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**CANADA**  
**DEPARTMENT OF TRADE AND COMMERCE**  
**DOMINION BUREAU OF STATISTICS**  
**CENSUS OF INDUSTRY**  
**MINING, METALLURGICAL & CHEMICAL BRANCH**

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Report

on

**THE MISCELLANEOUS NON-METALLIC MINERALS**  
**IN CANADA, 1938**

including

Barite  
Diatomite  
Fluorspar  
Garnet  
Graphite  
Grindstones  
Kyanite  
Lithium Minerals  
Magnesitic Dolomite

Magnesium Sulphate  
Natural Mineral Waters  
Peat  
Phosphate  
Silica Brick  
Sodium Carbonate  
Sodium Sulphate  
Strontium Minerals  
Sulphur (Pyrites)



OTTAWA  
1940

Price 25 cents



553 6071

C16m

1938

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(Jan 23/40 - Lato)

DEPARTMENT OF TRADE AND COMMERCE  
DOMINION BUREAU OF STATISTICS  
MINING, METALLURGICAL AND CHEMICAL BRANCH  
OTTAWA - CANADA

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MISCELLANEOUS INDUSTRIAL OR NON-METALLIC MINERALS IN CANADA, 1938.

Canadian operators producing certain industrial minerals, and who are usually relatively few in number, have been segregated for statistical purposes into a single group designated as the Miscellaneous Non-Metal Mining Industry. Minerals or primary mineral products produced (or deposits developed) by this industry during 1938 included: diatomite, fluorspar, garnets, graphite, grindstones, lithium minerals, magnesitic-dolomite (crude and refined), magnesium sulphate, mineral waters, phosphate, silica brick, sodium carbonate, and sodium sulphate. For convenience, the sulphur content of pyrites shipped, sulphur recovered from smelter gas, and peat are recorded with the various miscellaneous minerals listed above; the value of sulphur production, however, is not included in the total for the miscellaneous non-metallic or industrial minerals as the value of this element is credited to the copper-gold-silver mining and non-ferrous smelting industries.

The number of firms reported as active in the industry during 1938 was 50; capital employed totalled \$2,787,671; employees numbered 394 and salaries and wages paid amounted to \$475,567. The cost of fuel, purchased electricity and process supplies used during the year was reported at \$409,229 and the gross value of production totalled \$1,188,322 compared with \$1,687,317 in 1937.

**BARITE** - Barite production in Canada during past years came largely from deposits in Nova Scotia, Quebec and Ontario and in recent years more particularly from deposits in the Lake Ainslie district, Nova Scotia. Prior to 1939 the last commercial shipments from Canadian deposits were made in 1933 in which year 20 tons valued at \$60 were produced and shipped at the Tionaga mine, Penhorwood township, Ontario. The mineral also occurs in British Columbia.

Ground barite is used as a heavy, white, inert filler in many products, such as paint, paper, rubber, oilcloth, linoleum, plastics, resins, and cloth. It is also used in the manufacture of glass and as a heavy medium in mud in the drilling of deep oil wells where high gas pressures are encountered. The most important single chemical product made from barite is lithopone, an intimate mixture of zinc sulphide and barium sulphate prepared by co-precipitation by double decomposition of solutions of barium sulphide and zinc sulphate; its chief use is as a white pigment. The average value F.O.B. mine shipping point, of crude barite for the entire United States, as calculated from reports by producers to the United States Bureau of Mines, increased from \$6.30 in 1937 to \$6.47 in 1938.

Germany is the largest world producer of barite and consumption of the mineral in that country has increased during recent years owing to the demand for barite and its derivatives in the manufacture of paints, pigments, ceramics, explosives, rubber goods etc. The German use of barite in pigments has expanded recently on account of official requirements for mixing barite with red lead in order to extend the supplies of red lead. The United States and Great Britain are also large producers of barite.

During the first six months of 1939 Canada Baryte Mines Ltd., made commercial shipments of crude barite from a property located in Langmuir township, Porcupine District, Ontario. Production of barite in Canada from 1885 to 1933, inclusive, totalled 41,027 short tons valued at \$300,610.

Table 1 - PRODUCTION OF BARITE IN CANADA 1913 - 1933.

Year	Short tons	\$	Year	Short tons	\$
1913 .....	641	5,410	1924 .....	151	3,308
1914 .....	612	6,169	1925 .....	95	2,259
1915 .....	550	6,875	1926 .....	100	2,307
1916 .....	1,368	19,393	1927 .....	56	1,268
1917 .....	3,490	54,027	1928 .....	127	2,847
1918 .....	640	10,165	1929 .....	105	2,341
1919 .....	468	8,154	1930 .....	66	1,484
1920 .....	751	22,983	1931 .....	16	363
1921 .....	270	9,567	1932 .....	...	...
1922 .....	289	9,537	1933 .....	20	60
1923 .....	409	8,548			



Imports of barite into Canada during the war years 1914-1918 were not shown in the customs classification; imports of blanc fixé (artificially prepared barium sulphate) and satin white (made from alum and slaked lime) into Canada in 1918 totalled 3,528 short tons valued at \$92,241 compared with corresponding imports of 1,698 tons at \$38,043 in 1913.

During 1918 the only barite deposits worked in Canada were located at Lake Ainslie, Inverness County, Nova Scotia and in Langmuir township Ontario; commercial shipments were made from both properties in 1918.

Table 2 - BARITE AND BLANC FIXE USED BY THE CANADIAN PAINTS, PIGMENTS AND VARNISHES INDUSTRY IN CANADA, 1931 - 1938.

Year	BARITE		BLANC FIXE (x)	
	Pounds	\$	Pounds	\$
1931 .....	2,304,119	39,361	146,025	12,915
1932 .....	2,064,303	35,138	23,353	817
1933 .....	2,062,957	33,578	47,793	1,471
1934 .....	2,393,330	44,690	93,918	2,481
1935 .....	2,308,628	43,702	141,975	4,223
1936 .....	2,533,275	41,687	97,016	3,148
1937 .....	2,630,366	42,821	125,743	4,136
1938 .....	(a)	(a)	(a)	(a)

(x) Artificial barium sulphate.

(a) Not complete for 1938.

Table 3 - IMPORTS OF BLANC FIXE AND BARITE INTO CANADA, 1931 - 1938.

Year	BARITE		BLANC FIXE	
	Pounds	\$	Pounds	\$
1931 .....	3,372,800	32,712	1,596,173	34,483
1932 .....	2,583,400	22,989	932,168	20,932
1933 .....	3,174,700	28,255	552,801	11,390
1934 .....	3,113,800	26,397	968,201	21,638
1935 .....	4,278,400	33,739	1,139,106	25,759
1936 .....	3,316,000	26,554	1,064,032	21,480
1937 .....	4,156,600(x)	32,869	1,068,199	21,162
1938 .....	4,373,100 /	38,012	629,258	13,779

(x) 2,637,700 pounds from Germany, 852,700 pounds from the United States, and 492,900 pounds from the United Kingdom.

/ 325,900 pounds from United Kingdom, 2,532,800 from Germany and 1,124,600 from United States.

In 1937 lithopone imported into Canada totalled 22,162,600 pounds valued at \$777,752 compared with 17,731,708 pounds worth \$632,273 in 1938. Of the 1938 imports 9,276,970 pounds came from the United Kingdom; 3,882,900 pounds from the Netherlands and 2,584,971 pounds from the United States.

Table 4 - WORLD'S PRODUCTION OF BARIUM MINERALS, 1935, 1936 and 1937. (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries) (Long tons)

Producing Country and Description	1935	1936	1937
<b>BRITISH EMPIRE</b>			
United Kingdom - Barytes, unground .....	41,881	37,250	36,875
Witherite, unground .....	9,409	8,751	11,882
Barytes - Ground, bleached .....	6,288	5,731	5,427
Ground, unbleached .....	20,554	21,338	19,124
Union of South Africa .....	556	574	561
India .....	5,493	5,114	15,689
Australia .....	2,544	2,157	3,103

Table 4 - WORLD'S PRODUCTION OF BARIUM MINERALS, 1935, 1936 and 1937. (Concluded) (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries) (Long tons)

Producing Country and Description	1 9 3 5	1 9 3 6	1 9 3 7
<u>FOREIGN COUNTRIES</u>			
Austria .....	784	1,637	841
France .....	16,600	21,850	19,550
Germany -			
Baden .....	12,248	17,519	21,311
Bavaria .....	6,961	10,999	11,645
Prussia .....	321,786	385,910	404,149
Saxony .....	218	460	425
Thuringia .....	545	443	6,683
Wurtemberg .....	(a)	1,000	189
Greece .....	22,726	30,841	38,722
Italy .....	40,502	36,092	44,488
Norway .....	...	402	69
Portugal .....	...	10	99
Egypt .....	84	30	50
Cuba .....	...	256(b)	3,788
United States .....	194,710	244,698	322,212
French Indo-China .....	...	39	44
Japan .....	...	3,776	(a)
Korea .....	10,853	5,032	(a)

Barytes is also produced in Czechoslovakia, Spain, China, and U.S.S.R.

(a) Information not available.

(b) Exports.

CORUNDUM - Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the Province of Ontario. Corundum mining as an industry made its appearance there in 1900 and production reached a maximum in 1906. Shipments of the mineral in Canada during the period 1900 - 1921 totalled 19,524 short tons valued at \$2,104,251. No commercial shipments have been reported since 1921. No imports of corundum into Canada were shown in Customs reports for either 1937 or 1938. United States demand for crude corundum in 1938 was met by the importation of 2,098 tons valued at \$138,629, chiefly from the Union of South Africa. Virtually all corundum and emery is imported into the United States in the crude state and crushed and graded in that country for the domestic market. Production of corundum in the Union of South Africa in 1938 totalled 1,540 short tons valued at £12,454 and the Department of Mines of that country reports that with the depletion of the known eluvial deposits it has become increasingly difficult to maintain supplies of crystal corundum and during 1938 activity on the fields fell off considerably. Negotiations were proceeding with a view to persuading the American market, which absorbs practically all the crystals being produced at present, to take the corundum in the form of concentrates.

Imports into Canada in 1938 of manufactures of emery or of artificial abrasives n.o.p. were valued at \$42,345 of which those appraised at \$39,353 came from the United States. Imports of emery in bulk, crushed or ground were valued at \$38,743 in 1938.

Imports of emery in bulk, crushed or ground in 1917 were valued at \$79,176 compared with \$48,995 in 1913; imports of emery and carborundum wheels and manufactures of emery or carborundum were appraised at \$553,660 in 1917 against \$135,654 in 1913.

Artificial corundum or "fused alumina" ( $Al_2O_3$ ) is produced from calcined bauxite in steel-lined, water-cooled furnaces of the arc type. Canadian production of crude fused alumina in 1937 totalled 86,604 short tons valued at \$8,435,371.

DIATOMITE - Production of diatomite in Canada during 1938 totalled 398 short tons valued at \$13,842 compared with 643 short tons at \$18,606 in 1937. The greater part of the output in 1938, as in former years, came from deposits located near Tatamagouche, Colchester county, Nova Scotia. The balance of production as recorded for 1938 represented primary sales of material previously mined from deposits located in the Cariboo District of British Columbia. Diatomite was also produced in 1937 and previous years from deposits occurring in the Muskoka area, Ontario.



A report issued in 1938 by the Bureau of Mines, Ottawa, states - "Approximately 80 per cent of the diatomite now being consumed in Canada is in the form of filter-pads, about 15 per cent is used for insulation and the remainder is absorbed as a filler, concrete admixture, silver polish base, and in chemicals. Amongst the recent applications, the use of diatomite in the paint and varnish industry has demonstrated its advantages as a flattening agent and as an extender. Deposits containing medium quality diatomite are very common in some parts of Canada. Owing, however, to foreign competition and to the, at present, comparatively small Canadian demand, only the properly prepared diatomite of the highest quality can now be successfully marketed on a scale sufficiently large to warrant the operations of a property and the erection of a plant. The present price in Canada varies from \$35 to \$40 per ton for concrete admixture; \$35 to \$75 for insulation and filtration; up to \$200 in small lots of material suitable for polishes; imported insulation bricks vary from \$85 to \$140 per 1,000, according to grade and density."

Table 5 - PRODUCTION OF DIATOMITE IN CANADA FOR YEARS SPECIFIED

Year	short tons	\$	Year	short tons	\$
1913 .....	620	12,138	1926 .....	...	...
1914 .....	650	13,000	1927 .....	266	6,650
1915 .....	317	12,119	1928 .....	368	8,960
1916 .....	620	12,139	1929 .....	429	10,330
1917 .....	600	18,000	1930 .....	554	13,247
1918 .....	500	12,500	1931 .....	1,610	32,789
1919 .....	565	11,300	1932 .....	1,496	29,509
1920 .....	260	8,600	1933 .....	1,789	36,648
1921 .....	341	11,268	1934 .....	1,372	54,910
1922 .....	219	5,781	1935 .....	823	33,140
1923 .....	130	3,250	1936 .....	615	13,650
1924 .....	33	838	1937 .....	643	18,606
1925 .....	...	...	1938 .....	398	13,842

The total Canadian output of diatomite since 1896 when it was first produced in the Dominion, to the end of 1938, totalled 21,727 short tons valued at \$496,310.

Imports into Canada of diatomaceous earth or infusorial earth (Kieselguhr), ground or unground in 1938 totalled 2,565 short tons valued at \$73,900 compared with 2,197 tons at \$63,917 in 1937. Of the 1938 imports, 2,555 tons worth \$73,449 came from the United States.

