture in a big way, and in 1927 the Noranda smelter began the production of blister copper. Other copper properties in the vicinity also began shipping, and by 1931 Quebec was second among the copper-producing provinces.

The scene now shifts to Manitoba. Back in 1915 the Flin Flon ore deposit had been discovered by Thos. Creighton. The Mandy mine was discovered in the same year, and during the first great war shipped to Trail. The Sherritt Gordon was located in 1923.

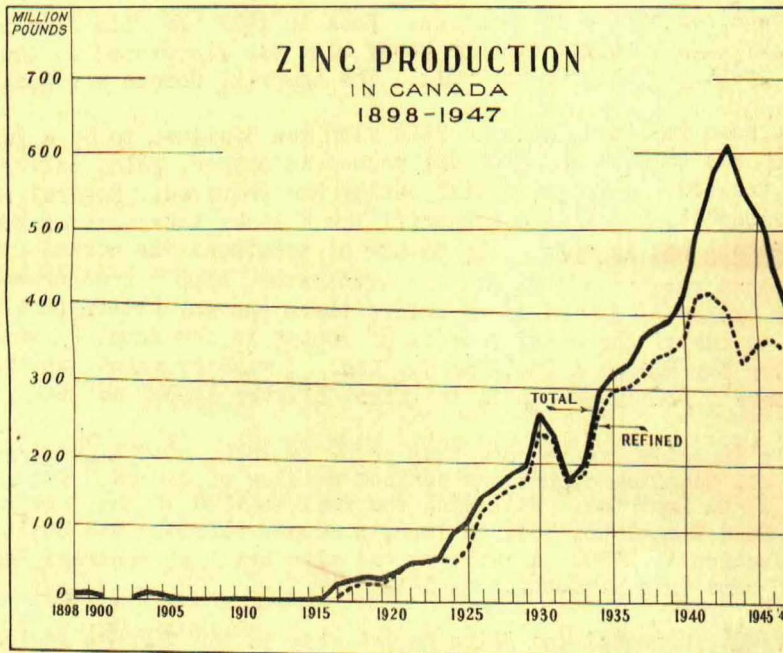
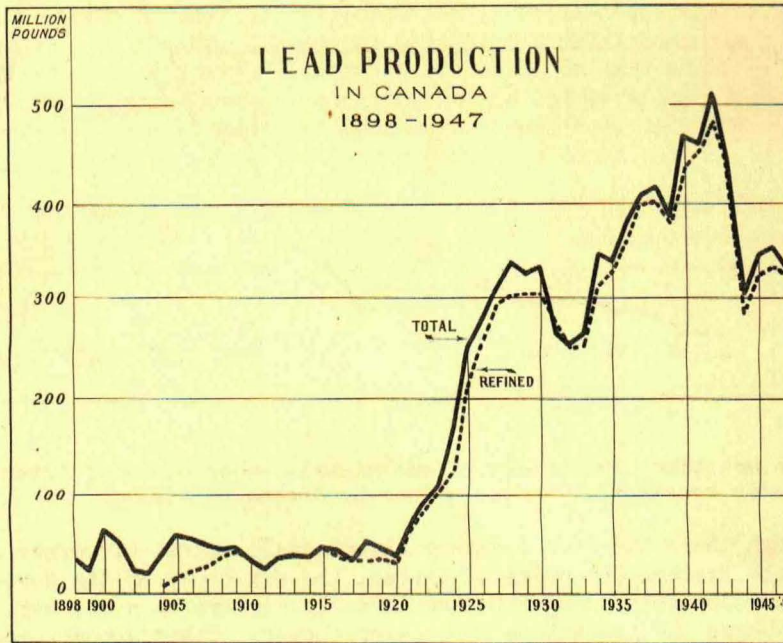
It was soon realized that the Flin Flon was destined to be a large mine, providing the ore which was complex and carrying values in copper, gold, silver and zinc, could be economically treated. A large initial outlay was required. Several attempts were made towards its development, but it was not until the Whitney interests of New York took control that its success was assured. The method of treatment was worked out, a large hydro-electric power plant was installed, and a concentrator, copper smelter and zinc refinery were built at an outlay of \$30 millions before there was any return on the investment. Today this mine is one of the chief sources of copper in the country, operating under the name of the Hudson Bay Mining & Smelting Co. Ltd. I wish to point out that it was 15 years from the date of discovery until the first blister copper was made.

Equally important is to note that prior to 1930, except for a small quantity produced at Trail, all Canadian copper was refined outside of Canada. Metallic copper for use by industry had to be imported. Following the amalgamation of the International Nickel Company and the Mond Nickel Co. Ltd. in 1928, a copper refinery was built at Copper Cliff, which began production in 1930. A refinery was also built at Montreal East by the Noranda interests, which came into production in 1931.

