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MISCELLANEOUS INDUSTRIAL OR NON-METALLIC MINERALS IN CANADA, 1940

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 1940 included: barite, diatomite, fluorspar, graphite, grindstones, lithium minerals, magnesitic-dolomite (crude and refined), 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 1940 was 46; capital employed totalled \$2,491,527; employees numbered 547 and salaries and wages paid amounted to \$705,501. The cost of fuel, purchased electricity and process supplies used during the year was reported at \$649,593 and the gross value of production totalled \$2,116,756 compared with \$1,358,922 in 1939.

BARITE -- Canadian production of barite in 1940 totalled 538 short tons valued at \$4,819, of which 25 tons worth \$162 came from deposits in Nova Scotia; 305 short tons at \$4,577 from Ontario and 8 short tons valued at \$80 from British Columbia. Production in 1939 came solely from Ontario and was valued at \$5,859.

In 1940 shipments of crude barite were made from a deposit located at Lake Ainslie, Cape Breton, Nova Scotia, by the North American Mining & Chemical Corporation Limited. Ontario production during the year under review represented shipments of the mineral in the crude state made by H. D. Eby from a property situated in Lawson township of the Elk Lake district, and by Benjamin Meen from the deposit of the Sudbury Basin Mines Limited, located at Tionaga. The production from these mines went chiefly to Canadian chemical plants. The output of barite credited to British Columbia in 1940 came from a deposit operated in the Fort Steele mining division by M. Gorrie.

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.

Production of barite in Canada from 1885 to the close of 1940 totalled 41,688 short tons valued at \$309,068.

During the summer of 1940 an important discovery of barite was made in the Pembroke district, Hants county, Nova Scotia by an engineer of Springer Sturgeon Gold Mines Limited. The deposit was diamond drilled and the Nova Scotia Department of Mines reported that a large reserve of barite, estimated at several hundred thousand tons was indicated; the property is within three miles of dock facilities at Walton and commercial production commenced in 1941. The Nova Scotia Department of Mines state that tests made by the Bureau of Mines, Ottawa, show the barite from this deposit meets the oil trade specifications in all respects. Specific gravity of the mineral is 4.5; a composite sample of the ore gave an analysis of 98.44 per cent barium sulphate.

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.

According to "The Mineral Industry", world production of barite in 1939 was in the order of 1,000,000 tons annually, almost half of which was from Germany, 30 per cent from the United States, 8 per cent from Great Britain, 5 per cent from Italy and 3 per cent from Greece; the remaining 4 to 6 per cent is scattered in small amounts among a number of still smaller producer.

Barite is a relatively low-priced commodity. Using the American trade as an index of recent price trends, market quotations in December, 1940 were as follows: crude ore \$6 to \$7 per ton according to grade, F.O.B. mines; prime white, floated Missouri, \$22-\$25 per ton, F.O.B., and off color grades, \$12 to \$16. Canadian Trade Journal quotations were \$47 per ton for prime white, and \$40 to \$44 for off-color grade.

Table 1 - PRODUCTION OF BARITE IN CANADA, 1913 - 1940

Year	Short tons	\$	Year	Short tons	\$
1913	641	5,410	1925	95	2,259
1914	612	6,169	1926	100	2,307
1915	550	6,875	1927	56	1,268
1916	1,368	19,393	1928	127	2,847
1917	3,490	54,027	1929	105	2,341
1918	640	10,165	1930	66	1,484
1919	468	8,154	1931	16	363
1920	751	22,983	1932 .....	...	...
1921	270	9,567	1933	20	60
1922	289	9,537	1939	(a)	3,639
1923	409	8,548	1940	338	4,819
1924	151	3,308			

(a) Data not available for publication.

Table 2 - BARITE AND BLANC FIXE USED BY THE CANADIAN PAINTS, PIGMENTS AND VARNISHES INDUSTRY IN CANADA, 1931 - 1939

Year	BARITE		BLANC FIXE (x)	
	Pounds	\$	Pounds	\$
1931	2 304,119	39,361	146,025	12,915
1932	1,064,305	55,138	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	125,745	4,136
1938	2,729,212	46,288	116,545	3,287
1939	2,884,985	49,659	139,408	4,455

(x) Artificial barium sulphate.

NOTE: Not complete for 1940.

Table 3 - IMPORTS OF BLANC FIXE AND BARITE INTO CANADA, 1931 - 1940

Year	BARITE		BLANC FIXE	
	Pounds	\$	Pounds	\$
1931	3,372,600	52,712	1,596,173	34,483
1932	2,585,400	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	1,064,082	21,480
1937	4,156,600(x)	32,869	1,068,199	21,162
1938	4,373,100(✓)	38,012	629,258	13,779
1939	4,350,300(a)	38,607	1,097,959	27,325
1940	5,244,700(b)	64,922	1,155,930	34,151

(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.

(a) 2,784,200 pounds from United States and 1,215,000 pounds from Germany.

(b) 4,868,400 pounds from United States.

Imports of lithopone into Canada in 1940 totalled 23,615,059 pounds valued at \$939,294 compared with 21,252,814 pounds at \$765,522 in 1939.

Table 4 - WORLD'S PRODUCTION OF BARIUM MINERALS, 1936 - 1939 (Taken from the Imperial Institute's publication The Mineral Industry of the British Empire and Foreign Countries)
(Long tons)

Producing Country and Description	1936	1937	1938	1939
<u>BRITISH EMPIRE</u>				
United Kingdom - Barytes, unground	57,250	56,875	47,568	...
Witherite, unground	8,751	11,882	9,914	...
Barytes - Ground, bleached	5,731	5,427	4,011	...
Ground, unbleached ..	21,358	19,124	14,825	...
Southern Rhodesia .....	...	...	89	49
Union of South Africa	574	561	483	452
India	5,114	15,689	8,075	...
Australia	2,157	3,103	2,863	...
<u>FOREIGN COUNTRIES</u>				
Austria	1,637	841	(a)	...
France	21,850	19,550	27,510	...
Germany - Baden	17,519	21,311)	...	...
Bavaria	10,999	11,645)	...	...
Prussia	385,910	404,149)	470,000	...
Saxony	460	425)	...	...
Thuringia	443	6,683)	...	...
Wurtemberg	1,000	189)	...	...
Greece	30,841	38,722	34,150	...
Italy	36,092	44,488	47,408	...
Norway	402	69	(a)	...
Portugal	10	99	22	20
Egypt	50	50	20	51
Cuba	(b) 256	3,788	(b) 6,065	(b) 11,595
United States	244,698	322,212	299,494	526,670
French Indo-China	39	44	49	...
Japan	3,776	(a)	(a)	...
Korea	5,032	(b) 10,872	(b) 15,481	...
Argentina .....	...	...	...	756

NOTE: Barytes is also produced in Czecho-Slovakia, Spain, U.S.S.R. and China.

(a) Information not available.

(b) Exports.

Complete data relating to world production of most minerals have been unobtainable since the outbreak of German aggression in 1939.

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 1939 or 1940. According to "The Mineral Industry", the entire United States supply of corundum is obtained from imports, mainly from South Africa; imports into the United States in 1940 totalled 2,609 long tons valued at \$165,270. Corundum output in South Africa in 1940 totalled 4,211 tons. It was announced recently that what appears to be a large field of alluvial corundum was discovered in the north-eastern Transvaal near Leydsdorp in 1939.

Imports into Canada in 1940 of manufactures of emery or of artificial abrasives, n.o.p., were valued at \$58,472 of which those appraised at \$56,173 came from the United States. Imports of emery in bulk, crushed or ground were valued at \$72,708 in 1940.

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 1940 totalled 85,536 short tons valued at \$8,249,815.

DIAMONDS - Diamonds are not produced in Canada and Canadian consumption is derived entirely from imports which in 1940 were as follows: Diamond dust or bort and black diamonds for borers, value \$2,708,414; diamonds, unset, value \$1,915,305.

"The Mining Journal", London, reported in December, 1940 as follows: "For the second time within a generation a general European war has disrupted the organization of the diamond cutting industry of the world. On the second occasion, however, the dislocation has been more complete than in World War No. 1 owing to the fact that on this occasion the occupation of the low countries by the Germans has included Holland as well as Belgium. Moreover, since 1918 diamond cutting has seen a remarkable development, especially these last few years, in the magnitude and importance of the use of the industrial diamond in many branches of the engineering industry. Already the consumption amounts for industrial purposes to about two-thirds of the total annual diamond production, and the rapid development in the output of diamond tools is specially important in war time. Diamond cutting, as an industry, is commencing in Great Britain. World production of diamonds in 1938 totalled 11,455,000 carats valued at £7,680,000; of this output the British Empire contributed 5,417,000 carats worth £5,750,000, chiefly from the Union of South Africa, Sierra Leone, South West Africa and the Gold Coast. Among foreign countries the Belgian Congo, Angola and Brazil were the principal producers.

In 1940 there were 32 firms engaged in contract diamond drilling of Canadian mineral deposits compared with 35 in 1939. The income received by this industry from drilling operations conducted during the year under review totalled \$5,021,629 as against \$3,013,249 in the preceding year. The number of employees in 1940 was reported at 1,350, and the amount of salaries and wages distributed totalled \$1,575,786. The footage drilled during 1940 in the entire Dominion aggregated 2,422,948 feet, of which 54 per cent was completed in Ontario, 32 per cent in Quebec, and 11 per cent in British Columbia. Contract diamond drilling was also conducted in Nova Scotia, Manitoba, Saskatchewan and the Northwest Territories.

The industry as a whole purchased, in 1940, borts, ballas, carbons, ready-set bits, etc., amounting in value to \$881,085 compared with \$607,806 in 1939. Data relating to Canadian imports and exports of diamonds in 1940 are not available for publication.

Not included in this survey are data relating to the drilling of gas and oil wells and diamond drilling conducted by Canadian mining companies with their own personnel and equipment. Statistics relating to these latter operations are combined with those pertaining to the Canadian mining industry proper.

DIATOMITE - Shipments of diatomite from Canadian deposits in 1940 totalled 248 short tons valued at \$7,957 compared with 301 tons at \$10,388 in 1939. Of the 1940 output, 241 tons worth \$7,786 originated in Nova Scotia and 7 tons (from stock) worth \$171 from the Quesnel district in British Columbia. In Nova Scotia, shipments were made in 1940 from East New Annan by International Diatomite Industries Limited; this Company conducted mining operations during May and milling from January 1st to May 31st when all operations ceased; at Little River, Digby county, shipments of calcined diatomite were made by G. W. Wightman, this property was active throughout most of the year.

A report prepared by the Bureau of Mines, Ottawa, states:

"Very little change occurred in the consumption of diatomite used in the home industries during 1940. About 80 per cent of the diatomite now being consumed in Canada is in the form of filter-aids, 14 per cent is used for insulation, a 9 per cent increase over 1939, and the remainder is absorbed as a filler, concrete admixture, silver polish base, and in chemicals. Two companies are manufacturing diatomite insulation bricks. 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 United States competition and to the, at present, comparatively small Canadian demand, only properly prepared diatomite of the highest quality can be successfully marketed on a scale sufficiently large to warrant the operation of a property and the erection of a plant.

"Indications are that not more than 25 per cent of the calcined material produced from the best quality Canadian deposit so far discovered, can be made into an efficient filter-aid that can compete with the imported product. Therefore, unless the remaining 75 per cent or more of the non-filter grades automatically produced can be sold, the cost of producing the filter-aid alone would be too high to be commercial. At present, the Canadian consumption of all non-filter grades is less than 600 tons annually, mainly in the form of made-up diatomite insulation bricks, the greatly increased production of which by Canadian firms is necessary before the Canadian diatomite industry can be profitable.