A recent British patent describes the manufacture of various iron oxide pigments by mixing iron sulphate or chloride with diatomite, ground quartz, or flint and heating the mixture until the iron compound is decomposed; the ferrous sulphate with diatomite yields a pigment with an orange undertone. If diatomite is roasted with ferric chloride a purple colored pigment is produced; heated without air with ferrous sulphate the product resembles raw sienna.

Table 6 - WORLD'S PRODUCTION OF DIATOMACEOUS EARTH, 1935 - 1937. (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)

Producing Country	(Long tons)	1935	1936	1937
<u>BRITISH EMPIRE</u>				
Great Britain .....	...	...	1,086	1,141
Northern Ireland .....	4,893	...	7,466	7,168
Canada .....	735	...	549	574
Barbados .....	10	...	10	10
Australia .....	3,014	...	2,778	3,190
Union of South Africa .....	169	...	96	148
<u>FOREIGN COUNTRIES</u>				
Bulgaria .....	...	...	62	138
Denmark (moler) .....	47,200	...	61,000	80,000
Estonia (exports) .....	...	...	...	100
Finland .....	984	...	1,378	1,771
France .....	7,150	...	9,600	10,600
Germany (d) .....	5,827	...	6,112	7,407
Hungary (exports) .....	1,376	...	1,197	2,105
Italy .....	3,007	...	3,701	4,586
Norway (exports) .....	140	...	229	106
Portugal .....	4,413	...	64	109
Roumania (c) .....	3,080	...	(a)	(a)
Sweden .....	1,207	...	1,095	1,736
U.S.S.R. ....	1,269	...	(a)	(a)
Algeria .....	11,200	...	11,922	12,759
United States .....	72,721(b)	...	(a)	(a)
Chile .....	12	...	40	(a)
Korea .....	3,440	...	742	2,460
Netherlands East Indies .....	88	...	124	39

Diatomaceous earth is also produced in Spain and Japan.

(a) Information not available. (b) Annual average production for years 1933 to 1935. (c) Converted from cubic metres at the rate of 1 cubic metre = 2 long tons. (d) Production of Hessen only.

Table 7 - CONSUMPTION OF INFUSORIAL EARTH BY THE CANADIAN SUGAR REFINING INDUSTRY, 1932 - 1938.

Year	Pounds	Value \$	Year	Pounds	Value \$
1932 .....	2,577,585	73,309	1936 .....	4,375,999	98,954
1933 .....	2,507,469	70,191	1937 .....	4,586,786	95,532
1934 .....	2,562,552	69,116	1938 .....	4,908,597	101,473
1935 .....	4,307,142	96,560			

**FLUORSPAR** - Fluorspar production in Canada during 1938 totalled 217 short tons valued at \$3,906 compared with 150 tons at \$2,550 in 1937. Production of the mineral in Canada since 1929 has been confined to the Madoc area, Hastings county, Ontario. Fluorspar was formerly produced at the Rock Candy mine, in British Columbia, by the Consolidated Mining and Smelting Company of Canada, Limited; production in 1929 from this mine totalled 17,800 short tons valued at \$267,000. Following the erection of a large fertilizer plant at Trail, the recovery of by-product fluorine from phosphate rock has obviated the necessity of employing fluorspar as a source of fluorine by the Consolidated Mining and Smelting Company of Canada, Ltd. According to the Bureau of Mines, Ottawa, the whole of such recovery is consumed in the lead refinery, but the company is considering other outlets, such as in the manufacture of sodium fluosilicate, used in the ceramic and glass industries, for laundry purposes, and as an insecticide; lead and zinc fluosilicates, also of value as grasshopper poisons; and ammonia fluosilicate, used as a detergent.

The Department of Public Works and Mines, Nova Scotia states in its annual report for 1938 that fluorite is associated with barite in veins occurring at East Lake Ainslie, Nova Scotia; a sample from one vein was reported to show a very high fluorite content.

Germany is second only to the United States as a producer of fluorspar, but it has been the chief exporting country. In 1937 according to the United States Bureau of Mines, German production was 144,469 metric tons; and exports were 46,009 metric tons, of which 12,699 metric tons went to the United States.

Shipments of fluorspar from Newfoundland in 1938 were 9,859 short tons, of which 2,539 tons of fluxing grade, 1,116 tons of acid grade, and 1,237 tons of special grade lump (93 to 95 per cent  $\text{CaF}_2$ ) went to Canada. The fluorspar veins in Newfoundland are described as varying in width from 6 inches to 14 feet of solid fluorspar, and in places a width of fluorspar and granite breccia up to 35 feet is to be found.

In 1938 the average selling price f.o.b. Illinois-Kentucky mines of fluorspar shipped to steel plants was \$18 a short ton and that of fluorspar shipped to manufacturers of hydrofluoric acid was \$25.29. The average selling price of imported fluorspar shipped to steel plants was \$20.56 a ton at seaboard (duty paid). Under the Anglo-American trade treaty, the duty on fluorspar containing more than 97 per cent calcium fluoride was decreased from \$5 a short ton to \$3.75 a ton, effective Jan. 1st, 1939.

Table 8 - PRODUCTION OF FLUORSPAR IN CANADA 1905 - 1938.

Year	short tons	\$	Year	short tons	\$
1905 .....	12	84	1924 .....	76	1,343
1906-1909 .....	...	...	1925 .....	3,886	19,234
1910 .....	2	15	1926-1928 .....	...	...
1911 .....	34	238	1929 .....	17,870	268,120
1912 .....	40	240	1930 .....	80	1,240
1913-1915 .....	...	...	1931 .....	40	620
1916 .....	1,284	10,238	1932 .....	32	464
1917 .....	4,249	68,756	1933 .....	73	1,064
1918 .....	7,362	156,029	1934 .....	150	2,100
1919 .....	5,063	97,837	1935 .....	75	900
1920 .....	11,235	240,446	1936 .....	75	900
1921 .....	5,519	136,267	1937 .....	150	2,550
1922 .....	4,503	102,138	1938 .....	217	3,906
1923 .....	139	1,732			



Table 9 - IMPORTS OF FLUORSPAR INTO CANADA 1929 - 1938.

Year	Tons	\$	Year	Tons	\$
1929 .....	12,092	159,798	1934 .....	7,220	56,628
1930 .....	12,651	160,995	1935 .....	11,591	92,775
1931 .....	3,216	31,257	1936 .....	11,194	95,268
1932 .....	1,009	22,965	1937 .....	11,444	168,082
1933 .....	2,219	21,165	1938 .....	15,057 /	212,131

/ 6,092 tons at \$87,874 from Newfoundland and 5,005 tons at \$50,421 from France.

NOTE: Imports of fluorspar into Canada during the war years 1914-1918 cannot be stated accurately as they were not shown separately in the reports of the Customs Department; in 1918 it was reported that Canadian steel companies used from 10,000 to 15,000 tons of fluorspar per annum.

Table 10 - FLUORSPAR USED IN THE CANADIAN GLASS INDUSTRY, 1931 - 1938.

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1931 .....	96	4,815	1935 .....	98	3,357
1932 .....	125	4,989	1936 .....	71	2,360
1933 .....	115	7,803	1937 .....	91	3,008
1934 .....	119	4,472	1938 .....	112	4,507

Table 11 - FLUORSPAR USED IN CANADIAN STEEL FURNACES, 1930 - 1938.

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1930 .....	6,486	92,743	1935 .....	5,859	73,047
1931 .....	4,969	66,471	1936 .....	7,942	88,403
1932 .....	2,253	27,939	1937 .....	9,039	139,181
1933 .....	2,949	31,657	1938 .....	7,128	119,301
1934 .....	4,555	55,643			

Table 12 - WORLD'S PRODUCTION OF FLUORSPAR, 1935, 1936 and 1937. (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)  
(Long tons)

Producing Country	1935	1936	1937
<b>BRITISH EMPIRE</b>			
United Kingdom .....	31,146	32,962	42,160
Union of South Africa .....	1,949	3,074	3,558
Canada .....	67	67	134
Australia .....	685	816	1,442
Newfoundland .....	4,000	10,424	12,000
<b>FOREIGN COUNTRIES</b>			
France .....	22,400	30,100	50,650
Germany -			
Anhalt .....	7,941	11,048	13,446
Baden .....	3,879	7,242	13,422
Bavaria .....	30,783	48,377	61,469
Prussia .....	24,229	35,698	30,032
Saxony .....	6,828	7,864	7,946
Thuringia .....	23,200	18,495	15,862
Italy .....	8,291	11,256	13,174
Norway .....	1,050	998	1,665
U.S.S.R. ....	48,300	64,000	(a)
Tunis .....	...	...	1,676
Mexico (estimated) .....	1,000	1,000	1,000
United States .....	91,000	150,000	163,000
Argentina .....	397	443	(a)
Korea .....	9,568	8,602	15,500(b)

Fluorspar is also produced in Spain and China.

(a) Information not available.

(b) Exports.



GARNETS - No commercial production of garnets has been reported in Canada for several years. In 1938 prospecting and exploratory work were conducted by Garnet Concentrates Inc., on a garnet deposit located in Beaudin township, Abitibi district, Quebec and in the same province construction work was carried on by Grenat Canada Limitée at a property situated in Joly township, Labelle county; neither of these firms reported commercial shipments during the year under review. The total recorded production of garnets in Canada during past years totalled 1,612 tons valued at \$107,350 and was confined to the years 1923, 1924 and 1927. In 1923 a deposit of garnets in Ashby township, Ontario was operated by the Bancroft mines syndicate; the total production of garnet concentrates and crude garnets amounting to 1,250 tons valued at \$100,000 was shipped to the Carborundum Company Limited, Niagara Falls, N.Y., for use as an abrasive material; the production of garnets in 1924 amounting to 360 tons valued at \$7,200 also originated in Ontario and was shipped to the same company at Niagara Falls, N.Y. In 1927 development work was conducted on a garnet deposit in Joly township, Labelle county, Quebec and a shipment of 2 tons was made.

Garnet is employed chiefly in the manufacture of abrasive papers and cloths while small amounts are utilized in the grinding of plate glass and other products.

No imports of garnet, described as such, were recorded in Canada during 1937 or 1938; the mineral, however, may enter in the form of abrasive paper or combined with other abrasive imports, n.o.p. It has been reported that approximately 175 tons of graded garnet grains are imported annually into Canada. In 1937 the Canadian artificial abrasives industry used 164 short tons of garnets valued at \$28,951 compared with 101 tons at \$17,849 in 1936.

Imports of sandpaper during 1913 were valued at \$171,516 compared with \$331,776 in 1917 and \$317,048 in 1918.

Engineering and Mining Journal's "Metal and Mineral Markets" - New York - October, 1939, quotations for garnet were - per ton, f.o.b. New Hampshire mines; concentrate, \$30; grain, \$80 to \$140. New York: Adirondack garnet concentrates, \$85. Spanish grades, \$60, c.i.f. port of entry. Nominal.

GRAPHITE - Canadian mine production of graphite during 1938 was valued at \$41,590 compared with \$125,343 in 1937. The output in 1938 as in the preceding year came solely from the Black Donald mine, Renfrew county, Ontario. Relatively small and intermittent shipments of graphite were also made from Quebec properties prior to 1935.

The products made from Black Donald ore are well adapted for lubricants and foundry facings. In recent years, the highest grade has been successfully employed in pencil manufacture. During 1938 the Black Donald mine was operated from January 1st to June 30th and the mill intermittently throughout the year; grades shipped included flake, dust and amorphous.

A half dozen or more countries are fairly large graphite producers but, according to the United States Bureau of Mines, none in recent years has challenged the supremacy of Ceylon and Madagascar as producers of high grade graphite; although the tonnage mined in Ceylon and Madagascar seldom exceeds 15 per cent of the world total the value of their products is probably at least half the world total.

"Metal and Mineral Markets" - New York - quoted graphite October 1939 as follows: per pound f.o.b. New York, Ceylon lump, 7 to 7½ cents; carbon lump 6 to 6½ cents; chip, 5 1/4 to 5 3/4 cents; dust 3 to 4 cents; Madagascar flake 6 to 8 cents; no. 1 flake, 9 to 16 cents; no. 2 7 cents upwards; fine ground, 55 to 70 per cent carbon, 3 cents upward; amorphous, 3 cents upward. Crude amorphous graphite, f.o.b. New York \$12 to \$23 per ton, according to grade.

Table 13 - MINE PRODUCTION (SALES) OF GRAPHITE IN CANADA 1913 - 1938.

Year	Short tons	\$	Year	Short tons	\$
1913 .....	2,162	90,282	1926 .....	2,727	194,860
1914 .....	1,647	107,203	1927 .....	1,829	111,656
1915 .....	2,635	124,223	1928 .....	1,097	57,041
1916 .....	3,955	325,362	1929 .....	1,461	103,174
1917 .....	3,714	402,892	1930 .....	1,535	96,392
1918 .....	3,114	248,870	1931 .....	548	32,149
1919 .....	1,360	100,221	1932 .....	346	18,483
1920 .....	2,190	165,617	1933 .....	405	18,367
1921 .....	937	65,862	1934 .....	1,518	71,424
1922 .....	597	31,353	1935 .....	1,782	79,781
1923 .....	1,113	67,873	1936 .....	(a)	88,812
1924 .....	1,334	76,117	1937 .....	(a)	125,343
1925 .....	2,569	158,763	1938 .....	(a)	41,590

The value of mine graphite produced in Canada from 1886 to the end of 1938 totalled \$3,606,925.

(a) Not published.

