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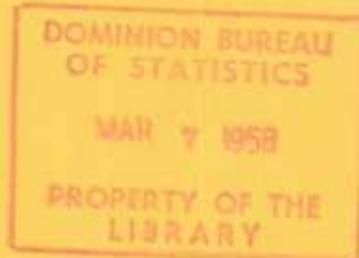
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CANADA

# THE MISCELLANEOUS NON-METAL MINING INDUSTRY

1956



DOMINION BUREAU OF STATISTICS

Industry and Merchandising Division

Mineral Statistics Section



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THE MISCELLANEOUS NON-METAL MINING INDUSTRY  
1956

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## NOTICE

The annual reports prepared by the Industry and Merchandising Division of the Bureau of Statistics are divided into 3 volumes, as follows: **Volume I**—The Primary Industries, including mining, forestry and fisheries; **Volume II**—Manufacturing; **Volume III**—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:

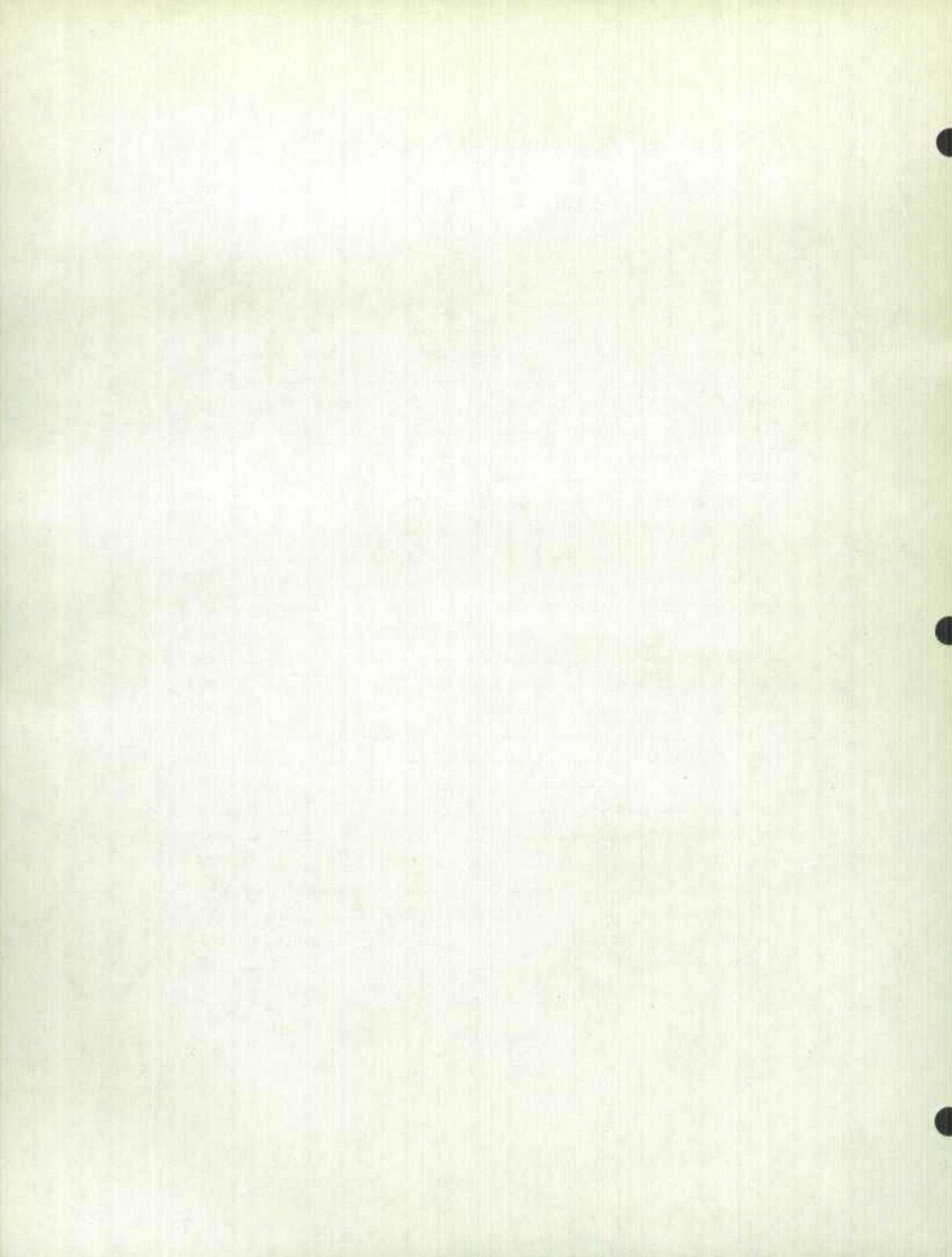
- Part I — Mineral Statistics
- Part II — Forestry Statistics — Operations in the Woods
- Part III — Fisheries Statistics

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.