"Prior to the war, England consumed about 50,000 tons of diatomite annually, which included a substantial tonnage of Danish "Moler" for insulation purposes. Since May, 1940, exports to England from Canada of all non-filter grades have been stopped owing to the lack of shipping space for this very bulky and non-critical material. England is, however, now importing from the United States at the rate of about 4,000 tons annually of the highest quality filter-aid only.

"The United States, which contributed about 50 per cent of the world's output, had 15 producers in 1940. The total sales were estimated at 125,000 short tons, about the same as in 1939. The largest of the 25 other world producers are Denmark, Germany, Japan, Algeria, and Northern Ireland, in order of their importance, each producing over 5,000 tons annually.

"The present price in Canada varies from \$30.00 to \$75.00 per ton for insulation and filtration; up to \$200.00 in small lots for material suitable for polishes; imported insulation bricks vary from \$85.00 to \$140.00 per 1,000, according to grade and density."

Imports into Canada in 1940 of diatomaceous earth or infusorial earth, ground or unground, totalled 8,242,300 pounds valued at \$153,876 compared with 8,615,900 pounds at \$123,808 in 1939; the 1940 imports came entirely from the United States.

Table 5 - PRODUCTION OF DIATOMITE IN CANADA, 1927 - 1940

Year	Short tons	\$	Year	Short tons	\$
1927	266	6,650	1934	1,372	54,910
1928	368	8,960	1935	823	33,140
1929	429	10,330	1936	615	13,650
1930	554	13,247	1937	643	18,606
1931	1,810	32,789	1938	398	13,842
1932	1,496	29,509	1939	301	10,338
1933	1,789	36,648	1940	248	7,957

The total Canadian output of diatomite since 1896 when it was first produced in the Dominion, to the end of 1940, totalled 22,276 short tons valued at \$514,655.

Table 6 - WORLD'S PRODUCTION OF DIATOMACEOUS EARTH, 1936 - 1939 (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)

Producing Country	1936	1937	1938	1939
(Long tons)				
<u>BRITISH EMPIRE</u>				
Great Britain	1,086	1,141	2,159	...
Northern Ireland	7,466	7,163	5,231	...
Union of South Africa	96	148	153	242
Canada	549	574	355	269
Barbados	10	10	10	...
Australia	2,778	3,190	3,390	...
<u>FOREIGN COUNTRIES</u>				
Bulgaria	62	138	231	...
Denmark (moler)	61,000	80,000	(a)	...
Estonia .....	...	573	1,113	...
Finland	1,378	1,771	1,574	...
France	9,600	10,600	(a)	...
Germany (d)	6,112	7,407	(a)	...
Italy	3,701	4,586	5,010	...
Norway (exports)	229	106	43	...
Portugal	64	109	848	579
Roumania (c)	3,748	2,972	2,994	...
Sweden	1,095	1,736	1,816	...
Algeria	11,922	12,659	17,800	...
United States (b)	83,223	83,228	83,228	...
Chile	40	340	(a)	...
Peru (exports) .....	...	...	7	...
Japan	12,800	16,700	21,650	...
Korea	742	2,480	4,500	...
Netherlands East Indies	124	39	140	...

NOTE: For footnotes, see page 6.

Footnotes to Table 6

NOTE: Diatomaceous earth is also produced in Hungary, Spain, and U.S.S.R. and during 1938 there was a small output in New Zealand valued at £70 (N.Z.).

- (a) Information not available.
- (b) Annual average production 1936-1938.
- (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 - 1940

Year	Pounds	Value	Year	Pounds	Value
		\$			\$
1932	2,577,585	73,309	1937	4,586,786	95,532
1933	2,507,469	70,191	1938	4,908,597	101,473
1934	2,562,552	69,116	1939	4,819,811	105,711
1935	4,307,142	96,560	1940	4,984,362	112,369
1936	4,375,999	98,954			

FLUORSPAR - Production of fluorspar in Canada from 1929 to 1939 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.

In 1940 the North American Mining & Chemical Corporation Limited shipped 17 tons of fluorspar to steel mills from a deposit located in the Lake Ainslie area, Cape Breton, Nova Scotia. The largest Canadian shipper in 1940 was the Dominion Fluorspar Company Limited, which operated a property in the first concession of Madoc township, Hastings county, Ontario; this Company was active from January 1st to December 19th; shipments from Madoc township were also made in 1940 by Chas. A. Storlosar, and in Huntingdon township, in the same county, shipments of milled grades of the mineral were reported by the Moira Fluorspar Mining Syndicate Limited. The only other Canadian production in 1940 consisted of a relatively small tonnage of crude ore shipped by Wm. E. Clark from a deposit located in Cardiff township, Haliburton county, Ontario.

The Bureau of Mines, Ottawa, reported that a discovery of fluorspar associated with metallic sulphides was made in Montbeillard township, in the Rouyn-Noranda district, Quebec, and Cook Copper & Fluorite Corporation Limited was formed to develop the property. According to the Bureau of Mines, Ottawa, the recent interest in Canadian fluorspar has been prompted largely by war demand for domestic steel trade, the requirements of which have been running at about 10,000 tons a year. Fluxing gravel or lump grades for metallurgical use is usually sold on a specification of 85 per cent CaF_2 with not over 5 per cent silica; it should contain not over 15 per cent fines; much lower grade material is, however, usable, provided it contains no excess of objectionable impurities, though the price commanded would be below the regular market level for standard spar. Regular metallurgical-grade fluorspar (imported) sold in 1940 at about \$21 per long ton delivered, while domestic 65 per cent grade was quoted at about \$18 per short ton. Ceramic (glass and enamel) grades call for not less than 95 per cent CaF_2 , with a maximum of 3 per cent silica and 0.12 per cent iron (Fe_2O_3). The material requires to be offered in various mesh sizes, from coarse to extra fine. American quotations for this grade at the end of 1940 were \$32.60 per ton in bags, F.O.B. Illinois mines.

Table 8 - PRODUCTION OF FLUORSPAR IN CANADA, 1924 - 1939

Year	Short tons	\$	Year	Short tons	\$
1924	76	1,343	1935	73	1,064
1925	3,886	19,254	1936	150	2,100
1926-1928 .....	...	...	1937	75	900
1929	17,870	268,120	1938	75	900
1930	80	1,240	1939	150	2,550
1931	40	620		217	3,906
1932	32	464		240	4,995

Table 9 - IMPORTS OF FLUORSPAR INTO CANADA, 1929 - 1940

Year	Tons	\$	Year	Tons	\$
1929	12,092	159,798	1935	11,591	92,775
1930	12,651	160,995	1936	11,194	95,288
1931	3,216	31,257	1937	11,444	158,082
1932	1,009	22,965	1938	15,057	212,151
1933	2,219	21,165	1939	16,322(✓)	258,798
1934	7,220	56,628	1940	50,511(a)	628,719

(✓) 5,640 tons at \$82,805 from Newfoundland and 6,502 tons at \$150,885 from United States.

(a) 12,722 tons at \$290,874 from Newfoundland and 11,787 tons at \$256,059 from United States.

Approximately 111 tons of fluorspar were consumed in 1940 by the Canadian miscellaneous non-metallic mineral products industry, including enamelling.

Table 10 - FLUORSPAR USED IN THE CANADIAN GLASS INDUSTRY, 1931 - 1940

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1931	96	4,815	1936	71	2,380
1932	125	4,989	1937	91	3,008
1933	115	7,803	1938	112	4,507
1934	119	4,472	1939	131	5,550
1935	98	3,357	1940	140	6,353

Table 11 - FLUORSPAR USED IN CANADIAN STEEL FURNACES, 1930 - 1940

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1930	6,486	92,743	1936	7,942	88,405
1931	4,969	66,471	1937	9,059	139,181
1932	2,253	27,939	1938	7,128	119,501
1933	2,949	31,657	1939	7,972	122,778
1934	4,555	55,643	1940	15,307	327,187
1935	5,859	73,047			

According to the United States Bureau of Mines the quantity of fluorspar used by individual plants per ton of basic open-hearth steel produced ranges from 1 to 50 pounds. The steel industry is the chief consumer of fluorspar followed in order by hydrofluoric acid, glass and enamel industries; smaller quantities are used in the production of iron castings, nickel and monel metal, cement, ferro-alloys, etc., also in smelting refractory ores of gold, silver and copper.

Table 12 - WORLD'S PRODUCTION OF FLUORSPAR, 1936 - 1939 (Taken from the Imperial Institute's publication The Mineral Industry of the British Empire and Foreign Countries)
(Long tons)

Producing Country	1936	1937	1938	1939
<u>BRITISH EMPIRE</u>				
United Kingdom	32,962	42,180	33,331	...
Southern Rhodesia .....	...	...	154	...
South West Africa .....	...	...	576	104
Union of South Africa	3,074	3,558	4,661	10,159
Canada	67	134	194	214
Australia	816	1,442	3,231	...
Newfoundland	10,424	12,000	14,000	...

Table 12 - WORLD'S PRODUCTION OF FLUORSPAR, 1936 - 1939 (Concluded)

Producing Country	1936	1937	1938	1939
<u>FOREIGN COUNTRIES</u>				
France	30,100	50,650	51,100	...
Germany - Anhalt	11,048	13,446	10,297	...
Baden	7,242	13,422	21,013	...
Bavaria	48,377	61,469	58,973	...
Prussia	35,698	30,032	22,593	...
Saxony	7,864	7,946	11,872	...
Thuringia	18,495	15,862	22,051	...
Italy	11,256	15,174	11,994	...
Norway	998	1,665	(a)	...
U.S.S.R.	64,000	(a)	(a)	...
Tunis .....	...	1,676	2,011	...
Mexico (estimated)	1,000	1,000	1,000	1,300
United States	150,000	163,000	88,000	154,000
Argentina	443	344	1,384	727
Korea	8,602	(b)9,532	(b)33,667	...

NOTE: Fluorspar is also produced in Spain and China.

(a) Information not available.

(b) Exports.

GARNET - A review of garnet in 1940 by the Bureau of Mines, Ottawa, states:

"Commercial garnet belongs to a group of complex silicate minerals of which almandite, the brownish-red iron-aluminium silicate is generally considered the hardest and the best as an abrasive. Garnet is a rather common mineral constituent of certain rocks distributed throughout the Dominion and it usually occurs as a garnetiferous-gneiss, large areas of which are known in parts of Ontario and Quebec. At present, however, little garnet is produced in the Dominion, the only company in operation in 1940 being Canada Garnet, Limited, at Labelle, Quebec. Some prospecting was also done on a deposit about 40 miles northwest of North Bay, in Ontario.

"Garnet, crushed and suitably graded as to size, is used for making abrasive-coated papers and cloth, which in turn are used mainly in the wood working (hard woods) and to a lesser extent in the shoe leather industry. As artificial abrasives rather than those made from garnet are used in the surfacing of metals, the marked increase in this work arising from the war effort has not affected activities in the garnet industry to any appreciable extent.

"The specifications for garnet for use in the making of high quality abrasives are somewhat exacting. The individual crystals should be clear and free from embedded impurities and from minute fractures. They should be of a deep wine-red colour, and not smaller than pea size, walnut size or larger being preferable. The garnet should be tough, but should yield sharp and angular grains when crushed. The deposit should be extensive and the garnet content should not be less than 25 per cent. It should also be close to rail transportation and industrial centres. Few, if any, of the hundred or more garnet deposits so far examined in Canada fulfil all of these requirements.