The 1917 production was obtained from two properties in Ontario and two in Quebec supplemented by a small shipment of high grade crucible plumbago taken out by the Hudson Bay Company from the vicinity of Lake Harbour on Baffin island.

By provinces the 1917 shipments were from Ontario 3,173 tons valued at \$296,587 and from Quebec (including Baffin island) 541 tons valued at \$106,305. By grades the shipments included 540 tons of no. 1 flake valued at \$158,656 or an average of \$293.80 per ton; 650 tons of no. 2 flake valued at \$99,621 or an average of \$153.26 per ton; and 2,524 tons of amorphous and dust valued at \$144,615; or an average of \$57.30 per ton. From three mills, operating on disseminated flake ores, the average recovery of refined graphite was 8.6 per cent of the rock milled; the Black Donald ore consisted largely of amorphous graphite, from which a large mill recovery was made. The Canadian production was almost all exported. According to operating returns 206 tons valued at \$30,195 were sold for domestic consumption during 1917 and 3,508 tons valued at \$372,697 sold for consumption in the United States.

Table 14 - IMPORTS OF GRAPHITE INTO CANADA, 1936, 1937 and 1938.

	1936	1937	1938
	\$	\$	\$
Plumbago, not ground or otherwise manufactured .....	5,166	9,545	18,546
Plumbago crucibles .....	38,559	62,433	60,616
Plumbago, ground, and manufactures of, n.o.p. ....	88,188	105,188	69,342
TOTAL GRAPHITE and ITS PRODUCTS .....	131,913	177,166	148,504 /
/ \$64,375 from United Kingdom and \$77,195 from United States.			

Table 15 - EXPORTS OF GRAPHITE FROM CANADA, 1936, 1937 and 1938.

	1936		1937		1938	
	Cwt.	\$	Cwt.	\$	Cwt.	\$
Graphite or plumbago, crude and refined	67,686	138,454	58,966	133,262	23,006	54,366
Carbon and graphite electrodes .....	...	657,361	...	721,727	...	614,925 /
/ \$202,030 to British South Africa; \$165,506 to Norway and \$142,782 to Australia.						

Table 16 - CONSUMPTION OF GRAPHITE OR PLUMBAGO IN CANADA, BY INDUSTRIES, AS REPORTED TO THE CENSUS OF INDUSTRY, 1937 and 1938.

Industry	1937		1938	
	Quantity	Cost at works	Quantity	Cost at works
	Short tons	\$	Short tons	\$
Paints and varnishes .....	48	4,112	(a)	(a)
Polishes .....	54	5,769	(a)	(a)
Foundries .....	159	19,788	(a)	(a)
Acids and salts (x) .....	58	17,192	75	21,890
Prepared foundry facings .....	157	7,120	(a)	(a)
Total Accounted for .....	476	53,981	...	...

(a) Not yet complete.

(x) In addition, electrodes valued at \$301,378 were used in 1937.

Production of graphite in Canada during the first six months of 1939 was valued at \$25,035 compared with \$22,616 in the corresponding period of 1938.

"Mineral Trade Notes" of the United States Department of the Interior reports as follows:- "As a result of increased demand for graphite in the United States, the amorphous graphite industry in the Guaymas consular district of Mexico showed marked improvement for the first quarter of 1939; shipments of amorphous graphite to the United States, the sole market for the output, totalled about 3,012 short tons in the first quarter of 1939. The price for amorphous graphite containing approximately 83 per cent carbon was steady throughout the quarter at about \$10 United States currency per short ton f.o.b. shipping point in Mexico.

"Japan continued to dominate the Ceylon graphite market in the first quarter of 1939, buying about 42 per cent of all graphite exports; the demand for crystalline or flake graphite in Japan shows no signs of declining. Exports of graphite from Ceylon during the first quarter of 1939 totalled 95,483 cwt. valued at 673,588 rupees and of these 41,676 cwt. went to Japan; 29,546 cwt. to the United States; 9,494 cwt. to the United Kingdom; 4,481 cwt. to Germany and 10,286 cwt. to other countries. (\$1 = Rs.2.86)



"In 1938, a total of 13,433 metric tons of graphite was exported from Madagascar. In the last quarter of 1938 graphite exports totalled 3,229 tons shipped to the following countries:- France 1,287, England 684, United States 548, Belgium 47, Japan 610, Germany 10, Denmark 1, Norway 2, China 10 and Poland 30."

Table 17 - WORLD'S PRODUCTION OF GRAPHITE, 1935, 1936 and 1937. (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)  
(Long tons)

Producing Country	1 9 3 5	1 9 3 6	1 9 3 7
<u>BRITISH EMPIRE</u>			
Union of South Africa .....	65	58	61
Canada (sales) .....	1,591	(b)	(b)
Ceylon (exports) .....	13,908	13,515	17,381
India .....	557	388	558
Australia .....	44	23	14
<u>FOREIGN COUNTRIES</u>			
Austria (crude) .....	19,182	21,367	17,871
Czechoslovakia .....	1,840	2,880	5,046
Germany (crude) .....	21,321	23,906	23,172
Italy .....	5,072	5,118	5,326
Norway .....	2,305	2,338	2,695
Sweden .....	68	62	25
U.S.S.R. ....	82,400	(a)	(a)
Madagascar .....	9,621	7,280	12,192(c)
Morocco (French) .....	...	400	331
Argentina .....	...	18	(a)
Mexico .....	6,866	10,092	11,032
Brazil .....	(a)	(a)	8
Japan .....	1,182	1,551	(a)
Korea - Flake .....	4,167	5,757	
Other .....	39,368	34,611	42,881(c)

NOTE - Graphite is also produced in the United States.

(a) Information not available.

(b) Recorded by value only (1936 ..... £17,859  
1937 ..... £25,373

(c) Exports.

GRINDSTONES - Quarry sales of grindstones and other natural abrasive stones in Canada during 1938 totalled 306 short tons valued at \$16,198 compared with 412 tons at \$21,429 in 1937. The shipments in 1938 included 21 tons of sharpening stones valued at \$3,408 and 285 tons of grindstones worth \$12,790. The stone for the processing of these products was quarried in Nova Scotia and New Brunswick. No production of pulpstones was reported in 1938; in 1937 the Canadian output of these stones totalled 87 short tons valued at \$4,875. The entire production of pulpstones in 1937 originated in a quarry situated on the northeast end of Gabriola Island, near Nanaimo, Vancouver Island, British Columbia.

In 1937 Canadian grindstones were valued at approximately \$50 per ton and pulpstones at \$57 per ton at the quarries. The Bureau of Mines, Ottawa reported in 1938 that there was a demand for good pulpstones, particularly for use in the large magazine grinders, but as deposits containing thick beds of the proper quality sandstone are very scarce in Canada, only about 1 per cent of the stones used recently in Canadian pulp mills was produced in the Dominion. The artificial pulpstones made of silicon carbide segments and also more recently of fused alumina segments are gradually but surely replacing the natural stone.

Imports of grindstones etc., into Canada in 1938 were as follows:- Grinding wheels, manufactured by the bonding together of either natural or artificial abrasives, value \$88,851 (\$84,404 from United States); Grinding stones or blocks, manufactured by the bonding together of either natural or artificial abrasives, value \$21,257 (\$20,848 from United States); Grindstones not mounted and not less than 36 inches in diameter number 840 value \$91,205 (189 at \$6,366 from United Kingdom and 650 at \$84,375 from United States); Grindstones n.o.p. number 4,516 value \$6,161.



In 1917 Canadian imports of grindstones were valued at \$185,607 against \$145,247 in 1913. Other imports in 1917 included manufactures of emery \$553,660 (1913 - \$135,654); sandpaper \$331,776 (1913 - \$171,516); pumice stone \$34,162 (1913 - \$17,861).

Exports of manufactured grindstones from Canada in 1938 were valued at \$5,441.

Table 18 - PRODUCTION OF GRINDSTONES, PULPSTONES and SCYTHESTONES IN CANADA, FOR YEARS SPECIFIED.

Year	Tons	\$	Year	Tons	\$
1886 .....	4,020	46,545	1929 .....	1,947	106,354
1900 .....	5,539	53,450	1930 .....	830	62,021
1905 .....	5,540	62,375	1931 .....	621	38,103
1913 .....	4,837	51,325	1932 .....	328	15,735
1914 .....	3,976	54,504	1933 .....	498	21,919
1915 .....	2,580	35,768	1934 .....	987	46,478
1916 .....	3,478	52,782	1935 .....	708	34,010
1917 .....	2,523	45,754	1936 .....	569	24,724
1918 .....	3,072	83,005	1937 .....	412	21,429
1928 .....	1,855	100,960	1938 .....	306	16,198

Table 19 - PRODUCTION OF NATURAL ABRASIVE STONES, BY KINDS, 1938.

	PULPSTONES		SHARPENING STONES		GRINDSTONES	
	Tons	\$	Tons	\$	Tons	\$
Nova Scotia .....	...	...	16	2,688	115	4,318
New Brunswick .....	...	...	5	720	170	8,472
British Columbia .....	...	...	...	...	...	...
CANADA .....	...	...	21	3,408	285	12,790

Table 20 - CONSUMPTION OF PULPSTONES BY THE CANADIAN PULP AND PAPER INDUSTRY, 1931 - 1938.

Year	Number for 2 ft. wood		Value	Number for 2.5 ft. wood		Value	Number for 4 ft. wood		Value
			\$			\$			\$
1931 .....	226	72,588		225	71,760		285	337,580	
1932 .....	210	65,450		139	46,436		222	249,373	
1933 .....	321	98,475		95	31,945		199	223,635	
1934 .....	378	103,811		84	29,680		268	292,359	
1935 .....	417	116,501		52	20,297		237	243,805	
1936 .....	463	120,227		61	19,478		253	281,265	
1937 .....	392	123,598		84	21,700		280	382,084	
1938 .....	306	92,822		37	13,351		186	238,488	

Table 21 - PRODUCTS MANUFACTURED BY THE CANADIAN ARTIFICIAL ABRASIVES INDUSTRY, 1936 and 1937.

Product	1936		1937	
	Short tons	Selling value at works	Short tons	Selling value at works
		\$		\$
Crude silicon carbide .....	23,805	2,299,602	25,644	2,808,016
Crude fused alumina .....	59,533	5,762,217	86,604	8,435,371
Silicon carbide firesand, etc. ....	2,411	38,800	703	11,192
Abrasive wheels and segments .....	...	862,283	...	1,165,406
Sharpening stones and files .....	...	89,524	...	95,317
Ferrosilicon .....	6,935	81,295	7,396	94,824
Other products (x) .....	...	1,497,812	...	1,564,225
TOTAL .....	...	10,631,533	...	14,174,351

(x) Includes abrasive cloth, abrasive paper, tiles, artificial pulpstones, artificial graphite, boron carbide, boron carbide shapes, calcium boride, fused magnesia, refractory cements, firebrick, etc., each of which was reported by only one or two companies. Boron carbide is made in an electric furnace from coke and dehydrated boric acid. Canadian imports of boric acid in 1938 totalled 1,624,725 pounds of which 1,601,386 pounds came from the United States. Canadian imports of borax and borax glass in 1938 amounted to 6,770,807 pounds valued at \$197,098.

NOTE - Some of the materials used in the making of artificial abrasives in 1937 included 102,843 short tons of bauxite and pure alumina valued at \$2,200,551; 45,240 tons silica sand at \$211,899; 2,364 tons artificial abrasive grains at \$406,479 and 164 tons of garnets at \$28,951.

**KYANITE** - The following information is from a recent bulletin of the "Imperial Institute", London (Vol. XXXVI - No. 4). Kyanite, a natural silicate of alumina ( $\text{Al}_2\text{SiO}_5$  or  $\text{Al}_2\text{O}_3 \cdot \text{SiO}_2$ ) is finding a steadily growing market for the preparation of refractories. It is not used in the raw state, but is first fired at  $1,460^\circ$  to  $1,500^\circ \text{C.}$ , and then ground ready to mix with the bond. The product of calcination, however, is known in the trade as "Sillimanite", a misnomer which often leads to confusion. Sillimanite and andalusite are other natural minerals of exactly the same chemical composition as Kyanite (but different in physical properties), and both are likewise converted on heating into mullite and silica. The conversion of andalusite into mullite is not accompanied by any change in volume and this mineral can therefore be used in the raw state as a refractory. Mullite made from Kyanite is used in the construction of numerous types of furnaces, including electric furnaces and those for the enamelling and glass industries. When added to ceramic compositions containing clay and kaolin, it is claimed to reduce shrinkage, lower the coefficient of expansion, increase breaking strength, resistance to abrasion and electrical resistance, and extend the sintering range. It is also a constituent of certain sparking-plug porcelains.

Kyanite is usually a rock-forming mineral, and only rarely does it occur in large monomineralic masses as segregations in quartz-kyanite gneiss or schist. Indian kyanite is the most popular at the present time; the production in India commenced in 1924 and amounted to 24,787 tons in 1936. The mineral also occurs in Nyasaland, British East Africa and Western Australia.

The leading andalusite mine in the world is operated by Champion Sillimanite, Inc., in the White Mountains California; this company is a subsidiary of the Champion Spark Plug Co., Detroit, Mich. Imports of kyanite and sillimanite into the United States in 1938 totalled 3,964 short tons valued at \$32,458 compared with 7,674 short tons at \$79,410 in 1937.

None of the minerals, kyanite, sillimanite or andalusite are commercially mined in Canada at the present time and any imports of these minerals into Canada are not shown separately in the Canadian Customs classification. "Metal and mineral markets" - New York, October 1939 quoted kyanite - per ton f.o.b. North Carolina and Georgia \$17.50 to \$25 nominal.