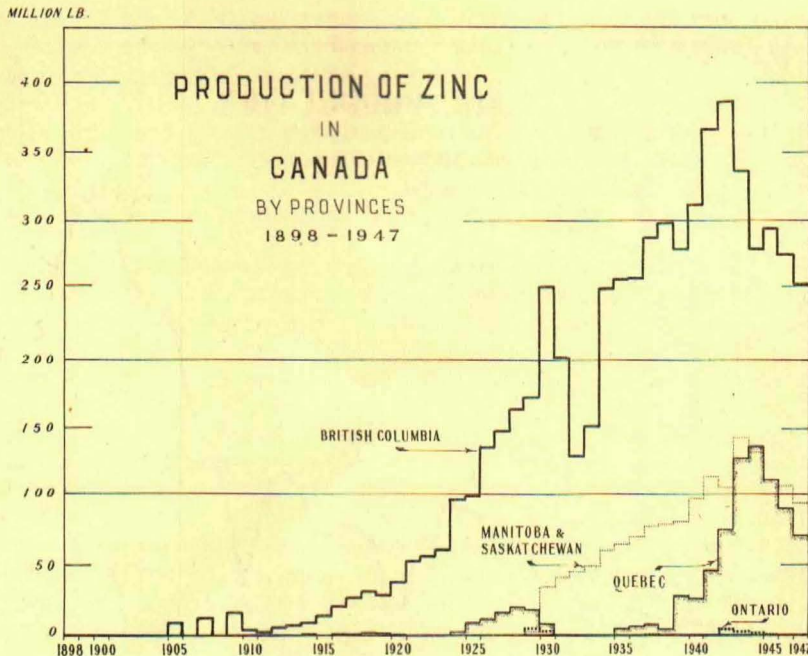
At present, Normetal and Waite Amulet ship to the Noranda smelter, and plans are going forward towards bringing the Quemont mine, adjoining Noranda, into production as speedily as possible. Considerable work was done on this property by United Verde Extension Company of Arizona in 1926 but without success. A 90 per cent interest was purchased by the Mining Corporation in 1928, and after some preliminary work ceased operations in 1930, because of unproductive results. A magnetometer survey was made in 1943, and with information gained, diamond drilling was done through the ice in 1945 with striking results.

More diamond drilling and work from the shafts sunk by former owners indicated a large ore-body, and official estimates as of March 31, 1947 gave ore reserves of 9 million tons. Thus the vicissitudes and uncertainties of the mining business even among the best of mining companies.

LEAD AND ZINC



Lead and Zinc - Though Quebec, Ontario and the Yukon have been responsible for the production of lead in varying amounts during the period under review, the East and West Kootenay districts of British Columbia have been for many years the principal source of this metal. The total Canadian production in 1898 is recorded at 32 million pounds, of which British Columbia's mines contributed 31.7 million. A large number of silver-lead mines in the Slocan area of West Kootenay were developed following the discoveries by Eli Carpenter and John L. Seaton in the early nineties. The St. Eugene mine was the important producer in East Kootenay for many years.



Today the largest single Canadian producer of lead and zinc is the Sullivan mine, situated about 20 miles north of Cranbrook, British Columbia. It was discovered in 1892 by Pat Sullivan and three associates. By 1903 it was considered the tonnage available justified the erection of a smelter at Marysville, five miles from Kimberley, but owing to financial difficulties this smelter was forced to close down in 1907. The Consolidated Mining and Smelting Co. Ltd. optioned the property in 1909, purchased it in 1910, and began shipping hand-sorted ore to its smelter at Trail. The ore was very complex and not easily amenable to treatment, and it was not until 1918 that a satisfactory method was worked out. In this connection, I quote from the annual report of the Company's Assistant General Manager, as given in the Report of the Minister of Mines for British Columbia, 1918, page 178:

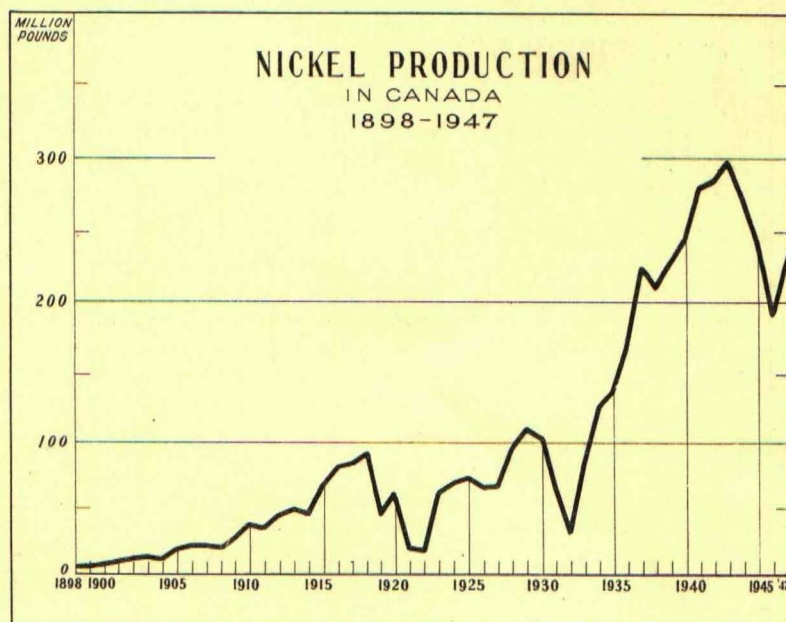
"Sullivan Problem Solved: The year's developments and improvements have demonstrated that at last the problem of handling the complex Sullivan zinc ore has been solved. With a plant operating of from 1,000 to 2,000 tons of this ore per day, there should be no trouble in producing zinc and lead at a profit on any market that has existed in recent years, provided that the cost of labour and supplies falls with the price of these metals. This successful solution of the problem makes available many millions of tons of mixed ore in the Sullivan mine which formerly could not be considered commercial ore, although very high in metal content."

A concentrator with a daily capacity of 2,500 tons was completed in 1923. This has since been enlarged to 8,500 tons. Again, may I point out the long period which often elapses between discovery and economic operation--in this case 1892-1918--26 years, and only dogged perseverance and high metallurgical and mechanical skill produced results. An electrolytic zinc refinery was built at Trail in 1916.