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- C — The Silver-Lead-Zinc Mining Industry, 25¢
- D — The Nickel-Copper Mining, Smelting and Refining Industry, 25¢
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# THE MISCELLANEOUS NON-METAL MINING INDUSTRY

## 1956

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 1956 included barite, brucite, diatomite, fluorspar, graphite, grindstones, dolomitic-magnesite, lithia, mineral waters, perlite, phosphate rock, silica brick, sodium carbonate and sodium sulphate. The general statistics also include some data on development work done on potash and pyrite deposits.

In 1956 shipments of materials were made by firms. Gross value of the producers' shipments amounted to \$15,813,812 in 1956 compared with

\$10,987,755 in 1955. The value of containers was included in these figures. The average number of employees was 1,773 to whom \$6,069,934 were paid as salaries and wages. Fuel cost \$1,466,728 and 52,619,958 kwh. of electricity were purchased for \$611,845. Process supplies cost \$1,713,172 and containers used were valued at \$223,155. Freight paid amounted to \$106,624.

This report also includes data for arsenious oxide, titanium dioxide, pyrite, pyrrhotite and sulphur in smelter gases; these are by-products of the metal mining and smelting industries, thus 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 of the Miscellaneous Non-metal Mining Industry,  
Significant Years<sup>1</sup>, 1921-1956**

Year	Establishments	Em-	Salaries	Cost of fuel	Cost of process	Gross value	Net value <sup>2</sup>
	No.	ployees	and wages	and electricity	supplies and containers	of production	of production
	No.	No.	\$	\$	\$	\$	\$
1921 .....	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1929 .....	38	506	545,216	79,463	"	1,502,574	"
1931 .....	34	275	297,394	205,149	"	1,247,697	"
1933 .....	36	297	241,999	176,512	"	913,380	"
1937 .....	53	530	658,723	321,919	228,953	1,687,317	1,136,445
1939 .....	47	465	539,143	260,652	133,705	1,358,922	964,565
1941 .....	62	683	878,700	482,043	315,521	2,442,748	1,645,184
1944 .....	52	865	1,500,250	706,929	462,999	3,986,579	2,797,719
1946 .....	43	911	1,582,846	822,546	493,642	4,248,107	2,859,009
1949 .....	37	1,160	2,632,808	1,011,021	576,919	6,236,811	4,461,930
1951 .....	39	1,359	3,699,789	1,471,290	1,063,878	8,914,360	6,209,886
1953 .....	40	1,405	4,168,645	1,261,364	1,161,201	9,987,665	7,505,860
1954 .....	47	1,343	4,839,822	1,419,441	1,202,247	10,421,552	7,716,472
1955 .....	73	1,650	5,340,186	1,597,371	1,665,679	10,987,755	7,561,714
1956 .....	60	1,773	6,069,934	2,078,573	1,936,327	15,813,812	11,692,288

1. During the years under review there have been changes in the methods of compilation. Some commodities have been added to this group and some commodities have been removed to form a separate classification.

2. Gross value of production, less the value of fuel, electricity, process supplies, containers and freight.

## MINERAL STATISTICS

TABLE 2. Production of Miscellaneous Non-metallic Minerals, 1955 and 1956

Item		1955		1956	
		Quantity	Value	Quantity	Value
			\$		\$
Barite .....	tons	253,736	2,277,166	320,835	3,031,034
Diatomite .....	"	16	352	2	40
Fluorspar .....	"	128,114	2,708,437	140,071	3,407,582
Garnet (schist) .....	-	-	-	-	-
Graphite .....	tons	-	-	-	-
Grindstones .....	"	10	1,500	-	-
Dolomitic-magnesite .....	-	...	2,151,820	...	2,783,181
Lithia .....	lb.	114,376	61,752	4,789,360	2,643,950
Mineral waters .....	imp. gal.	306,683	160,510	292,526	149,867
Perlite .....	-	-	-	-	-
Silica brick .....	M	4,763	602,625	5,799	736,817
Sodium carbonate .....	-	-	-	-	-
Sodium sulphate .....	tons	178,888	2,799,715	181,053	2,838,186
<b>Total</b> .....	-	...	<b>10,763,877</b>	...	<b>15,590,657</b>
Pyrite, pyrrhotite .....	tons	1	1	1,046,740	4,538,785
Sulphur <sup>2</sup> .....	"	628,443	5,984,953	236,590	2,323,590
Arsenious oxide <sup>3</sup> .....	"	786	69,159	895	77,612
Titanium dioxide <sup>3</sup> .....	"	117,042	5,192,810	157,374	7,682,911
Iron oxides .....	"	7,702	162,512	8,803	186,225
Mica .....	"	820	77,541	922	95,666

1. Data for 1955 and preceding years are included in sulphur.

2. Data for 1955 and preceding years include the sulphur contained in pyrite shipments and in smelter gases which were used to make acid or sulphur dioxide. Data for 1956 include sulphur in smelter gases in the form of acid or sulphur dioxide. General statistics relating to production of sulphur are included with those of the metal mining and non-ferrous smelting industries.