"Canada Garnet, Limited, completed the mill on its property at Labelle, but made no shipments of abrasive garnet, other than a few hundred pounds for trial. The company, however, sold about 88 tons of mixed garnet and rock valued at \$629 for use in sand-blasting.

"Between 90 and 95 per cent of the world output of garnet comes from the United States, Barton Mines Corporation, North Creek, New York, being by far the largest producer. Its product is regarded as the world standard abrasive garnet and its deposits are large. Total sales of the three active companies in the United States in 1940 amounted to 3,600 tons as compared with 4,056 tons, valued at \$278,538 in 1939.

"The price in the United States of the best quality concentrate from which grain is prepared for abrasive papers and cloths ranges from \$75 to \$80 a ton f.o.b. mines and of graded grain, \$90 a ton. Some sales of garnet fines, for use in the surfacing of plate glass, were made at about \$26.00 a ton delivered, and garnet for use in sand-blasting sold at \$30.00 a ton.

"Crude garnet ore or ungraded mixed concentrate enters the United States duty free, the duty on grains graded into separate sizes and specially prepared garnet being one cent a pound."

No imports of garnet, described as such, were recorded in Canada during 1939 or 1940; 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 1939 the Canadian artificial abrasives industry used 155 short tons of garnets valued at \$25,737 compared with 98 tons at \$17,219 in 1938.

GRAPHITE - Canadian mine production of graphite during 1940 was valued at \$94,038 compared with \$81,884 in 1939. The output in 1940 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. No ore was mined at the Black Donald mine in 1940 and milling operations during the year represented the retreatment of some 3,000 tons of tailings. The mill was in operation from May 5 to December 31 and finished products included flake, dust and amorphous grades. Flotation is employed in the treatment of Black Donald ore.

The Bureau of Mines, Ottawa, in its 1940 review of the graphite industry states:

"World production of natural graphite of all grades, and including flake, crystalline (Plumbago), and amorphous, during the past decade has averaged about 140,000 short tons a year. Madagascar, Germany, Austria, and Czechoslovakia are the principal sources of flake graphite; Ceylon of crystalline; and Mexico and Korea of the amorphous variety.

"Graphite has a variety of uses in industry, but it is employed principally in foundry facings, lubricants, crucibles, pencils and crayons, paints, and stove polish. Using the United States as an index of the trend of consumption, the above industries took 63 per cent of the total graphite sales in 1938, the remainder going into minor, unspecified trades. Dry batteries, electrodes, and commutator brushes use important quantities, mostly amorphous or artificial.

"By the end of 1940, the war had not occasioned any serious shortage of graphite shipments to the American continent, and dealers' stocks were then estimated at about twelve months' supply. American importers, however, early in 1941 commenced to show concern over a threatened curtailment of shipments from Madagascar for the crucible trade, which consumes about 90 per cent of such imports. This involved the possibility that American crucible makers might be forced to revert to earlier practice and use Ceylon graphite, now largely discarded in favour of Madagascar flake.

"Graphite for United States consumption is mainly handled through large importing houses who supply the trade. Prices as the close of 1940, as reported by one such importer were: Madagascar flake, 6½ - 8 cents per pound; Ceylon lump, 7 - 15 cents per pound; Ceylon chip, 5 - 10 cents per pound; Ceylon dust, 5½ - 8 cents per pound, all ex-dock, duty paid, New York."

Imports into Canada of plumbago, not ground or otherwise manufactured, were valued at \$24,380 in 1940 compared with \$13,384 in 1939. Imports of plumbago crucibles in 1940 were appraised at \$131,200 as against \$60,091 in the preceding year. Imports of plumbago ground and manufactures of, n.o.p. totalled \$179,677 in 1940 compared with \$86,944 in 1939.

Table 15 - MINE PRODUCTION (SALES) OF GRAPHITE IN CANADA, 1931 - 1940

Year	Short tons	\$	Year	Short tons	\$
1931	548	32,149	1936	(a)	89,812
1932	346	18,483	1937	(a)	125,343
1933	405	18,367	1938	(a)	41,590
1934	1,518	71,424	1939	(a)	81,684
1935	1,782	79,781	1940	(a)	94,038

(a) Not published.

Table 14 - IMPORTS OF GRAPHITE INTO CANADA, 1938 - 1940

	1938	1939	1940
	\$	\$	\$
Plumbago, not ground or otherwise manufactured	18,546	13,384	24,380
Plumbago crucibles	60,616	60,091	131,200
Plumbago, ground, and manufactures of, n.o.p.	69,342	86,944	179,677
TOTAL GRAPHITE and ITS PRODUCTS	148,504	160,419(✓)	335,257

(✓) \$58,838 from United Kingdom and \$95,516 from United States in 1939.

Table 15 - EXPORTS OF GRAPHITE FROM CANADA, 1938 - 1940

	1938		1939		1940	
	Cwt.	\$	Cwt.	\$	Cwt.	\$
Graphite or plumbago, crude and refined	23,006	54,366	26,429	56,614	30,460	75,947
Carbon and graphite electrodes .....	...	614,925	...	762,334(✓)	...	512,732

(✓) \$191,587 to British South Africa; \$194,587 to Norway and \$164,214 to Australia.

Table 16 - CONSUMPTION OF GRAPHITE OR PLUMBAGO IN CANADA, BY INDUSTRIES, AS REPORTED TO THE CENSUS OF INDUSTRY, 1938 and 1939

Industry	1938		1939	
	Quantity	Cost at works	Quantity	Cost at works
	Short tons	\$	Short tons	\$
Paints and varnishes	47	4,057	48	4,164
Polishes	46	5,231	39	4,667
Foundries	134	15,789	208	21,706
Acids and salts	75	21,890	23	6,815
Prepared foundry facings	177	8,387	...	4,653
TOTAL ACCOUNTED FOR	479	55,354	...	42,005

Table 17 - WORLD'S PRODUCTION OF GRAPHITE, 1936 - 1939 (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries) (Long tons)

Producing Country	1936	1937	1938	1939
BRITISH EMPIRE				
Union of South Africa	58	61	53	58
Canada (sales)	(b)	(b)	(b)	...
Ceylon (exports)	13,515	17,381	11,783	22,896
India	388	558	458	...
Australia	23	14	10	...
FOREIGN COUNTRIES				
Austria (crude)	21,367	17,871	15,586	...
Czechoslovakia	2,880	5,063	(a)	...
Germany (crude)	23,906	23,172	27,662	...
Italy	5,118	5,326	5,396	...
Norway (exports)	3,344	3,684	3,781	...
Sweden	62	25	47	...
Madagascar - Flake	6,124	7,877	10,305	...
Powder	1,117	2,583	4,011	...
Morocco (French)	400	331	193	...
Argentina	18	25	28	...
Mexico	10,092	11,032	9,459	9,660
Brazil .....	...	8	(a)	3
Japan	1,551	(a)	(a)	...
Korea - Flake	5,757	(c) 5,182	(c) 7,742	(c) 56,354
Other	34,511	(c) 37,698	(c) 41,811	

(a) Graphite is also produced in the U.S.S.R. and the United States.

(b) Information not available.

(c) Recorded by value only

(1936	£17,859
(1937	£25,373
(1938	£ 8,440
(1939	£13,350

(d) Exports.

GRINDSTONES - Quarry sales of grindstones and other natural abrasive stones (sandstone) in Canada during 1940 totalled 341 short tons valued at \$14,543 compared with 304 short tons at \$15,278 in 1939. The shipments in 1940 included 18 short tons of sharpening stones valued at \$2,520 and 290 short tons of grindstones worth \$11,853. No pulpstones were produced in 1940 and the sharpening stones came entirely from a plant in New Brunswick. The grindstones sold during the year under review were made from both Nova Scotia and New Brunswick stone. Included as abrasives in the total figures of grindstone production in 1940 are 33 short tons of grinding pebbles valued at \$165; these were obtained from a deposit in southern Saskatchewan and were shipped to a feldspar grinding plant in the province of Quebec.

The Bureau of Mines, Ottawa, reports, in part, in its 1940 review of Grindstone Production as follows:

"The large-size Canadian grindstones are used mainly for sharpening pulp-mill and tobacco knives, and in the United States in the file, machine-knife, granite tool, and shear manufacturing industries. The small stones are used for scythe and axe grinding. Substantial competition from the artificial grinding wheel, and to some extent from foreign natural stones, are causes of the dwindling of this business.

"Good pulpstones are in demand, particularly for use in the large magazine grinders, but as known Canadian deposits containing thick beds of sandstone of the proper quality appear to have been worked out, production for the present has ceased. Added to this there is substantial and increasing competition from Canadian made artificial segmental pulpstones mainly of silicon carbide grit, there being at present nearly 500 of these stones in operation in the various Canadian pulp mills. The imported natural pulpstones come mainly from West Virginia, United States.

"The exports of these stones in 1940 were valued at \$4,149 as against a valuation of \$6,312 in the previous year. The imports which consisted chiefly of pulpstones, were valued at \$192,493 as against \$133,275 in the previous year. Most of these come from the United States."

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

Year	Tons	\$	Year	Tons	\$
1886	4,020	46,545	1930	830	62,021
1900	5,539	53,450	1931	621	38,103
1905	5,540	62,375	1932	328	15,735
1913	4,837	51,325	1933	498	21,919
1914	3,976	54,504	1934	987	46,478
1915	2,580	35,768	1935	708	34,010
1916	3,478	52,782	1936	569	24,724
1917	2,523	45,754	1937	412	21,429
1919	3,072	83,005	1938	306	16,198
1928	1,855	100,960	1939	504	15,278
1929	1,947	106,354	1940	341	14,543

Table 19 - PRODUCTION OF NATURAL ABRASIVE STONES, BY KINDS, 1940

	PULPSTONES		SHARPENING STONES		GRINDSTONES	
	Tons	\$	Tons	\$	Tons	\$
Nova Scotia	53	2,378
New Brunswick	18	2,520	237	9,480
Saskatchewan	33(✓)	165	...	...
CANADA	51	2,685	290	11,858

(✓) Grinding pebbles.

Table 20 - CONSUMPTION OF PULPSTONES BY THE CANADIAN PULP AND PAPER INDUSTRY, 1931 - 1940

Year	Number for 2 ft. wood		Number for 2.5 ft. wood		Number for 4 ft. wood	
		Value \$		Value \$		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	238,498
1939	242	60,622	60	22,443	203	238,620
1940	311	96,957	110	49,899	163	257,628

Table 21 - PRODUCTS MANUFACTURED BY CANADIAN ARTIFICIAL ABRASIVES INDUSTRY, 1938 and 1939

Product	1938		1939	
	Short tons	Selling value	Short tons	Selling value
		at works		at works
		\$		\$
Crude silicon carbide	19,094	2,002,041	17,225	1,865,604
Crude fused alumina	50,515	5,165,920	51,118	4,565,569
Silicon carbide firesand, etc.	321	5,147	416	10,034
Abrasive wheels and segments .....	...	916,695	...	1,117,689
Sharpening stones and files .....	...	91,467	...	96,217
Ferrosilicon	6,819	79,369	5,698	65,533
Other products (x) .....	...	1,319,066	...	1,554,497
TOTAL .....	...	9,579,705	...	9,275,143

(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.

KYANITE - The following information is from a recent bulletin of the "Imperial Institute", London (Vol. XXXVI - No. 4). Kyanite, a natural silicate of alumina (Al_2SiO_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 $1,450^\circ$ 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 spark-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.

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 - June, 1941 quoted kyanite - per ton f.o.b. North Carolina and Georgia \$20.00 to \$32.00.

MAGNESITIC-DOLOMITE - Production of magnesitic-dolomite was not published in 1940. The value of the output in 1939 was \$474,418. Production is confined to the province of Quebec.