With the successful treatment of the Flin Flon ores, a zinc refinery was also built at Flin Flon, Manitoba, in 1930.

Other principal contributors to Canadian production of zinc are the Sherritt Gordon in Manitoba, the Golden Manitou, Waite Amulet, Normetal and New Calmet in Quebec.

The total production of zinc in 1898 was only 788,000 pounds, which was recorded as zinc in ores exported from Canada for treatment. In 1909 it had risen to 18 million pounds, in 1919 to 32 million, in 1929 to 197 million and in 1939 to 394 million. Peak production was in 1943 at 610 million and in 1947 it had dropped to 414 million. According to the latest figures, Canada is second among the countries of the world producing zinc, being exceeded only by the United States.



**Nickel** - The story of nickel has been told many times, and the growth of the nickel-copper industry of Ontario to its present status is one of the outstanding metallurgical achievements of this or any other country. The first deposit of nickel ore actually found was by Thomas Flanagan in 1883 when the Canadian Pacific Railway was under construction west of Sudbury. The early history of the industry is in the main that of the Canadian Copper Company which was incorporated in 1886 and after 1902 became a subsidiary of the International Nickel Company.

In 1900 a British company, the Mond Nickel Company Ltd., was incorporated and operated until 1928 when it was merged with the International Nickel Company of Canada Ltd. Nickel-copper matte made by the Mond was exported to Wales for refining, and that from the International Nickel Company to the United States. During the first great war, objections were raised against sending this matte to the United States for refining, and following the recommendations of the Royal Ontario Nickel Commission, which was appointed by the Ontario Government to look into the matter of refining nickel in Canada, a refinery was built at Port Colborne, Ontario, which began production in 1918. The British America Nickel Co. Ltd. operated a mine and smelter at Nickelton, Ontario, and a refinery at Deschenes, Quebec, for a short time but went into liquidation in 1924.

The Falconbridge Nickel Mines Ltd. began production in 1930, the smelter matte being shipped to Kristiansand, Norway, for refining. When the Germans invaded Norway, this refinery fell into their hands, but in mid 1945 again came into the company's possession.

The discovery of a nickel-copper orebody in the Lynn Lake area, Manitoba, and acquired by Sherritt Gordon Mines Ltd., has resulted in considerable activity. A shaft is being sunk and good progress is being made on the installation of the mining plant at the shaft site.

Canadian mines furnish the bulk of the world's nickel. In 1898 production was recorded at 5,517,690 pounds; ten years later production totalled 19,143,111 pounds; in 1918 the figures stood at 92,507,293 pounds. With the ending of the first great war, production dropped to a low of 19,293,060 pounds in 1921. Large sums were spent on research to develop new nickel alloys for peace-time uses, and in 1929 output had grown to 110,275,912 pounds. The world-wide slump of the early thirties reduced the demand, and in 1932 output fell to 30,327,968 pounds. From that year there was a steady rise till 1943, when the peak production of 288,018,615 pounds was reached. The 1947 output is recorded at 235,561,113 pounds.

Metals of the platinum group—platinum, palladium, iridium, rhodium and ruthenium, as well as gold and silver, are recovered in the refining of nickel and copper. Selenium and tellurium are also produced as by-products.

Space will not permit detailed accounts of the other metals produced in Canada during this period, but mention should be made of the fact that for many years Canada was the world's leading producer of cobalt. At present, northern Rhodesia and the Belgian Congo are the principal world sources of the ores of this metal.

During the fifty-year period the commercial production of several metallic minerals began. Molybdenite concentrates were produced in 1902; this activity was short lived and was not revived until world war I. Production between the wars was spasmodic. Renewed interest brought the Quebec mines into production during the latest conflict. At the end of the past year all had ceased operations. The same general statements apply to tungsten which was produced in Nova Scotia in 1917. During world war II several mines contributed scheelite until 1944. The Emerald Tungsten mine, under the direction of the Canadian Exploration Company, resumed production in 1947. Mercury was produced as early as 1895 for a short time, then there was a long barren period. The Pinchi Lake operation was one of the continent's largest producers during the war, but only an emergency demand could make this scheme economically feasible. Cadmium is recovered from the ores at Flin Flon and in British Columbia. Bismuth, antimony and tin are listed among the many metals produced by Consolidated Mining & Smelting Co. Near Renfrew, Ontario, a plant was built during the war to produce metallic magnesium from dolomitic rock, using the Pidgeon process. Metallic calcium is now included in this plant's products. Among the minerals which have suffered the vicissitudes of mining and economics are antimony, chromium and manganese ores.

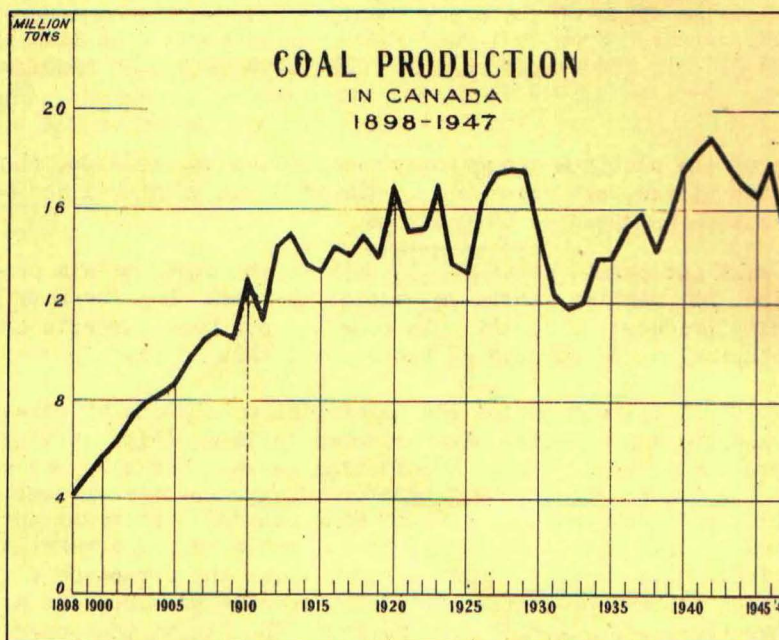
For many years interest in iron ore centered in the Michipicoten area of Ontario. Algoma Ore Properties, a subsidiary of the Algoma Steel Corporation, is the only producer in this district at present. The ore is siderite, which is sintered before shipment to blast furnaces in the United States and Canada. Shipments of sinter in 1947 totalled 672,000 short tons.