3. General statistics relating to arsenious oxide and titanium dioxide are included with the smelting industry.

Note. Value of containers is excluded.

TABLE 3. Employees and Their Earnings in the Miscellaneous Non-metallic Mining Industry, 1952-1956

	Number of employees				Total	Number of man-hours worked (all employees)	Earnings				
	Office and Administrative		Workmen				Office and Adminis-trative	Workmen	Total		
	Male	Female	Male	Female							
1952 .....	177	25	1,327	6	1,535	3,270,305	\$ 567,116	\$ 3,690,729	\$ 4,257,845		
1953 .....	126	20	1,253	6	1,405	3,110,359	543,105	3,625,540	4,168,645		
1954 .....	145	17	1,177	4	1,343	2,984,543	574,756	4,265,066	4,839,822		
1955 .....	179	19	1,447	5	1,650	3,205,343	734,172	4,606,014	5,340,186		
1956 .....	186	21	1,562	4	1,773	3,769,255	947,470	5,122,464	6,069,934		

TABLE 4. Workmen, by Months, in the Miscellaneous Non-metal Mining Industry, 1955 and 1956

Month	1955								1956								
	Mine								Mine								
	Surface		Under-ground		Mill		Total	Surface		Under-ground		Mill		Total			
	Male	Female			Male	Female		Male	Female			Male	Female	Male	Female		
Number																Number	
January .....	309	3	337	640	2	1,291	462	2	476	581	2	1,523					
February .....	297	3	335	643	2	1,230	466	2	476	560	2	1,506					
March .....	276	3	327	637	2	1,245	429	2	476	566	2	1,475					
April .....	277	3	346	690	2	1,322	423	2	469	558	2	1,454					
May .....	334	3	359	746	2	1,454	461	2	468	590	2	1,523					
June .....	346	3	369	738	2	1,472	468	2	473	598	2	1,543					
July .....	334	3	373	768	2	1,511	512	2	485	627	2	1,628					
August .....	327	3	376	788	2	1,554	522	2	498	623	2	1,647					
September .....	353	3	391	781	2	1,604	486	2	515	613	2	1,618					
October .....	336	3	392	758	2	1,571	504	2	520	560	2	1,588					
November .....	329	3	384	755	2	1,557	495	2	501	633	2	1,633					
December .....	326	3	383	708	2	1,506	507	2	492	628	2	1,631					
Average .....	323	3	401	723	2	1,452	479	2	488	595	2	1,566					
Total man-hours worked						2,857,650						3,419,665					

TABLE 5. Fuel and Electricity Used in the Miscellaneous Non-metallic Mining Industry, 1956

Kind	Unit of measure	Quantity	Cost at plant
Bituminous coal (a) From Canadian mines .....	short ton	1,616	\$ 26,125
(b) Imported .....	"	1	12
Sub-bituminous coal (from Alberta mines only) .....	"	—	—
Anthracite coal .....	"	—	—
Lignite coal .....	"	38,959	173,363
Coke (for fuel only) .....	"	—	—
Gasoline, (includes gasoline used in cars and trucks) .....	imp. gal.	386,500	147,178
Kerosene or coal oil .....	"	71,777	16,186
Fuel oil .....	"	8,343,758	1,031,972
Wood (cords of 128 cubic feet of piled wood) .....	cord	18	129
Gas (a) Liquefied petroleum gases (propane, etc.) .....	imp. gal.	2,660	1,277
(b) Other manufactured gas .....	M cu. ft.	314,791	69,257
(c) Natural gas .....	"	25,848	1,229
Other fuel .....	"	—	—
Electricity purchased for power and lighting .....	k.w.h.	51,493,478	523,729
Electricity purchased for other purposes .....	"	11,226,480	88,116
Total (cost only) .....		...	\$ 2,078,573
Electricity generated (a) For own use .....	k.w.h.	7,530,808	...
(b) For sale .....	"	60,600	1,818

## ARSENIOUS OXIDE

Shipments of arsenious oxide during 1956 amounted to 1,790,381 pounds valued at \$77,612. 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.

The production from Ontario ores originated in the silver-cobalt ores treated at the Deloro plant. In 1954 the Cobalt Chemical Division of Quebec Metallurgical Industries Ltd. recovered arsenic

from cobalt-silver ores at Cobalt, Ontario, but there was no commercial production in 1955-1956.