The annual review on magnesite by the Bureau of Mines, Ottawa, contains the following information:

"Magnesitic dolomite consisting of an intimate mixture of magnesite and dolomite is quarried at Kilmar and at Harrington East, in Argenteuil county, Quebec, and is processed for use as refractory materials. Products at present marketed include caustic-calcined magnesitic dolomite, dead-burned or grain material, bricks and shapes (both burned and unburned), finely ground refractory cements, and, in combination with chrome, the dead-burned material is used as an ingredient in certain other types of refractory. Magnesia products made in Canada from imported magnesite and magnesia include fused magnesia (artificial periclase), optical periclase, and "85 per cent magnesia" pipe covering.

"The recent discovery by the Bureau of Mines of deposits of a magnesium mineral known as brucite, at Rutherglen, Ontario, and at Bryson and Wakefield, Quebec, is considered a matter of importance. The brucite occurs as granules thickly disseminated through a matrix of crystalline limestone, and by a process developed in the Bureau of Mines laboratories, and described in a report recently issued by the Bureau, it is possible to recover these brucite granules in the form of magnesia of a high degree of purity, apparently at a cost

that will enable it to compete with imported magnesite in Eastern Canada. The magnesite so obtained is suitable for the manufacture of high-grade basic refractories, magnesium metal, and various chemical compounds. Hitherto, magnesite of equal purity has not been available from any Canadian source, but has had to be imported from Asia, Europe, or the United States. Being an essential war commodity, supplies of magnesite are difficult to obtain during wartime, and a domestic source is of prime importance. At present the deposits are being investigated by several companies in cooperation with the Bureau of Mines, and early production of magnesite from them is expected.

"Magnesite is available in many countries. Russia is probably the world's greatest producer of magnesite, but almost all is for domestic use. For export, the magnesite is generally shipped in either the calcined or the dead-burned state.

"Magnesite is usually calcined before shipment and the resultant magnesite is used for the making of refractory products to withstand extremely high temperatures, for making oxychloride cement, and for magnesium metal. It is also the basis of a number of magnesium salts and has many minor uses. The world-wide demand for magnesium metal has greatly stimulated interest in deposits of magnesite. Although until three years ago almost all the world's magnesium was made from magnesium chloride brine and from waste water used in treating potash minerals, magnesite is now an important source of this light metal in Europe. Sea-water and magnesium chloride brine are the sources of all magnesium at present produced in the United States.

"Competing with magnesite as sources of magnesite products are dolomite, brucite, and sea-water. Dolomite, in addition to its newly discovered possibilities for the making of refractories, has long been the principal source of basic magnesium carbonate and pure magnesium oxide, and processes have been worked out for the production of magnesium metal from it. Brucite is being quarried in the United States for the manufacture of refractories. The extraction of magnesite from sea-water has now reached the commercial stage in California and in England, the material so obtained being now marketed in various forms for industrial and pharmaceutical purposes, and for use in refractory products.

"Prices of calcined magnesite f.o.b. Montreal or Toronto, as quoted by Canadian Chemistry and Process Industries for March, 1941, were \$70 to \$90 per ton. This price has obtained since November, 1939, when the price rose from the \$48 to \$60 range that had prevailed for more than a year previously."

Table 22 - PRODUCTION OF MAGNESITIC-DOLOMITE (CALCINED) IN CANADA, 1925 - 1939

Year	Tons	Value	Year	Tons	Value
		\$			\$
1925	5,576	122,325	1933	(a)	360,128
1926	4,571	137,431	1934	(a)	382,927
1927	7,337	250,309	1935	(a)	486,084
1928	13,195	346,990	1936	(a)	768,742
1929	18,809	491,170	1937	(a)	677,207
1930	13,336	336,162	1938	(a)	420,261 (A)
1931	11,411	295,579	1939	(a)	474,418
1932	(a)	262,860			

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

(a) Not published.

Table 23 - MAGNESITE AND DOLOMITE USED IN THE CANADIAN PRIMARY IRON AND STEEL INDUSTRY, 1931 - 1940

	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
1939	40,592(b)	78,904	11,401	351,680
1940	59,284(b)	123,429	13,673	506,032

(a) Information not available. (b) In addition 14,858 tons of calcined were valued at \$99,838 in 1939 and 21,949 tons at \$156,560 in 1940.

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 - 1939

Year	Tons	Value	Year	Tons	Value
		\$			\$
1933	(a)	16,430	1937	484	29,242
1934	104	6,370	1938 .....	...	...
1935	40	2,448	1939 .....	...	...
1936	418	25,256			

(a) Information not available.

Table 25 - IMPORTS OF MAGNESITE AND MAGNESITE FIRE BRICK INTO CANADA, 1931 - 1940

Year	Calcined magnesite for making insula- tion materials		Magnesite, dead burned, sintered caustic cal- cined or plastic magnesia		Magnesite fire brick
	Cwt.	\$	Cwt.	\$	\$
1931 .....	...	...	55,741	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) .....	...	8,222	20,383	55,360	653,507
1938	5,966	9,507	13,962	43,956	571,910
1939	8,654	16,745	11,928	37,366	677,011
1940	12,672	73,829	19,273	62,925(✓)	785,408

(✓) In addition, 240 cwt. of crude magnesite rock valued at \$498.

(a) From April 10, 1937.

Imports into Canada in 1939 of magnesium carbonate, basic or otherwise, excepting crude rock, and magnesium carbonate, for use in compounding or manufacture of rubber products totalled 1,034,641 pounds valued at \$51,864; of these imports, 918,178 pounds at \$41,424 came from the United Kingdom.

In 1940, corresponding imports totalled 1,259,291 pounds worth \$61,153, of which 1,216,161 pounds at \$57,502 came from the United Kingdom. Also in 1940, imports of magnesia (magnesium oxide) amounted to 255,650 pounds valued at \$38,894, of which 116,283 pounds at \$19,599 came from the United Kingdom and 118,807 pounds worth \$19,152 from United States.

Table 26 - EXPORTS OF MAGNESITE, CALCINED, DEAD-BURNED, ETC., FROM CANADA, 1931 - 1940

Year	Cwt.	\$	Year	Cwt.	\$
1931	32,214	45,257	1936	58,554	71,183
1932	23,885	33,103	1937	40,554	49,401
1933	46,396	63,056	1938	79,415(✓)	95,607
1934	39,933	56,670	1939	147,973(✓)	183,034
1935	31,531	43,538	1940	256,518(✓)	333,958

(✓) Practically all to the United Kingdom.

Cwt. = 100 pounds.

"Metal and Mineral Markets" - New York, June, 1941 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. These same prices were quoted October, 1939.

Table 27 - WORLD'S PRODUCTION OF MAGNESITE, 1936 - 1939 (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)
(Long tons)

Producing Country and Description	1936	1937	1938	1939
<u>BRITISH EMPIRE</u>				
Union of South Africa - Crude	1,667	1,724	2,574	3,959
Canada - Crude	(d)	(d)	(d)	(d)
India - Crude	15,468	26,166	25,611	...
Australia - Crude	17,615	19,705	19,516	...
<u>FOREIGN COUNTRIES</u>				
Austria - Crude	391,494	451,980	(a)	...
Caustic (c)	57,621	(a)	(a)	...
Dead-burnt (c)	97,025	(a)	(a)	...
Bricks (c)	42,015	(a)	(a)	...
Czecho-Slovakia - Crude (b)	8,545	12,010	12,789	...
Calcined (b)	34,957	37,465	28,925	...
Bricks (b)	1,612	5,256	902	...
Germany (Prussia) - Crude	14,789	20,758	(a)	...
Greece - Crude	114,272	159,123	165,586	...
Caustic (c)	22,762	44,548	36,474	...
Dead-burnt (c)	6,552	5,404	3,254	...
Italy - Crude	3,105	5,307	6,060	...
Calcined (c) .....	...	...	650	...
Norway - Crude	3,067	2,063	(a)	...
Calcined (c)	544	601	(a)	...
Bricks (c)	607	587	(a)	...
Yugoslavia (Serbia only) - Crude ...	38,392	40,531	38,693	32,366
Calcined	13,910	19,464	15,146	13,442
United States - Crude	184,928	181,640	86,600	177,661
Caustic (sales)(a) ..	7,141	8,956	6,607	9,069
Dead-burnt (sales)(c)	80,338	74,239	34,588	76,854
Korea - Crude	14,033	(b) 14,188	(b) 15,820	...
Manchuria - Crude	227,000	(b) 163,797	(b) 168,996	...
Turkey - Crude	2,247	316	850	428
Calcined .....	...	...	...	57

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

(a) Information not available.

(b) Exports less imports.

(c) Derived from crude shown, and not additional.

(d) Production recorded by value only: -

1936	£154,583
1937	£137,086
1938	£ 85,280
1939	£103,000

MAGNESIUM SULPHATE - No commercial production of mine or primary magnesium sulphate was reported in Canada in 1940. The output of this mineral in the Dominion in 1939 totalled 550 short tons valued at \$9,900 and came entirely from deposits located in British Columbia. The following information pertaining to magnesium sulphate is from a review prepared by the Bureau of Mines, Ottawa.

"Natural hydrous magnesium sulphate (Epsom Salts or Epsomite) occurs in deposits in lake bottoms or in solution in brine lakes in British Columbia. In Saskatchewan it is found associated with sodium sulphate. Attempts have been made to produce refined salts, and a number of years ago there was considerable production from several of the "lakes" in British Columbia, and experimental shipments were made from one of the lakes in Saskatchewan.

"The largest production has come from the deposits at Basque, British Columbia, the material from which is refined at Ashcroft, 15 miles south of the deposit. The refinery, now owned by Ashcroft Epsom Salts Company, has a capacity of 10 tons of salt a day. It was operated until the early summer of 1939, when it closed down pending improved marketing conditions. The material produced was of high grade, four samples, representative of the different crystal sizes prepared, all ran over 99.5 per cent $MgSO_4 \cdot 7H_2O$.

"There are a number of other occurrences in British Columbia, near Clinton, north of Kamloops, and in Kruger's Pass, south of Penticton.

"In Saskatchewan, two lakes south of Wiseton contain brines high in magnesium sulphate, and Muskiki Lake, just north of Dana, contains brine high in magnesium and sodium sulphate, which at certain times of the year, crystallizes into a bedded deposit with layers of both salts.

"The imports in 1940 were 2,211 tons valued at \$86,090, compared with 1,950 tons valued at \$56,648 in 1939.

"As magnesium sulphate is not at present being manufactured in Canada, imports are dutiable at the rate of 17½ per cent, otherwise the duty would be 20 per cent. The tariff on the material entering the United States is 3/4 of a cent per pound, or \$15.00 per ton.

"Prices for Epsom salts remained steady for the greater part of the year, but with the discontinuance of supplies from European countries, hitherto the main source of supply, prices increased rapidly. Quotations at the end of the year for the technical grade, as given by Canadian Chemistry and Process Industries for Toronto or Montreal delivery, ranged from \$65.00 to \$70.00 per short ton in bags, whereas the B.P. material in barrels is quoted at from 3½ to 3¾ cents per pound."

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

Year	Tons	Value	Year	Tons	Value
		\$			\$
1917	929	4,645	1934	42	1,100
1918	1,949	14,565	1935	340	7,965
1919	738	9,115	1936	654	13,712
1920	1,947	39,886	1937	727	14,456
1921	2,029	39,506	1938	470	9,400
1922	1,021	24,017	1939	550	9,900
1923	121	6,580	1940 .....	...	...
1924-1932 .....	...	...	
1933	120	3,360	GRAND TOTAL	11,637	198,207

(x) Produced entirely in British Columbia.