**LITHIUM MINERALS** - Commercial production of Canadian lithium minerals were first recorded in 1937. These were made by the Lithium Corporation of Canada, Limited, from deposits located at Bernic Lake, near Pointe du Bois, Eastern Manitoba. The material was valued at \$1,694 and was consigned to a United States chemical plant. The Bureau of Mines, Ottawa, reports that the present supply of lithium minerals is drawn from deposits in the United States, Southwest Africa, and France. The newly discovered spodumene deposits in North Carolina are regarded as one of the world's largest potential sources of supply of lithium. The principal commercial lithium ores are amblygonite, a fluophosphate of lithium and aluminium; spodumene, a silicate of these two elements; and lepidolite or lithia mica, also a silicate. All of the above minerals occur in Canada, but there has, as yet, been only a small production, mainly of lepidolite and spodumene; the important deposits are all in Manitoba. No commercial mine shipments of lithium minerals were reported in Canada during 1938.

South West Africa and France are the largest producers of lithium ores outside the United States. In 1938 the total production of lithium compounds in the United States as given by producers to the United States Bureau of Mines, aggregated 892 short tons valued at \$329,088.

Spodumene expands in whiteware bodies, and if properly controlled this expansion may offset shrinkage and other production troubles in ceramic work. Lepidolite hardens and toughens clear glass and lowers the expansion coefficient.

"Metal and Mineral Markets" New York quoted lepidolite (Oct. 1939), per ton, \$20 to \$25 for ordinary grades, lump f.o.b. mines. Amblygonite - per ton f.o.b. mines 8 to 9 per cent  $\text{Li}_2\text{O}$  \$40. Spodumene - per unit  $\text{Li}_2\text{O}$  contained \$5 on 6 per cent grade carload lots, North Carolina.

Statistics relating to possible imports of lithium minerals or chemicals into Canada are not shown separately in the Canadian Customs classification.

**MAGNESITIC-DOLOMITE** - Production of magnesitic-dolomite (sales and producers consumption of calcined and dead burned) in Canada during 1938 was valued at \$420,261.

Magnesitic dolomite, an intimate mixture of magnesite and dolomite is quarried and processed at Kilmar and Harrington East, in Argenteuil county, Quebec. It is marketed in the caustic and dead-burned states; in the form of bricks; as finely ground refractory cement; and also in combination with chrome as an ingredient in certain types of refractories. Caustic-calcined magnesia is used for fettling the bottoms of basic open hearth furnaces and for the construction of floors and floor tiles. The deposits of magnesitic dolomite in Argenteuil county, Quebec, are ample to supply magnesia products for domestic requirements for many years, and also to support a large export trade. An interesting development during the year was the discovery by one of the officers of the Federal Bureau of Mines, at Rutherglen, Ontario and at Bryson, Quebec, of brucite-bearing limestone. Brucite, a hydrated magnesium oxide contains a higher percentage of magnesium than magnesite and can be utilized for the manufacture of refractory material for lining metallurgical furnaces. It has value also as a potential source of magnesium metal. The mineral also occurs at Farm Point in the Gatineau River Valley, Quebec.



Large deposits of hydromagnesite are reported to occur near Atlin and at other localities in British Columbia.

The United States Bureau of Mines reported on brucite in its 1939 minerals Year Book as follows:- "After sundry set-backs, brucite mining has just become established on a moderately extensive scale. The deposits near Luning, Nevada are of enormous extent and high purity. Small quantities of this natural hydrate of magnesia  $Mg(OH)_2$ , have been employed in petroleum refineries and for making magnesium compounds but the important outlet at present is in the manufacture of furnace refractories, largely to increase the slag resistance of dolomite".

Table 22 - PRODUCTION OF MAGNESITIC-DOLOMITE (CALCINED) IN CANADA, 1908 - 1938.

Year	Tons	Value \$	Year	Tons	Value \$
1908 .....	120	840	1924 .....	3,873	101,356
1909 .....	330	2,508	1925 .....	5,576	122,326
1910 .....	323	2,160	1926 .....	4,571	137,431
1911 .....	991	5,531	1927 .....	7,337	230,309
1912 .....	1,714	9,845	1928 .....	13,195	346,990
1913 .....	515	3,335	1929 .....	18,809	491,170
1914 .....	358	2,240	1930 .....	13,336	336,162
1915 .....	14,779	126,584	1931 .....	11,411	295,579
1916 .....	55,413(b)	562,829	1932 .....	(a)	262,860
1917 .....	58,090	728,275	1933 .....	(a)	360,128
1918 .....	39,565	1,016,765	1934 .....	(a)	382,927
1919 .....	11,273	328,465	1935 .....	(a)	486,084
1920 .....	18,578	512,756	1936 .....	(a)	768,742
1921 .....	3,720	81,320	1937 .....	(a)	677,207
1922 .....	2,849	76,294	1938 .....	(a)	420,261 /
1923 .....	4,801	134,382	Grand Total \$ .....	...	9,014,460

/ represents value of magnesite (dead-burned etc.) only, whereas the values for years immediately preceding include the value of some end products containing imported material; for this reason the 1938 value is not entirely comparable with those for recent years.

(a) not published.

(b) includes shipments of 635 tons of hydromagnesite valued at \$9,525 from Atlin, B.C.

Table 23 - MAGNESITE AND DOLOMITE USED IN THE CANADIAN PRIMARY IRON AND STEEL INDUSTRY, 1931 - 1938.

DOLOMITE			MAGNESITE		
	Short tons	Value \$		Short tons	Value \$
1931 .....	15,773	76,317	(a)	(a)	
1932 .....	6,725	32,523		420	14,500
1933 .....	6,874	30,557		399	14,798
1934 .....	14,748	69,104		2,733	105,072
1935 .....	18,394	79,914		3,891	149,987
1936 .....	43,562	145,502		6,432	230,656
1937 .....	53,066	181,146		8,994	326,091
1938 .....	40,540	137,127		9,219	336,811

(a) Information not available.

Relatively large quantities of magnesite or magnesium refractories are also used in the smelting of non-ferrous ores but complete data relating to this consumption are not yet available.

Table 24 - CALCINED MAGNESITE USED BY THE ARTIFICIAL ABRASIVES AND ABRASIVE PRODUCTS INDUSTRY IN CANADA, 1933 - 1938.

Year	Tons	Value \$	Year	Tons	Value \$
1933 .....	(a)	16,430	1936 .....	418	25,256
1934 .....	104	6,370	1937 .....	484	29,242
1935 .....	40	2,448	1938 .....	...	...

(a) Information not available.



Table 25 - IMPORTS OF MAGNESITE AND MAGNESITE FIRE BRICK INTO CANADA, 1931 - 1938.

Year	Magnesite, dead burned, sintered caustic calcined or plastic magnesite		Magnesite fire brick
	Cwt.	\$	
1931 .....	35,741	40,628	152,435
1932 .....	21,302	28,626	71,077
1933 .....	28,053	43,229	246,855
1934 .....	9,439	26,740	396,915
1935 .....	15,296	42,644	384,141
1936 .....	23,254	56,515	568,565
1937(a) .....	20,383	55,360	653,507
1938 .....	13,962	43,956	571,910(b)

- (a) In addition, 8,222 cwt. of calcined magnesite was imported for the manufacture of insulating materials for use exclusively in the manufacture of such insulating materials; in 1938 corresponding imports totalled 5,966 cwt. valued at \$9,307.
- (b) \$568,165 from the United States.

Imports into Canada in 1938 of magnesium carbonate, basic or otherwise, excepting crude rock, and magnesium carbonate, for use in compounding or manufacture of rubber products totalled 764,655 pounds valued at \$35,575; of these imports 718,192 pounds at \$32,646 came from the United Kingdom.

Table 26 - EXPORTS OF MAGNESITE, CALCINED, DEAD-BURNED, ETC., FROM CANADA, 1931 - 1938.

Year	Cwt.	\$	Year	Cwt.	\$
1931 .....	32,214	45,257	1935 .....	31,531	43,338
1932 .....	23,885	33,103	1936 .....	58,554	71,183
1933 .....	46,396	63,056	1937 .....	40,554	49,401
1934 .....	39,933	56,670	1938 .....	79,415	95,607

/ Practically all to the United Kingdom.

Exports and imports of magnesite were not separately recorded during most of the war years of 1914-1918; the imports of magnesite brick during the nine months ending December 31, 1917 were valued at \$470,801, the quantity not being stated; exports of magnesite in 1918 were valued at \$816,553.

Canadian magnesite producers in 1918, marketed approximately 16,697 tons of crude ore valued at \$158,380, averaging about \$9.50 per ton. Calcined material sold at \$25 per ton and dead burnt clinker between \$35 and \$40. In 1918 about 57,799 tons of magnesite rock were quarried and about 49,303 tons were calcined in lime kilns, or sintered in rotary cement kilns. The sintering was done in plants of the Canada Cement Company at Hull and Montreal, Quebec. The manufacture in Canada of metallic magnesium was undertaken in 1918 by the Shawinigan Electro Metals Co. Ltd., at Shawinigan Falls, Quebec; the metal was recovered from imported magnesium chloride salts.

"Metal and Mineral Markets" New York October 1939 quotations for magnesite were: - per ton f.o.b. California, dead burned, \$25. Artificial periclase, 94 per cent MgO, \$65; 90 per cent \$35. Caustic 95 per cent MgO, white color, \$40; 85 per cent MgO, no color standard \$37.50. Washington: Dead-burned grain magnesite, \$22.

The 21st annual report of the National Research Council of Canada for the fiscal year 1937-1938 refers to metallic magnesium as follows:- "During the year under review research has been initiated on production of metallic magnesium. Being the lightest metal (its specific gravity 1.74, may be compared with that of aluminium 2.71) which is reasonably stable under atmospheric conditions, its use is expanding rapidly in aircraft construction. Canada possesses abundant supplies of magnesium-bearing minerals, and with cheap electric power, this country should be in a position to enter the field when demand increases. Research has been undertaken to examine the Canadian raw materials and to develop suitable methods for winning the metal therefrom...experiments are under way on various methods for producing the oxide in reasonably pure form from magnesite, dolomite-magnesite, and serpentine, extensive deposits of all of which occur in Canada.... Up to the present practically all the commercial metallic magnesium has been produced by electrolysis of the fused chloride. Electrothermic reduction with carbon or other suitable reducing agent is very attractive and future developments are likely to be on these lines..."

Table 27 - WORLD'S PRODUCTION OF MAGNESITE, 1935, 1936 and 1937. (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)  
(Long tons)

Producing Country and Description	1935	1936	1937
<u>BRITISH EMPIRE</u>			
Union of South Africa - Crude .....	1,462	1,667	1,724
Canada - Crude .....	26,684	(d)	(d)
India - Crude .....	16,984	15,468	26,166
Australia - Crude .....	16,068	17,615	19,705
<u>FOREIGN COUNTRIES</u>			
Austria - Crude .....	295,569	391,494	(a)
Caustic (c) .....	43,042	57,621	(a)
Dead-burnt (c) .....	93,029	97,025	(a)
Bricks (c) .....	38,172	42,015	(a)
Czechoslovakia - Crude (b) .....	9,317	8,545	12,010
Calcined (b) .....	28,763	34,957	37,465
Germany (Prussia) - Crude .....	13,600	14,789	20,758
Greece - Crude .....	92,085	114,272	159,123
Caustic (c) .....	18,807	22,762	44,548
Dead-burnt (c) .....	6,162	6,552	5,404
Italy - Crude .....	1,231	3,105	5,307
Calcined (c) .....	653	...	...
Norway - Crude .....	2,486	3,067	2,063
Calcined (c) .....	603	544	601
Bricks (c) .....	787	607	587
Yugoslavia (Serbia only) - Crude .....	29,286	38,392	40,531
Calcined .....	11,475	13,910	19,464
United States - Crude .....	158,173	184,928	181,640
Caustic (sales) (c) .....	5,401	7,141	8,956
Dead-burnt (sales) (c) .....	64,677	80,338	74,289
Korea - Crude .....	2,372	14,033	(a)
"Lanchoukuo" - Crude .....	154,000	203,000	(a)
Turkey - Crude .....	1,075	2,247	316

Magnesite is also produced in the U.S.S.R.

- (a) Information not available.
- (b) Exports less imports.
- (c) Derived from crude, and not additional.
- (d) Production recorded by value only - 1936 .....£154,583 ..... 1937 £137,086.

MAGNESIUM SULPHATE - Production (sales) of natural magnesium sulphate or crude epsom salts in Canada during 1938 totalled 470 short tons valued at \$9,400 compared with 727 short tons at \$14,456 in 1937. Output in both years came from a deposit of the mineral occurring at Basque, British Columbia. The crude material obtained from the Basque deposits is refined in a plant at Ashcroft, British Columbia, by the Ashcroft Epsom Salts Co. Ltd., successor to Epsom Refineries Ltd. The output of the Ashcroft plant has been marketed chiefly in the tanning and medicinal industries.

In 1918 crude magnesium sulphate was mined at Spotted Lake in the Osoyoos division, British Columbia, the crude material was refined at Oroville, Wash., U.S.A.; shipments in 1916 were reported at 250 tons and in 1915 about 300 tons; the same operator also made shipments during 1918 from a deposit near Clinton, in Lillooet, British Columbia.

Table 28 - TOTAL RECORDED PRODUCTION OF NATURAL MAGNEISUM SULPHATE IN CANADA(x).