The discovery of a large body of high-grade hematite by Jules Cross in the winter of 1937-38 at Steep Rock Lake, about 135 miles west of Port Arthur, has resulted in an iron ore mining operation of major proportions. The orebody lay under the lake and large initial expenditures were required in order to drain the lake before mining operations could be undertaken. Last year 1,351,000 short tons of ore were shipped.

Of still further importance to Canada is the exploratory and development work being carried on by the Hollinger Interests on iron ore deposits in northeastern Quebec, near the Labrador boundary. Because of the remoteness of the area, large sums will be required. A 300 mile railway is being located from the lower St. Lawrence to tap this area, and plans are being made to develop hydro-electric power. It is a bold scheme and well worthy of the mining interests behind it.

But the most far-reaching discovery during the past fifty years was that made by Gilbert Labine when he found pitchblende ore on the east shore of Great Bear Lake in the Northwest Territories in March, 1930. The discovery of the ore of radium was the important feature at that time, and little did Mr. Labine, or anyone else then, realize that the uranium content would have such momentous results. The important part it played in the sudden ending of the war and the feverish activity now developing with this important element as the starting point, overshadows all other activities, and we can only be thankful that Canada is blessed with one of the few sources of supply known throughout the world, and that she breeds men of Labine's character who are unafraid to pit their experience and strength against the forces of nature, so that her riches may be uncovered to the benefit of all.

## FUELS

Coal, Oil, Natural Gas

Coal - Coal was for many years, from point of value, the most important mineral produced in Canada. Large deposits of coal exist in the Maritimes, on the Prairies, and in British Columbia, but the provinces of Ontario and Quebec, where the greater part of Canadian industry is concentrated, must depend on supplies from sources outside their boundaries.

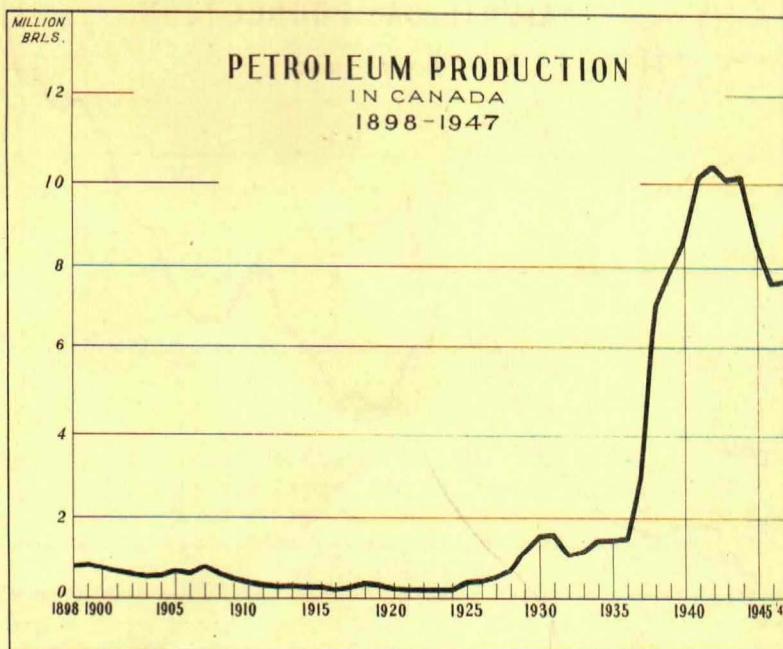
In 1898 the coal production of the Dominion totalled 4,173,000 tons, consisting of 2,563,000 from Nova Scotia, 1,264,000 from British Columbia, and the remainder from New Brunswick, Saskatchewan and Alberta. Coal production in Nova Scotia was stimulated by railway building and the development of the iron and steel industries. Prior to the first great war, markets along the St. Lawrence grew steadily, but with the loss of vessels used for this movement the market in Quebec was considerably reduced. This market was largely recovered following the war, but during the 1920's the steel industry in the Maritime Provinces experienced serious reverses which caused a reduction in coal output. By 1929, however, production had risen to over seven billion tons, only to decline to a low of four million in 1932, after which production advanced to 7,849,000 in 1940. Production gradually fell off again to 4,101,000 in 1947.

New Brunswick production was never large. In 1898 the output totalled 6,000 tons; in 1908, 60,000 tons; in 1918, 268,000 tons; in 1928, 207,000 tons, and in 1938, 342,000 tons. The peak was reached in 1940 at 547,000 tons, and then gradually fell off to 544,000 tons in 1947.

Coal produced in Saskatchewan is all lignite. Production in 1898 was recorded at 25,000 tons; in 1908, 150,000; 1918, 346,000; 1928, 472,000; 1938, 1,022,166 tons, and in 1947, 1,538,000.