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.

TABLE 6. Production, Imports and Exports of Arsenic, 1955 and 1956

	1955		1956	
	Quantity	Value	Quantity	Value
			lb.	\$
Production:				
White arsenic (crude and refined) <sup>1</sup>	1,571,787	69,159	1,790,381	77,612
Imports:				
Arsenic acid	857,413	32,110	408,840	14,490
Arsenious oxide and arsenic sulphide	—	—	16,320	1,691
Sodium arsenate and sodium stannate	94,990	32,843	72,320	34,391
Arsenate of lead	120,800	22,912	133,671	26,161
Arsenate of lime	564,865	28,601	12,000	888
Exports:				
Arsenic <sup>2</sup>	940,600	40,794	1,168,100	50,482

1. Includes some arsenic recovered from foreign ores.

2. Includes arsenic content in gold ores exported from British Columbia.

TABLE 7. Production, Imports and Exports of White Arsenic, 1947-1956

Year	Production, crude and refined, but no duplication	Imports <sup>1</sup>	Exports	
			Refined	Crude
Pounds				
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
1952	1,708,351	19,249	294,800	—
1953	1,403,740	32,233	934,000	—
1954	1,180,350	—	1,422,600	—
1955	1,571,787	—	940,600	—
1956	1,790,381	16,320	1,168,100	—

1. Arsenious oxide and arsenic sulphide.

TABLE 8. Consumption of Refined White Arsenic, 1951-1955

Industry	1951	1952	1953	1954	1955
Pounds					
Glass .....	362,426	340,631	343,279	337,071	356,211
Insecticides <sup>1</sup> .....	2	2	2	2	2
White metals .....	99,821	68,127	36,515	28,292	29,563
Miscellaneous chemicals .....	41,308	114,314	88,804	13,389	11,163
Total accounted for .....	503,555	523,072	468,598	378,752	396,937

1. Does not include arsenic acid ( $As_2O_5$ ) imported for use in making insecticides, as follows: 1951 - 1,664,855 pounds; 1952 - 670,303 pounds; 1953 - 1,002,424 pounds; 1954 - 1,397,596 pounds; 1955 - 847,413 pounds; 1956 - 408,840 pounds.

2. Included with miscellaneous chemicals total.

TABLE 9. World Production of White Arsenic, by Countries  
(Taken from the "Minerals Yearbook", by the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
North America:					
Canada .....	1,177	854	702	590	325
Mexico .....	14,072	3,159	2,204	2,675	3,255
United States .....	16,190	15,673	10,873	13,167	10,780
South America:					
Brazil .....	1,456	1,062	411	1,275	3
Peru .....	-	17	-	105	3
Europe:					
Belgium (exports) .....	358	1,106	1,903	1,979	2,281
France .....	5,844	6,934	6,217	812	3
Germany:					
West (exports) .....	3,862	122	675	239	635
Greece .....	62	97	68	55	42
Italy .....	1,754	2,209	1,179	3	3
Portugal .....	618	1,452	1,301	1,631	660 <sup>4</sup>
Spain .....	332	173	60	22	3
Sweden .....	20,427	17,189	3	10,762	13,803
United Kingdom .....	3	3	3	3	3
Asia:					
Iran <sup>5</sup> .....	-	-	-	3	3
Japan .....	1,515	1,545	1,576	1,583	1,248
Africa:					
Southern Rhodesia .....	84	568	417	459	503
Union of South Africa .....	-	-	-	-	-
Oceania:					
Australia .....	134	134	-	-	-
New Zealand .....	-	-	-	-	-
Total (estimate) <sup>1</sup> .....	69,000	54,000	45,000	41,000	37,000

1. Arsenic is also produced in Argentina, Austria, and East Germany, and estimates are included in the total. It is believed to be produced in China, Czechoslovakia, Finland, Hungary and U.S.S.R., but data are not available.

2. This table incorporates revisions of data published in previous white arsenic chapters.

3. Data not available; estimate included in total.

4. Estimate.

5. Year ended March 20, of year following that stated.

## BARITE

During 1956 the barite producers shipped 320,835 tons valued at \$3,031,034 compared with 253,736 tons valued at \$2,277,166 in the preceding year. The larger portion of Canada's output was produced in Nova Scotia. British Columbia's output was milled at Lethbridge, Alberta.

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<sub>4</sub> 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. The requirements are a minimum specific gravity of 4.25 (corresponding to a BaSO<sub>4</sub> 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<sub>4</sub>, under 3 per cent moisture, and not more than 0.4 per cent iron oxide (Fe<sub>2</sub>O<sub>3</sub>), with a fineness range of 20 to 100 mesh.

