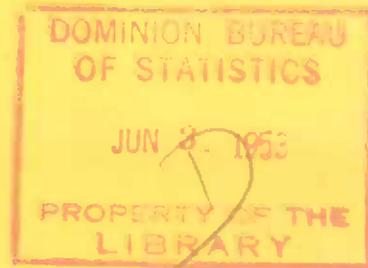


6-220 c.3
~~(D) [unclear]~~

GOVERNMENT OF CANADA



THE MISCELLANEOUS
NON-METAL MINING INDUSTRY
1951



EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1953

THE MISCELLANEOUS NON-METAL
MINING INDUSTRY
1951

Published by
Authority of the Rt. Hon. C. D. Howe
Minister of Trade and Commerce

Prepared in the Mining, Metallurgical and Chemical Section
Industry and Merchandising Division
Dominion Bureau of Statistics
Ottawa

NOTICE

The annual reports prepared by the Industry and Merchandising Division of the Bureau of Statistics are divided into 4 volumes, as follows: **Volume I**—The Primary Industries, including mining, forestry and fisheries; **Volume II**—Manufacturing; **Volume III**—Construction; **Volume IV**—Merchandising and Services. The volumes are made up of parts, and the parts in turn are subdivided according to the industries which they comprise.

Volume I consists of the following parts:

- Part I—Mineral Statistics
- Part II—Forestry Statistics—Operations in the Woods
- Part III—Fisheries Statistics

Part I includes the following reports which constitute the complete series on Mineral Statistics of Canada. Individual reports are issued as the information becomes available; they are arranged in a form suitable for binding.

- A—General Review of the Mining Industry, 50¢.
- B—The Gold Mining Industry, 50¢.
- C—The Silver-Lead-Zinc Mining Industry, 25¢.
- D—The Nickel-Copper Mining, Smelting and Refining Industry, 25¢.
- E—The Miscellaneous Metal Mining Industry, 25¢.
- F—The Non-ferrous Smelting and Refining Industry, 25¢.
- G—The Coal Mining Industry, \$1.00.
- H—The Crude Petroleum and Natural Gas Industry, 25¢.
- I—The Asbestos Mining Industry, 25¢.
- J—The Feldspar and Quartz Mining Industry, 25¢.
- K—The Gypsum Industry, 25¢.
- L—The Peat Industry, 25¢.
- M—The Salt Industry, 25¢.
- N—The Talc and Soapstone Industry, 25¢.
- O—The Miscellaneous Non-Metal Mining Industry, 25¢.
- P—The Cement Manufacturing Industry, 25¢.
- Q—The Clay and Clay Products Industry, 25¢.
- R—The Lime Industry, 25¢.
- S—The Sand and Gravel Industry, 25¢.
- T—The Stone Industry, 25¢.
- U—Contract Diamond Drilling in the Mining Industry, 25¢.

TABLE OF CONTENTS

	Page
Principal statistics.....	0- 5
Arsenious oxide	0- 7
Barite.....	0- 9
Corundum.....	0-11
Diatomite.....	0-11
Fluorspar.....	0-12
Garnet	0-15
Graphite.....	0-15
Grindstones, Pulpstones and Scythestones (natural).....	0-17
Iron oxides (natural)	0-17
Lithium	0-19
Magnesite and Brucite	0-19
Magnesium sulphate (natural).....	0-20
Mica	0-21
Mineral waters (natural)	0-25
Perlite	0-25
Phosphate rock.....	0-26
Silica brick	0-27
Sodium carbonate (natural)	0-28
Sodium sulphate (natural).....	0-28
Strontium	0-34
Sulphur.....	0-30
Vermiculite	0-34
Volcanic dust.....	0-34
Directory of firms.....	0-35

THE MISCELLANEOUS NON-METAL MINING INDUSTRY

1951

Canadian operators which produce certain industrial or non-metallic minerals, and which are usually too few in number to permit the publication separately of complete details of operations, have been classified for statistical purposes to a group which has been designated as the Miscellaneous Non-Metal Mining Industry. Minerals or primary mineral products recovered (or deposits developed) by this industry during 1951 included barite, brucite, diatomite, fluorspar, garnet, graphite, grindstones, dolomitic-magnesite, mineral waters, phosphate rock, silica brick, sodium carbonate and sodium sulphate.

In 1951 there were 20 producing plants or mines in this industry which had a gross value of production of \$8,914,360 compared with \$6,709,579 in 1950.

Salaries and wages paid to the 1,359 employees amounted to \$3,699,789. About \$1,213,201 was paid for fuel, and \$258,089 for 21,393,703 k.w.h. of electricity. Process supplies cost \$925,537 and containers cost \$138,341.

This report also includes data for arsenious oxide, titanium oxide, and sulphur contained in pyrites and smelter gases; these are by-products of the metal mining and smelting industries and output, employment, etc., are credited to the producing industries. Also, for convenience, the statistics for the mica mining industry and for the iron oxides mining industry are published in this report, although they are not included in the figures for the Miscellaneous Non-Metal Mining Industry.

TABLE 1. Principal Statistics Relating to The Miscellaneous Non-Metal Mining Industry, 1949, 1950 and 1951

—	1949	1950	1951
Number of plants	37	36	39
Number of employees:			
Administrative	144	140	132
Workmen	1,016	981	1,227
Total	1,160	1,121	1,359
Salaries and wages:			
Administrative	\$ 388,797	412,968	442,866
Workmen	\$ 2,244,011	2,226,045	3,256,923
Total	\$ 2,632,808	2,640,013	3,699,789
Gross selling value of products	\$ 6,236,811	6,709,579	8,914,360
Cost of fuel and electricity	\$ 1,011,021	1,048,111	1,471,290
Cost of process supplies used	\$ 576,919	696,907	925,537
Cost of containers	\$ 107,820	100,951	138,341
Freight	\$ 79,121	42,286	169,306
Net value of production	\$ 4,461,930	4,821,324	6,209,886

TABLE 2. Production of Miscellaneous Non-Metallic Minerals, 1950 and 1951

Item	1950		1951		
	Quantity	Value	Quantity	Value	
		\$		\$	
Barite	tons	77,177	750,378	96,865	1,115,693
Diatomite	"	49	1,665	92	3,148
Fluorspar	"	64,213	1,553,004	74,211	2,189,875
Garnet (schist)	"	3	240	---	---
Graphite	"	3,586	390,815	1,569	231,167
Grindstones	"	100	10,000	60	6,000
Dolomitic-magnesite	—	—	1,717,879	---	2,437,773
Mineral waters	Imp. gal.	318,829	158,897	325,350	146,971
Phosphate	tons	129	1,070	6	94
Silica brick	M	3,126	408,813	3,510	465,229
Sodium carbonate	tons	—	—	—	---
Sodium sulphate	—	130,730	1,615,867	192,371	2,383,770
Total	—	—	6,608,628	—	8,979,720
Sulphur ¹	tons	301,172	2,189,660	371,790	3,120,785
Iron oxides	"	13,696	262,632	13,342	262,277
Mica	"	1,940	252,611	2,481	447,650
Arsenious oxide ²	"	397	52,029	1,177	129,435
Titanium dioxide ²	"	1,596	149,565	14,123	738,577

1. 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. General statistics relating to production of sulphur are included with those of the copper-gold mining and non-ferrous smelting industries.

2. General statistics relating to arsenious oxide and titanium dioxide are included with the non-ferrous smelting industry.

Note. Value of containers is excluded.

TABLE 3. Workmen, by Months, in the Miscellaneous Non-Metal Mining Industry, 1950 and 1951

Month	1950						1951					
	Mine			Mill		Total	Mine			Mill		Total
	Surface		Under-ground	Male	Female		Surface		Under-ground	Male	Female	
	Male	Female				Male	Female	Male				Female
No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	
January	156	2	141	484	1	784	239	2	295	580	1	1,057
February	159	2	143	528	1	833	255	2	245	577	1	1,080
March	171	2	234	534	1	942	280	2	245	586	1	1,117
April	162	2	238	517	1	920	258	3	248	675	1	1,209
May	197	2	258	516	1	974	284	3	272	668	1	1,242
June	206	2	260	511	1	980	289	3	286	667	1	1,259
July	224	2	259	563	1	1,049	282	3	299	653	1	1,242
August	254	2	264	544	1	1,065	279	3	303	697	1	1,314
September	250	2	260	534	1	1,047	304	4	334	657	1	1,282
October	257	2	257	557	1	1,074	278	4	316	709	1	1,318
November	235	2	239	592	1	1,069	268	3	326	686	1	1,291
December	210	2	234	551	1	998	248	3	333	678	1	1,255
Average	208	2	234	536	1	981	273	3	326	655	1	1,227

ARSENIUS OXIDE

Shipments of arsenious oxide during 1951 amounted to 2,353,367 pounds valued at \$129,435. Included in the output is some arsenic which was recovered from foreign ores. The Canadian and foreign ores are mixed for treatment and separate data are not available.

In Quebec the Consolidated Beattie Mines Ltd. and the O'Brien Gold Mines Ltd., roast their arsenical ores. Both crude and refined grades of arsenic are produced by the Beattie mine but the crude from the O'Brien mine is shipped to the Deloro smelter

for refining. The production from Ontario ores originated in the silver-cobalt ores treated at the Deloro plant. The auriferous quartz ores exported to the United States from British Columbia mines contain considerable amounts of arsenic but no data are available on the possible recovery of this arsenic and, since the Canadian gold mines receive no payment for the arsenic content, it is not credited as commercial production. Because there are only two producers, the figures for refined arsenic are not shown separately.

TABLE 4. Production, Imports and Exports of Arsenic, 1950 and 1951

	1950		1951 ¹	
	Quantity lb.	Value \$	Quantity lb.	Value \$
Production:				
White arsenic (crude and refined)	794,091	52,029	2,353,367	129,435
Imports:				
Arsenic acid	2,114,532	100,960	1,664,855	82,427
Arsenious oxide and arsenic sulphide	16,290	3,229	—	—
Sodium arsenate and sodium stannate	75,020	23,223	148,609	69,278
Arsenate of lead	—	—	4,480	961
Arsenate of lime	—	—	59,080	4,134
Exports:				
Arsenic ²	3,567,400	147,074	4,852,400	199,460

1. Includes some arsenic recovered from foreign ores.

2. Includes arsenic content in gold ores exported from British Columbia as follows: 1949—3,868,300 pounds at \$157,017; 1950—3,206,000 pounds at \$129,692.