Table 29 - MAGNESIUM SULPHATE USED IN CANADIAN PHARMACEUTICAL PREPARATIONS AND TANNING, 1932 - 1939

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	16,165
1938	855,547	23,687	1,272,549	14,153
1939	850,927	24,091	1,139,670	17,808

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

Data not complete for 1940.

Table 30 - IMPORTS INTO CANADA OF MAGNESIUM SULPHATE (EPSOM SALTS), 1931 - 1940

Year	Pounds	\$	Year	Pounds	\$
1931	4,120,086	43,807	1936	3,579,069	57,928
1932	4,383,115	47,679	1937	3,355,147(x)	33,116
1933	4,269,852	49,868	1938	3,606,167(a)	33,018
1934	4,599,518	48,459	1939	3,901,383	56,648
1935	5,684,390	40,407	1940	4,422,618	86,090

(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 in 1938 and 1,375,626 pounds at \$9,901 from Germany and 2,353,269 pounds at \$43,513 from United States in 1939; in 1940, 4,291,058 pounds at \$82,655 from United States and 131,560 pounds worth \$3,435 from United Kingdom.

MINERAL WATERS - Shipments of natural mineral waters from Canadian springs totalled 140,663 imperial gallons valued at \$20,892 in 1940 compared with 123,769 imperial gallons worth \$19,105 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. François river in Yamaska county; Potton 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 Preston 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 was 15 in 1940, of which 11 were located in the province of Quebec and 4 in Ontario.

Table 31 - SHIPMENTS OF NATURAL MINERAL WATERS FROM CANADIAN SPRINGS, 1931 - 1940

	QUEBEC		ONTARIO		CANADA	
	Imp. gal.	\$	Imp. gal.	\$	Imp. gal.	\$
1931	19,868	4,746	197,540	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
1939	104,629	17,503	19,140	1,602	123,769	19,105
1940	109,025	18,466	31,638	2,426	140,663	20,892

Imports into Canada of natural mineral waters, not in bottles, totalled 60 imperial gallons valued at \$23 in 1939; there were no corresponding imports in 1940. Mineral and aerated waters, n.o.p., imported during 1940 were valued at \$37,013 against \$69,525 in the preceding year.

Exports of mineral and aerated waters during 1940 were valued at \$2,363 while in 1939 similar exports amounted to \$1,842.

Table 32 - SALES OF NATURAL MINERAL WATERS(x) BY THE CANADIAN AERATED WATERS INDUSTRY, 1930 - 1939

Years	\$	Years	\$
1930	178,348	1935	45,100
1931	140,730	1936	63,687
1932	92,066	1937	102,648
1933	77,125	1938	105,872
1934	52,113	1939	95,531

(x) Whether fortified or not.

PEAT - Production of peat (fuel) in Canada during recent years came entirely from the provinces of Ontario and Quebec. Output in both 1939 and 1940 originated in Ontario only and in 1940 amounted to 30 short tons valued at \$75 compared with 445 tons at \$2,445 in 1939. In 1940 there was 1 firm reporting operations compared with 2 in 1939.

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 1940 totalled 11 tons valued at \$677 compared with 354 tons worth \$6,508 in 1939; the greater part of this material came from the United States.

PHOSPHATE - Production (mine sales) of phosphate in Canada in 1940 totalled 358 short tons valued at \$4,039 compared with 157 tons at \$1,712 in 1939. The following information relating to this mineral is from a review prepared by the Bureau of Mines, Ottawa:

"As in past years, phosphate production consisted of apatite obtained from the mica-apatite deposits of the Precambrian area north of Ottawa, in western Quebec, where a little was taken out by about a dozen small-scale producers in the Gatineau-Lièvre rivers-Templeton district. Most of the output was in less than individual car-load lots, and the bulk of it was sold to the Electric Reduction Company, Buckingham, Quebec, for the production of phosphorus or its products. This company has for years been practically the sole customer for domestic apatite: purchases in 1940 are reported as 332 tons, at a base price of \$11 for 80 per cent grade, plus or minus 14 cents per unit above or below this figure. Early in 1941, Canadian Refractories Limited, Kilmar, Quebec, reported that they would be in the market for about 100 tons annually.

"The only other known occurrence of phosphate in Canada is a belt of rather low-grade sedimentary rock extending northward along the continental divide from the Crowsnest area, just west of the Alberta-British Columbia boundary; it has been traced as far north as Jasper, Alberta. Operations some ten years ago in the Crowsnest-Michel area by the Consolidated Mining and Smelting Company resulted in the shipment of 5,000 tons of this rock to Trail, British Columbia, for the manufacture of fertilizer, but attempts to concentrate it proved unsuccessful and the company discontinued mining and has since drawn its supplies from Garrison, Montana. Eastern Canadian plants using phosphate for fertilizer or other purposes employ mainly Florida rock; in 1940, this cost about \$15 per ton, delivered, for 75 per cent grade.

"Total world production of phosphate is of the order of about 11 million long tons annually. The great bulk consists of sedimentary rock, but the Russian output of apatite, produced as concentrate from nepheline-apatite rock, amounts to about one million tons. Outside of Russia, Sweden and Canada are the only other producers of apatite for which figures are available.

"Although fertilizers will always continue to consume the great bulk of the world's phosphate produced, a growing future for phosphorus and its compounds seems to be assured. One of such chemicals that is rapidly coming into extensive use is trisodium 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 removal of injurious fluorine, the cause of "mottled" teeth, from the potable waters is now accomplished by filtering through a bed of tricalcium phosphate. Sodium pyrophosphate and tetrphosphate are proving of value for deflocculating and lowering the viscosity of the muds used in oil-well drilling. Sodium metaphosphate is a strong "wetting" agent, and is highly efficient in the flotation of certain non-metallic minerals, and also in laundry practice. Alkaline-earth phosphate binders are proving of value for refractory materials. Research is proceeding on the use of phosphate in glass batches. Non-fertilizer uses for phosphate in the United States have been showing a steady expansion and now total about half a million tons annually."

Table 33 - PRODUCTION OF PHOSPHATE IN CANADA, 1918 and 1928 - 1940

Year	Short tons	\$	Year	Short tons	\$
1918	140	1,200	1934	81	683
1928	641	8,276	1935	186	1,103
1929	1,185	5,380	1936	525	4,927
1930	40	760	1937	100	900
1931 .....	...	...	1938	208	1,886
1932	1,316	12,333	1939	157	1,712
1933	2,214	5,475	1940	358	4,039

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 1940 totalled 342,700 short tons valued at \$4,662,087.

Table 34 - IMPORTS OF PHOSPHATE ROCK INTO CANADA, 1914, 1918 and 1931 - 1940

Year	Cwt.	\$	Year	Cwt.	\$
1914	(a)	20,220	1935	1,270,284	234,480
1918	(a)	90,363	1936	1,669,478	298,179(x)
1931	2,834,458	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	1939	2,498,006	477,517(x)
1934	635,494	165,240	1940	3,517,160	665,554(x)

(x) Came entirely from the United States.

(a) Not recorded.

Cwt. = 100 pounds.

Imports of acid phosphate, not medicinal, totalled 718,409 pounds valued at \$48,944 in 1940, while those of soda phosphates in the same year totalled 1,741,599 pounds valued at \$79,454.

In 1940 imports into Canada of fertilizers, superphosphate or acid phosphate of lime totalled 1,933,728 cwt. valued at \$982,337, all of which came from the United States. Imports of phosphoric acid in 1940 totalled 369,625 pounds appraised at \$20,026.

Phosphate chemicals and ferro-phosphate are now manufactured in Canada at Buckingham, Quebec, from phosphate rock. The Consolidated Mining and Smelting Company of Canada Limited treat imported phosphate rock, (at Trail, B.C.) with sulphuric acid, producing "triple" superphosphate; the Company 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 - 1940

Year	SUPERPHOSPHATE		PHOSPHATE ROCK	
	Short tons	\$	Short tons	\$
1931	51,639	595,789	48,373	595,547
1932	36,005	366,462	41,114	516,518
1933	59,443	657,123	21,961	164,614
1934	73,182	839,980	48,007	396,135
1935	86,701	986,674	74,507	610,118
1936	97,515	1,103,222	60,924	438,948
1937	137,801	1,661,243	101,704	726,572
1938	180,243	2,193,699	102,125	765,816
1939	174,939	2,026,293	96,319	711,508
1940	175,045	2,175,615	143,667	1,262,847

"Metal and Mineral Markets" - New York - June, 1941 - 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; 72 per cent, \$2.40; 70 per cent, \$2.15.

Table 36 - WORLD'S PRODUCTION OF PHOSPHATE ROCK, 1936 - 1939 (Taken from the Imperial Institute's publication - The Mineral Industry of the British Empire and Foreign Countries)

Producing Country	(Long tons)			
	1936	1937	1938	1939
<u>BRITISH EMPIRE</u>				
Tanganyika .....	...	102	104	425
Seychelles (exports)	23,564	9,442	21,360	...
Canada	469	89	186	140
India	128	166	23	...
Christmas Island	161,440	162,568	159,859	171,161
Australia	175	16	(a)	...
Nauru Island	547,400	688,900	841,050	...
Ocean Island	403,100	398,800	299,550	...
TOTAL	1,136,000	1,260,000	1,322,000	...

Table 36 - WORLD'S PRODUCTION OF PHOSPHATE ROCK, 1936 - 1939 (Concluded)

Producing Country	1936	1937	1938	1939
<u>FOREIGN COUNTRIES</u>				
Belgium (b)	15,836	...	(a)	...
Estonia	11,228	9,952	12,806	...
France	54,100	101,747	91,285	...
Germany	1,043	3,262	(a)	...
Italy .....	...	197	...	...
Poland	12,300	(a)	(a)	...
Roumania (c)	1,023	935	1,940	...
Sweden	6,043	4,839	6,094	...
U.S.S.R. (d)	2,178,900	(a)	(a)	...
Algeria	523,000	621,180	575,221	...
Egypt	522,644	508,837	451,164	538,890
Madagascar	5,265	4,222	5,602	...
Morocco (French)	1,314,303	1,455,156	1,464,021	...
Tunis	1,464,000	1,757,100	1,906,300	...
Netherlands West Indies	78,787	96,288	97,715	...
United States	3,462,837	4,261,416	3,860,476	3,987,970
Formosa	210	(a)	(a)	...
French Indo-China	9,200	19,932	36,751	...
China (estimated)	8,000	8,000	8,000	...
Japan	111,315	(a)	(a)	...
Netherlands East Indies	11,238	25,754	32,590	18,480
Philippine Islands	444	738	(a)	...
Angaur Island (exports)	87,817	89,220	103,910	...
French Oceania	144,900	160,000	111,000	...
New Caledonia	4,800	302	1,730	...
TOTAL	10,000,000	(a)	(a)	(a)
WORLD'S TOTAL	11,100,000	(a)	(a)	(a)

(a) Information not available.

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

1936	58,737 long tons
1937	51,444 " "
1938	42,990 " "

(c) Phosphatic guano, converted from cubic metres at the rate of 1 cubic metre = 2 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 -

Phosphate rock (excluding apatite), 1936 ... 1,764,400 long tons.

SILICA BRICK - The production of silica brick in Canada during 1940 totalled 3,438 M valued at \$182,786 compared with 2,493 M worth \$124,807 in 1939. 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 - 1940

Year	M	\$	Year	M	\$
1928	3,224	155,502	1935	2,461	96,194
1929	3,951(✓)	173,581	1936	2,393	97,285
1930	2,413	97,379	1937	3,744	181,126
1931	900	35,746	1938	1,788	100,403
1932	93	4,304	1939	2,493	124,807
1933	636	23,185	1940	3,438	182,786(a)
1934	2,528	85,945			

(✓) Largest annual output.