The settlement of the west in the early part of the century, the building of the railways and the smelter operations in the boundary country of British Columbia, were responsible for the development of coal mining in Alberta, which today is the largest coal-producing province in the Dominion. Production in 1898 was only 315,000 tons--ten years later it reached 1,700,000 tons, and in 1918 the recorded production was 5,973,000 tons. By 1928 it was over 7,000,000. The next few years' production declined to 4,719,000 in 1933. By 1942 the province was producing more than 7,000,000 tons annually, and in 1946 it reached a new high at 8,700,000 tons. Preliminary figures for 1947 give an output of 7,956,000 tons.

Coal has been mined in British Columbia for many years, the principal operating fields being on Vancouver Island and in Crowsnest Pass. The maximum production was reached in 1910 at 3,331,000 tons. Output dropped to a low point of 1,331,000 tons in 1935, after which a rise to a high point of 2,168,000 tons in 1942 is noted. Production in 1947 was recorded at 1,752,000 tons. The growth in consumption of fuel oils for industrial and domestic use has made serious inroads on the potential market for British Columbia coal.



Crude Petroleum - Canadian production of crude petroleum totalled 758,000 barrels in 1898, all from Ontario wells. It is interesting to note that the first oil well on the North American Continent was dug to a depth of 100 feet at Oil Springs, Ontario, in 1858. Ontario was the only producing province until 1910, when a small output was recorded from wells in New Brunswick. Present production from Ontario wells is in the neighbourhood of 125,000 barrels a year.

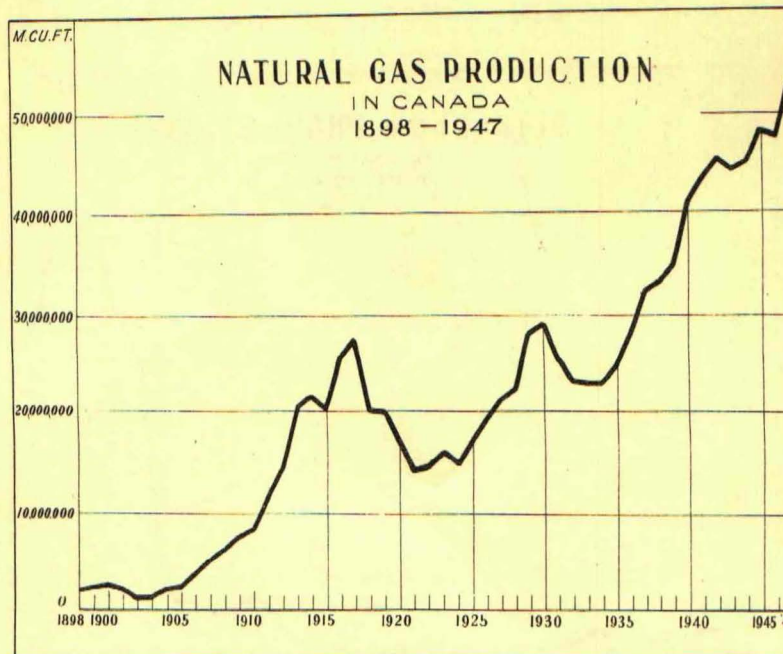
The bringing in of the Dingman well in the Turner Valley, Alberta, in 1914 started what is commonly known as the "Calgary Oil Boom". This well was completed at a depth of 2,700 feet and did not reach the present depth of productive limestone. In 1924 Royalite No. 4 came into production in the Palaeozoic limestone in the Turner Valley, with a gas flow of 20,000 M cubic feet per day, and a naphtha content of about 1 gallon per thousand cubic feet. More wells followed, and soon Turner Valley production started to climb. Other smaller "oil pools" were tapped and the total production for the province reached over 10 million barrels in 1942. Production gradually declined until a new field, now known as the Leduc, came into major production on February 13, 1947. By the end of November, twenty-three wells were producing, with a grand total in excess of 3,000 barrels per day, and production from this new source is more than offsetting the downward trend of Turner Valley output. This is a major find in Canada at a most opportune time, and the result of long experience and scientific search by the Imperial Oil Company. Exploration in Alberta is presently at its highest peak, and many major and independent companies are actively engaged in the search for oil.

In Saskatchewan, the Lloydminster field was responsible for a considerable increase in oil production in 1947, when output totalled 529,000 barrels as against 116,000 barrels in 1946. Licences have been issued for drilling of wells in new areas, and the search goes on for this now all-important black gold.

During the war (1942), much activity centered around Norman Wells on the Mackenzie River in the Northwest Territories. In 23 of the total of 30 wells drilled, oil in commercial quantities was found. Production rose from 75,000 barrels in 1942 to 1,223,000 barrels

in 1944. A pipeline was laid to connect this field with a refinery at Whitehorse, Yukon, 1943-1944. About a million barrels were run through this pipeline before it was abandoned. This refinery is now being moved to Edmonton to treat the Leduc crude.

Production from the Fort Norman Wells in 1947 was recorded at 244,000 barrels.



Natural Gas - Natural gas is found in New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan and Alberta. The southwestern part of Ontario has long been an important source of this valuable fuel, the maximum production being reached in 1917 at 19,868,035 thousand cubic feet. From 1921 to 1935, output in the province dropped to from 7 to 8 million thousand cubic feet annually, and then rose gradually to 13 million thousand cubic feet in 1940. Since 1943, production has been in the neighborhood of seven million thousand cubic feet per year.