TABLE 5. Production, Imports and Exports of White Arsenic, 1942-1951

Year	Production (crude and refined but no duplication)	Imports ¹	Exports	
			Refined	Crude
Pounds				
1942	7,853,123	2,082	2,204,889	5,844,611
1943	3,153,538	400	2,358,400	199,358
1944	2,627,022	2,405	2,016,000	—
1945	2,045,730	—	1,519,697	—
1946	745,885	500	418,000	—
1947	787,736	246,379	130,300	—
1948	1,161,996	84,390	170,800	—
1949	526,645	256,957	12,400	—
1950	794,091	16,290	361,400	—
1951	2,353,367	35,231	1,508,200	334,000

1. Arsenious oxide and arsenic sulphide.

TABLE 6. Consumption of Refined White Arsenic, 1948-1951

Industry	1948	1949	1950	1951
	Pounds			
Glass	432,711	392,560	384,079	362,426
Insecticides ¹	5,390	2	2	2
White metals	30,927	34,828	62,830	99,821
Miscellaneous chemicals	229,561	49,313	107,293	41,308
Total accounted for	698,589	476,701	554,202	503,555

1. Does not include arsenic acid (As_2O_5) imported for use in making insecticides, as follows: 1948—1,395,809 pounds; 1949—1,701,154 pounds; 1950—2,114,532 pounds; 1951—1,664,855 pounds.

2. Included with miscellaneous chemicals total.

TABLE 7. World Production of White Arsenic, by Countries

(Taken from the "Minerals Yearbook", by the United States Bureau of Mines)

Country ¹	1947	1948	1949	1950
	Metric tons			
Argentina ²	3	3	3	3
Australia	1,210	520	257	3
Belgium-Luxembourg	3	151	527	1,909
Brazil	1,001	984	959	3
Canada	357	527	239	245
France	2,510	3,000	3	3
Greece	14	18	13	3
Italy	1,620	1,730	1,440	520 ⁴
Japan	1,407	1,765	2,489	1,627
Mexico	9,685	7,571	3,576	8,987
New Zealand	8	8	19	3
Peru	608	1,011	980	3
Portugal	1,005	1,616	744 ⁵	801
Southern Rhodesia	416	283	148	114
Spain	484	573	124	3
Sweden	16,088	16,979	3	3
Union of South Africa	3	13	—	—
United Kingdom ⁶	91	3	3	3
United States	17,014	16,909	11,607	12,041
Total⁷	56,000	55,000	37,000	43,000

1. Arsenic is also believed to be produced in Austria, China, Czechoslovakia, Germany, Hungary, Iran, Korea, Turkey, and U.S.S.R., but data are not available.

2. Arsenic content of ore mined.

3. Data not available; estimate included in total.

4. January to September, inclusive.

5. Exports.

6. White arsenic, including arsenic soot.

7. Total includes estimates for Austria and Germany but no estimates are included for other countries listed in footnote 1.

BARITE

Shipments of barite from Canadian mines in 1951 amounted to 98,113 tons valued at \$1,131,917 compared with 77,177 tons worth \$750,378 in 1950. The greater portion of Canada's output was produced in Nova Scotia by the Canadian Industrial Minerals, Limited. The Maritime Barytes Limited, commenced milling at Brookfield, Nova Scotia in 1951.

For most industrial purposes barite is used in finely ground form, 325 mesh being the general specification. The material should be of good white colour, the best grades being obtained by wet grinding, bleaching with acid, and water floating. Some off-colour material is used for less exacting purposes.

The content of $BaSO_4$ is usually required to be not less than 95 per cent. Chief uses for ground

barite are as a heavy, inert filler or loader in rubber, asbestos products, paper, linoleum and oilcloth, textiles, leather and plastics. It is one of the leading pigments and extenders in paints, and has become of increasing importance as a heavy weighting medium in oil-well drilling muds to overcome gas pressures. About 5 tons of barite are used for each 1,000 feet of hole drilled. The requirements are a minimum specific gravity of 4.25 (corresponding to a $BaSO_4$ content of 93 per cent) and absence of soluble salts. Considerable barite is used in the glass industry as a batch fluxing ingredient for moulded flint glass, for which purpose it should contain not less than 96 per cent $BaSO_4$, under 3 per cent moisture, and not more than 0.4 per cent iron oxide (Fe_2O_3), with a fineness range of 20 to 100 mesh.

TABLE 8. Production of Barite, 1942-1951

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1942	19,667	188,144	1947	128,675	1,380,753
1943	24,474	279,253	1948	95,747	1,073,380
1944	118,719	1,023,696	1949	47,138	557,662
1945	139,589	1,211,403	1950	77,177	750,378
1946	120,419	1,006,473	1951	98,113	1,131,917

TABLE 9. Imports of Barite, 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942	2,536	68,196	1947	1,737	51,060
1943	1,686	43,239	1948	1,263	39,613
1944	1,824	47,913	1949	934	32,269
1945	1,150	32,531	1950	2,089	70,095
1946	1,547	42,904	1951	1,068	37,471

TABLE 10. Consumption of Barite, 1949-1951

	1949	1950	1951
	Tons		
(a) By Uses:			
Paints	1,202	1,457	1,219
Rubber goods	559	589	375
Glass	184	265	212
Oil well drilling	1,200	1,000	1,976
Miscellaneous	—	821	866
Total	3,145	4,132	4,648
(b) By Provinces:			
Newfoundland	34	19	10
Nova Scotia	18		
Quebec	1,274	1,659	1,517
Ontario	1,329	1,140	890
Manitoba	116	155	112
Saskatchewan	6	1	—
Alberta	297	1,096	2,053
British Columbia	71	62	66
Canada	3,145	4,132	4,648

TABLE 11. World Production of Barite, by Countries, 1947-1950

(Taken from the "Minerals Yearbook" of the United States Bureau of Mines).

Country ¹	1947	1948	1949	1950
	Metric tons			
Algeria	23,692	16,681	16,874	19,890
Argentina	35,000 ²	3	3	3
Australia	5,500	3,831	5,552	6,000 ²
Austria	1,932	3,672	8,004	10,800
Brazil	13,971	10,000 ²	6,010	3
Canada	116,731	86,860	42,763	53,522
Chile	2,546	2,141	1,461	3
Colombia	2,800 ²	120	3	3
Cuba	—	—	—	3
Egypt	167	—	30	3
France	53,970	47,951	32,833	3
French Morocco	—	—	—	4,910
Germany:				
Federal Republic	35,000 ⁴	41,000 ⁴	183,457	3
Soviet Zone	3	3		
Greece	20,000 ²	18,706	15,604	20,799
India	24,700	22,691	21,487	3
Ireland	12,927	7,035	3	3
Israel and Jordan	3	3	3	3
Italy	68,736	62,234	46,616	48,142
Japan	907	3,404	9,322	14,239
Korea:				
Northern	1,000 ²	3	3	3
Southern	—	—	3	3
Leeward Islands: Antigua	14	—	3	3
Peru	6,560	1,787	3	3
Portugal	1,211	406	3	3
South-West Africa	—	—	48	—
Southern Rhodesia	18	51	488	261
Spain	19,817	14,153	7,665	3
Swaziland	172	98	104	441
Sweden	1,319	1,914	3	3
Tunisia	470	230	630	25
Union of South Africa	2,672	1,734	2,222	2,268
United Kingdom ⁵	96,267	3	3	3
United States	802,146	705,642	663,428	629,060
Total⁶	1,395,000	1,320,000	1,255,000	1,210,000

1. In addition to countries listed, barite is produced in Belgium, China, Czechoslovakia, Mexico, Norway, Pakistan, Switzerland, U.S.S.R. and Yugoslavia, but production data are not available.

2. Estimate.

3. Data not available; estimate included in total.

4. United States zone.

5. Includes witherite.

6. Estimate; excludes countries listed in footnote 1.

CORUNDUM

No corundum has been produced in Canada since October, 1946, when treatment of the old tailings at the Craigmont property, Renfrew county, Ontario, for the recovery of corundum was completed. This operation was undertaken during the war at the request of the United States Government. During the two years of operation about 2,600 tons of concentrate were shipped from the Craigmont property to American Abrasive Company, Westfield, Massachusetts, the only handler of corundum on the continent.

The main and only zone from which production has been obtained is in a belt 100 miles long and 6 miles wide in Haliburton, Hastings, and Renfrew counties in Ontario. Several of the numerous de-

posits examined recently contain fair amounts of corundum, the most promising being an extensive deposit in Monteagle township on the east side of the York River, about 10 miles northeast of Bancroft. (For a description of corundum-bearing nepheline syenite belts of south and eastern Ontario, see report No. 820 "The Corundum Mineral Industry in 1945", page 53, issued by the Bureau of Mines, Ottawa.) It is doubtful, however, if the production of corundum alone would be economic and consequently marketable by-products would be necessary. Present indications are that a large tonnage of good quality nepheline feldspar product suitable for the glass trade, as well as fine mica for fillers and for backing, can be extracted from the Monteagle deposit, in addition to high-quality fine-grained corundum.

DIATOMITE

All of the Canadian production of diatomite since 1939 has come from deposits in the swamps and lake bottoms of northern Nova Scotia, in southern British Columbia, in the Muskoka area, Ontario, and in various parts of British Columbia. Production in 1951 amounting to 92 tons came from two deposits, one at Digby Neck, Nova Scotia, operated by G. Wightman, and the other on the west bank of the Fraser River, north of Quesnel, British Columbia, operated by L.T. Fairey of Vancouver. The Tertiary fresh-water deposits near Quesnel in the Cariboo area are by far the largest known in Canada; they extend for many miles along the Fraser River, are compact, and are up to 40 feet thick. At Digby Neck, Nova Scotia, is the largest known recent fresh-water (swamp) deposit in Canada.

Diatomite is used as a fertilizer dusting agent, for filtration, and as a filler in the paint, chemical, paper, rubber and textile industries. Small amounts are used in silver polish bases, and as an admixture

in concrete. A small amount of lime-diatomite insulation bricks is made by a company in Toronto which uses diatomite from Nova Scotia. Diatomite is being used in pressure filters in industrial plants in place of sand filters for the removal of disease-producing organisms.

The ammonium nitrate fertilizers in which diatomite is used as a dusting agent are made in Canada by The Consolidated Mining and Smelting Company of Canada Limited in its plants at Trail, British Columbia, and at Calgary, Alberta; and by North American Cyanamid, Limited, in its plant near Welland, Ontario. The diatomite thus used is highly porous and when added to the nitrate it absorbs moisture and coats the small grains or nitraprills which prevents caking and ensures even spreading. Specifications call for uncalcined material of 325 mesh and less than 5 per cent moisture. Much of the output of these fertilizers is exported.