TABLE 10. Production of Barite, 1947-1956

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1947.....	128,675	1,380,753	1952.....	136,002	1,521,162
1948.....	95,747	1,073,380	1953.....	247,227	2,220,292
1949.....	47,138	557,662	1954.....	221,472	2,003,796
1950.....	77,177	750,378	1955.....	253,736	2,277,166
1951.....	98,113	1,131,917	1956.....	320,835	3,031,034

TABLE 11. Imports of Barite, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947.....	1,737	51,060	1952.....	1,445	44,488
1948.....	1,263	39,613	1953.....	1,207	40,143
1949.....	934	32,269	1954.....	1,236	39,264
1950.....	2,089	70,095	1955.....	1,449	46,017
1951.....	1,068	37,471	1956.....	1,475	50,828

TABLE 12. Consumption of Barite, 1952-1955

	1952	1953	1954	1955
Tons				
(a) By uses:				
Paints.....	1,051	1,200	1,842	963
Rubber goods.....	513	437	422	537
Glass.....	209	238	237	287
Oil-well drilling, estimate <sup>1</sup> .....	2,000	2,000	2,639	...
Miscellaneous.....	254	279	...	...
Asbestos products.....	...	...	41	39
Miscellaneous chemicals.....	...	...	134	96
Miscellaneous non-metallics.....	...	...	558	...
Total accounted for.....	3,927	4,154	5,873	...
(b) By provinces:				
Newfoundland.....	14	—	...	...
Nova Scotia.....	838	780	1,209	...
Quebec.....	932	1,090	1,776	...
Ontario.....	106	126	103	...
Manitoba.....	—	—	—	...
Saskatchewan.....	1,986	2,099	2,732	...
Alberta.....	51	59	53	...
British Columbia.....	3,927	4,154	5,873	...
Total accounted for.....				

1. Reported data unreliable, consumption may be as high as 10,000 tons annually.

**TABLE 13. World Production of Barite, by Countries<sup>1</sup>**  
 (Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
North America:					
Canada .....	98,113	136,002	247,227	221,472	202,600
Cuba (exports) .....	—	—	4,904	—	—
Mexico (exports) .....	1,542	12,421	63,042	56,871	117,654
United States .....	845,579	1,012,811	920,025	946,744	1,128,504
Total North America .....	945,234	1,161,234	1,235,198	1,225,087	1,448,758
South America:					
Argentina .....	11,023	17,637 <sup>5</sup>	14,000 <sup>4</sup>	22,046 <sup>5</sup>	22,000 <sup>4</sup>
Brazil .....	55	7,605 <sup>5</sup>	15,863 <sup>5</sup>	6,272 <sup>5</sup>	5,071 <sup>4</sup>
Chile .....	1,179	2,464	1,556	2,200 <sup>4</sup>	2,200 <sup>4</sup>
Colombia .....	2,240	4,480	8,543	9,921	6,614
Peru .....	25,370	10,035	17,129	12,348	9,410
Total South America .....	39,867	42,221	57,000 <sup>4</sup>	53,000 <sup>4</sup>	45,000 <sup>4</sup>
Europe:					
Austria .....	10,632	5,688	2,116	4,802	4,365
France .....	43,535	47,025	43,869	48,061	60,627
East Germany <sup>4</sup> .....	22,000	22,000	27,600	27,600	27,600
West Germany .....	428,618	314,513	334,422	414,542	449,052
Greece .....	32,407	23,897	28,064	24,251	21,451
Ireland .....	9,081	2,008	—	—	—
Italy .....	84,372	62,031	76,411	79,254	103,819
Portugal .....	793	685	347	385	313
Spain .....	13,723	17,491	19,727	11,984	9,882
Sweden .....	165	—	—	108	—
U.S.S.R. (estimate) .....	110,000	110,000	110,000	110,000	110,000
United Kingdom <sup>6</sup> .....	97,909	78,563	77,175	81,967	92,181
Yugoslavia .....	27,362	38,381	89,457	114,640	109,129
Total Europe <sup>1,4</sup> .....	890,000	730,000	815,000	920,000	990,000
Asia:					
India .....	11,727	11,234	10,528	21,048	22,000 <sup>4</sup>
Japan .....	18,415	15,687	19,350	20,815	13,342
Korea, Republic of .....	—	874	1,012	336	933
Total Asia <sup>1,4</sup> .....	41,000	39,000	42,000	53,000	53,000
Africa:					
Algeria .....	23,172	10,852	14,154	14,961	33,720
Egypt .....	45	33	33	35	67
French Morocco .....	3,589	3,429	55	10,246	27,170
Southern Rhodesia .....	93	299	268	—	—
Swaziland .....	525	445	455	362	449
Tunisia .....	11	28	—	—	—
Union of South Africa .....	2,247	1,894	2,092	2,342	1,892
Total Africa .....	29,682	16,980	17,057	27,946	63,298
Australia .....	6,919	5,537	6,358	7,696	7,016
World total (estimate) <sup>1</sup> .....	2,000,000	2,000,000	2,200,000	2,300,000	2,600,000

1. In addition to countries listed, barite is produced in China, Czechoslovakia, Mexico and North Korea, but production data are not available. Estimates are included in total.