Year	Tons	Value \$	Year	Tons	Value \$
1917 .....	929	4,645	1924-1932 .....	...	...
1918 .....	1,949	14,565	1933 .....	120	3,360
1919 .....	738	9,115	1934 .....	42	1,100
1920 .....	1,947	39,886	1935 .....	340	7,965
1921 .....	2,029	39,506	1936 .....	654	13,712
1922 .....	1,021	24,017	1937 .....	727	14,456
1923 .....	121	6,580	1938 .....	470	9,400
			GRAND TOTAL .....	11,087	188,307

(x) Produced entirely in British Columbia.



Table 29 - MAGNESIUM SULPHATE USED IN CANADIAN PHARMACEUTICAL PREPARATIONS AND TANNING, 1932 - 1938.

Year	Pharmaceutical preparations		Tanning(x)	
	Pounds	Value \$	Pounds	Value \$
1932 .....	622,459	28,073	181,811	2,418
1933 .....	851,355	24,629	396,424	4,467
1934 .....	816,830	33,793	228,281	4,789
1935 .....	826,082	22,647	759,744	12,254
1936 .....	878,120	23,162	1,115,965	15,120
1937 .....	919,825	23,881	992,203	16,166
1938 .....	(a)	(a)	(a)	(a)

(x) Data not entirely complete for years prior to 1935.

(a) Not complete for 1938.

Table 30 - IMPORTS INTO CANADA OF MAGNESIUM SULPHATE (EPSOM SALTS), 1931 - 1938.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	4,120,086	43,807	1935 .....	3,624,390	40,407
1932 .....	4,383,115	47,679	1936 .....	3,579,069	37,928
1933 .....	4,269,852	49,868	1937 .....	3,355,147(x)	33,116
1934 .....	4,599,518	48,459	1938 .....	3,606,167(a)	33,018

(x) 2,553,069 pounds valued at \$17,030 from Germany and 693,204 pounds at \$14,058 from United States.

(a) 2,883,622 pounds valued at \$18,659 from Germany and 604,205 pounds valued at \$12,312 from the United States.

Canadian trade publications quoted (September, 1939) magnesium sulphate, B.P. bbls. 2½ to 3 cents per pound. Technical, bags, \$35 to \$40 per ton.

**MINERAL WATERS** - Shipments of natural mineral waters from Canadian springs totalled '88,309 imperial gallons valued at \$21,619 in 1938 compared with 225,019 imperial gallons worth \$20,586 in the preceding year. Production during both years originated in Ontario and Quebec. Some of the more prominent Canadian mineral waters possessing special therapeutic or hygienic properties include the following: in Quebec, the Abenakis springs on the St. Francois river in Yamaska county; Pottou Springs in Brome county and the Coulombia spring at L'Epiphanie. In Ontario, saline, sulphur and gas springs occur at Caledonia Springs and at Carlsbad Springs, near Ottawa; the waters range from alkaline to strongly saline. St. Catharines, near Niagara, is one of the oldest Canadian mineral water resorts and sulphur waters are found at the Freston mineral springs in Waterloo county. The most famous of all Canadian springs is undoubtedly the group of hot sulphur springs at Banff, Alberta. In British Columbia the Harrison Hot Springs in the Fraser Valley and the Halcyon Hot springs on Arrow Lake are noted for their curative properties.

The total number of firms reporting production of natural mineral waters in the Dominion totalled 14 in 1938, of which 11 were located in the province of Quebec and 3 in Ontario.

It is interesting to note that natural mineral waters from springs in the county of Lac St. Jean, Quebec, were utilized during both 1936 and 1937 in highway maintenance.

Table 31 - SHIPMENTS OF NATURAL MINERAL WATERS FROM CANADIAN SPRINGS, 1930 - 1938.

	QUEBEC		ONTARIO		CANADA	
	Imp. gal.	\$	Imp. gal.	\$	Imp. gal.	\$
1930 .....	12,941	3,727	214,200	20,754	227,141	24,481
1931 .....	19,868	4,746	197,640	8,578	217,408	13,324
1932 .....	15,506	4,697	61,208	2,473	76,714	7,170
1933 .....	9,024	3,094	29,794	2,347	38,818	5,441
1934 .....	75,665	16,116	21,775	1,622	97,440	17,738
1935 .....	126,616	15,113	19,900	1,477	146,516	16,590
1936 .....	131,186	17,399	23,100	1,117	154,286	18,516
1937 .....	198,319	19,697	26,700	889	225,019	20,586
1938 .....	159,893	19,033	28,416	2,586	188,309	21,619



Shipments of natural mineral waters from Canadian springs during the first six months of 1939 totalled 54,664 imperial gallons valued at \$9,321 compared with 49,391 gallons at \$6,442 in the corresponding period of 1938.

Imports into Canada of natural mineral waters, not in bottles, totalled 90 imperial gallons valued at \$20 in 1938 compared with 60 gallons worth \$37 in 1937. Mineral and aerated waters, n.o.p., imported during 1938 were valued at \$61,928 against \$88,607 in the preceding year.

Exports of mineral and aerated waters during 1938 were valued at \$6,177 while in 1937 similar exports amounted to \$5,097.

Table 32 - SALES OF NATURAL MINERAL WATERS(x) BY THE CANADIAN AERATED WATERS INDUSTRY, 1930 - 1938.

Years	\$	Years	\$
1930 .....	178,348	1935 .....	45,100
1931 .....	140,730	1936 .....	63,687
1932 .....	92,066	1937 .....	102,648
1933 .....	77,125	1938 .....	(a)
1934 .....	52,113		

(x) Whether fortified or not.

(a) Not complete.

PEAT - Production of peat (fuel) in Canada during recent years came entirely from the provinces of Ontario and Quebec. Output in both 1937 and 1938 originated in Ontario only and in 1938 amounted to 620 short tons valued at \$3,500 compared with 478 tons at \$2,676 in 1937. In 1938 there were 3 firms reporting operations compared with 4 in 1937.

In addition to the production of peat as a fuel there is now produced in Canada a peat moss for use as a litter and insulator. Imports of peat moss into Canada in 1938 totalled 433 tons valued at \$8,746 compared with 336 tons worth \$5,770 in 1937; the greater part of this material came from the United States.

PHOSPHATE - Production of phosphate in 1938 amounted to only 208 tons valued at \$1,886. The mineral during the year under review was obtained entirely from deposits located in the Hull-Buckingham district of the province of Quebec and was utilized in the manufacture of chemicals. The mineral as produced in Canada usually represents a by-product in the mining of mica.

The Department of Mines and Resources, Ottawa, reports that the only important recorded occurrences of phosphate rock in Canada are the Precambrian apatite deposits of the Ottawa-Kingston region in Ontario and Quebec, and the rather low-grade sedimentary phosphate of the Crownsnest district just west of the boundary between southern Alberta and British Columbia.

The Quebec and Ontario apatite deposits were once of considerable importance and were actively mined as a source of fertilizer phosphate, but the industry became unprofitable upon the discovery of the immense sedimentary phosphate deposits of the Southern United States about 1890. Enormous tonnages of apatite are now being produced by concentration from low-grade ores of the Murmansk region in Russia.

Although fertilizers will always continue to consume the great bulk of the world's phosphate produced, a growing future for phosphorous and its compounds appears to be assured. One of such chemicals that is rapidly coming into extensive use is tri-sodium phosphate, employed as a detergent in laundry work and as a general cleanser, as well as for preventing scale or scum in boiler-feed and washing waters, and in the tanning, photographic, sugar, and other industries.

The largest annual output of phosphate to be recorded in Canada was for 1890 in which year production was reported at 31,753 tons valued at \$361,045. The total production of the mineral in the Dominion from 1870 to the end of 1938 totalled 342,185 short tons valued at \$4,666,336.

Table 33 - PRODUCTION OF PHOSPHATE IN CANADA 1916 and 1926 - 1938.

Year	Short tons	\$	Year	Short tons	\$
1916 .....	140	1,200	1933 .....	2,214	5,475
1928 .....	641	8,276	1934 .....	81	683
1929 .....	1,185	5,380	1935 .....	186	1,103
1930 .....	40	760	1936 .....	525	4,927
1931 .....	...	...	1937 .....	100	900
1932 .....	1,316	12,333	1938 .....	208	1,886

Table 34 - IMPORTS OF PHOSPHATE ROCK INTO CANADA, 1914, 1918 and 1931 - 1938.

Year	Cwt.	\$	Year	Cwt.	\$
1914 .....	(a)	20,220	1935 .....	1,270,284	234,580
1918 .....	(a)	90,363	1936 .....	1,669,478	298,179(x)
1931 .....	2,834,468	619,079	1937 .....	2,279,410	453,599(x)
1932 .....	1,428,657	346,907	1938 .....	2,568,172	455,697(x)
1933 .....	367,020	74,527			
1934 .....	635,494	165,240			

(x) Came entirely from the United States.

(a) Not recorded.

Imports of acid phosphate, not medicinal, totalled 844,287 pounds valued at \$48,070 in 1938 while those of soda phosphates for the same year totalled 2,802,699 pounds valued at \$122,064. Imports of phosphoric acid during 1938 totalled 319,999 pounds valued at \$15,898.

Imports of manufactured fertilizers into Canada in 1918 were valued at \$670,364 compared with \$1,045,140 in 1917 and \$505,904 in 1913.

In 1938 imports into Canada of fertilizers, superphosphate or acid phosphate of lime totalled 2,287,135 cwt. valued at \$1,092,859 of which 1,559,892 cwt. at \$737,411 came from the United States. The grand total of all fertilizers (other than phosphate rock) imported into Canada during 1938 was 4,684,462 cwt. valued at \$3,872,579 of which 2,661,838 cwt. at \$2,167,218 came from the United States.

Imports of phosphorous and compounds thereof, n.o.p. in 1938 totalled 135,760 pounds valued at \$39,804. Imports of phosphorous in 1913 totalled 13,807 pounds valued at \$4,012 compared with 74,000 pounds at \$35,125 in 1918. Phosphate chemicals and ferro-phosphate are manufactured in Canada at Buckingham, Quebec from phosphate rock.

According to the United States Bureau of Mines the Montana Phosphate Products Co., Trail, British Columbia, operated the Anderson mine near Garrison, Montana and United States Government leases in 1938, supplying the requirements of the Consolidated Mining and Smelting Co. of Canada Ltd. at Trail. The Trail plant treat the phosphate rock with sulphuric acid, producing "triple (or treble)" superphosphate. The plant at Trail also makes ammonium phosphate and mixtures of ammonium phosphate and ammonium sulphate.

Table 35 - PHOSPHATE ROCK AND SUPERPHOSPHATE USED IN THE MANUFACTURE OF CANADIAN FERTILIZERS, 1931 - 1938.

Year	SUPERPHOSPHATE		PHOSPHATE ROCK	
	Short tons	\$	Short tons	\$
1931 .....	51,639	595,789	48,373	395,547
1932 .....	36,005	366,462	41,114	316,518
1933 .....	59,443	657,123	21,961	164,614
1934 .....	73,132	839,990	48,007	396,133
1935 .....	86,701	986,674	74,507	610,115
1936 .....	97,515	1,103,222	60,924	438,948
1937 .....	137,801	1,661,243	101,704	726,572
1938 .....	168,519	2,047,206	102,125	765,816

"Metal and Mineral Markets" - New York - October, 1939 - phosphate quotations - were - per long ton, f.o.b. mines: Florida pebble, domestic; 77 to 76 per cent, \$3.65; 75 per cent, \$2.90. Tennessee, ground lime phosphate, 85 per cent, through 300 mesh, 34.30 per cent P<sub>2</sub>O<sub>5</sub>, \$7.00 per short ton, bags extra.

Table 36 - WORLD'S PRODUCTION OF PHOSPHATE ROCK, 1935, 1936 and 1937. (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)  
(Long tons)

Producing Country	1 9 3 5	1 9 3 6	1 9 3 7
<u>BRITISH EMPIRE</u>			
Tanganyika .....	191	...	102
Seychelles (exports) .....	9,923	23,564	9,442
Canada .....	166	469	89
India .....	102	128	166
Christmas Island .....	147,929	161,440	162,568
Australia .....	235	175	20
Nauru Island .....	480,950	547,400	688,900
Ocean Island .....	228,100	403,100	398,800
TOTAL .....	868,000	1,136,000	1,250,000
<u>FOREIGN COUNTRIES</u>			
Belgium (b) .....	15,531	15,836	(a)
Estonia .....	11,458	11,228	9,952
France .....	49,300	54,100	101,747
Germany .....	177	1,043	3,262
Poland .....	11,457	12,300	(a)
Roumania (e) .....	2,740	(a)	(a)
U.S.S.R. (d) .....	1,800,000	2,178,900	(a)
Algeria .....	594,326	523,000	621,180
Egypt .....	466,411	522,644	508,837
Madagascar .....	6,000	5,250	(a)
Morocco (French) .....	1,134,117	1,314,087	1,455,156
Tunis .....	1,470,000	1,464,000	1,757,100
Netherlands West Indies (exports) .....	89,276	76,897	100,229
United States .....	3,159,328	3,462,837	4,261,416
Formosa .....	...	210	(a)
French Indo-China .....	(f) 5,795	9,200	21,800
China (estimated) .....	8,000	8,000	8,000
Japan .....	89,807	111,315	(a)
Netherlands East Indies .....	11,371	11,238	25,754
Philippine Islands .....	1,169	444	(a)
Augaur Island (exports) .....	76,878	87,817	89,220
French Oceania .....	133,800	145,000	160,000
New Caledonia .....	9,000	4,800	...
TOTAL .....	9,100,000	10,000,000	(a)
WORLD'S TOTAL .....	10,000,000	11,000,000	(a)

(a) Information not available.