TABLE 12. Production of Diatomite, 1942-1951

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1942	365	9,088	1947	103	2,677
1943	98	3,331	1948	46	1,487
1944	13	437	1949	60	1,703
1945	46	1,238	1950	49	1,655
1946	90	2,532	1951	92	3,148

TABLE 13. Consumption of Infusorial Earth in the Sugar Refining Industry, 1941-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1941.....	2,672	138,973	1946.....	2,196	104,794
1942.....	1,504	75,295	1947.....	2,490	141,885
1943.....	1,726	89,075	1948.....	2,865	167,259
1944.....	2,188	115,053	1949.....	2,871	187,508
1945.....	1,992	102,961	1950.....	2,989	205,856
			1951.....	2,322	169,743

TABLE 14. Consumption of Diatomaceous Earth in the Manufacture of Fertilizers, 1947-1951

Year	Tons	Value
		\$
1947.....	7,488	295,773
1948.....	7,653	316,383
1949.....	7,469	324,702
1950.....	7,861	344,461
1951.....	7,352	350,685

TABLE 15. Imports of Diatomaceous Earth, 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942.....	4,294	155,802	1947.....	15,074	431,125
1943.....	5,623	184,010	1948.....	17,050	512,115
1944.....	11,664	335,939	1949.....	16,914	551,954
1945.....	13,217	362,882	1950.....	18,247	599,216
1946.....	17,063	469,968	1951.....	21,069	709,433

FLUORSPAR

Shipments of fluorspar by Canadian producers during 1951 amounted to 74,211 tons valued at \$2,189,875 compared with 64,213 tons worth \$1,553,004 in the preceding year. Over 90 per cent of the output came from the fluorspar deposits at St. Lawrence, Newfoundland. Ontario's production originated in the Madoc area.

Fluorspar is used chiefly as a powerful fluxing agent in the steel industry, and is used in small

amounts in numerous other metallurgical industries. The next largest market is in the manufacture of hydrofluoric acid, which is used mainly in making artificial cryolite and aluminum fluoride for the aluminum industry; the fluorspar from Newfoundland is used for this purpose at Arvida, Quebec. The ceramic industry is next, using fluorspar as a fluxing and opacifying ingredient in glass and enamels. Uranium hexafluoride is used for the gaseous diffusion separation of the uranium isotopes U235 and U238 in the development of atomic energy.

TABLE 16. Principal Statistics of the Fluorspar Mining Industry, 1949-1951

	1949	1950	1951
Active firms	5	5	5
Employees:			
Administrative	32	36	22
Workmen	282	296	381
Total	314	332	403
Salaries and wages:			
Administrative	\$ 86,052	111,099	75,960
Workmen	\$ 546,112	615,405	982,588
Total	\$ 632,164	726,504	1,058,548
Gross value of production	\$ 1,592,908	1,553,004	2,189,875
Cost of fuel and electricity	\$ 139,205	146,433	156,330
Cost of process supplies	\$ 48,785	60,926	85,179
Freight on material shipped	\$ —	—	75,009
Net value of production	\$ 1,404,918	1,345,645	1,873,357

TABLE 17. Production of Fluorspar, 1942-1951

Year	Short tons	Selling value, f.o.b. works	Year	Short tons	Selling value, f.o.b. works
		\$			\$
1942	6,199	146,039	1947	7,186	209,886
1943	11,210	318,424	1948	11,340	344,834
1944	6,924	217,701	1949	64,477	1,592,908
1945	7,369	233,708	1950	64,213	1,553,004
1946	8,042	237,491	1951	74,211	2,189,875

TABLE 18. Imports of Fluorspar, 1942-1951

Year	Tons	\$	Year	Tons	\$
1942	47,784	1,046,526	1947	32,001	702,419
1943	77,436	1,738,669	1948	48,925	1,105,190
1944	37,100	840,309	1949	2,510	81,650
1945	20,517	530,670	1950	1,572	66,823
1946	31,813	717,094	1951	8,188	239,120

TABLE 19. Consumption of Fluorspar, 1949-1951

	1949	1950	1951
	Tons		
(a) By Uses:			
Steel	21,136	21,800	23,374
Glass	432	484	586
Enamelling and glazing	297	229	300
Heavy chemicals	32,947	29,620	33,266
White metal alloys	14	4	—
Total	54,826	52,137	57,526
(b) By Provinces:			
Nova Scotia	8,522	8,570	8,928
Quebec	30,629	27,670	30,695
Ontario	15,357	15,598	17,507
Manitoba	313	214	285
Alberta	—	—	57
British Columbia	5	85	54
Total	54,826	52,137	57,526

TABLE 20. World Production of Fluorspar, by Countries

(Taken from the "Minerals Yearbook" by the United States Bureau of Mines)

Country ¹	1947	1948	1949	1950
	Metric tons			
Argentina (shipments)	2,400	2	2	2
Australia:				
Queensland	887	361	571	2
Victoria	332	159	—	2
Bolivia (exports)	28	227	264	2
Brazil	841	751	537	2
Canada:				
Newfoundland	36,191	47,833	50,417	} 50,107
Other provinces	6,519	10,287	5,795	
France	31,596	32,388	39,954	2
French Morocco	—	—	445	40
Germany:				
Federal Republic	19,235	37,549	33,871	2
Soviet Zone	21,000	2	2	2
India	2	2	2	2
Italy	20,800	39,540	17,746	31,611
Japan	61	68	960	2,425
Korea:				
North	2	2	2	2
South	2,600	—	1,230	2
Mexico (exports)	45,737	75,381	55,772	65,667
Norway	1,089	1,120	2	2
Southern Rhodesia	154	12	239	447
Spain	13,885	42,549	59,594	32,669
Sweden	2,780	4,303	2	2
Tunisia	—	560	352	—
Union of South Africa	4,815	3,754	4,857	7,200 ³
United Kingdom	45,016	71,124	67,575	2
United States (shipments)	298,901	300,956	214,733	273,524
Total (estimate)	648,000	791,000	673,000	758,000

1. In addition to countries listed, China and U.S.S.R. produce fluorspar, but data on output are not available, estimates included in total.

2. Data not available; estimates included in total.

3. Estimate.

GARNET

In 1951 there was no garnet mined in Canada. In earlier years the Niagara Garnet Company mined a deposit near River Valley in Danatowship, Ontario. The ore was crushed and concentrated at the firm's mill located at Sturgeon Falls.

Garnet is used for making abrasive-coated papers and cloth, which in turn are used mainly in the wood-working and shoe-leather industries. Garnet flour or superfine grade is used as a partial substitute for corundum flour for polishing optical lenses.

GRAPHITE

Production of graphite in Canada came from the Black Donald Mine, Renfrew county, Ontario, the only operating property in Canada. This property has been sold to the Hydro-Electric Commission of Ontario, in connection with water power development on the Madawaska River. Completion of the project will result in flooding a part of the property, but the Black Donald mine retains the right to operate until the land is actually required for flooding purposes.

Graphite has many uses, but is employed principally in foundry facings, lubricants, crucibles, retorts and stoppers, packings, pencils and crayons, paints, and stove polish. Important quantities, mostly amorphous or artificial, are used in dry batteries, electrodes, and commutator brushes. Flake from the

Black Donald deposit is too small for crucible use and finished products consist mainly of amorphous foundry grades, but include high-grade fine flake and dust sold for use in lubricants, packings, and polishes. Prepared facings for the domestic foundry trade also are made.

In Canada, graphite is used chiefly in the foundry, dry battery, packings, lubricants, and paint trades. Foundry needs are met in part by domestic production, and in part by plumbago from Ceylon. The battery trade uses mainly Mexican amorphous, and paint requirements are filled largely by low-grade amorphous flake. American imports of Canadian graphite are used chiefly in foundry facings, lubricants, and pencils.

TABLE 21. Mine Shipments of Graphite, 1942-1951

Year	Short tons	\$	Year	Short tons	\$
1942	1,192	117,904	1947	2,398	207,364
1943	1,903	197,431	1948	2,539	239,931
1944	1,582	179,457	1949	2,147	212,496
1945	1,910	187,364	1950	3,586	390,315
1946	1,975	180,405	1951	1,569	231,167

TABLE 22. Imports and Exports of Graphite¹, 1949-1951

	1949	1950	1951
	\$	\$	\$
Imports:			
Plumbago, not ground	83,301	71,440	96,725
Crucibles, plumbago, and covers.....	128,696	164,142	215,297
Plumbago, ground, and manufactures of	293,267	330,442	476,511
Exports:			
Graphite, crude and refined	166,224	313,457	156,536
Carbon and graphite electrodes.....	1,158,499	1,194,964	1,805,834

1. Includes artificial graphite.

TABLE 23. Available Data on the Consumption of Graphite, 1948-1950

	1948	1949	1950
		Pounds	
By Industries:			
Iron and steel foundries	2,310,375	2,665,000	2,541,000
Paints	165,699	143,000	104,000
Electrical apparatus	1,401,254	250,000	692,000
Heavy chemicals	300,852	372,000	535,000
Prepared foundry facings	1,091,280	444,000	440,000
Polishes	47,937	54,000	66,000
Brass and bronze foundries	59,416	63,000	59,000
Total for above industries	5,376,613	3,991,000	4,437,000
By Provinces:			
Newfoundland	—	3,000	11,000
Nova Scotia	20,345	9,000	
New Brunswick	3,107	3,500	2,000
Quebec	1,344,380	1,048,000	948,000
Ontario	3,765,538	2,655,000	3,234,000
Manitoba	42,088	47,500	51,000
Saskatchewan	6,050	6,700	7,000
Alberta	15,085	21,300	16,000
British Columbia	180,020	197,000	168,000
Total	5,376,613	3,991,000	4,437,000

TABLE 24. World Production of Natural Graphite, by Countries

(Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country ¹	1947	1948	1949	1950
	Metric tons			
Argentina	²	²	²	²
Australia	308	235	126	62 ³
Austria	3,845	11,300	14,093	14,685
Brazil (exports)	129	83	137	²
Canada	2,175	2,303	1,948	3,231
Ceylon (exports)	9,150	14,221	12,437	13,030
China	---	---	²	²
Czechoslovakia	7,000	15,000	²	²
Egypt	---	50	---	---
French Morocco	400	284	72	75
Germany:				
Federal Republic	4,930	5,757	5,097	6,200 ⁴
India	1,255	1,675	988	²
Italy	3,845	6,743	4,011	3,855
Japan	10,584	9,132	5,100	3,804
Kenya	---	---	---	²
Korea	10,000 ⁴	15,454 ⁵	40,671 ⁵	²
Madagascar	5,170	8,438 ⁶	9,767 ⁶	12,757 ⁶
Malaya	---	---	²	²
Mexico	27,984	35,261	23,812	24,626
Mozambique	126	90	110	²
Norway	2,481	1,083	2,196 ⁶	1,902 ⁶
South-West Africa	1,639	1,627	2,264	1,380
Spain	309	241	256	313
Spanish Morocco	150	25	15	²
Sweden	---	---	---	²
Union of South Africa	221	172	107	244
United States	3,980	9,026	5,536	4,628
Total (estimate)¹	---	---	---	---

1. In addition to countries listed, graphite has been produced in Bulgaria, Finland, French Equatorial Africa, Greenland, Nyasaland, Peru, Uruguay, and U.S.S.R., but production data are not available. No estimates for these countries are included in totals.