2. This table incorporates a number of revisions of data published in previous barite chapters.

3. Data not available; estimate included in total.

4. Estimate.

5. Exports.

6. Includes witherite.

## 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 deposits examined in 1951 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.

TABLE 14. World Production of Corundum, by Countries<sup>1</sup>  
(Taken from the "Minerals Yearbook" published by the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
Argentina .....	3	3	3	3	3
Australia .....	—	55	—	—	9
Brazil .....	3	3	3	—	—
Canada .....	—	—	—	—	—
French Equatorial Africa .....	—	—	—	—	—
India .....	563	647	329	478	135
Madagascar .....	—	—	—	—	—
Malaya, Federation of .....	25	—	—	—	—
Mozambique .....	—	—	1	1	8
Rhodesia and Nyasaland, Federation of:					
Nyasaland .....	101	47	—	15	18
Southern Rhodesia .....	—	—	765	2,576	1,060
South West Africa .....	—	—	—	—	—
Union of South Africa .....	4,563	3,791	1,692	1,310	757
World total (estimate) <sup>1</sup> .....	10,000	10,000	9,000	9,000	7,000

1. In addition to countries listed, corundum is produced in U.S.S.R., but data on production are not available and estimate is included in the total.

2. This table incorporates a number of revisions of data published in previous annual reviews of corundum.

3. Data not available; estimate included in total.

## DIATOMITE

During 1956 the shipments of diatomite amounted to 2 tons valued at \$40. This small tonnage was shipped from a deposit in British Columbia.

In 1953 only 3 tons came from the Nova Scotian deposits; the remainder was an impure diatomaceous earth from a deposit in Ontario. For statistical purposes it has been included in diatomite. 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 nitraptills 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 15. Production of Diatomite, 1947-1956

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1947 .....	103	2,677	1952 .....	28	1,074
1948 .....	46	1,487	1953 .....	103	12,150
1949 .....	60	1,703	1954 .....	4	192
1950 .....	49	1,665	1955 .....	16	352
1951 .....	92	3,148	1956 .....	2	40

TABLE 16. Consumption of Infusorial Earth in the Sugar Refining Industry, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947 .....	2,490	141,885	1952 .....	2,020	132,796
1948 .....	2,865	167,259	1953 .....	1,944	128,658
1949 .....	2,871	187,508	1954 .....	1,871	126,414
1950 .....	2,989	205,856	1955 .....	2,094	158,960
1951 .....	2,322	169,743	1956 .....		Not yet available

TABLE 17. Consumption of Diatomaceous Earth in the Manufacture of Fertilizers, 1951-1955

Year	Tons	Value
		\$
1951 .....	7,352	350,685
1952 .....	7,683	371,124
1953 .....	8,643	427,881
1954 .....	9,384	448,533
1955 .....	9,166	429,149

TABLE 18. Imports of Diatomaceous Earth, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947.....	15,074	431,125	1952 .....	15,888	563,950
1948.....	17,050	512,115	1953 .....	19,350	670,610
1949.....	16,914	551,954	1954 .....	19,373	664,016
1950.....	18,247	599,216	1955 .....	22,158	738,503
1951.....	21,069	709,433	1956 .....	21,078	888,090

TABLE 19. World Production of Diatomite, by Countries<sup>1</sup>  
(Taken from the "Minerals Yearbook" by the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
North America:					
Canada .....	91	28	103	104	16
Costa Rica .....	500	750	430	595	3,000
United States .....	302,816 <sup>3</sup>	302,816 <sup>3</sup>	302,816 <sup>3</sup>	4	4
South America:					
Argentina .....	4	4	4	4	2,756
Chile .....	4	4	4	4	4
Europe:					
Austria .....	4,292	4,300	3,435	3,532	4,445
Denmark:					
Diatomite .....	5,356	15,023	12,454	30,337	4
Moler <sup>4</sup> .....	105,000	110,000	110,000	120,000	120,000
Finland .....	1,483	1,236	1,985	1,367	2,059
France .....	43,155	37,159	58,422	66,690	4
Germany, West .....	48,449	52,748	55,501	59,745	67,725
Italy .....	11,646	10,505	11,023	11,261	11,314
Sweden .....	2,036	1,733	1,504	1,619	1,625
United Kingdom, Great Britain .....	10,304	19,040	13,974	10,778	11,000 <sup>5</sup>
Northern Ireland .....	9,773	9,742	8,139	4,675	7,293
Asia:					
Korea, Republic of .....	4	4	4	1,377	3,393
Africa:					
Algeria .....	23,140	22,064	28,162	37,283	30,384
Egypt .....	3,034	784	131	173	220
Kenya .....	4,725	6,644	4,903	3,649	3,304
Union of South Africa .....	96	1,190	120	1,047	850
Oceania:					
Australia .....	9,776	7,130	4,973	6,091	4,054
New Zealand .....	133	228	115	188	200 <sup>5</sup>
World total (estimate) <sup>1</sup> .....	640,000	660,000	670,000	4	4