(b) In addition phosphatic chalk was produced as follows:-

1935 ..... 62,979 long tons.  
1936 ..... 58,737 long tons.  
1937 ..... 51,444 long tons.

(d) Figures refer to concentrates of apatite and phosphate-rock plus the ground phosphate used directly as a fertilizer. The production of phosphate-rock before concentration was:-

	1935	1936
Apatite .....	1,530,700	(a)
Other phosphate-rock .....	1,722,700	1,764,400

(e) Converted from cubic metres at the rate of 1 cubic metre = 2 long tons.

(f) Amount ground.



**SILICA BRICK** - The production of silica brick in Canada during 1938 totalled 1,788 M valued at \$100,403 compared with 3,744 M worth \$181,126 in 1937. The manufacture of these refractories was confined, in both years, to the plants of the Dominion Steel and Coal Company, Ltd., at Sydney, Nova Scotia, and the Algoma Steel Corporation Ltd., Sault Ste. Marie, Ontario. The brick manufactured by both of these companies are processed from crushed silica rock and are utilized in furnace construction and repairs.

Table 37 - PRODUCTION OF SILICA BRICK IN CANADA, 1928 - 1938.

Year	M	\$	Year	M	\$
1928 .....	3,224	155,502	1934 .....	2,528	85,945
1929 .....	3,951 <sup>/</sup>	173,681	1935 .....	2,461	96,194
1930 .....	2,418	97,379	1936 .....	2,393	97,285
1931 .....	900	35,746	1937 .....	3,744	181,126(a)
1932 .....	93	4,304	1938 .....	1,788	100,403
1933 .....	636	23,185			

<sup>/</sup> largest annual output.

(a) largest annual value.

Table 38 - IMPORTS OF SILICA BRICK(x) INTO CANADA, 1931 - 1938.

Year	\$	Year	\$
1931 .....	234,909	1935 .....	215,500
1932 .....	122,952	1936 .....	261,974(a)
1933 .....	147,901	1937 .....	539,253(b)
1934 .....	210,190	1938 .....	240,184(c)

(x) Containing not less than 90 per cent silica.

(a) \$261,952 from the United States.

(b) \$527,414 from the United States.

(c) All from United States.

**SODIUM CARBONATE (NATURAL)** - Production of natural sodium carbonate in Canada during 1938 totalled 252 short tons valued at \$2,268 compared with 286 tons at \$2,574 in 1937. Deposits of this material in the form of "natron" (sodium carbonate with 10 molecules of water) and also as brine, occur in a number of "lakes" throughout the central part of the province of British Columbia, chiefly in the Clinton mining division, around 70 Mile House, and in the neighbourhood of Kamloops. Production in Canada during recent years has come entirely from deposits in British Columbia and in 1938 all commercial shipments of primary or mine material were made from 70 mile and chasm on the line of the Pacific Great Eastern Railway. The first commercial shipments of natural sodium carbonate from Canadian deposits were recorded for 1921 in which year 197 short tons valued at \$14,775 were reported as sold. The total Canadian production of the material to the end of 1938 totalled 8,159 short tons valued at \$97,470.

Table 39.- PRODUCTION OF SODIUM CARBONATE (NATURAL) IN CANADA, 1929 - 1938.

Year	Tons	\$	Year	Tons	\$
1929 .....	600	8,100	1934 .....	244	1,920
1930 .....	364	4,650	1935 .....	242	2,430
1931 .....	712	7,351	1936 .....	192	1,677
1932 .....	495	5,450	1937 .....	286	2,574
1933 .....	559	5,773	1938 .....	252	2,268

Table 40 - IMPORTS OF SODA ASH OR BARILLA INTO CANADA, 1931 - 1938.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	1,647,304	25,771	1935 .....	2,647,572	37,995
1932 .....	1,803,951	27,751	1936 .....	(a) 3,184,692	43,503
1933 .....	1,616,483	23,256	1937 .....	(b) 10,103,477	113,219
1934 .....	2,311,498	32,258	1938 .....	(c) 2,908,364	41,831

(a) 2,600,080 pounds from the United States and 584,612 pounds from the United Kingdom.

(b) 10,101,867 pounds from the United States and 1,610 pounds from the United Kingdom.

(c) 2,907,264 pounds from the United States.

Table 41 - SODIUM CARBONATE (SODA ASH) USED IN THE CANADIAN CHEMICALS AND ALLIED PRODUCTS INDUSTRIES, 1931 - 1937.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	12,439,458	201,654	1935 .....	24,971,934	372,286
1932 .....	11,421,879	193,422	1936 .....	27,352,622	424,729
1933 .....	12,221,928	191,639	1937 .....	29,511,323	430,657
1934 .....	21,879,170	327,214			

Table 42 - SODA ASH USED IN CANADIAN INDUSTRIES, AS SPECIFIED, 1931 - 1938.

Year	Pulp and Paper		Non-metallic minerals(x)		Dyeing, cleaning and laundry		Dyeing and finishing of textiles		Sugar refineries	
	Tons	\$	Pounds	\$	Pounds	\$	Pounds	\$	Pounds	\$
1931 ....	3,707	120,461	47,764,713	694,806	(not available)		...	...	...	...
1932 ....	2,556	86,996	43,545,840	598,884	502,459	16,322	424,340	8,122	278,152	7,078
1933 ....	2,628	92,818	38,336,000	505,152	556,599	17,220	310,073	6,197	173,066	4,364
1934 ....	1,863	67,276	49,259,418	644,655	761,515	19,274	497,328	10,255	192,241	4,635
1935 ....	2,074	74,568	47,847,466	632,715	682,033	16,282	419,909	8,014	193,966	4,578
1936 ....	2,692	93,418	52,222,000	673,232	617,432	16,343	339,812	5,922	173,203	4,095
1937 ....	2,696	91,989	62,582,000	817,455	795,312	25,534	324,247	5,827	190,320	4,134
1938 ....	2,166	73,236	(a)	(a)	(a)	(a)	299,601	5,575	189,171	4,118

(x) Includes coke and gas, glass, and petroleum refining.

(a) Not yet complete.

"Canadian Chemistry and Metallurgy" - Toronto - quoted soda ash (September, 1939) - bags of 100 pounds, \$2.00.

Imports of soda ash into Canada in 1918 totalled 45,569 tons valued at \$1,973,641; caustic soda 6,180 tons valued at \$623,023 and sal soda 5,691 tons at \$174,555. Imports of soda ash or barilla in 1913 totalled 33,162 tons valued at \$492,115; caustic soda 7,948 tons at \$286,432 (25 lb. packages +) and sal soda 4,344 tons worth \$53,649. In 1918-1919 a plant for the production of soda ash was under construction at Amherstburg, Ontario. With a view of encouraging the manufacture of caustic soda in Canadian plants, the Dominion Government early in 1914 increased the duty on caustic soda. Previous to 1911 the salt industry of Canada was confined to the production of salt, but in that year, the Canadian salt company, at their Sandwich (Ontario) plant, commenced the manufacture of caustic soda by the electrolytic method.

SODIUM SULPHATE - NATURAL - (Glauber's Salt and Salt Cake) - Producers' shipments of natural sodium sulphate in Canada totalled 63,009 short tons valued at \$553,307 in 1938 compared with the all time high output of 79,884 tons at \$618,028 in 1937.

Sodium sulphate is recovered in Canada almost entirely in the province of Saskatchewan and is produced either as hydrated sodium sulphate, known as Glauber's salt, or anhydrous sodium sulphate, known to the trade as "salt cake". It occurs as crystals (Glauber's salt) or in the form of partially saturated or saturated brines in many lakes throughout western Canada. Some of the Saskatchewan properties are equipped with plants for the purification and dehydration of the crude salt. It is interesting to note that a relatively small commercial output of the mineral was recorded in the province of Alberta during 1937 and 1938. The increased demand for sodium sulphate from the pulp mills and the nickel-copper smelting industry was largely responsible for the large increase in output of sodium sulphate in recent years.

The total commercial shipments of Canadian natural sodium sulphate since the commencement of production in 1920 to the close of 1938 totalled 510,301 short tons valued at \$4,371,546.

During 1938 seven firms, five in Saskatchewan and two in Alberta, reported production of natural sodium sulphate; capital employed by the industry was reported at \$903,237; fuel, purchased electricity and process supplies consumed totalled \$184,306 and \$138,901 were distributed as salaries and wages to 108 employees.

"Canadian Chemistry and Metallurgy" - Toronto - (September, 1939) - quoted sodium sulphate (Glauber's salt), crystals, in bags, cwt., to \$1.25; carlots, bulk - \$16.00 per ton; anhydrous, bags \$25.00 to \$35.00 per ton.



Table 43 - PRODUCTION OF NATURAL SODIUM SULPHATE(x) IN CANADA, 1929 - 1938.

Year	Short tons	\$	Year	Short tons	\$
1929 .....	5,018	64,112	1934 .....	66,821	587,986
1930 .....	31,571	293,847	1935 .....	44,817	343,764
1931 .....	44,957	421,097	1936 .....	75,598	552,681
1932 .....	22,466	271,736	1937 .....	79,804	617,548
1933 .....	50,080	485,416	1938 .....	63,009	553,307

(x) Produced in the province of Saskatchewan, with the exception of 80 tons valued at \$480 produced in Alberta during 1937 and 89 tons worth \$1,127 produced in the same province in 1938.

Table 44 - IMPORTS INTO CANADA OF SALT CAKE (SULPHATE OF SODA), 1931 - 1938.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	17,321,652	97,215	1935 .....	10,352,070	49,354
1932 .....	8,865,730	51,925	1936 .....	(x) 23,494,805	110,676
1933 .....	5,191,036	34,371	1937 .....	(a) 28,234,278	132,352
1934 .....	21,154,815	123,980	1938 .....	(b) 11,572,628	61,122

(x) Of the 1936 imports, 9,202,877 pounds came from the United States and 14,291,982 pounds from the United Kingdom.

(a) 17,755,034 pounds from the United States and 10,479,244 pounds from the United Kingdom.

(b) 9,537,472 pounds from United Kingdom and 2,035,156 pounds from the United States. Exports of soda and sodium compounds from Canada, totalled 825,413 cwt. valued at \$4,000,307 in 1938. Exports of natural sodium sulphate are not shown separately in the customs classification.

Imports of salt cake or sodium sulphate in 1918 were 34,387 tons valued at \$676,571 compared with 12,951 tons at \$133,030 in 1913.

Table 45 - IMPORTS INTO CANADA OF GLAUBER'S SALTS, 1931 - 1938.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	1,999,042	10,838	1935 .....	3,167,715	26,591
1932 .....	1,806,882	11,027	1936 .....	(x) 2,510,103	27,521
1933 .....	1,791,011	13,237	1937 .....	(a) 3,512,363	25,090
1934 .....	1,266,665	8,853	1938 .....	(b) 4,532,986	30,288

(x) 2,037,970 pounds from Germany, 248,716 pounds from the United States, and 80,784 pounds from the United Kingdom.

(a) 3,307,638 pounds from Germany.

(b) 4,344,748 pounds from Germany.

Imports of bisulphate of soda, or nitre cake, during 1938 totalled 1,171,921 pounds valued at \$18,183 all from the United States.

Table 46 - SALT CAKE USED IN THE MANUFACTURE OF CANADIAN WOOD PULP, 1930 - 1938.

Year	Tons	\$	Year	Tons	\$
1930 .....	33,119	676,597	1935 .....	35,350	642,801
1931 .....	24,756	503,560	1936 .....	41,524	711,635
1932 .....	24,301	489,343	1937 .....	50,584	884,437
1933 .....	29,563	580,251	1938 .....	33,213	588,217
1934 .....	34,559	655,905			

Table 47 - SODIUM SULPHATE USED IN THE CANADIAN ACIDS, ALKALIES AND SALTS, and MEDICINAL AND PHARMACEUTICAL INDUSTRIES, 1932 - 1938.

Year	Acids, Alkalies and Salts Industry		Medicinal and Pharmaceutical Industry	
	Tons	\$	Tons	\$
1932 .....	94	1,811(x)	...	...
1933 .....	9,929	141,322	39	4,879
1934 .....	26,075	368,576	51	7,278
1935 .....	22,485	316,734	59	4,617
1936 .....	7,220	102,176(x)	27	2,546
1937 .....	8,006	113,054(x)	29	2,234
1938 .....	(a)	(a)	(a)	(a)

(x) Does not include sodium sulphate consumed direct in the smelting of nickel-copper ores.

(a) Information not yet available.

In 1938 there were 645,306 pounds of Glauber's salts valued at \$8,419 used in Canada in the dyeing and finishing of textiles.

**STRONTIUM MINERALS** - Four celestite ( $\text{Sr SO}_4$ ) deposits of economic interest occur in eastern Ontario but there has been no commercial production of the mineral in Canada for several years. A special report prepared by the Imperial Institute, London, refers to strontium minerals, as follows - "The reserves of strontium minerals, however, in both England and Germany appear to be limited, and it is possible that the known deposits in Canada, United States, France, Tunis, and the U.S.S.R. will be opened up and exploited to an increasing extent in the future ... Strontium minerals are used principally in the beet-sugar industry; in pyrotechnics; as fillers; as "cleansers" for removing sulphur and phosphorous from special steels; as precipitants in the purification of caustic soda; in the chemical, pharmaceutical and ceramic industries; and in certain refrigerators". Strontium nitrate is used in Canada in the manufacture of pyrotechnics but the amount is not available for publication. No production of strontium ore in the United States has been reported since 1918 and domestic needs in that country are supplied by imports which in 1938 comprised 552,868 pounds of strontionite and celestite valued at \$2,824; strontium nitrate 364,362 pounds at \$23,921 and precipitated carbonate (and oxide) 82,859 pounds worth \$8,502. Data relating to Canadian imports of strontium minerals and chemicals are not shown separately in the Canadian customs classification.