2. Data not available: estimates included in total.

3. Excluding South Australia.

4. Estimate.

5. South Korea only.

6. Exports.

GRINDSTONES, PULPSTONES AND SCYTHESTONES

Sandstone beds in Nova Scotia, New Brunswick and British Columbia contain material suitable for grindstones. The output is only from the New Brunswick coast where the stones are removed along the

shore area of the Bay of Chaleur. During 1951 the shipments of grindstones amounted to 60 tons valued at \$6,000 compared with 100 tons valued at \$10,000 in the preceding year.

TABLE 25. Production of Grindstones, Pulpstones and Scythestones, 1942-1951

Year	Tons	\$	Year	Tons	\$
1942	216	10,000	1947	335	21,475
1943	164	6,225	1948	220	20,100
1944	225	12,000	1949	195	12,450
1945	225	10,970	1950	100	10,000
1946	295	17,450	1951	60	6,000

TABLE 26. Purchases of Pulpstones by the Canadian Pulp and Paper Industry, 1946-1951

Year	Number for 2 ft. wood	Value	Number for 2.5 ft. wood	Value	Number for 4 ft. wood	Value
		\$		\$		\$
1946	233	121,705	41	16,868	139	349,866
1947	258	153,075	35	22,629	153	409,060
1948	201	146,328	38	34,339	127	372,453
1949	105	102,685	26	29,650	95	295,664
1950	136	101,029	12	8,773	124	378,950
1951	107	111,295	25	34,251	155	511,676

IRON OXIDES

Ochreous iron oxides shipped during 1951 amounted to 13,342 tons valued at \$262,277 compared with 13,696 tons valued at \$262,632 in 1950. All production came from deposits in Quebec. The depletion of ore stopped operations in British Columbia.

The ochreous iron oxide used in the manufacture of paints is largely in the calcined form. However, a small quantity of natural iron oxides associated with clay-like materials in the form of umbers and siennas is also used as pigments in paints, both in the raw and calcinated state.

Iron oxide pigments are used also as colouring agents and fillers in the manufacture of imitation leather, shade cloth, shingle stain, paper and cardboard. Siennas and umbers are used in wood stains and wood fillers. The natural ochre is used as a pigment for linoleum and oilcloth; as a pigment in wood stains and wood fillers; and in colouring cement, stuccos, and mortar.

A portion of iron oxide mined in Quebec and nearly all of that mined in British Columbia is used for the purification of illuminating gas.

TABLE 27. Principal Statistics of The Natural Iron Oxides Industry, 1949-1951

	1949	1950	1951
Number of firms.....	8	5	5
Number of employees:			
Administration.....	7	5	5
Workmen.....	37	39	38
Total	44	44	43
Salaries and wages:			
Administration..... \$	12,301	8,737	12,864
Workmen..... \$	50,810	61,667	74,419
Total \$	73,111	70,404	87,283
Gross selling value of products..... \$	207,887	262,632	262,277
Cost of fuel and purchased electricity..... \$	20,692	23,405	22,896
Cost of process supplies..... \$	4,424	3,049	3,651
Freight..... \$	15,290	10,906	15,878
Net value of production..... \$	167,481	225,272	219,852

TABLE 28. Production of Natural Iron Oxides, 1942-1951

Year	Quantity	Value	Year	Quantity	Value
	Short tons	\$		Short tons	\$
1942.....	9,304	151,653	1947.....	13,418	258,322
1943.....	8,401	135,893	1948.....	13,181	203,391
1944.....	8,599	150,250	1949.....	13,625	207,887
1945.....	10,314	172,053	1950.....	13,696	262,632
1946.....	12,695	152,268	1951.....	13,342	262,277

TABLE 29. Imports and Exports of Ochres and Colours, 1950 and 1951

	1950		1951	
	Quantity	Value	Quantity	Value
	Tons	\$	Tons	\$
Imports:				
Ochres, ochrey earths, siennas and umbers.....	1,544	89,043	1,470	83,629
Oxides, fireproofs, rough stuff, fillers and colours, dry, n.o.p.	4,096	2,980,758	4,552	3,460,568
Exports:				
Iron oxides.....	3,934	411,895	3,646	449,745

TABLE 30. Consumption of Iron Oxides in Specified Canadian Industries, 1947-1951

Year	Coke and gas		Paints and varnishes			
			Iron oxide pigments		Ochres, siennas and umbers	
	Quantity	Value	Quantity	Value	Quantity	Value
	Tons ¹	\$	Tons	\$	Tons	\$
1947.....	10,105	78,244	2,865	339,151	404	57,876
1948.....	9,157	77,035	2,222	302,562	306	47,379
1949.....	8,189	77,824	2,045	291,378	260	48,240
1950.....	11,624	114,138	2,453	378,423	268	51,514
1951.....	10,310	105,709	2,946	467,059	249	50,851

1. Oxide and purifying materials.

LITHIUM MINERALS

Amblygonite, spodumene, and lepidolite are the chief lithium minerals of commerce; their ores contain, respectively, about 8, 6 and 4 per cent of lithium oxide. Spodumene is in greatest supply, and is the base raw material for the manufacture of many lithium salts, lithium metal, and alloys. Amblygonite has similar uses, but is scarcer and more expensive. Lepidolite, or lithia mica, is employed mainly in the natural state as a batch ingredient in glass. The occurrence of all three minerals is confined to pegmatite dykes of a definite type, which usually have a localized, regional distribution and often carry, also, important amounts of beryl and tantalite-columbite. In some cases, such dykes have been worked for the recovery of all of these minerals.

There has been no recorded production of lithium minerals in Canada since 1937, when 32 tons of amblygonite and spodumene valued at about \$1,700

were shipped, and little if any lithium ore is known to be used or required for any purpose in the Dominion. Thus, an outside market would have to be found for any production. Considerable development work has been done in recent years, however, on deposits in the Pointe du Bois area in southeastern Manitoba; increased interest was shown in the commercial possibilities of lithium deposits in other sections of that province though activities have been confined to exploratory drilling. Some attention has been given, also, to lithium-bearing deposits in the Yellowknife-Beaulieu area in the Northwest Territories, and in LaCorne township in northwestern Quebec.

Total production in Canada during the active period 1925-1937, inclusive, has been estimated at about 250 tons, and comprised lepidolite, spodumene, and amblygonite. Most of the material was exported to the United States.

MAGNESITE AND BRUCITE

Dolomitic magnesite is quarried at Kilmar, Argenteuil county, Quebec, by Canadian Refractories Limited, and is processed there into basic refractory products. These include dead-burned grain material, bricks and shapes (burned and unburned), and finely ground refractory cements.

Brucitic limestone, a rock composed of granules of the mineral brucite (magnesium hydroxide) thickly distributed throughout a matrix of calcite, is quarried

from large deposits near Wakefield, Quebec, by Aluminum Company of Canada, Limited, and is processed there for the recovery of magnesia and lime. The magnesia was used in part by the company for making magnesium metal at Arvida, Quebec, but the major part of the output is sold for the manufacture of basic refractories and for use as fertilizer. Hydrated lime, the co-product, is produced in the process of recovering the magnesia and is sold for the various purposes for which lime is used.

TABLE 31. Production of Dolomitic Magnesite, 1942-1951

Year	Value	Year	Value
	\$		\$
1942	1,059,374	1947	1,167,584
1943	1,260,056	1948	1,587,709
1944	1,139,281	1949	1,536,200
1945	1,278,596	1950	1,717,879 ¹
1946	1,225,593	1951	2,437,773 ¹

1. Includes some metallic magnesium.

Note. Above figures include the value of brucite shipped.

TABLE 32. Magnesite and Dolomite Used in the Canadian Primary Iron and Steel Industry, 1947-1951

Year	Calcined dolomite		Dolomite, crude		Magnesite	
	Short tons	Value	Short tons	Value	Short tons	Value
		\$		\$		\$
1947	6,748	124,107	188,449	357,288	18,261	783,336
1948	9,587	198,040	226,683	539,522	18,334	888,755
1949	25,769	533,679	233,372	569,348	17,094	843,274
1950	29,857	648,830	255,616	611,762	14,315	711,658
1951	32,852	755,989	290,052	692,684	18,240	995,071

TABLE 33. Calcined Magnesite Used by the Artificial Abrasives Industry, 1947-1951

Year	Tons	Value
		\$
1947	1,832	195,586
1948	3,284	389,335
1949	1,416	156,290
1950	2,510	291,566
1951	3,688	407,191

MAGNESIUM SULPHATE

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 a considerable production from several of the "lakes" in British Columbia. Experimental shipments have been made also from one of the lakes in Saskatchewan.

Canada's output of magnesium sulphate has come chiefly from a deposit in Basque, British Columbia, production from which was discontinued in the autumn of 1942. The salt was refined at Ashcroft, 15 miles south of the deposit, and the grade of the product was high. The refinery, now owned by Ashcroft Salts Company, Limited, had a capacity of 10 tons of salt a day. There are a number of other occurrences in British Columbia, near Clinton, north of Kamloops, and in Kruger's Pass, south of Penicton.

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 sulphates, which at certain times of the year crystallizes into a bedded deposit with layers of both salts.

In the chemical industries Epsom salts has many uses. It is employed for tanning and in dyeing, and for textile and medicinal use. Magnesium sulphate is used in the paper industry for weighting paper. In the sole leather industry it is used to obtain a clean shiny cut, and it also helps to retain moisture in the leather and increases its weight. Magnesium salt is used to a small extent in the dyeing industry. In some cases it is used in the treatment of leather to increase the fastness of the colour in washing. It is used extensively and in large quantities in medicine and for various purposes in the manufacture of textiles. In bleaching wool, magnesium sulphate is added to destroy the corrosive effect of sodium peroxide. It is also used for weighting textile fabric, especially silk. Mixed with gypsum and ammonium sulphate, it is used in the manufacture of non-inflammable fabrics.