1. Diatomaceous earth is believed to be produced also in Brazil, Hungary, Japan, Mozambique, Norway, Portugal, Rumania, Spain, and U.S.S.R., but complete data are not available; estimates included in total.

2. This table incorporates a number of revisions of data published in previous diatomite chapters.

3. Average annual production 1951-1953.

4. Data not available; estimate included in total.

5. Estimate.

## FLUORSPAR

Canadian producers of fluorspar shipped 140,071 tons valued at \$3,407,582 during 1956, compared with 128,114 tons valued at \$2,708,437 in the preceding year. Over 98 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.

Exports of fluorspar in 1956 amounted to 78,380 tons valued at \$1,941,500.

TABLE 20. Principal Statistics of the Fluorspar Mining Industry, Significant Years, 1921-1956

Year	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of production	Net value <sup>1</sup> of production
	No.	No.	\$	\$	\$	\$	\$
1921 .....	3	81	29,422	13,181	N.A.	136,267	N.A.
1929 .....	2	42	40,414	...	"	268,120	"
1931 .....	1	...	...	...	"	620	"
1933 .....	2	2	310	—	"	1,064	"
1937 .....	1	2	1,500	—	20	2,550	2,530
1939 .....	2	15	12,376	544	450	4,995	4,001
1941 .....	5	60	63,563	15,449	7,831	97,767	74,487
1944 .....	10	78	102,331	14,869	10,148	217,701	192,684
1946 .....	4	72	91,674	16,648	9,729	237,491	211,114
1949 <sup>2</sup> .....	5	314	632,164	139,205	48,785	1,592,908	1,404,918
1951 .....	5	403	1,058,548	156,330	85,179	2,189,875	1,873,357
1953 .....	3	485	1,378,010	205,621	187,240	2,670,585	2,277,724
1954 .....	3	430	1,528,769	165,694	185,618	2,987,026	2,634,026
1955 .....	3	499	1,566,532	175,662	221,557	2,708,437	2,311,218
1956 .....	4	480	1,442,545	182,826	236,786	3,407,582	2,987,970

1. Gross value of production, less the value of fuel, electricity, process supplies, containers and freight.  
2. Newfoundland joined confederation.

TABLE 21. Production of Fluorspar, 1947-1956

Year	Short tons	Selling value f.o.b. works	Year	Short tons	Selling value f.o.b. works
		\$			\$
1947 .....	7,186	209,886	1952 .....	82,187	2,523,408
1948 .....	11,340	344,834	1953 .....	88,569	2,670,585
1949 .....	64,477	1,592,908	1954 .....	118,969	2,987,026
1950 .....	64,213	1,553,004	1955 .....	128,114	2,708,437
1951 .....	74,211	2,189,875	1956 .....	140,071	3,407,582

TABLE 22. Imports of Fluorspar, 1947-1956

Year	Tons	\$	Year	Tons	\$
1947 .....	32,001	702,419	1952 .....	22,714	684,968
1948 .....	48,925	1,105,190	1953 .....	20,161	546,915
1949 .....	2,510	81,650	1954 .....	16,240	382,935
1950 .....	1,572	66,823	1955 .....	21,774	518,002
1951 .....	8,188	239,120	1956 .....	28,148	690,779

TABLE 23. Consumption of Fluorspar, 1952-1955

—	1952	1953	1954	1955
Tons				
(a) By uses:				
Steel .....	22,576	22,730	16,002	18,610
Glass .....	642	672	757	592
Enamelling and glazing .....	131	152	85	97
Heavy chemicals .....	45,399	59,556	63,751	68,592
White metal alloys .....	—	6	15	36
Total accounted for .....	<b>68,748</b>	<b>83,116</b>	<b>80,610</b>	<b>87,927</b>
(b) By provinces:				
Nova Scotia .....	9,477	10,071	7,765	7,808
Quebec .....	42,546	57,077	61,338	65,888
Ontario .....	16,242	15,566	11,082	13,721
Manitoba .....	370	247	255	317
Alberta .....	63	100	103	123
British Columbia .....	50	55	67	70
Total accounted for .....	<b>68,748</b>	<b>83,116</b>	<b>80,610</b>	<b>87,927</b>