"Metal and Mineral Markets" New York, October 1939 quoted - per ton in carload lots, 90 per cent  $\text{Sr SO}_4$ , finely powdered, \$37. Strontionite - per ton, lump in carload lots, minimum 84 - 86 per cent  $\text{Sr CO}_3$  \$55 - nominal.

**SULPHUR** - The sulphur content of iron pyrites shipped and sulphur recovered from non-ferrous smelter gas in 1938 totalled 112,395 short tons valued at \$1,044,817 compared with the all time high output of 130,913 short tons at \$1,154,992 in 1937. Production in 1938, as in immediate preceding years, came from the provinces of Quebec, Ontario and British Columbia. The corresponding sulphur production in Canada during the first six months of 1939 totalled 71,747 short tons valued at \$652,070 as against 58,930 tons at \$577,011 in the first half of 1938.

No iron pyrites deposits, known as such, have been mined in Canada for some years and statistics published regarding recent pyrites production refer to by-product iron pyrites recovered in the mining and concentrating of copper-gold-silver ores.

Sulphur employed in the manufacture of sulphuric acid during 1938 was recovered from salvaged smelter gas in Ontario and British Columbia. In Ontario, Canadian Industries Limited continued the operation of its acid plant at Copper Cliff, using sulphur dioxide obtained from the smelter of the International Nickel Company, while in British Columbia the Consolidated Mining and Smelting Company of Canada, Limited, manufactured sulphuric acid and other chemical products at Trail, using the by-product gases of its metallurgical plants. During 1938 a complete new hydrogen unit was added to the ammonia plant of the Consolidated Mining and Smelting Co. Ltd.; the company reported that the ammonia production should average 100 tons per day - an increase of about 18 tons of ammonia per day. This in turn corresponds to an increase of 72 tons in the ammonium sulphate production, or its equivalent in ammonium phosphates, and at the same time makes it possible to increase the elemental sulphur production by 27 tons per day. Two 120 ton monosanto sulphuric acid units were completed by the company in 1938 - one going into service in November and the other in December. These plants bring the sulphuric acid capacity of the Trail plant up to 600 tons of 100% sulphuric acid per day. A third 50 ton reduction unit was added to the sulphur plant; production of sulphur and fertilizer in the chemical plants was 170,108 tons in 1938 and 115,586 tons in 1937.



During 1938 iron pyrites was concentrated and shipped in the province of Quebec by the Alderman Copper Corporation Ltd., Beauchastel township, Temiscamingue county and by the Consolidated Copper and Sulphur Company Ltd, Eustis. The only other Canadian producer of iron pyrites in 1938 was the Britannia Mining and Smelting Co. Ltd., Britannia Beach, British Columbia. The greater part of the iron pyrites produced in Canada during the year under review was exported to foreign countries.

In British Columbia, Northern Pyrites Ltd., conducted work during 1938 on a pyrites deposit located on the east side of the Ecstall River about 45 miles from Port Essington. In 1938 several permanent buildings were erected and a 750 cubic-foot air compressor installed; a development adit 9x8 feet in section was started and is to be driven approximately 2,800 feet; twenty three men were employed. The Matachewan Hub Pioneer Mines Ltd., with a pyrites deposit in Cairo township, District of Matachewan, Ontario, reported that research work was carried on during 1938 and a pilot plant was established in Toronto for the purpose of working out a process of sulphur and iron recovery. No mining development work was conducted at the deposit during 1938.

"Mining and metallurgy, of the A. I. of M & M.E. (July, 1939) states:- "Pyrites, largely used for the manufacture of sulphuric acid is consumed in the United States to the extent of about a million long tons a year, half of which is normally produced there and half imported, mostly from Spain ... Germany produces only a quarter of her requirements. Buyers of pyrites in the Eastern United States include the General Chemical Co.; the Baugh Chemical Co., the Davison Chemical Co., and the F.S. Royster Guano Co., all of Baltimore; and to some extent the American Sheet and Tin Plate Co., Vandergrift, Pa., the Reliance Phosphate Co., of Savannah, the Monsanto Chemical Co., and the Maybank Fertilizer Co. Some of these have stocks sufficient for some months to come, but it would appear that some of them may soon be looking for new sources of supply."

According to the United States Consul at Frankfort - on - Main there has been a shortage of sulphuric acid in Germany for several years and it has been difficult to receive adequate supplies of foreign iron pyrites because of adverse foreign exchange. In 1937 production could not keep pace with requirements of the superphosphate and nitrogen fertilizers, and for stretching the supplies of sulphuric acid, Germany resorted again to the substitution of gypsum for producing ammonium sulphate. Utilization of iron pyrites from upper Bavaria as a basic raw material for producing sulphuric acid in the new factory installed at Affeking, upper Bavaria, presages expansion of the Bavarian pyrites. This is the first plant, to use pyrites from upper Bavaria, as heretofore all of Germany's output of pyrites has been furnished by mines at Meggen, Westphalia. The entire output of the new Bavarian factory is taken exclusively by the so-called "Cellwoll" or cut-staple rayon plant at Kelheim.

"Metal and Mineral Markets" - New York October 1939 quotation for iron pyrites was per long ton unit of sulphur, c.i.f. United States ports, guaranteed 48 per cent sulphur, Spanish 12 cents. Sulphur - per long ton for domestic market \$16 f.o.b. Texas Mines." Canadian chemistry and process Industries", Toronto quoted sulphur September 1939: - sulphur, crude, contracts, f.o.b. cars at mines, long ton \$18.00 to \$20.00; crude, contracts, ex vessel, St. Lawrence and Maritime ports long ton \$23.50-\$25.50.

Table 48 - PRODUCTION OF SULPHUR/ IN CANADA FOR YEARS SPECIFIED.

Year	Tons	\$	Year	Tons	\$
1886 .....	(a)42,906	193,077	1925 .....	7,587	58,899
1896 .....	13,823	101,155	1926 .....	8,975	63,899
1906 .....	17,525	169,990	1927 .....	25,229	198,388
1913 .....	65,012	521,181	1928 .....	(b)38,589	321,033
1914 .....	93,609	744,508	1929 .....	42,781	350,843
1915 .....	116,157	985,190	1930 .....	37,730	314,835
1916 .....	116,975	1,084,095	1931 .....	50,107	429,457
1917 .....	155,453	1,610,762	1932 .....	53,172	470,014
1918 .....	154,269	1,705,219	1933 .....	57,373	510,299
1919 .....	65,674	522,704	1934 .....	51,537	515,502
1920 .....	67,608	719,110	1935 .....	67,446	634,235
1921 .....	12,213	116,326	1936 .....	122,132	1,033,056
1922 .....	6,900	74,303	1937 .....	130,913	1,154,992
1923 .....	11,073	113,020	1938 .....	112,395	1,044,817
1924 .....	9,742	95,620			

/ Sulphur in iron pyrites shipped plus sulphur recovered from non-ferrous smelter gases.

(a) Tonnage of pyrites shipped.

(b) 1928-1938 includes sulphur recovered from smelter gas.

Table 49 - PRODUCTION IN CANADA OF PYRITES WITH SULPHUR CONTENT, including SULPHUR CONTAINED IN SULPHURIC ACID, ETC., MADE FROM SMELTER GASES, 1936, 1937 and 1938.

ACID, ETC., MADE FROM SMELTER GASES, 1936, 1937 and 1938.								
PYRITES (x)			:	SMELTER	GAS	:	TOTAL	SULPHUR
Sales		Sulphur content		:	Sulphur content		:	
Tons	Tons	Value	:	Tons	Value	:	Tons	Value
			\$			\$		
<u>1936</u>								
Quebec .....	86,919	43,084	282,743	...	...		43,084	282,743
Ontario .....	...	...	...	14,152	141,520		14,152	141,520
British Columbia (a) .....	40,293	20,084	160,672	(b)44,812	448,120		64,896	608,792
CANADA .....	127,212	63,168	443,415	58,964	589,640		122,132	1,033,055
<u>1937</u>								
Quebec .....	56,760	28,534	194,496	...	...		28,534	194,496
Ontario .....	...	...	...	14,009	140,090		14,009	140,090
British Columbia .....	62,698	31,647	253,176	(b)56,723	567,230		88,370	820,406
CANADA .....	119,458	60,181	447,672	70,732	707,320		130,913	1,154,992
<u>1938</u>								
Quebec .....	33,179	16,580	98,261	...	...		16,580	98,261
Ontario .....	...	...	...	16,897	168,970		16,897	168,970
British Columbia .....	11,425	5,797	46,376	(b)73,121	731,210		78,918	777,586
CANADA .....	44,604	22,377	144,637	90,018	900,180		112,395	1,044,817

(x) Recovered from copper ores.

(a) In addition, iron pyrites ore was shipped for smelting purposes.

(b) Includes elemental sulphur and sulphur in sulphuric acid and direct ammonium sulphate.

Table 50 - IMPORTS INTO CANADA OF BRIMSTONE AND SULPHUR, 1931 - 1938.

Year	Cwt.	\$	Year	Cwt.	\$
1931 .....	2,483,842	2,281,654	1935 .....	2,733,499	2,297,650
1932 .....	2,099,895	2,023,085	1936 .....	3,375,484	2,802,282
1933 .....	2,816,202	2,529,920	1937 .....	(a)4,513,683	3,669,082
1934 .....	3,153,943	2,589,311	1938 .....	(b)1,873,938	1,471,741

(a) 4,511,961 cwt. from United States. (b) 1,872,536 cwt. from United States.

Table 51 - IMPORTS OF BRIMSTONE AND SULPHUR AND SULPHURIC ACID 1913 - 1918.

Year	Sulphur		Sulphuric acid	
	Tons	\$	Tons	\$
1913 .....	30,433	633,114	73	4,054
1914 .....	41,964	870,868	166	7,149
1915 .....	30,182	480,317	141	4,872
1916 .....	73,467	1,186,618	2,403	115,173
1917 .....	82,445	1,515,309	216	15,680
1918 .....	92,062	2,058,811	5,954	208,288

Table 52 - EXPORTS OF SULPHUR CONTAINED IN IRON PYRITES 1931 - 1938.

Year	Tons	\$	Year	Tons	\$
1931 .....	26,613	139,814	1935 .....	7,610	48,446
1932 .....	17,455	89,568	1936 .....	52,192	284,718
1933 .....	15,347	121,280	1937 .....	46,317	251,834
1934 .....	9,821	94,623	1938 .....	22,109/	145,189

/ 16,551 tons valued at \$115,881 to United States.



Table 53 - EXPORTS OF IRON PYRITES\* 1913 - 1918.

Year	Tons	\$
1913 .....	46,066	211,640
1914 .....	89,999	377,985
1915 .....	137,598	527,318
1916 .....	156,722	557,024
1917 .....	279,646	974,200
1918 .....	240,453	949,067

\* Sulphur content not shown.

The principal shipments of iron pyrites in 1918 were obtained as usual from the same source as in previous years. In Quebec, practically the same tonnage of cupriferous ores was shipped from the Eustis and Weedon mines, in the Eastern Townships. In Ontario the largest shippers for export in 1918 were the mines at Goudreau, on the Algoma central railway, in Michipicoten district, and at North Pines, on the Canadian national railway, northwest of Port Arthur. Mines shipping in 1918 for domestic consumption were the Helen, in Michipicoten, the Sulphide, Queensboro, Craig, Clyde Lake, and Bannockburn, in central Ontario; additional trial shipments of carlots were made from three other properties. In British Columbia shipments were made from the Sullivan mine at Kimberley to the sulphuric acid plant at Trail, and from Anyox to the acid plant at Barnet, B.C.

Table 54 - ANNUAL PRODUCTION OF SULPHURIC ACID IN CANADA, 1913 - 1920.

Year	Sulphuric acid	Ores used in the production of acid		Exports sulphuric acid	
	made in terms	Sulphur	Pyrites	Short tons	\$
	66° Be.				
	short tons	short tons	short tons		
1913 .....	47,227	4,281	31,774	1,247	15,295
1914 .....	41,919	2,227	33,331	3,743	45,612
1915 .....	75,838	4,716	55,586	9,635	243,457
1916 .....	124,920	20,566	62,681	1,576	74,527
1917 .....	153,530	25,994	66,128	9,478	197,888
1918 .....	190,621	25,552	75,941	5,600	165,579
1919 .....	63,596	2,245	54,879	5,447	108,392
1920 .....	82,811	13,534	44,398	5,217	89,992

Note: 66° Baume acid or oil of vitriol contains 93.19 per cent H<sub>2</sub> SO<sub>4</sub>.

In 1917 sulphuric acid was made in Canada by the following firms:- Dominion Iron and Steel Co. Ltd., Sydney, N.S.; Cons. M. & S. Co., Trail B.C.; Algoma Steel Corp. Ltd.; Sault Ste. Marie, Ontario. Grasselli Chemical Co. Ltd., Hamilton, Ontario; Nichols Chemical Corp. Can. Ltd. Capelton Quebec, Sulphide, Ontario and Barnet B.C.; Victoria Chemical Co. Ltd., Victoria, B.C.; British Chemical Co., Trenton, Ontario and Aetna Chemical Corp. Can. Ltd., Drummondville, Quebec.