TABLE 34. Production of Natural Magnesium Sulphate¹, 1941-1951

Year	Tons	Value
		\$
1941	265	7,343
1942	1,140	38,760
1943-1951	—	—

1. Produced entirely in British Columbia.

TABLE 35. Imports of Magnesium Sulphate, 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942	1,688	68,532	1947	2,908	108,840
1943	3,379	137,372	1948	2,797	118,792
1944	2,684	108,795	1949	2,783	120,881
1945	2,545	101,695	1950	2,793	100,644
1946	3,463	132,342	1951	3,065	95,005

TABLE 36. Available Data on Consumption of Magnesium Sulphate, 1949-1951

Industry	1949	1950	1951
	(tons)		
Leather tanneries	723	673	554
Medicinals	645	570	570
Fertilizers	150	81	81
Textiles	19	42	36
Total accounted for	1,537	1,366	1,241

MICA

Shipments of mica by Canadian producers in 1951 amounted to 4,961,508 pounds valued at \$447,650, compared with 3,879,209 pounds valued at \$252,611 in 1950. Quebec mines shipped 3,329,418 pounds

worth \$125,753 while producers in Ontario shipped 1,025,090 pounds valued at \$314,435. The shipments of schisted mica in British Columbia amounted to 607,000 pounds valued at \$7,462.

TABLE 37. Principal Statistics of the Mica Mining Industry, 1949-1951

	1949	1950	1951
Number of firms or operators	34	26	31
Number of employees:			
Administrative	6	10	3
Workmen	90	90	135
Total	96	100	138
Salaries and wages:			
Administration	\$ 12,163	\$ 27,999	\$ 2,673
Workmen	\$ 103,504	\$ 108,728	\$ 179,360
Total	\$ 115,667	\$ 136,727	\$ 182,033
Gross selling value of products	\$ 108,458	\$ 252,611	\$ 447,650
Cost of fuel and electricity	\$ 14,490	\$ 18,620	\$ 14,580
Cost of process supplies used	\$ 6,026	\$ 28,768	\$ 18,148
Net value of production	\$ 87,942	\$ 205,223	\$ 414,922

TABLE 38. Mica Production (Primary Sales), by Classes, 1950 and 1951

Grade	1950		1951	
	Pounds	Total value f.o.b. shipping point	Pounds	Total value f.o.b. shipping point
		\$		\$
Rough, mine-run or rifted.....	20	4	274,980	48,646
Mica sold for mechanical splitting	104,400	17,062	108,331	17,350
Splittings.....	2,100	1,785	6,302	5,421
Ground or powdered	2,215,919	58,253	2,062,854	75,140
Scrap—mine or shop waste and mica mined and sold for grinding	1,376,040	11,651	2,278,009	12,784
Trimmed mica	180,730	153,856	230,532	288,309
Total mica shipments	3,879,209	252,611	4,961,508	447,650
Varieties:				
Phlogopite mica (amber) and biotite	3,236,430	118,594	3,559,426	129,658
Muscovite mica (white)	642,779	134,017	1,402,082	317,992

TABLE 39. Production of Mica, by Provinces and by Varieties, 1951

Province	Phlogopite and biotite		Muscovite		Total	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Quebec	3,329,418	125,753	—	—	3,329,418	125,753
Ontario	230,008	3,905	795,082	310,530	1,025,090	314,435
British Columbia.....	—	—	607,000	7,462	607,000	7,462
Total Canada.....	3,559,426	129,658	1,402,082	317,992	4,961,508	447,650

TABLE 40. Production of Mica, 1942-1951

Year	Short tons	\$	Year	Short tons	\$
1942	3,010	383,567	1947	4,159	200,903
1943	4,025	553,856	1948	3,951	219,948
1944	3,342	841,026	1949	1,745	108,458
1945	3,522	233,270	1950	1,940	252,611
1946	4,360	199,039	1951	2,481	447,650

TABLE 41. Imports and Exports of Mica, 1949-1951

	1949		1950		1951	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Imports:						
Mica and manufactures of, n.o.p.	—	567,469	—	757,825	—	976,467
Exports:						
Mica, scrap and waste	678,300	3,526	1,183,000	12,585	980,400	10,555
Mica splittings	—	—	—	—	—	—
Mica manufactures	—	3,426	—	1,475	—	2,217
Mica, rough, untrimmed	78,000	12,983	164,800	27,983	246,700	49,060
Mica, trimmed	97,900	26,571	67,300	96,481	430,700	378,846
Mica, ground	460,000	17,086	560,000	28,117	775,000	44,090
Total mica exports	—	67,018	—	166,641	—	484,768

TABLE 42. Consumption of Mica, in Specified Industries, as Reported to The Annual Census Of Industry, 1948-1950

	1948	1949	1950
		Pounds	
By Industries:			
Paints	582,417	1,137,583	1,680,720
Electrical apparatus	402,877	531,149	485,602
Rubber goods	435,308	383,361	349,792
Roofing	1,742,000	2,284,000	1,068,000
Wallpaper	230,000	158,000	184,000
Mica products	100,007	105,534	118,108
Total accounted for	3,492,609	4,599,627	3,886,222
By Provinces:			
Nova Scotia	—	—	50
Quebec	1,761,832	2,755,660	1,932,804
Ontario	1,169,123	1,243,945	1,264,158
Manitoba	3,150	6,067	5,568
British Columbia	558,504	593,955	683,642
Canada	3,492,609	4,599,627	3,886,222

TABLE 43. World Production of Mica by Countries, 1947-1950

(Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country ¹	1947	1948	1949	1950
	Metric tons			
North America:				
Canada (sales)	3,773	3,584	1,583	1,634
Mexico (exports)	231	2	2	2
United States:				
Block	189	122	233	262
Scrap	45,175	47,316	29,806	62,922
South America:				
Argentina	2	2	273 ³	308 ³
Bolivia (exports)	—	—	2	2
Brazil	1,226	1,898	558 ³	2
Peru	2	—	—	2
Uruguay	14	2	2	1
Europe:				
Austria	78	95	253	368
Italy	16	23	2	2
Norway (exports)	169	241	113	571
Portugal	3	—	—	2
Spain	12	12	9	14
Sweden	155	64	61	2
Asia:				
Ceylon	2	—	—	—
India (exports)	9,788	18,384	13,743	15,874
Korea:				
North	2	2	2	} 2
South	—	—	—	
Africa:				
Angola	89	108	57	24
Eritrea	3	4	4	4
French Morocco	—	144	54	82
Kenya	—	2	4	6
Madagascar	450	507	959	802
Mozambique	1	1	103	40
Northern Rhodesia	—	—	3	2
Southern Rhodesia	296	293	303	407
Tanganyika (exports)	71	75	99	136
Uganda	—	2	2	2
Union of South Africa	2,008	1,362	1,066	1,371
Oceania:				
Australia	371	427	736	450 ⁵
New Zealand	—	—	—	2
Total (estimate)¹	77,000	87,000	64,000	100,000

1. In addition to countries listed, mica is also produced in China, Colombia, Ethiopia, Romania and U.S.S.R., but data on production are not available; estimates for these countries are included in total.

2. Data not available; estimate included in total.

3. Exports.

4. Less than 1 ton.

5. Estimate.

NATURAL MINERAL WATERS

Production of natural mineral waters in past 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'Épiphanie. 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 Fraser Valley and the Halcyon Hot Springs on Arrow Lake are noted for their curative properties.

There were 14 firms reporting production of natural mineral waters in the Dominion in 1951. Twelve of these firms were in Quebec and 2 in Ontario.

TABLE 44. Shipments of Natural Mineral Waters from Canadian Springs, 1942-1951

Year	Quebec		Ontario		Canada	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		\$		\$		\$
1942.....	129,062	60,316	28,023	14,189	157,085	74,505
1943.....	125,605	61,793	14,006	5,748	139,611	67,541
1944.....	148,965	88,113	7,185	805	156,150	88,918
1945.....	236,476	148,714	8,285	976	244,761	149,690
1946.....	211,842	121,526	6,000	878	217,842	122,404
1947.....	195,452	116,840	3,500	600	198,952	117,440
1948.....	190,136	109,789	2,400	470	192,539	110,259
1949.....	304,216	145,830	2,475	410	306,691	146,240
1950.....	316,654	158,457	2,175	440	318,829	158,897
1951.....	322,800	146,521	2,500	450	325,300	146,971

PERLITE

Perlite is a volcanic glass characterized by a concentric "onion skin" fracture and usually a 2 to 5 per cent water content. When heated rapidly in a furnace it expands into a frothy material of low density.

Commercially expanded perlite is granular material and is generally white. Because of its cellular nature it is light in weight and has good insulating and sound-proofing qualities. Expanded perlite is used chiefly in lightweight concrete aggregates, insulating and sound-proofing pre-cast

wallboard, and in lightweight plaster. A sack of expanded perlite containing 3 cubic feet weighs approximately 30 to 36 pounds.

Development work has been done on deposits of perlite at François Lake, B.C., about eighteen miles by road from Burns Lake on the C.N.R. Other deposits have been found in British Columbia at Empire Valley northwest of Clinton.

There was one plant in Montreal producing insulation from imported perlite.

PHOSPHATE

Phosphate in the form of apatite was mined in Canada on a fairly substantial scale up to 1895, but since then the production has been small and spasmodic. In 1951 about 6 tons were shipped.

There has been renewed activity at the High Rock and Big Union mines near Notre Dame de la Salette in the Buckingham-Quebec area. It is expected that an economical separation process may be developed to produce a high grade material. In Ontario some development work was done in Bedford township.

For many years, the Electric Reduction Company Limited, Buckingham, Quebec, has purchased most of the small output for use in the production of elemental phosphorus and various phosphorus compounds. This company, however, obtains most of its phosphate rock requirements from Florida. That state and Montana supply the great bulk of the phosphate rock which Canada imports for the manufacture of fertilizer, occasional shipments being obtained also from North Africa. Rock low in fluorine is obtained from Curacao, Netherlands West Indies, for use in stock feeds.