(a) Largest annual value.

Table 38 - IMPORTS OF SILICA BRICK(x) INTO CANADA, 1931 - 1940

Year	\$	Year	\$
1931	234,909	1936	261,974(a)
1932	122,952	1937	539,253(b)
1933	147,901	1938	240,184(c)
1934	210,180	1939	312,415(d)
1935	215,500	1940	472,215(e)

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

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

(b) \$527,444 from the United States.

(c) All from United States.

(d) \$294,228 from the United States.

(e) \$442,649 from the United States.

Imports of silica sand for the manufacture of glass and carborundum and for steel and filtration plants, etc., in 1940 totalled 5,574,549 cwt. valued at \$556,683; practically all from the United States. In addition, there were 82,986 cwt. of siliceous or crystallized quartz valued at \$56,814 imported in the same year.

SODIUM CARBONATE (NATURAL) - Production of natural sodium carbonate in Canada during 1940 totalled 220 short tons valued at \$1,760 compared with 300 tons at \$2,400 in 1939. 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 1940 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 1940 amounted to 8,679 short tons valued at \$101,630.

Table 39 - PRODUCTION OF SODIUM CARBONATE (NATURAL) IN CANADA, 1929 - 1940

Year	Tons	\$	Year	Tons	\$
1929	600	8,100	1935	242	2,430
1930	364	4,550	1936	192	1,677
1931	712	7,351	1937	286	2,574
1932	495	5,450	1938	252	2,268
1933	559	5,773	1939	300	2,400
1934	244	1,920	1940	220	1,760

Table 40 - IMPORTS OF SODA ASH OR BARILLA INTO CANADA, 1931 - 1940

Year	Pounds	\$	Year	Pounds	\$
1931	1,647,304	25,771	1936	(a) 3,184,692	45,503
1932	1,803,951	27,751	1937	(b) 10,103,477	115,219
1933	1,616,483	23,256	1938	(c) 2,908,364	41,851
1934	2,311,498	32,258	1939	(d) 3,145,499	45,377
1935	2,647,572	37,995	1940	(e) 9,293,344	110,285

(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.

(d) 3,123,883 pounds from the United States.

(e) 9,286,864 pounds from the United States.

Table 41 - SODIUM CARBONATE (SODA ASH) USED IN THE CANADIAN CHEMICALS AND ALLIED PRODUCTS INDUSTRIES, 1931 - 1939

Year	Pounds	\$	Year	Pounds	\$
1931	12,439,458	201,654	1936	27,352,622	424,729
1932	11,421,879	193,422	1937	29,511,323	430,657
1933	12,221,928	191,639	1938	30,034,048	437,835
1934	21,879,170	327,214	1939	31,320,339	437,443
1935	24,971,934	372,286			

Table 42 - SODA ASH USED IN CANADIAN INDUSTRIES, AS SPECIFIED, 1931 - 1939

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	47,764,715	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	617,452	16,243	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	59,092,451	757,283	860,315	22,073	299,601	5,575	189,171	4,118
1939 ...	2,538	83,548	55,444,267	697,277	789,244	21,119	346,476	6,686	128,987	2,619

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

"Canadian Chemistry and Metallurgy" - Toronto - quoted soda ash (June, 1941) - bags of 100 pounds, \$2.00.

SODIUM SULPHATE - NATURAL - (Glauber's Salt and Salt Cake) - Producers' shipments of natural sodium sulphate in Canada totalled 94,260 short tons valued at \$829,589 in 1940 compared with 71,485 tons at \$628,151 in 1939.

Sodium sulphate is recovered in Canada almost entirely in the province of Saskatchewan and is produced either as a 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 has been reported in the province of Alberta since 1937. 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 1940 totalled 676,046 short tons valued at \$5,829,286.

During 1940 six firms, five in Saskatchewan and one in Alberta, reported production of natural sodium sulphate; capital employed by the industry was reported at \$961,602; fuel, purchased electricity and process supplies consumed totalled \$216,779 and \$157,538 were distributed as salaries and wages to 109 employees.

"Canadian Chemistry and Metallurgy" - Toronto - (June, 1941) - quoted sodium sulphate (Glauber's salt), crystals, in bags, cwt., to \$1.25; carlots, bulk - \$18.00 per ton; anhydrous, bags \$52.00 to \$60.00 per ton. Salt cake f.o.b. western points, \$8.00 - \$8.50 per ton.

Table 43 - PRODUCTION OF NATURAL SODIUM SULPHATE (x) IN CANADA, 1929 - 1940

Year	Short tons	\$	Year	Short tons	\$
1929	5,018	64,112	1935	44,817	343,764
1930	31,571	293,847	1936	75,598	552,681
1931	44,957	421,097	1937	79,804	617,548
1932	22,466	271,736	1938	63,009	553,307
1933	50,080	485,416	1939	71,485	628,151
1934	66,821	587,986	1940	94,260	829,589

(x) Produced in the province of Saskatchewan, with the exception of 80 tons valued at \$480 produced in Alberta during 1937, 89 tons worth \$1,127 produced in the same province in 1938, 30 tons at \$186 in 1939 and 10 tons at \$50 in 1940.

Table 44 - IMPORTS INTO CANADA OF SALT CAKE (SULPHATE OF SODA), 1931 - 1940

Year	Pounds	\$	Year	Pounds	\$
1931	17,321,652	97,215	1936	23,494,305	110,676
1932	8,865,730	51,925	1937	28,234,278	132,352
1933	5,191,036	34,371	1938	11,572,628	61,122
1934	21,154,815	123,990	1939	(x)13,083,040	73,575
1935	10,352,070	49,354	1940	(a)16,590,812	94,674

(x) Of the 1939 imports, 4,788,768 pounds came from the United States and 8,294,272 pounds from the United Kingdom.

(a) 14,502,720 pounds from United Kingdom and 2,088,092 pounds from United States.

Exports of sodium sulphate from Canada are not shown separately in the Customs classification.

Table 45 - IMPORTS INTO CANADA OF GLAUBER'S SALT, 1931 - 1940

Year	Pounds	\$	Year	Pounds	\$
1931	1,999,042	10,838	1936	2,510,103	27,521
1932	1,906,832	11,027	1937	3,512,363	25,090
1933	1,791,011	13,237	1938	4,532,986	30,288
1934	1,266,665	8,853	1939	(x)2,660,372	20,102
1935	3,167,715	26,591	1940	(a)1,086,057	12,450

(x) 1,861,068 pounds from Germany, 761,332 pounds from the United States, and 17,472 pounds from the United Kingdom.

(a) 1,079,637 pounds from United States.

Imports of bisulphate of soda, or nitre cake, during 1940 totalled 1,319,718 pounds valued at \$18,356, all from the United States.

Table 46 - SALT CAKE USED IN THE MANUFACTURE OF CANADIAN WOOD PULP, 1930 - 1939

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	1939	40,685	722,178

Table 47 - SODIUM SULPHATE USED IN THE CANADIAN ACIDS, ALKALIES AND SALTS, and MEDICINAL AND PHARMACEUTICAL INDUSTRIES, 1932 - 1939

Year	Acids, Alkalies and Salts Industry		Medicinal and Pharmaceutical Industry	
	Tons	\$	Tons	\$
1932	94	1,811(x)	...	...
1933	9,329	141,322	39	4,879
1934	26,075	368,576	51	7,278
1935	22,485	318,734	59	4,617
1936	7,220	102,176(x)	27	2,546
1937	8,006	113,054(x)	29	2,234
1938	3,412	48,486(x)	21	1,593
1939	10	314(x)	23	1,940

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

In 1939 there were 801,220 pounds of Glauber's salt valued at \$11,636 used in Canada in the dyeing and finishing of textiles as compared with 645,306 pounds at \$8,419 in 1938.

"At Sybouts Lake, 9 miles south of Gladmar, Saskatchewan, a start was made in 1940 on the erection of a dehydrating plant by a company known as Sybouts Sodium Sulphate Company, Limited with head office at Gladmar, Saskatchewan. This plant is expected to be in operation during the summer of 1941. In anticipation of the completion of the plant some 10,000 tons of crystals were harvested and stockpiled on the shore adjacent to the new plant site.

"No production is reported from British Columbia in 1940. Sodium sulphate is the predominant salt in a number of deposits and, during the past year, several of these deposits were prospected to prove their extent.

"A discovery made in New Brunswick during 1937, may yet prove to be of importance as a source of sodium sulphate. New Brunswick Gas and Oilfields, Limited, in drilling for gas at Weldon, has proved large thicknesses of rock salt (sodium chloride). Two holes drilled 3,500 feet apart, from which cores have been obtained, have shown the presence of a bed of glauberite ($\text{Na}_2\text{SO}_4 \cdot \text{CaSO}_4$) from 60 to 100 feet thick, mostly overlying the rock salt, the sodium sulphate content of which ranges from 25 to 30 per cent. Both glauberite and sodium chloride were proved by drilling in 1939, thus further extending the salts basin. Many millions of tons of sodium sulphate would seem to be indicated in this deposit. The Bureau of Mines, Ottawa, has done much research work on the material recovered in these cores, and has been able to indicate a probable method of recovery of the sodium sulphate, but further detailed work must be done to determine the full commercial possibilities of the deposit.

"The industry in Western Canada seems now to be well established, and steady progress is being made. The investigation of sodium sulphate deposits in this section of the Dominion was started by the Bureau of Mines in 1921, and over 120,000,000 tons of hydrous salts was proved in the few deposits examined in detail. In 1921 none of this material was used commercially, but by 1939 the revenue derived by Canadian railways from this industry in incoming and outgoing freight exceeded \$1,500,000." (Bureau of Mines, Ottawa)

STRONTIUM MINERALS - The Bureau of Mines, Ottawa, in a 1940 review of strontium minerals states:

"Several occurrences of celestite of possible economic interest are known in Canada, but there has been very little attempt at development; the last was in 1920-21, when some ground material was produced from a deposit in Bagot township, Ontario, and sold to the paint trade. The Bagot ore has coarsely-fibrous character and is not very pure, containing about 18 per cent of barium sulphate. On this account, it would not be favoured for chemical use, but is regarded as suitable for paints and general filler or loader use. Renewed interest in the deposit developed in 1940 and plans were reported for placing the property in production, but these have not yet materialized. Celestite similar in character and analysis occurs at some of the old fluorspar mines of the Madoc area, in Ontario, and some might be recoverable from the waste dumps.

"A very pure celestite, analysing 98-99 per cent strontium sulphate, occurs as a small vein of coarse platy crystals in Lansdowne township, Ontario. Some was mined many years ago, but its disposition is not on record. Calcite appears to be the only associated mineral, and recovery of a concentrate of high purity should be easily made by jigging and tabling. In the event of a war shortage of imported strontium compounds, this deposit probably offers the best possibility for supplying the deficiency, though the indicated tonnage is not great.

"Celestite of similar type to the above occurs also in Fitzroy township, Ontario, where it was disclosed in a small prospect shaft made for galena about 30 years ago. Analysis of selected material showed 93 per cent strontium sulphate. A moderate supply might be obtainable from this source, but the ore would probably need to be concentrated.

"No important deposits of strontianite are known in Canada, though several occurrences of the mineral are on record: these are probably only of mineralogic interest.