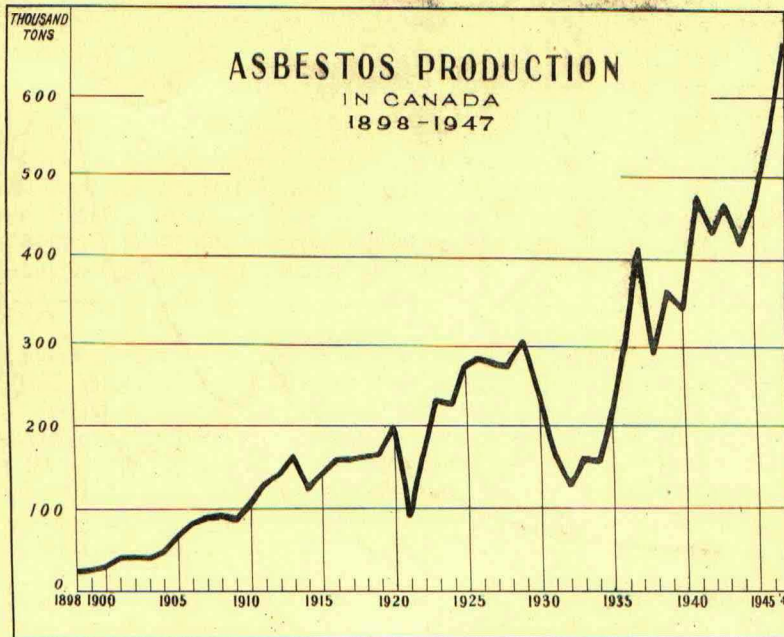
Natural gas discovery in Alberta occurred a short distance west of Medicine Hat in 1885, and in 1890 a well which was being drilled within the city limits encountered a flow of gas. The real gas horizon was penetrated in the Medicine Hat gas sand in 1904 at a depth of 1,010 feet. Several other fields have been developed since that time. Today the major portion of the provincial production comes from Turner Valley, but about 30 per cent comes from the Viking, Kinsella, Foremost, Medicine Hat, Red Cliff and other fields. Production in 1947 was the highest on record at 45 million thousand cubic feet.

The first commercial production of natural gas in Saskatchewan was at Lloydminster on March 30, 1934. In that year production is recorded at 13 thousand thousand cubic feet. Output gradually increased to a high point in 1946 at 210 thousand thousand cubic feet and preliminary figures for 1947 are given at 172 thousand thousand cubic feet.

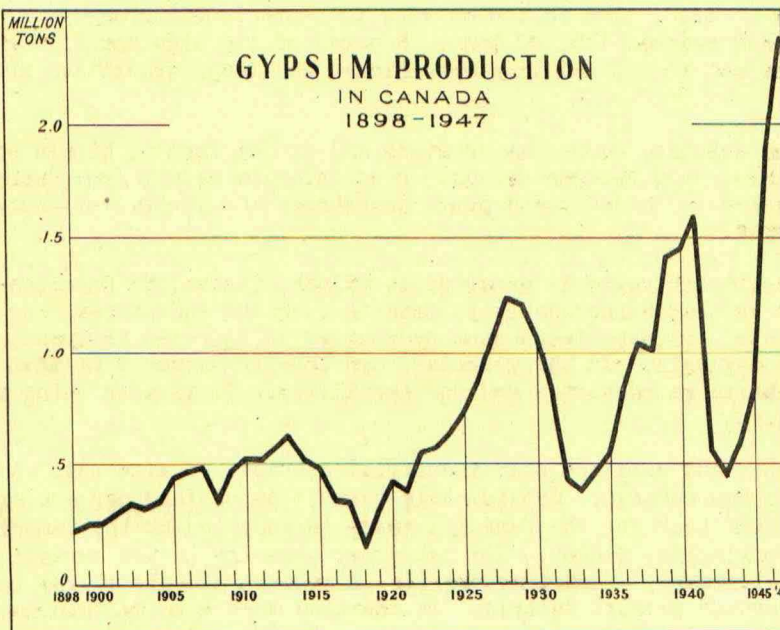
#### THE INDUSTRIAL MINERALS

Canada has long been a source of many non-metallic minerals which find a market in various manufacturing industries both at home and in other countries. The relative importance of each is difficult to define, as each has its particular use, but the most outstanding from point of value are asbestos, gypsum, salt, barite, magnesitic-dolomite, sulphur (in the form of pyrites or in sulphuric acid made from waste smelter gases), sodium sulphate, peat moss and quartz. Other minerals of which Canada has long been a consistent producer include feldspar, nepheline syenite, mica, talc and soapstone and graphite. Minor minerals include iron oxides, corundum, fluorspar and phosphate.