TABLE 45. Production of Phosphate Rock, 1942-1951

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1942.....	1,264	17,431	1947.....	—	—
1943.....	1,451	18,385	1948.....	—	—
1944.....	482	6,716	1949.....	20	291
1945.....	299	4,356	1950.....	129	1,070
1946.....	57	869	1951.....	6	94

TABLE 46. Imports of Phosphate Rock, 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942.....	271,373	1,053,229	1947.....	485,391	2,857,522
1943.....	260,846	1,085,080	1948.....	482,008	2,911,168
1944.....	388,247	1,710,378	1949.....	620,808	3,879,523
1945.....	317,695	1,450,580	1950.....	491,026	3,296,341
1946.....	373,677	2,164,841	1951.....	499,711	3,178,899

TABLE 47. Consumption of Phosphate Rock, 1949-1951

	1949	1950	1951
	Tons		
(a) By Uses:			
Fertilizers	390,370	419,000	421,154
Chemicals	28,949	43,957	67,509
Pig iron	—	236	236
Refractories	191	252	286
Stock and Poultry Feeds	—	13,305	16,516
Miscellaneous	10,209	9,183	9,500
Total	429,719	485,933	515,301
(b) By Provinces:			
Prince Edward Island	—	190	130
Nova Scotia	—	223	318
New Brunswick	—	373	408
Quebec	105,068	115,610	134,680
Ontario	78,157	93,078	94,217
Manitoba	—	362	809
Saskatchewan	—	169	259
Alberta	—	432	344
British Columbia	246,494	275,496	284,036
Canada	429,719	485,933	515,201

TABLE 48. World Production of Phosphate Rock, by Countries¹

(Taken from "Minerals Yearbook," of the United States Bureau of Mines.)

Country ¹ .	1947	1948	1949	1950
	Metric tons			
Algeria	713,790	670,591	645,906	684,657
Angaur Island	107,898	76,713	157,049	119,000 ³
Australia	5,402	2,170	11	2
Austria	11,525	2	2	2
Belgium	58,045	68,938	44,643	50,846
Brazil (apatite)	5,592	2	4,553	2
British Borneo (guano)	283	427	508	2
Canada	—	—	18	117
Chile (apatite)	13,994	59,529	49,311	13,437
Christmas Island (exports)	106,765	108,311	255,236	2
Egypt	371,227	377,005	350,480	397,207
France	104,068	84,580	67,509	73,752
French Morocco	2,960,735	3,226,700	3,693,000	3,872,250
French West Africa	853	3,965	5,675	11,635
Germany: Federal Republic	698	473	2	2
India	867	1,132	588	2
Indochina	2	2	2	2
Indonesia	—	—	5,000 ³	—
Ireland	10,780	2	2	2
Israel and Jordan (exports)	6,058	4,000 ³	2	2
Italy	—	2	2	2
Japan	6,802	3,590	684	258
Makatea Island (exports)	196,430	183,104	239,532	245,804
Nauru Island (exports)	177,606	544,298	802,070	1,070,358
Netherlands Antilles	79,229	58,827	92,784	104,240
New Zealand	203	—	—	2
Ocean Island (exports)	212,456	126,854	265,087	251,218
Philippines (guano)	—	—	10,998	32,606
Seychelles Islands (exports)	14,516	21,722	14,171	10,005
Southern Rhodesia	9	—	67	36
South-West Africa (guano)	2,223	1,638	957	581
Spain	20,204	23,012	23,093	24,080
Sweden (apatite)	7,696	1,441	1,604	2
Tanganyika Territory	220	313	157	468
Tunisia	1,759,236	1,863,710	1,441,918	1,524,800
Uganda	7,269	—	—	467
Union of South Africa	41,831	39,656	56,471	51,844
U.S.S.R. (apatite) ³	2,032,000	2,336,915	2	2
United States (sold or used by producers)	9,171,914	8,807,903	9,131,173	10,418,122
Total (estimate)¹	18,240,000	18,755,000	19,420,000	21,250,000

1. In addition to countries listed, Cayman Islands (B.W.I.), China (including Formosa), Korea, Madagascar, New Caledonia, Norway, Poland, and Romania produce phosphate rock; but data of output are not available, and estimates have been included in the total.

2. Data not available; estimate included in total.

3. Estimate.

SILICA BRICK

The manufacture of silica brick for refractory use was confined to the plants of the Dominion Steel and Coal Company, Limited, Sydney, Nova Scotia, and the Algoma Steel Corporation Limited, Sault

Ste. Marie, Ontario. The brick manufactured by both these firms are processed from crushed silica rock and are utilized in furnace construction and repairs.

TABLE 49. Production of Silica Brick, 1942-1951

Year	M	Value	Year	M	Value
		\$			\$
1942	4,273	263,006	1947	3,094	193,998
1943	4,165	295,505	1948	3,464	393,821
1944	3,997	312,092	1949	3,663	453,797
1945	4,208	317,263	1950	3,126	408,813
1946	2,902	197,804	1951	3,510	465,229

Note. Quantities are shown as 9" equivalent.

SODIUM CARBONATE (NATURAL)

Deposits of natural sodium carbonate in the form of "Natron" (sodium carbonate with 10 molecules of water) and of brine occur in a number of small "lakes" throughout the central part of British Columbia, chiefly in the Clinton Mining Division and in the neighborhood of Kamloops. As the deposits are far from the main eastern Canadian markets, production

is restricted to the requirements of consumers within economical rail haul.

Sodium carbonate has many industrial uses, notably in the manufacture of glass and soap, in the purification of oils, in the production of aluminum, in the flotation of minerals, in the refining of metals, and in the production of caustic soda.

TABLE 50. Production of Sodium Carbonate (Natural), 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942	256	2,048	1947	163	1,793
1943	468	5,148	1948	—	—
1944	44	484	1949	47	513
1945	286	3,146	1950	—	—
1946	—	—	1951	—	—

SODIUM SULPHATE (NATURAL)

Natural sodium sulphate was obtained from the brine lakes in Saskatchewan. During 1951 the shipments amounted to 192,371 tons valued at \$2,383,770 compared with 130,730 tons valued at \$1,615,867 in 1950.

Sodium sulphate occurs as crystals or in the form of highly concentrated brines in many lakes and deposits throughout Western Canada. From these, hydrated sodium sulphate, known as Glauber's salt,

and anhydrous sodium sulphate, known to the trade as "salt cake", are produced in Canada.

Glauber's salt is used widely in the chemical industries and the demand is increasing. Sodium sulphate is used chiefly in the sulphate process for the manufacture of kraft pulp. It is used in the glass, dye and textile industries, and to a smaller extent for medicinal purposes and for tanning.

TABLE 51. Principal Statistics of Sodium Sulphate Mining Industry, 1949-1951

	1949	1950	1951
Active firms	5	5	5
Producing plants	5	5	5
Employees:			
Administrative	31	24	45
Workmen	181	157	203
Total	212	181	248
Salaries and wages:			
Administrative	\$ 79,671	62,536	114,449
Workmen	\$ 412,606	408,358	605,689
Total	\$ 492,277	470,894	720,138
Gross value of production	\$ 1,616,631	1,620,639	2,383,770
Cost of fuel and electricity	\$ 399,355	431,040	662,601
Cost of process supplies and containers	\$ 58,891	97,062	113,806
Net value of production	\$ 1,158,385	1,092,537	1,607,363

TABLE 52. Production of Natural Sodium Sulphate¹, 1942-1951

Year	Short tons	Selling value f.o.b. shipping points	Year	Short tons	Selling value f.o.b. shipping points
		\$			\$
1942	131,258	1,079,692	1947	163,290	1,793,043
1943	107,121	1,025,151	1948	153,698	2,136,276
1944	102,421	987,842	1949	120,259	1,614,731
1945	93,068	884,322	1950	130,730	1,615,867
1946	105,919	1,117,683	1951	192,371	2,383,770

1. All produced in the province of Saskatchewan, with the following exception: includes production in Alberta-1941 - 8 tons, value \$32.

TABLE 53. Production of Manufactured Sodium Sulphate, 1942-1951

Year	Salt cake		Glauber's salt	
	Tons	Value	Tons	Value
		\$		\$
1942	4,945	68,377	914	18,761
1943	4,256	57,526	-	-
1944	3,758	46,077	-	-
1945	2,850	35,226	-	-
1946	2,584	33,333	-	-
1947	3,175	51,047	-	-
1948	3,198	69,876	-	-
1949	3,738	83,996	-	-
1950	3,674	74,555	-	-
1951	3,297	72,206	-	-

TABLE 54. Imports of Sodium Sulphate, 1942-1951

Year	Salt cake		Glauber's salt	
	Tons	Value	Tons	Value
		\$		\$
1942	7,070	85,479	75	4,664
1943	11,904	150,496	566	15,399
1944	20,460	195,105	777	21,960
1945	13,535	120,982	1,016	29,452
1946	20,881	244,617	1,258	33,136
1947	9,329	172,531	1,383	41,125
1948	12,394	240,228	1,472	52,212
1949	4,294	65,722	1,996	59,959
1950	15,705	201,260	2,256	62,996
1951	19,432	340,740	3,234	102,930

TABLE 55. Exports of Sodium Sulphate, 1945-1951

Year	Long tons	Value	Year	Long tons	Value
		\$			\$
1945.....	15,682	270,013	1948.....	26,439	468,561
1946.....	20,041	352,407	1949.....	18,830	294,367
1947.....	41,906	530,388	1950.....	25,335	302,329
			1951.....	56,416	735,902

Note. Exports from Canada are not recorded separately in the official trade statistics of Canada, but the imports into the United States from Canada are shown as above in the "U.S. Imports for Consumption of Merchandise" by the U.S. Department of Commerce.

TABLE 56. Available Data on Consumption of Sodium Sulphate (Salt Cake) in Canada, by Industries, 1948-1951

Industry	1948	1949	1950	1951
	Net tons			
Pulp and paper.....	107,592	105,112	114,494	141,640
Non-ferrous smelters.....	20,000	—	—	—
Heavy chemicals.....	74	—	—	—
Glass, including glass wool.....	1,234	1,107	1,412	1,587
Medicinals.....	26	38	31	28
Total accounted for.....	128,926	106,257	115,937	143,255

SULPHUR (INCLUDING PYRITE)

Deposits of native sulphur of commercial grade have not been found in Canada, but sulphur occurs in combination with copper, lead, zinc, nickel, or iron in many base metal sulphide orebodies in various parts of the country. In smelting these ores sulphur dioxide gas is produced, and to 1925 this gas was a total waste as no facilities were available for the recovery from it of sulphur or of sulphur compounds. In practice this gas can be used directly for the manufacture of liquid sulphur dioxide or for the production of elemental sulphur. Sulphur used in the making of sulphuric acid is recovered in the form of sulphur dioxide from salvaged gas by The Consolidated Mining and Smelting Company of Canada, Limited, at Trail, British Columbia, and by Canadian Industries Limited, at Copper Cliff,

Ontario. There has been no production of elemental sulphur in Canada since July 1943, but two projects for the recovery of elemental sulphur from natural gas in Alberta are in the planning stage.