"Celestite (strontium sulphate) is the principal commercial source of strontium for the manufacture of the various strontium salts used in industry. Strontianite (the carbonate) is a less common mineral, used for the same purpose. Most of the world's supply of celestite is obtained from England, and some strontianite is mined in Germany. Important deposits are reported to occur in India and Newfoundland, but there has been no production from these sources as yet. There are no very complete figures on the world trade in these minerals, but in recent years total annual production would appear to have been around 5,000-7,000 tons.

"As stated above, the chief use for both celestite and strontianite is for the manufacture of various strontium salts and chemicals used in industry and medicine. Of such compounds, the nitrate, carbonate, and hydrate are the most important. Strontium nitrate is employed mainly in pyrotechnics, for fireworks, signal flares, tracer bullets, etc., to which it imports the characteristic strong red flame colour of the

element. The hydrate is chiefly used in the refining of beet sugar by the Scheibler process, but this is little practised on this continent, where the Staffens, or lime, process is mainly used. The carbonate is said to be used to some extent as a batch ingredient in the manufacture of certain types of glass, and as a fluxing and desulphurizing and dephosphorizing agent in iron and steel.

"Strontium metal, made from either the natural sulphate or carbonate, finds limited application in certain alloys, mainly of copper, tin, lead, zinc, and cadmium.

"According to American trade journals, ground celestite of 92 per cent grade currently sells at \$45 per ton.

"A review of the strontium situation in the United States, published early in 1941, furnished the following information: A new, and possibly the principal, outlet for strontium ores is now offered by the employment of powdered celestite for purifying caustic soda solutions used in the manufacture of rayon. Domestic reserves of celestite are held to be abundant, though American requirements have been supplied almost entirely by imported material for many years. In 1940, several deposits were reported to be under development in California, and celestite-bearing limestones in Ohio are regarded as of possible commercial interest. An occurrence of strontianite has been reported in New Mexico, and impure celestite has been mined in Texas to replace barite in oil-well drilling muds. American importers of celestite are stated to have stocked up heavily in 1939 at a delivered price of about \$14 per ton for crude ore, and though quotations on certain strontium salts have shown a slight rise, no shortage is feared".

Data relating to Canadian imports of strontium minerals or chemicals are not published separately in Canadian trade reports.

SULPHUR - Canadian sulphur production is computed as the sulphur in iron pyrites shipped plus the sulphur recovered from non-ferrous smelter gases. Production for 1940 is not being published owing to war-time restrictions.

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 1940 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. The Consolidated Mining and Smelting Company reported in 1939 that the percentage of sulphur dioxide removed from flue gases from metallurgical operations and utilized mainly in the production of sulphuric acid and fertilizers, increased to 70.3 per cent compared with 53.3 per cent in 1937.

The Bureau of Mines, Ottawa, reviews pyrites for 1940 as follows:

"Pyrites is produced in Canada as a by-product in the treatment of copper-pyrites ores at the Aldermac and Noranda mines in Quebec, and at the Britannia mine in British Columbia. No lump pyrites has been produced in Canada for several years.

"Aldermac Copper Corporation's mine and concentrator, twelve miles west of Noranda, Quebec, were in continuous operation in 1940. The copper concentrate is shipped for treatment to the Noranda smelter, while the high grade iron pyrites concentrate is shipped partly to chemical plants in the United States and partly to Three Rivers, Quebec, for use by St. Lawrence Paper Mills Company. The main shaft of the mine was extended 125 feet to a depth of 1,375 feet, and the tenth, or bottom level, was opened up. The east end of the property was explored on the surface by diamond drilling and geophysical work, and underground by crosscutting and diamond drilling.

"At the Noranda mine, a small tonnage of pyrites concentrate - a by-product of the milling process - was marketed for the manufacture of acid.

"At Three Rivers, all of the pyrites used in the Freeman flash-roasting plant in the mill of St. Lawrence Paper Mills Company is now being obtained from the Aldermac mine. Formerly the plant burned pyrites obtained from the old Eustis mine which was closed down in June, 1939. The Freeman plant supplies all of the sulphur dioxide and part of the steam required for the operation of the company's sulphite plant.

"In British Columbia, part of the large output of pyrites from the Britannia mine was consigned to the acid plant of Nichols Chemical Company at Barnet, British Columbia. As in previous years, however, much of the output was stored, awaiting more favourable market conditions. Some of this stock was exported in 1939.

"Northern Pyrites, Limited last year completed a program of development work that has been in progress for the past four years on its Ecstall pyrites property, located on Ecstall river about sixty miles south of Prince Rupert. A large plant as well as a railway to tidewater is required before active production can commence, but in the meantime, the company is awaiting more favourable market conditions. The Granby Company did considerable exploratory diamond drilling on the Ecstall property several years ago. According to reports, the orebodies contain 5,000,000 tons of ore averaging 49 per cent sulphur, 42 per cent iron, 2.3 per cent zinc, less than one per cent copper, and about \$1.00 a ton in gold and silver.

"Although the Freeman process of flash roasting, designed for by-product flotation fines that are obtained from the treatment of copper ore, has opened a prospective market for this class of ore, it is not to be assumed that the mining of pyrites will be stimulated. Ample supplies of pyrites fines are already available at strategic points to meet any demand that may arise in the immediate future.

"There is apparently no standard price in Canada for sulphur in pyrites. Most contracts are believed to be based on a price of 5 cents or better per unit (22.4 pounds) of sulphur per long ton, f.o.b. cars at point of production."

"Metal and Mineral Markets" - New York - June, 1941, 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 nominal. Sulphur - per long ton for domestic market \$16 f.o.b. Texas Mines. "Canadian Chemistry and Process Industries" Toronto, quoted sulphur, June, 1941; - sulphur, crude, contracts, f.o.b. cars at United States mines, long ton \$16.00 (U.S.); crude, contracts, St. Lawrence and Maritime ports long ton \$21.50 to \$22.50 U.S. funds.

Table 48 - PRODUCTION OF SULPHUR(✓) IN CANADA FOR YEARS SPECIFIED

Year	Tons	\$	Year	Tons	\$
1886	(a) 42,906	193,077	1926	8,975	63,899
1896	13,823	101,155	1927	25,229	198,388
1906	17,525	169,990	1928	(b) 38,589	321,033
1913	65,012	521,181	1929	42,781	350,843
1914	93,609	744,508	1930	37,730	314,835
1915	116,157	985,190	1931	50,107	429,457
1916	116,975	1,084,095	1932	53,172	470,014
1917	155,453	1,610,762	1933	57,373	510,299
1918	154,269	1,705,219	1934	51,537	515,502
1919	65,674	522,704	1935	67,446	634,235
1920	67,608	719,110	1936	122,132	1,033,055
1921	12,213	116,326	1937	130,913	1,154,992
1922	6,900	74,303	1938	112,395	1,044,817
1923	11,073	113,020	1939	211,278	1,668,025
1924	9,742	95,620			
1925	7,587	58,899			

(✓) Sulphur in iron pyrites shipped plus sulphur recovered from non-ferrous smelter gases.

(a) Tonnage of pyrites shipped.

(b) 1928-1939 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, 1938 and 1939

	PYRITES (x)			SMELTER GAS		TOTAL SULPHUR	
	Sales	Sulphur content	Value	Sulphur content	Value	Tons	Value
	Tons	Tons		Tons			
			\$		\$		\$
<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	(a) 73,121	731,210	78,918	777,586
CANADA	44,604	22,377	144,637	90,018	900,180	112,595	1,044,817
<u>1939</u>							
Quebec	122,218	61,476	275,951	...	...	61,476	275,951
Ontario .....	...	...	...	16,126	161,260	16,126	161,260
British Columbia ..	105,418	52,973	423,784	(a) 80,703	807,030	133,676	1,230,814
CANADA	227,636	114,449	699,735	96,829	968,290	211,278	1,668,025

(x) Recovered from copper ore deposits.

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

The production of sulphuric acid in Canada totalled 312,699 tons (66° Bé) in 1940 compared with 249,558 tons in 1939 and 288,339 tons in 1938.

Imports of sulphuric acid amounted to 142 tons valued at \$17,661 during 1940 and exports totalled 2,244 tons at \$39,844.

Table 50 - IMPORTS INTO CANADA OF BRIMSTONE AND SULPHUR, 1931 - 1940

Year	Cwt.	\$	Year	Cwt.	\$
1931	2,483,842	2,281,654	1936	3,375,484	2,802,282
1932	2,099,895	2,023,085	1937	(a) 4,513,683	3,609,082
1933	2,816,202	2,529,920	1938	(b) 1,873,938	1,471,741
1934	3,153,943	2,589,311	1939	(c) 3,044,329	2,453,836
1935	2,733,499	2,297,650	1940	(d) 4,311,946	3,628,348

(a) 4,511,961 cwt. from United States.

(b) 1,872,536 cwt. from United States.

(c) 3,043,850 from United States.

(d) All from United States.

Table 51 - EXPORTS OF SULPHUR CONTAINED IN IRON PYRITES, 1931 - 1940

Year	Tons	\$	Year	Tons	\$
1931	26,613	139,814	1936	52,192	284,718
1932	17,455	89,568	1937	46,317	251,834
1933	15,347	121,280	1938	22,109(✓)	145,189
1934	9,821	94,623	1939	110,142(✓)	793,466
1935	7,610	48,446	1940	48,380(✓)	230,981

(✓) 16,551 tons valued at \$115,881 to United States in 1938, 93,957 tons at \$636,938 in 1939 and 48,380 tons at \$230,981 in 1940.

Table 52 - AVAILABLE DATA ON THE CONSUMPTION OF SULPHURIC ACID, 66° Be, BY INDUSTRIES, 1938 and 1939

Industry	1 9 3 8		1 9 3 9	
	Short tons	Cost at works	Short tons	Cost at works
Acids, alkalies and salts	4,290	76,393	6,690	110,003
Explosives	18,203	518,061	16,883	323,554
Fertilizers	161,829	1,579,949	157,926	1,657,510
Adhesives	554	10,075	312	5,911
Cellulose products	2,119	38,272	2,560	46,383
Paints, pigments and varnishes	326	5,478	(not shown)	
Soaps	77	3,435	52	2,380
Insecticides	1	56	3	257
Hardwood distillation .....	...	...	4	292
Miscellaneous chemicals	304	10,937	353	12,339
Wire and wire goods	3,935	71,733	4,333	81,323
Sheet metal products	1,549	34,803	1,425	32,130
Castings and forgings	545	11,663	623	13,318
Heating and cooking apparatus	12	651	21	1,070
Boilers, tanks and engines	44	1,528	20	826
Electrical apparatus	2,062	60,279	2,255	61,891
Coke and gas	21,857	317,195	22,865	320,002
Petroleum refining	9,937	194,046	10,189	219,201
Leather tanning	1,488	38,499	1,725	50,254
TOTAL ACCOUNTED FOR	229,132	2,773,053	228,239	2,938,644

NOTE: This information was not asked for on all questionnaires which were sent out under the annual Census of Industry, consequently complete data are not available.