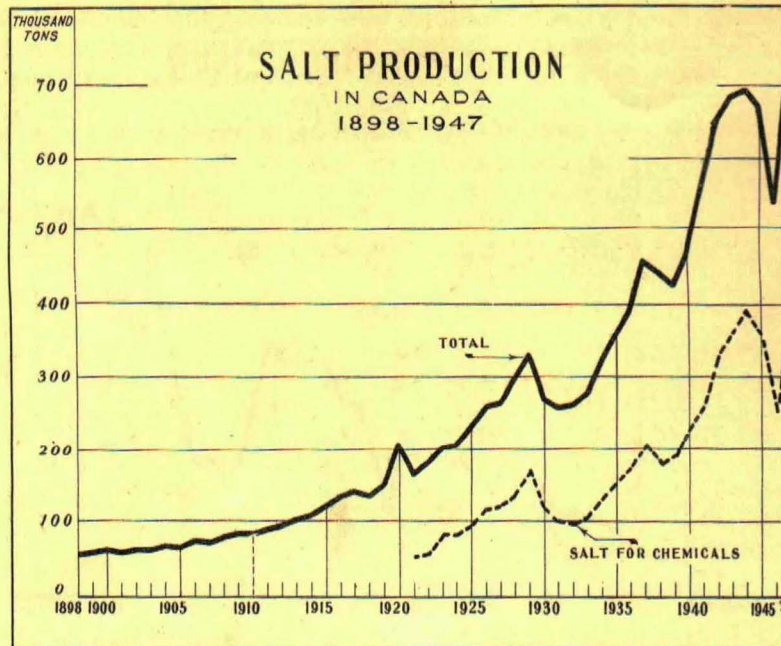




Canada leads the world in the production of asbestos. It was first mined in Quebec in 1878 by Andrew Johnston, and a company bearing the name is still operating. In 1888 a mill was put into operation by the Scottish Canadian Asbestos Company. The year the Institute was founded production had reached 24 thousand tons. Ten years later, output had reached 90 thousand tons, and by 1920 this figure was doubled. The 1937 output was double that of 1920 at 410,000 tons, and peak production was reached in 1947 at 663,000 tons. Canada has a large export market for this mineral; in 1947 exports totalled 636,196 tons valued at \$32,291,000, of which 557,660 tons valued at \$25,334,000 went to the United States.



Gypsum was one of the first minerals mined in Canada. Production in Nova Scotia began in 1779. It was also mined in early years in New Brunswick and Ontario. Production in Manitoba was first recorded in 1901 and in British Columbia in 1911. A large part of the Nova Scotia output is exported in the raw state, but that from mines in other provinces is used in the manufacture of various gypsum products, such as plaster of Paris, gypsum wallboard, and other fire-resistant or insulating materials.



Salt, another of our important industrial minerals, is produced in Nova Scotia, Ontario, Manitoba and Alberta. In addition to its regular commercial uses, over half the Canadian production finds its way into the manufacture of basic chemicals, such as caustic soda, chlorine, hydrochloric acid and soda ash. It is also an important raw material for the manufacture of synthetic rubber. Maximum Canadian production was reached in 1947 at 731,515 tons valued at \$3,694,000. The 1898 output is recorded at only 57,142 tons valued at \$248,000.

Small quantities of barite had been mined in Ontario and Nova Scotia for a number of years, but important production did not occur until the discovery of a deposit in the latter province in 1940. The following year the Nova Scotia production totalled 7,000 tons and in 1947 it had reached 130,000 tons. Because of its high specific gravity, it is used in weighting the mud in oil drilling operations, and large quantities are exported for this purpose.

Sodium sulphate occurs as crystals and in the form of highly concentrated brines in many lakes throughout Western Canada. Production is mainly from Saskatchewan and finds an extensive market in the pulp and paper industries and in the metallurgical treatment of nickel-copper ores.

Magnesitic-dolomite is produced at Kilmar, Quebec, by Canadian Refractories Ltd. and is marketed as dead-burned or grain material, bricks and shapes, and finely ground refractory cements. Brucite (magnesium hydroxide) is quarried in Quebec near Wakefield, and calcined to magnesia. In the granular form brucite magnesia is used mostly in the manufacture of basic refractories and for fertilizer. It is also being used to make magnesium metal.

Feldspar and mica are also industrial minerals of wide use. They are produced mainly in Quebec and Ontario. Considerable quantities of feldspar are exported in the crude form. Ground spar for the Canadian trade is supplied by the Canadian Flint and Spar Company Ltd., Buckingham, Quebec. Its principal uses are in the ceramic trade and in the manufacture of cleansers. Nepheline-syenite, a mineral closely allied to feldspar, is mined in Peterborough county, Ontario. It contains more alumina than does feldspar and has thus found favour by some glass manufacturers. Most of the mica mined in Ontario and Quebec is of the phlogopite variety and finds its principal use as an insulator in the manufacture of electrical equipment. In the ground form it is used for dressing shingles, in the manufacture of wallpapers, and as a filler for rubber. An important deposit of muscovite mica was discovered in 1943 near Mattawa, Ontario, from which were obtained large sheets of this mineral. Operations have been discontinued at this property.

Peat moss is becoming of increasing importance as an insulating and sound-proofing material. Its high absorptive properties render it highly useful as bedding litter for animals. Production was valued at \$2,500,000 in 1947. It is produced in New Brunswick, Quebec, Ontario, Manitoba and British Columbia. Talc mining started in Hastings county, Ontario in 1901 and production has been reported annually since that time. Soapstone and some talc are also produced in Quebec. The soapstone is sold in the form of sawn blocks and bricks to be used in lining alkali recovery furnaces and kilns of kraft and paper mills. It is also used as brick and slab liners for fire boxes and ovens, for switchboard panels, laboratory tables, etc. In the ground form, some of the principal uses are in the paint, roofing, paper, rubber and ceramic industries, also in foundry facings, cosmetics and pharmaceuticals, soaps, cleansers and polishes.

Native sulphur does not occur in Canada, but sulphur occurs in combination with copper, nickel, lead, zinc or iron in many base metal sulphide bodies, and the Canadian production is recorded as sulphur in pyrites shipped, plus sulphur contained in sulphuric acid made from waste smelter gases. In 1898 sulphur in pyrites shipped is recorded at 13,209 tons, and this rose to 155,000 tons during World War I. Following the installation of plants at Copper Cliff and Trail to recover sulphur from smelter gases, the total Canadian output rose rapidly. The peak was reached in 1942 at 304,000 tons. Production in 1947 was estimated at 197,000 tons.