Production of sulphuric acid in Canada totalled 268,339 tons (66° Be) in 1938 compared with 282,716 tons in 1937; imports of sulphuric acid amounted to 95 tons valued at \$10,944 in 1938 and exports totalled 1,260 tons at \$17,900. Canadian consumption of sulphuric acid in 1937 included 172,570 short tons for fertilizers; 23,179 tons for coke and gas; 16,342 tons for explosives and 11,543 tons for petroleum refining. Canadian plants manufacturing sulphuric acid in 1938 were located at Copper Cliff, Sulphide, and Hamilton in Ontario; New Westminster, Barnet and Trail in British Columbia and Sydney, Nova Scotia.

Table 55 - CONSUMPTION OF SULPHUR BY SPECIFIED CANADIAN INDUSTRIES, 1936, 1937 and 1938.

Industry	1936		1937		1938	
	Tons	\$	Tons	\$	Tons	\$
Wood-pulp .....	143,317	3,310,932	165,559	3,827,991	106,255	2,433,161
Petroleum refining .....	66	4,631	80	6,776	(a)	(a)
Acids, alkalies and salts ...	11,738	222,053	21,329	403,511	(a)	(a)
Matches .....	28	1,344	63	3,043	(a)	(a)
Explosives .....	1,902	49,427	2,377	62,075	(a)	(a)
Insecticides .....	1,038	42,920	1,023	35,077	(a)	(a)
Adhesives .....	59	1,963	70	2,336	(a)	(a)
Chemicals, miscellaneous ....	7	259	32	994	(a)	(a)
Rubber .....	1,190	51,059	1,393	60,370	(a)	(a)
Sugar .....	179	8,568	157	7,104	133	6,280
Fruit and vegetable preparations	38	3,054	33	2,343	(a)	(a)
Other industries (x) .....	193	6,235	224	7,895	(a)	(a)

(a) Data not yet complete.

(x) Starch and glucose, dyeing and finishing of textiles.

Table 56 - PRODUCTION OF MISCELLANEOUS NON-METALLIC MINERALS IN CANADA, 1937 and 1938.

Item	Unit of measure	1937		1938	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous sands .....	Ton	35	142	(d)	(d)
Diatomite (c) .....	Ton	643	18,606	398	13,842
Fluorspar .....	Ton	150	2,550	217	3,906
Graphite .....	\$	...	125,343	...	41,590
Grindstones (b) (c) .....	Ton	412	21,429	306	16,198
Lithium minerals .....	\$	...	1,694	...	...
Magnesium sulphate .....	Ton	727	14,456	470	9,400
Magnesian-dolomite .....	\$	...	677,207	...	420,261
Mineral waters .....	Imp. gal.	225,019	20,586	188,309	21,619
Peat production .....	Ton	478	2,676	620	3,500
Phosphate (a) .....	Ton	100	900	208	1,886
Silica brick .....	M	3,744	181,126	1,788	100,403
Sodium carbonate .....	Ton	286	2,574	252	2,268
Sodium sulphate .....	Ton	79,884	618,028	63,009	553,307
TOTAL (Gross) .....	\$	...	1,687,317	...	1,188,180
Sulphur production (x) .....	Ton	130,913	1,154,992	112,395	1,044,817

(a) Represents apatite mined in Quebec.

(b) Includes pulpstones, etc.

(c) In preceding years included under the natural abrasives industry.

(x) Includes sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making or recovered as elemental sulphur, or in ammonium sulphate (direct). General statistics relating to production of sulphur included with those of the copper-gold mining and non-ferrous smelting industries.

(d) Included in 1938 with petroleum refining industry. No crude material sold in 1938.

Table 57 - PRINCIPAL STATISTICS RELATING TO MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1937 and 1938 (a)

	1937	1938
Number of plants .....	53	50
Capital employed .....	3,050,376	2,787,671
Number of employees - On salary .....	78	71
On wages .....	452	323
Total .....	530	394
Salaries and wages - Salaries .....	143,820	134,727
Wages .....	514,903	340,840
Total .....	658,723	475,567
Selling value of products (gross) .....	1,687,317	1,188,322
Cost of fuel and electricity .....	321,919	274,670
Cost of process supplies used .....	228,953	134,559
Selling value of products (net) .....	1,136,445	779,093

(a) Statistics for 1937 and 1938 are not entirely comparable with those for preceding years in that data relating to production of natural abrasives were included with "miscellaneous non-metallic minerals" for the first time in 1937.



Table 58 - WAGE-EARNERS, BY MONTHS, IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1936 - 1938.

Month	1936	1937	1938		mill
			Surface	Underground	
January .....	214	320	155	24	103
February .....	219	335	147	26	131
March .....	165	343	111	12	164
April .....	379	396	154	28	106
May .....	404	447	159	39	130
June .....	473	555	265	34	78
July .....	509	562	230	2	50
August .....	429	519	246	21	79
September .....	533	520	249	20	120
October .....	507	491	212	22	113
November .....	481	512	192	10	148
December .....	452	384	136	4	123
AVERAGE .....	401	452	191	20	112

Table 59 - FUEL AND ELECTRICITY USED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1937 and 1938.

Kind	Unit of measure	1937		1938	
		Quantity	Cost	Quantity	Cost
			\$		\$
Bituminous coal - Canadian .....	ton	16,314	97,399	2,321	10,623
Imported .....	ton	2,446	12,049	11,850	75,553
Anthracite - From the United States .....	ton	7	103	15	221
Anthracite - Other .....	ton	12	180	96	775
Lignite coal .....	ton	5,690	14,417	13,151	33,649
Coke .....	ton	88	636	...	...
Gasoline .....	Imp.gal.	75,375	16,004	51,688	10,739
Fuel oil and diesel oil .....	Imp.gal.	2,316,527	120,291	2,125,709	91,407
Kerosene or coal oil .....	Imp.gal.	1,525	300	574	115
Wood (cords of 128 cubic feet) .....	cord	1,895	6,189	3,007	9,143
Gas - Manufactured .....	M cu.ft.	256,050	26,792	118,555	9,992
- Natural .....	M cu.ft.	...	...	...	...
Other .....	\$	...	...	...	16
Electricity purchased .....	K.W.H.	3,990,380	27,559	3,289,219	32,437
TOTAL .....	\$	...	321,919	...	274,670
Electricity generated for own use .....	K.W.H.	1,282,840	...	1,038,578	...

Table 60 - POWER EQUIPMENT EMPLOYED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES, 1937 and 1938.

Kind	1937		1938	
	Number of units	Total rated horse power	Number of units	Total rated horse power
Steam engines and steam turbines .....	4	650	4	465
Diesel engines .....	6	885	11	1,607
Gasoline, gas and oil engines .....	18	557	16	465
Hydraulic turbines or water wheels .....	2	150	2	150
Electric motors .....	210	3,957	164	3,674
Boilers .....	7	950	6	500

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1936.

<u>Name of Operator and Province</u>	<u>Head Office Address</u>	<u>Plant Location</u>
x Active but not producing.		
<u>DIATOMITE</u>		
NOVA SCOTIA - International Diatomite Industries Ltd.	Tatamagouche	Little River, New Annan.
BRITISH COLUMBIA - Fairley and Company	661 Taylor St., Vancouver	Cariboo District
<u>FLUORSPAR</u>		
ONTARIO - Moirs Fluorspar Mining Synd. Ltd. (a) Stockloser, Chas. A.	219 Front St., Belleville Box 198, Madoc	Huntington Tp. Madoc Tp.
(a) Shipments commenced first half 1939.		
<u>GARNETS</u>		
QUEBEC - Garnet Concentrates Inc. x Grenat Canada Ltd. x	80 rue St-Pierre, Quebec 4203 rue Brébeuf, Montreal	Beaudin Tp. Joly Tp.
ONTARIO - Damigo Mining Synd. Ltd. x	Room 203 .. 34 King St. E., Toronto	Ashby Tp.
<u>GRAPHITE</u>		
ONTARIO - Black Donald Graphite Co. Ltd.	Calabogie	Brougham Tp.
<u>GRINDSTONES, PULPSTONES AND SCYTHESTONES</u>		
NOVA SCOTIA - Read Stone Co. Ltd.  The Stanley Works Wallace Quarries Ltd.	c/o A. Perry 3726 St. Ambroise St., Montreal, Que. New Britain Conn. Wallace, N.S.	Quarry Island (Pictou)  Merigonish Harbour Wallace.
NEW BRUNSWICK - Read Stone Co. Ltd.  Smith, E.A. x	c/o A. Perry St. Ambroise St., Montreal, Que. Shediac	Stonehaven  Shediac
BRITISH COLUMBIA - J. A. and C. H. McDonald, Ltd. x	1571 Main St., Vancouver	Gabriola and Hadd- ington Islands and Vancouver.
<u>LITHIUM ORE</u>		
MANITOBA - The Lithium Corp. of Canada, Ltd. x	403 Avenue Bldg., Winnipeg	Bernic Lake Cat Lake
<u>MAGNESITIC-DOLomite</u>		
QUEBEC - International Magnesite Co. Ltd. Canadian Refractories Ltd.	Calumet 1050 Canada Cement Bldg., Montreal	Harrington Tp. Kilmar
BRITISH COLUMBIA - Consolidated Mining & Smelting Co. of Canada, Ltd. x	Trail	Marysville



DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1938. (continued)

<u>Name of Operator and Province</u>	<u>Head Office Address</u>	<u>Plant Location</u>
	x Active but not producing	
<u>MAGNESIUM SULPHATE</u>		
BRITISH COLUMBIA - Ashcroft Epsom Salts Co.	116 Market Ave., Winnipeg, Man.	Ashcroft
<u>MINERAL WATERS</u>		
QUEBEC - Abenakis Springs Co. Eau Minérale Etoile	Blondin Ste. Genevieve de Batiscan  1016 Bleury St., Montreal 935 Robillard Ave., Montreal St. Sévère St. Barnabé Nord 148 Concorde St., St. Hyacinthe 65 rue St. Pierre, St. Hyacinthe 3 St. Germain St., St. Hyacinthe St. Grégoire St. Justin St. Barnabé Nord St. Maurice L'Epiphanie	Yamaska Co. Ste. Genevieve de Batiscan Varennes Chambly Basin St. Sévère St. Maurice Co. St. Hyacinthe St. Hyacinthe Co. Yamaska Co. St. Grégoire Maskinongé Co. St. Barnabé Nord Village Fermont L'Epiphanie
ONTARIO - Belleville Aqua Vitae Co. Ltd. Boyd, T. Russell Deneault, F. x Gurd, Chas., & Co. Ltd.	201 McDonald Ave., Belleville Carlsbad Springs Bourget 1016 Bleury St., Montreal	Thurlow Tp. Carlsbad Springs Bourget Caledonia Springs
<u>PHOSPHATE</u>		
QUEBEC - Blackburn Bros. Currie, Wm. Wilson, G.	Blackburn Bldg., Ottawa, Ont. Holland Mills, Que. Ottawa, Ont.	Templeton - -
<u>SILICA BRICK</u>		
NOVA SCOTIA - Dominion Steel and Coal Corp. Ltd.	Sydney	Sydney
ONTARIO - Algoma Steel Corp. Ltd.	Sault Ste. Marie	Sault Ste. Marie
<u>SODIUM CARBONATE</u>		
BRITISH COLUMBIA - Bishop, J.A. jr. / Davidson, E.C. / Engeman, F.W. / McTavish, B. /	Clinton, B.C. 70 Mill P.G.E.R.R. 70 Mill P.G.E.R.R. Chasm P.C.E.R.R.	Chasm 70 Mill 70 Mill Chasm
/ Reported as shippers by P.G.E.R.R.		
<u>SODIUM SULPHATE</u>		
SASKATCHEWAN - Alexander, W. H. Horseshoe Lake Mining Co. Ltd. Midwest Chemicals Ltd. Mellor, John F. Natural Sodium Products Ltd. Oban Salt Co. Ltd. x Sodium Corporation, Ltd. x	Viscount Ormiston Palo Alaska Bishopric Oban c-o L. I. Hockley, Indian Head	Viscount Ormiston Whiteshore Lake Alaska Frederick Lake Oban Alaska



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DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1938. (concluded)

<u>Name of Operator and Province</u>	<u>Head of Office Address</u>	<u>Plant Location</u>
	x Active but not producing	
	<u>SODIUM SULPHATE (con.)</u>	
<u>ALBERTA -</u>		
Bohannon, D. W.	Garfield	Oyen
Buschert, J.	Cereal	Cereal
	<u>SULPHUR (including pyrites)</u>	
<u>QUEBEC -</u>		
Aldermac Mines Ltd. (a)	941 Dominion Square Bldg., Montreal	Rouyn Dist.
Consolidated Copper and Sulphur Co. Ltd. (a)	Eustis	Eustis
<u>ONTARIO -</u>		
International Nickel Co. of Canada, Ltd. (b)	Copper Cliff	Copper Cliff
Matachewan Hub Pioneer Mines Ltd. x	1109 Northern Ontario Bldg., Toronto	Cairo Tp.
<u>BRITISH COLUMBIA -</u>		
Consolidated Mining & Smelting Co. of Canada, Ltd. (b)	Trail	Trail
Britannia Mining & Smelting Co. Ltd. (a)	Britannia Beach	Britannia Beach
Northern Pyrites Ltd. x	744 West Hastings St., Vancouver	Ecstall River
(a) Produce by-product iron pyrites.		
(b) Salvage sulphur from smelter gases.		

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NOTE - Unless otherwise specified in this report 1 cwt. = 100 pounds and 1 ton = 2,000 pounds