Table 53 - CONSUMPTION OF SULPHUR BY SPECIFIED CANADIAN INDUSTRIES, 1937 - 1939

Industry	1 9 3 7		1 9 3 8		1 9 3 9	
	Tons	\$	Tons	\$	Tons	\$
Wood-pulp	165,559	3,827,991	106,255	2,433,161	126,818	2,763,657
Petroleum refining	80	6,776	140	8,128	88	4,161
Acids, alkalies and salts	21,529	403,511	12,103	246,774	13,894	286,296
Matches	63	3,043	67	3,130	84	3,924
Explosives	2,377	62,075	2,284	60,712	1,862	39,285
Insecticides	1,023	35,077	1,163	40,463	1,284	54,735
Adhesives	70	2,336	71	2,487	66	1,904
Chemicals, miscellaneous	32	994	3	136	3	129
Rubber	1,393	60,370	1,115	49,262	1,269	58,977
Sugar	157	7,104	133	6,280	152	7,379
Fruit and vegetable preparations ..	33	2,343	20	1,525	36	3,131
Other industries (x)	224	7,895	195	7,177	227	8,687

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

Table 54 - PRODUCTION OF MISCELLANEOUS NON-METALLIC MINERALS IN CANADA, 1939 and 1940

Item	Unit of measure	1 9 3 9		1 9 4 0	
		Quantity	Value	Quantity	Value
Barytes	Ton	(c)	3,639	338	4,819
Diatomite	Ton	301	10,388	248	7,957
Fluorspar	Ton	240	4,995	...	...
Graphite .....	\$	...	61,684	...	...
Grindstones (b)	Ton	304	15,278	341	14,543
Lithium minerals .....	\$	...	...	...	...
Magnesium sulphate	Ton	550	9,900	...	...
Magnesitic-dolomite .....	\$	...	474,418	...	...
Mineral waters	Imp.gal.	123,769	19,105	140,663	20,892
Peat production	Ton	445	2,445	30	75
Phosphate (a)	Ton	157	1,712	358	4,039
Silica brick	M	2,493	124,807	3,438	182,786
Sodium carbonate	Ton	300	2,400	220	1,760
Sodium sulphate	Ton	71,485	628,151	94,260	829,589
TOTAL (Gross) .....	\$	...	1,358,922	...	...
Sulphur production (x)	Ton	211,278	1,668,025	...	...

NOTE: For Footnotes see Page 29.

Footnotes to Table 54 -

- (a) Represents apatite mined in Quebec, usually a by-product in mica production.
 (b) Includes pulpstones, etc.
 (c) Not available for publication.
 (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.

Table 55 - PRINCIPAL STATISTICS RELATING TO MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1939-1940

	1 9 3 9	1 9 4 0
Number of plants	47	46
Capital employed	\$ 3,128,035	2,491,527
Number of employees - On salary	68	67
On wages	397	480
Total	465	547
Salaries and wages - Salaries	\$ 140,202	169,102
Wages	\$ 398,941	554,399
Total	\$ 539,143	703,501
Selling value of products (gross)	\$ 1,358,922	2,116,756
Cost of fuel and electricity	\$ 260,652	402,969
Cost of process supplies used	\$ 133,705	205,059
Selling value of products (net)	\$ 964,565	1,467,363

Table 56 - WAGE-EARNERS, BY MONTHS, IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1938 - 1940

Month	1 9 3 8	1 9 3 9	1 9 4 0		
			Surface	Underground	Mill
January	282	216	123	47	182
February	304	238	123	52	177
March	287	248	113	66	213
April	288	270	103	65	191
May	328	425	216	67	199
June	377	485	242	55	175
July	282	451	249	73	226
August	346	474	235	53	229
September	389	453	262	72	270
October	347	488	288	67	259
November	350	481	251	70	260
December	263	473	193	26	232
AVERAGE	323	397	202	60	218

Table 57 - FUEL AND ELECTRICITY USED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1939 and 1940

Kind	Unit of measure	1 9 3 9		1 9 4 0	
		Quantity	Cost	Quantity	Cost
Bituminous coal - Canadian	Ton	4,998	\$ 21,327	22,205	\$ 156,358
Imported	Ton	1,928	9,189	2,105	11,721
Anthracite - From the United States	Ton	4	56	19	240
Other	Ton	7,666	51,759	...	...
Lignite coal	Ton	13,596	34,321	15,611	43,042
Coke	Ton	...	...	2	20
Gasoline	Imp.gal.	61,890	13,276	108,749	25,304
Kerosene or coal oil	Imp.gal.	883	166	3,039	606
Fuel oil and diesel oil	Imp.gal.	1,704,199	76,787	2,533,736	108,488
Wood (cords of 128 cubic feet)	cord	2,433	6,883	2,479	9,045
Gas - Manufactured	M cu. ft.	146,854	18,063	206,302	24,715
Natural	M cu. ft.	...	...	...	...
Other .....	\$	...	4	...	188
Electricity purchased	K.W.H.	2,862,866	28,821	4,635,587	43,242
TOTAL .....	\$	...	260,652	...	402,969
Electricity generated for own use	K.W.H.	1,088,712	...	1,658,894	...

Table 58 -- POWER EQUIPMENT EMPLOYED IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES, 1939 and 1940

Kind	1 9 3 9		1 9 4 0	
	Number of units	Total rated horse power	Number of units	Total rated horse power
Steam engines and steam turbines	3	200	7	130
Diesel engines	13	1,984	13	1,974
Gasoline, gas and oil engines	14	410	13	563
Hydraulic turbines or water wheels	2	150	2	150
Electric motors	173	3,717	187	3,824
Stationary boilers	8	757	8	567

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1940Name of Operator and ProvinceHead Office AddressPlant Location

x Active but not producing.

BARITENOVA SCOTIA -North American Mining & Chemical Corp.Ltd.
Springer Sturgeon Gold Mines Ltd. x4 Poplar St., Halifax
Room 1207 .. 67 Yonge St., Toronto, Ont.Lake Ainslie
WaltonONTARIO -

Meen, Benjamin

Room 607 .. 67 Yonge St., Toronto, Ont.

Tionaga, Ont.

BERYLONTARIO -

Canadian Beryllium Mines & Alloys Ltd. x

901 Royal Bank Bldg., Toronto

Renfrew Co.

DIATOMITENOVA SCOTIA -International Diatomite Industries Ltd.
Wightman, E. W.Tatamagouche
Smith's CoveEast New Annan
Digby Co.BRITISH COLUMBIA -

Fairey & Company

661 Taylor St., Vancouver

Cariboo District

FLUORSPARNOVA SCOTIA -

North American Mining & Chemical Corp.Ltd.

4 Poplar St., Halifax

Lake Ainslie

ONTARIO -Clark, Wm. E.
Dominion Fluorspar Co. Ltd.
Moirs Fluorspar Mining Synd. Ltd.
Stoklosar, Chas. A.Harcourt
Room 712 Royal Bank Bldg., Montreal, Que.
Madoc
Box 198, MadocCardiff Tp.
Madoc Tp.
Huntingdon Tp.
Madoc Tp.GARNETSQUEBEC -

Grenat Canada Ltd.

4203 Brebeuf St., Montreal

Joly Tp.

GRAPHITEONTARIO -

Black Donald Graphite Co. Ltd.

Calabogie

Brougham Tp.

DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1940
(Continued)

<u>Name of Operator and Province</u>	<u>Head Office Address</u>	<u>Plant Location</u>
	x Active but not producing.	
	<u>MAGNESITIC DOLOMITE</u>	
<u>QUEBEC</u> - Canadian Refractories Ltd. International Magnesite Co. Ltd.	1050 Canada Cement Bldg., Montreal Calumet	Kilmar Harrington Tp.
	<u>MAGNESIUM SULPHATE</u>	
<u>BRITISH COLUMBIA</u> - Riley, W. P. x	116 Market Ave., Winnipeg, Man.	Ashcroft
	<u>MINERAL WATERS</u>	
<u>QUEBEC</u> - Abenakis Springs Co. Eau Minerale Etoile	St. François du Lac Ste. Genevieve de Batiscan	Yamaska Co. Ste. Genevieve de Batiscan Yamaska Co.
Embouteillage d'eau Gazeuse Gurd, Charles & Co. Ltd. La Cie d'eau Minerale La Cie Embouteillage St. Laurent MacPeak, T. H. Pellerin, A. Radnor Mineral Water Springs Source Coulombe Usine D'Embouteillage Maski	St. Hyacinthe 1016 Bleury St., Montreal St. Hyacinthe 65 rue St. Pierre 264 Hospital St., Montreal St. Barnabe Nord St. Maurice L'Epiphanie St. Justin	Varenes St. Hyacinthe Rapid Plat Rd. Canton de la Salle St. Barnabe Nord St. Maurice L'Epiphanie St. Justin
<u>ONTARIO</u> - Belleville Aqua Vitae Co. Ltd. Boyd, T. R. Gurd, Charles & Co. Ltd. Renaud, Victor	201 McDonald Ave., Belleville Carlsbad Springs 1016 Bleury St., Montreal, Que. Blackburn	Thurlow Tp. Carlsbad Springs Caledonia Springs Blackburn
	<u>NATURAL ABRASIVES (GRINDSTONES, ETC.)</u>	
<u>NOVA SCOTIA</u> - Chaldercott, Guy (Mic Mac Quarry)	Edgerton	Merigomish Harbour
<u>NEW BRUNSWICK</u> - Read, H. C. (Read Stone Co.)	Stonehaven	Stonehaven
<u>SASKATCHEWAN</u> - Davis, N. B. (✓)	207 Victoria Bldg., Ottawa, Ont.	Gouverneur
	<u>PHOSPHATE</u>	
<u>QUEBEC</u> - Bigelow, R. Bigelow, S. Cross, W. C. Hart, R. Osler, C. E. Poirier, C. Poirier, H. Poulin, Jos. Stewart, Wm. Wallingford, Ed. Wilson, N.	Buckingham Glen Almond Hull La Salette Wilson's Corners Wilson's Corners Wilson's Corners St. Lambert Buckingham Perkins Cantley	Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist. Gatineau--Lievre Dist.

(✓) Shipped grinding pebbles.

Misc. Non-Metallic Minerals

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DIRECTORY OF FIRMS IN THE MISCELLANEOUS NON-METAL MINING INDUSTRIES IN CANADA, 1940
(Concluded)

<u>Name of Operator and Province</u>	<u>Head Office Address</u>	<u>Plant Location</u>
	x Active but not producing.	
<u>SILICA BRICK</u>		
<u>NOVA SCOTIA -</u> Dominion Steel & Coal Corp. Ltd.	Sydney	Sydney
<u>ONTARIO -</u> Algoma Steel Corp. Ltd.	Sault Ste. Marie	Sault Ste. Marie
<u>SODIUM CARBONATE</u>		
<u>BRITISH COLUMBIA -</u> Bishop, Viola C. Davison, E. C. Engman, F. W.	Chasm P.G.E.R.R. 70 Mile P.G.E.R.R. 70 Mile P.G.E.R.R.	Chasm 70 Mile 70 Mile
<u>SODIUM SULPHATE</u>		
<u>SASKATCHEWAN -</u> Alexander, W. R. Horseshoe Lake Mining Co. Ltd. Mallor, John F. Midwest Chemicals Limited Natural Sodium Products Limited	Viscount Ormaiston Alsask Palo Bishopric	Berry Lake Ormiston Alsask Whiteshore Lake Frederick Lake
<u>ALBERTA -</u> Buschert, Iven	Cereal	Cereal
<u>SULPHUR - PYRITES</u>		
<u>QUEBEC -</u> Aldermac Mines Ltd. (a) Noranda Mines Ltd. (a)	941 Dominion Square Bldg., Montreal Royal Bank Bldg., Toronto, Ont.	Rouyn Dist. Noranda
<u>ONTARIO -</u> International Nickel Co. of Canada, Ltd. (b)	Copper Cliff	Copper Cliff
<u>BRITISH COLUMBIA -</u> Consolidated Mining & Smelting Co. of Canada, Ltd. (b) Britannia Mining & Smelting Co. Ltd. (a) Northern Pyrites Ltd. x	Trail Britannia Beach 744 W. Hastings St., Vancouver	Trail Britannia Beach Skeena M.D.

- (a) Produce by-product iron pyrites.
(b) Salvage sulphur from smelter gases.

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