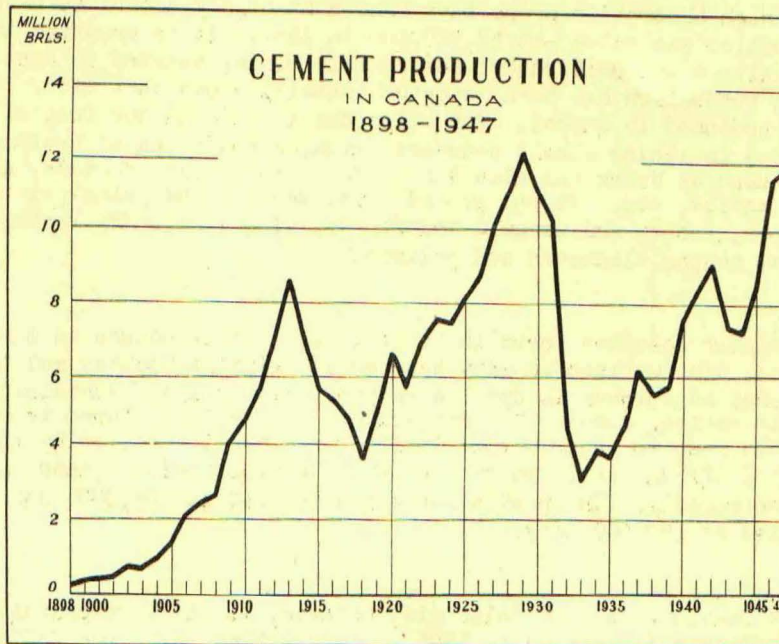
The Black Donald mine near Calabogie, Ontario, is the only graphite producer in Canada at present. It was discovered in 1896 and operations began the following year. Several graphite mines were operating in Quebec and Ontario during World War I, and production rose to over \$400,000. Production in 1947 totalled 2,350 tons valued at \$210,000.

Quartz and quartzite is supplied by quarries in Nova Scotia, Quebec, Ontario, Saskatchewan and British Columbia. It is used as a smelter flux, for the production of ferrosilicon, silicon carbide and silica brick, in the manufacture of glass, for sand blasting, and in steel foundries. The price varies greatly depending on its purity and the purpose for which it is to be used. Production in 1947 totalled 1,700,000 tons valued at \$1,800,000.

#### STRUCTURAL MATERIALS

The structural materials group, which includes lime, cement, clay products, sand and gravel and stone, though not possessing the interest that mining people accord some metals and non-metallic minerals, nevertheless plays a most important part in our daily existence and furnishes the major raw materials of our great construction enterprises. The aggregate value of the structural materials was only \$5,000,000 in 1898. By 1908 this had more than doubled at \$11,000,000, and by 1929 it was twelve times that of 1898, at \$59,000,000. Construction fell off during the next few years and shipments of these materials amounted to \$17,000,000 in 1933. Improvement followed, and by 1937 the aggregate value had reached \$35,000,000. Construction of new plants, air fields, etc., during the early years of the war is reflected in the increase in the value of shipments of these materials. After the war, projects which had long been withheld got under way, and the 1947 figures stood at an all-time high of \$73 million.

Cement is produced in Quebec, Ontario, Manitoba, Alberta and British Columbia. Quebec leads in the output of this commodity, with production in 1947 totalling over 5 million barrels out of a Canadian total of 11,900,000 barrels. All plants making cement from domestic raw material are using the wet process. Close technical control assures a standard product.



Clay products include such items as building brick, structural tile, drain tile and sewer pipe, and the value of the annual output reflects the activity of construction operations in the country. Shipments of clay products in 1947 were valued at \$13,700,000, the second highest year on record. The high year was in 1929 at \$13,900,000.

Lime is not so important today as a structural material, but its use as quicklime and in the hydrated form is growing rapidly in the field of chemical processes. Total production of lime in 1947 constituted a record at 922,000 tons valued at \$7,315,000.

The kinds of stone quarried in Canada include granite (trap rock, syenite and other igneous rock), limestone, marble, sandstone and slate. Stone of almost every known variety occurs in Canada; rocks of the igneous areas of British Columbia, Manitoba, Ontario, Quebec and the Maritime Provinces exhibit a wide range of physical characteristics, some varieties being especially noted for their richness of colour and beauty of crystallization. The sedimentary rocks, including limestones, sandstones and marbles are quarried at various points in Canada. The products from quarries operating in these different formations not only yield high class structural and decorative materials but provide the chemical and other allied industries with many of their increasing requirements.

So with this year of 1948 we begin the next half century of the Institute's life. One cannot help wondering what the mining future of Canada will be. The canoe and pack horse for many years the chief means of transportation to remote places, have been replaced by the outboard motor and the airplane. Radio has provided rapid communication. Deposits of economic ore will always be difficult to find, but the field has been widened and the chances of success are as great as ever. Certainly the demand for the products of our mines will not grow less. Trained prospectors and scientific equipment should bring more satisfactory results and reduce the number of failures. New metallurgical and mechanical processes will help us to utilize more of our lower grade ores. The physical and chemical research now going on will enlarge the scope of our vision. May we not look forward to the early day when the products of our mines and our minds will be for the good of all mankind and not for its destruction. Then and only then will we know that we have properly utilized the heritage placed in our hands by the Great Architect of the Universe.

STATISTICS CANADA LIBRARY  
BIBLIOTHÈQUE STATISTIQUE CANADA



1010780878