Pyrite is produced as a by-product in the treatment of copper ores at Quemont, East Sullivan, Waite-Amulet and Noranda mines in Quebec and Britannia mine in British Columbia.

Shipments of pyrite are made to pulp and paper mills and chemical plants in Canada and United States. Noranda Mines, Limited, has done extensive work on a process for the recovery of elemental sulphur from pyrites, and mention has been made of plans for a commercial plant in the near future.

TABLE 57. Production of Sulphur¹, 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942.....	303,714	1,994,891	1947.....	221,781	1,822,867
1943.....	257,515	1,753,425	1948.....	229,463	1,836,358
1944.....	248,088	1,755,739	1949.....	261,871	2,039,384
1945.....	250,114	1,881,321	1950.....	301,172	2,189,660
1946.....	234,771	1,784,666	1951.....	371,790	3,120,785

1. Sulphur content of pyrites and of recovered smelter gases; also in 1942 to 1943 some elemental sulphur recovered from smelter gases.

TABLE 58. Production of Pyrite with Sulphur Content, Including Sulphur Contained in Sulphuric Acid, etc., Made from Smelter Gases, 1949-1951

—	Pyrite			Smelter gas		Total sulphur	
	Sales	Sulphur content		Sulphur content			
	Tons	Tons	Value	Tons	Value	Tons	Value
			\$		\$		\$
1949							
Quebec.....	186,071	88,804	348,777	—	—	88,804	348,807
Ontario.....	—	—	—	12,630	126,300	12,630	126,300
British Columbia.....	64,405	28,777	247,677	131,660	1,316,600	160,437	1,564,277
Canada.....	250,476	117,581	596,154	144,290	1,442,900	261,871	2,039,384
1950							
Quebec.....	299,879	144,675	627,594	—	—	144,675	627,594
Ontario.....	—	—	—	13,154	131,540	13,154	131,540
British Columbia.....	12,735	5,812	55,216	137,531	1,375,310	143,343	1,430,526
Canada.....	312,614	150,487	682,810	150,685	1,506,850	301,172	2,189,660
1951							
Quebec.....	335,000	161,489	895,253	—	—	161,489	895,253
Ontario.....	—	—	—	15,605	156,050	15,605	156,050
British Columbia.....	109,948	53,874	661,257	140,822	1,408,225	194,696	2,069,482
Canada.....	444,948	215,363	1,556,510	156,427	1,564,275	371,790	3,120,785

TABLE 59. Available Data on The Consumption of Sulphur (Brimstone), 1948-1951

	1948	1949	1950	1951*
	Tons of 2,000 pounds			
(a) By industries:				
Pulp and paper	260,830	252,502	282,608	306,000
Heavy chemicals	60,882	68,508	80,008	89,000
Rubber goods	2,154	2,001	2,524	2,700
Explosives	1,759	1,712	1,900	2,100
Insecticides	1,298	2,333	4,114	3,600
Adhesives	61	83	95	100
Starch	227	244	268	300
Fruit and vegetable preparations	23	185	76	80
Sugar refining	107	153	213	220
Petroleum refining	167	215	220	250
Matches	74	71	64	70
Miscellaneous	561	295	257	300
Total accounted for	328,143	328,302	372,347	404,720
(b) By provinces:				
Newfoundland	—	15,659	14,078	17,000
Nova Scotia	4,455	6,233	5,769	6,000
New Brunswick	37,542	35,731	38,399	39,000
Quebec	124,074	115,475	128,962	140,000
Ontario	128,605	125,223	149,624	155,000
Manitoba	1,867	2,125	2,250	2,500
Alberta	92	93	119	500
British Columbia	31,508	27,763	33,146	44,720
Canada	328,143	328,302	372,347	404,720

* Estimated.

TABLE 60. Imports of Sulphur, 1942-1951

Year	Tons	Value	Year	Tons	Value
		\$			\$
1942	290,121	4,680,672	1947	361,424	5,466,201
1943	218,527	3,524,006	1948	354,622	5,528,740
1944	235,955	3,875,649	1949	280,557	5,213,921
1945	248,846	4,063,324	1950	390,333	7,730,126
1946	273,502	4,271,081	1951	395,928	8,959,677

TABLE 61. World Production of Pyrites (including Cupreous Pyrites), by Countries¹

(Taken from "Minerals Yearbook," of the United States Bureau of Mines.)

Country ¹	1948		1949		1950	
	Gross weight	Sulphur content	Gross weight	Sulphur content	Gross weight	Sulphur content
	Metric tons					
Algeria	35,900	14,360	32,705	13,082	25,075	10,000
Australia	90,848	42,230	87,923	41,021	113,973	53,887
Austria	7,871	2,942	11,624	4,064	12,489	3,133
Brazil	3,600	1,500 ²	3	3	3	3
Canada	166,985	79,039	227,227	106,667	3	3
China	42,907	19,300	3	3	3	3
Cyprus	589,772	283,091	942,808	452,548	655,059 ⁴	314,400 ^{2,4}
Czechoslovakia	3,195	1,200	3	3	3	3
Finland	177,512	79,170	180,040	80,409	210,000 ²	95,000
France	181,683	82,238	205,909	86,000 ²	3	3
French Morocco	70	34	202	95	1,470	690 ²
Germany:						
Federal Republic	383,100	153,245	431,963	173,582	525,400	210,200 ²
Soviet Zone	3	3	3	3	3	3
Greece	16,236	7,800 ²	15,785	7,600 ²	87,678	42,000 ²
Italy	835,027	384,100 ²	866,179	398,400 ²	895,459	412,000 ²
Japan	1,138,782	489,676	1,535,082	660,085	1,916,181	785,634
Norway	735,422	312,400 ²	745,367	316,500 ²	749,363	318,500 ²
Poland	58,100	25,000 ²	81,000	36,000 ²	3	3
Portugal	561,136	252,500 ²	622,925	280,300 ²	613,522	276,085
Romania	3	3	5,000 ²	3	3	3
Southern Rhodesia	13,224	5,500 ²	16,968	6,787	13,810	5,524
Spain	1,463,912	702,700 ²	1,132,793	543,700 ²	1,306,859	627,300 ²
Sweden	392,033	181,987	424,007	205,085	3	3
Tunisia	2,851	1,297	2,920	1,300 ²	1,150	500 ²
Turkey	3	3	—	—	3	3
Union of South Africa	35,992	15,456	35,527	15,274	36,026	15,400 ²
United Kingdom	11,800	4,720	13,181 ²	5,270	3	3
United States	943,434	394,583	905,746	385,518	946,108	399,092
Yugoslavia	90,000	38,000	73,000	32,300	3	3
Total (estimate)	9,700,000	4,000,000	10,500,000	4,400,000	11,200,000	4,800,000

1. In Addition to countries listed Belgium, Egypt, Hungary, India, Iran, Ireland, Kenya, Korea, U.S.S.R. and Uruguay produce or have produced pyrites, but production data are not available; estimates included in total.

2. Estimate.

3. Data not available; estimate included in total.

4. Exports.

STRONTIUM MINERALS

In Ontario, several occurrences of celestite are known in the general Ottawa region, but very little mining has been undertaken for the mineral, and production has been small and intermittent.

Between 1918 and 1920, about 250 tons of white, fibrous celestite were mined from a deposit in Bagot township, Renfrew county, and after grinding in a small mill erected on the property were sold for use in paint. The material was not very pure and contained about 18 per cent of barium sulphate. The old pit was pumped out in 1941 and a few tons of ore were scaled down from a small drift. This,

together with some stockpile material from the earlier work, was shipped to Montreal for grinding and pigment use. The property has since been idle. The above comprises the only production of strontium minerals in Canada of which there is any official record.

In British Columbia, celestite occurs near Birch Island, North Thompson River, Kamloops Mining Division. The deposit is reported to contain a large tonnage of ore consisting of a fine-grained intergrowth of fluorspar, celestite, feldspar, quartz, mica, and pyrite.

VERMICULITE

Vermiculite, a hydrated magnesian aluminum silicate, resembles mica closely but is softer and inelastic. Colours range from black through brown and dark green to almost colourless. Its principal characteristic is its ability to expand many times on heating, and in its expanded form it possesses low bulk density, low thermal conductivity, high heat resistance, chemical inertness, and acoustic properties. Vermiculite is generally regarded as a product of alteration and is usually associated with metamorphosed ultra-basic rocks.

There has been no production of vermiculite in Canada up to the present. Imports, all of which have been obtained from United States and South Africa, were valued at \$305,339 in 1951, an increase over 1950 of over 16 per cent.

During the year Siscoe Vermiculite Mines, Limited, subsidiary of Siscoe Gold Mines, Limited, undertook the development of what may be the first commercial deposit of vermiculite in Canada. The deposit,

which was brought to light in the course of field investigations by the Mines Branch, is located near Stanleyville, about eight miles southwest of Perth, Ontario. A deposit of vermiculite was reported also from Blue River, Kamloops Mining Division, British Columbia.

The principal uses for vermiculite are loose insulation in buildings; concrete and plaster aggregate; lightweight fire-resistant and acoustic tile and wallboard; rooting medium; and soil amendment. It is also used in lubricants, dry chemicals (as a diluent), combination refractory and insulating brick, as a pigment and extender in paint, and as decorative filler in wallpaper. Vermiculite has been used as fireproof deck covering and partitions on ships, as loose insulation in fire and sound-proof partitions in vehicles and aircraft, as filler for life jackets and in finely powder forms, for oil-less bearings.

In 1951 there were 6 plants in Canada making insulation aggregates, etc., from imported vermiculite.

VOLCANIC DUST

Volcanic dust (pumice or pumice dust) is a natural glass or silicate, atomized by volcanic explosions and thrown into the air in great clouds which ultimately settle, forming beds of varying thickness, often hundreds of miles from its source. In many instances the dust has been washed down from higher levels and redeposited by the agency of waters, in which case the beds are stratified and mixed with foreign substances. It consists of aluminum silicate (80 to 90 per cent) and of oxides and silicates of iron, sodium, magnesium, calcium, etc.

During 1924 to 1933 the annual production varied from 30 to 485 tons. There has been no production in recent years. The last recorded shipments were 50 tons in 1943.

Volcanic dust deposits have been found in Alberta, Saskatchewan and British Columbia. Pumice dust is used for concrete aggregate, acoustic plaster, cleansing compounds, paint fillers, absorbents, etc.

Directory of Firms in the Miscellaneous Non-Metal Mining Industry, 1951

Name of operator	Head office address	Plant or mine location
BARITE		
Nova Scotia:		
Canadian Industrial Minerals Ltd.	Walton	Walton
Maritime Barytes Ltd.	320 Bay St., Toronto, Ontario	Brookfield
Ontario:		
Northern Barite Development Co. Ltd. ¹	347 Bay St., Toronto	Langmuir
British Columbia:		
Mountain Minerals Ltd.	Box 273, Lethbridge, Alberta	Golden M.D.
BRUCITE		
Quebec:		
Aluminum Company of Canada Ltd.	Sun Life Bldg., Montreal	Wakefield
Davis, Norman B. ¹	512 Victoria Bldg., Ottawa, Ontario	Wakefield
DIATOMITE		
Nova Scotia:		
Wightman, Mrs. G.W.	Smith's Cove	Digby Co.
British Columbia:		
Fairey and Co.	661 Taylor St., Vancouver	Cariboo M.D., Vancouver
FLUORSPAR		
Newfoundland:		
Newfoundland Fluorspar Ltd.	Bank of Montreal Bldg., St. John's	St. Lawrence
St. Lawrence Corporation of Nfld., Ltd.	120 Broadway, New York, U.S.A.	St. Lawrence
Ontario:		
Cardiff Fluorite Mines Ltd. ¹	26 Queen St. E., Toronto	Wilberforce
Millwood Fluorspar Mines Ltd.	Box 206, Madoc	Madoc Dist.
Reliance Fluorspar Mining Synd. Ltd.	Madoc	Huntingdon Twp.
GARNET		
Ontario:		
Niagara Garnet Co. ¹	c/o Wm. A. Yarwood, 8373 Krull Parkway, Niagara Falls, New York, U.S.A.	River Valley
GRAPHITE		
Quebec:		
Laurentian Mining & Extraction Co. Ltd. ¹	St. Jovite	Canton Joly
Ontario:		
Frobisher Exploration Co. Ltd.	Black Donald Mines	Brougham Twp.
GRINDSTONES		
New Brunswick:		
Read, H.C.	Bathurst	Stonehaven
Bay of Chaleur Grindstone Co.	Clifton	Clifton
IRON OXIDE		
Quebec:		
Argall, Mrs. Thomas H.	1695, boul. St-Louis, Trois-Rivières	Pointe-du-Lac
Begin Iron Oxide Mine	Casier 1203, Trois-Rivières	Chemin des Forges
Girardin, Chas. D.	Yamachiche	Almaville en Haut
Leveille, Oscar	791 St-Catherine, St-Louis de France	St-Louis de France
The Sherwin-Williams Co. of Canada	2875 Centre St., Montreal	Red Mill, Champlain Co
Vennes, Wm.	90-6 1 ^{ère} ave., Grand'Mère	St-Adelphe
British Columbia:		
British Columbia Electric Co. Ltd. ¹	425 Carrall St.	Alta Lake
Burgess Bros. & Lundgren ¹	Ymir	Pend Oreille
LITHIUM MINERALS		
Quebec:		
Canadian Lithium Co. Ltd. ¹	100 Adelaide St. W., Toronto, Ontario ...	Landrienne Twp.
LaCorne Lithium Mines Ltd. ¹	320 Bay St., Toronto, Ontario	LaCorne Twp.
Great Lakes Carbon Corp. ¹	18 East 48th St., New York, U.S.A.	LaCorne Twp.
Manitoba:		
Lithium Corp. of Canada Ltd. ¹	403 Avenue Bldg., Winnipeg	Bernic and Cat Lakes
Sherritt Gordon Mines Ltd. ¹	25 King St. W., Toronto, Ontario	Herb Lake

1. Active but not producing.

Directory of Firms in the Miscellaneous Non-Metal Mining Industry, 1951 - Continued

Name of operator	Head office address	Plant or mine location
MAGNESITE DOLOMITE		
Quebec: Canadian Refractories Ltd.	1050 Canada Cement Bldg., Montreal	Kilmar and Harrington
MINERAL WATERS		
Quebec: Cie d'eau Minérale, de St. Hyacinthe	632 Concord Ave., St. Hyacinthe	St. Hyacinthe
Eau Minérale Etoile	Ste-Geneviève de Batiscan	Batiscan
Orange Crush Ltd.	1016 Bleury St., Montreal	Varenes
Lemay, Lucien	St-François-du-Lac	Nicolet Twp.
Gauthier, Charles	Louiseville	St-Léon
Montclair-Richelieu Spring Water Co. Ltd.	1515 Mountain St., Montreal	Chambly
Pellerin, Rolland	St-Barnabé Nord	St. Maurice
Paille, J.J.	Mackinongé	Maskinongé
Sources Abenakis Springs Ltd.	St-François-du-Lac	St-François-du-Lac
Source Coulombia	L'Epiphanie	L'Epiphanie
Source d'eau Minérale Radnor	St-Maurice	St-Maurice
Usine d'Embouteillage Maski	St-Justin	St-Justin
Ontario: Carlsbad Springs, The	Carlsbad Springs	Gloucester Twp.
Deneault, J.F.	Bourget	Bourget
MICA		
Quebec: Anacon Lead Mines Ltd.	330 Bay St., Toronto, Ontario	Montauban les Mines
Active Exploration Prospecting Syndicate	11 Orrin Ave., Ottawa, Ontario	Low Twp.
Ahearn, W.	538 MacLaren St., Ottawa, Ontario	Hull Twp.
Bigras, E.	Notre Dame-du-Laus	Notre Dame-du-Laus
Biscope, G.W.	380 Cooper St., Ottawa, Ontario	Papineau
Blackburn Bros. Ltd.	85 Sparks St., Ottawa, Ontario	Cantley
Cross, W.C.	209 Bridge St., Hull	
Chenier Carrière	Grand Remous	Grand Remous
Charbonneau, Noé	Perkins	Perkins
Cherney, John	Pointe Comfort	Cantley
Courville, E.	Perkins Mills	Perkins
Dominion Petroleum Co.	394 Sparks St., Ottawa, Ontario	Templeton
Gauthier, J.B.	Box 226, Buckingham	Denholm
Genest, Leo	31 Graham St., Hull	
Halpern, Wm.	288 Booth St., Ottawa, Ontario	Villeneuve Twp.
Joanisse, Leo	33, Graham St., Hull	Gatineau
Laroche, E.	716 DeLaverendrye, Trois-Rivières	St. Boniface
Massé, Onide	Wilson's Corners	Cantley
Murphy, Philip	Gatineau Point	
Mica Co. of Canada Ltd.	2 Lois St., Hull	
Poirier, A.	Wilson's Corners	Wakefield
Poirier, C.	Wilson's Corners	Wakefield
Rousseau, Comé	St-Rémi	Argenteuil
Renaud, E. and J.	Perkins	Hull
Sparks, W.J.	Kazabazua	Kazabazua
Sabourin, V.	Perkins	Hull Twp.
Suzorite Company Ltd.	907 Dominion Square Bldg., Montreal	McCarthy
Wallingford, E.	Perkins	Templeton
Wallingford, J.H. and G.	15 Main St., Hull	Hull Twp.
White Mica, A.W., Ltd.	145 Yonge St., Toronto, Ontario	Notre Dame-de-Laus
Zimmerling, Adolf	Otter Lake	Pontiac
Ontario: Bancroft Mica & Stone Co.	Selby	Faraday Twp.
Buchanan, Geo.	31 South St., Perth	Perth
Cordick, H.V.	Perth	Lanark
Donnelly, J.C.	Stanleyville	N. Burgess Twp.
Green, W.E. and E.C.	Perth Road	North Burgess
McGlade, W.A.	8 Church St., Perth	Burgess Twp.
North Bay Mica Co.	393 Fisher St., North Bay	Mattawa Twp.
Powers, Fred	Stanleyville	Burgess Twp.
Ontario Mica Mines Ltd.	Verona	Thirty Island Lake
Orser, C.C.	Verona	Mazanawa
Thompson, Frank	Perth Road	Buck Lake
Watts, Weekes & Gibson	21 Isabella St., Perth	Lanark
British Columbia: Fairey & Co.	661 Taylor St., Vancouver	Vancouver

Directory of Firms in the Miscellaneous Non-Metal Mining Industry, 1951 - Concluded

Name of operator	Head office address	Plant or mine location
PERLITE		
British Columbia: Trans-Continental Resources Co. Western Gypsum Products Ltd.	Vancouver Childs Building, Winnipeg, Manitoba	Black Dome Francois Lake
PHOSPHATE		
Quebec: Bigelow, Robert ¹ Blackburn Bros. Ltd. ¹ Quebec Smelting & Refining Ltd. Industrial Phosphate Mines Ltd. ¹	Buckingham 85 Sparks St., Ottawa, Ontario..... 215 St. James St. W., Montreal..... 18 Toronto St., Toronto, Ontario	Bowman Twp. Perkins Notre Dame de la Salette Portland East Twp.
Ontario: Ontario Phosphate Industries Ltd. ¹ McGlade, W.A.	Room 1101, 62 Richmond St. W., Toronto 8 Church St., Perth	Bedford Twp. Burgess Twp.
SILICA BRICK		
Nova Scotia: Dominion Steel & Coal Corp. Ltd.....	Sydney	Sydney
Ontario: Algoma Steel Corp. Ltd.	Sault Ste. Marie	Sault Ste. Marie
SODIUM CARBONATE (Natural)		
British Columbia: Bishop, V.C. (Mrs.)	c/o Boyd's Garage, Clinton	Clinton area
SODIUM SULPHATE (Natural)		
Saskatchewan: Ormiston Mining & Smelting Co. Ltd. Midwest Chemicals Ltd. Natural Sodium Products Ltd. Sybouts Sodium Sulphate Co. Ltd..... Saskatchewan Minerals	Ormiston..... Palo Bishopric Gladmar 401 Westman Chambers, Regina.....	Ormiston Whitashore Lake Frederic Lake, Alsask Gladmar Chaplin
SULPHUR (Pyrite and smelter gas)		
Quebec: East Sullivan Mines Ltd. Quemont Mining Corp. Ltd..... Noranda Mines Ltd. Waite-Amulet Mines Ltd.....	1604 Aldred Bldg., Montreal..... 350 Bay St., Toronto, Ontario	Bourlamaque Twp. Rouyn Twp. Noranda Duprat Twp.
Ontario: International Nickel Company of Canada Ltd. ²	Copper Cliff.....	Copper Cliff
British Columbia: Consolidated Mining & Smelting Company of Canada Ltd. ² Britannia Mining & Smelting Co. Ltd.....	Trail Britannia Beach	Trail Britannia Beach

1. Active but not producing.

2. Recover sulphur from smelter gas.

STATISTICS CANADA LIBRARY
BIBLIOTHÈQUE STATISTIQUE CANADA



1010739334