TABLE 24. World Production of Fluorspar, by Countries<sup>1</sup>

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

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
North America:					
Canada .....	74,211	82,187	88,569	118,969	131,728
Mexico (exports) .....	73,590	198,680	173,163	146,198	145,105
United States (shipments) .....	347,024	331,273	313,036	245,628	279,540
Total North America .....	<b>494,825</b>	<b>612,140</b>	<b>579,768</b>	<b>510,795</b>	<b>556,373</b>
South America:					
Argentina (shipments) .....	7,937	7,882	8,000 <sup>3</sup>	8,000 <sup>3</sup>	12,125
Bolivia (exports) .....	42	83	21	213	569
Brazil .....	660 <sup>3</sup>	—	—	—	—
Total South America .....	<b>8,600<sup>3</sup></b>	<b>7,970</b>	<b>8,000<sup>3</sup></b>	<b>8,200<sup>3</sup></b>	<b>12,694</b>
Europe:					
Belgium .....	4	4	4	4	4
France .....	59,961	78,336	69,702	64,595	71,650
Germany, East <sup>3</sup> .....	80,000	90,000	90,000	90,000	90,000
West .....	154,753	161,566	177,719	190,916	176,370
Italy .....	45,216	63,546	83,544	85,041	110,694
Norway .....	995	750	777	488	317
Spain .....	62,472	63,899	56,426	81,032	69,446
Sweden (sales) .....	5,607	4,926	4,773	4,140	1,459
United Kingdom .....	83,725	84,922	88,624	92,607	96,235
Total Europe <sup>3</sup> .....	<b>500,000</b>	<b>560,000</b>	<b>575,000</b>	<b>615,000</b>	<b>620,000</b>
Asia:					
Japan .....	4,405	4,356	7,206	6,771	4,730
Korea, Republic of .....	4,677	6,121	12,139	9,780	11,111
Turkey .....	—	277	110	—	—
U.S.S.R. .....	90,000	90,000	90,000	110,000	110,000
Total Asia .....	<b>105,000</b>	<b>110,000</b>	<b>140,000</b>	<b>170,000</b>	<b>180,000</b>
Africa:					
French Morocco .....	2,169	3,642	3,188	1,188	11
Southern Rhodesia .....	122	—	373	120	480
South West Africa .....	859	4,870	5,641	3,063	675
Tunisia .....	—	2,723	2,249	—	—
Union of South Africa .....	13,537	11,343	16,029	21,996	32,839
Total Africa .....	<b>16,687</b>	<b>22,578</b>	<b>27,480</b>	<b>26,367</b>	<b>34,005</b>
Australia .....	548	96	373	21	316
World total (estimate) .....	<b>1,130,000</b>	<b>1,300,000</b>	<b>1,330,000</b>	<b>1,330,000</b>	<b>1,400,000</b>

1. In addition to countries listed, fluorspar is produced in China and North Korea. Estimates are included in the total.

2. This table incorporates a number of revisions of data in previous fluorspar chapters.

3. Estimate.

4. Data not available; estimate included in total.

5. U.S.S.R. in Europe included in U.S.S.R. in Asia as deposits are predominantly in Asiatic Russia.

**GARNET**

In 1956 there was no garnet mined in Canada. In earlier years the Niagara Garnet Company mined a deposit near River Valley in Dana Township, 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 of 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 mine closed during the spring of 1954. A small quantity was shipped from a Quebec mine in that year. No shipments were made in 1956. Some development work was done on properties in eastern Ontario and in Quebec.

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 25. Producers' Shipments of Graphite, 1946-1956**

Year	Short tons	\$	Year	Short tons	\$
1946 .....	1,975	180,405	1951 .....	1,569	231,167
1947 .....	2,398	207,364	1952 .....	2,040	255,732
1948 .....	2,539	239,931	1953 .....	3,466	366,528
1949 .....	2,147	212,496	1954 .....	2,463	254,534
1950 .....	3,586	390,815	1955-1956 .....	-	-

**TABLE 26. Imports and Exports of Graphite<sup>1</sup>, 1954-1956**

	1954	1955	1956
	\$	\$	\$
<b>Imports:</b>			
Plumbago, not ground .....	54,385	64,798	87,926
Crucibles, plumbago, and covers .....	156,516	202,864	260,000
Plumbago, ground, and manufactures of .....	548,824	561,394	815,384
<b>Exports:</b>			
Graphite, crude and refined .....	199,612	761	200
Carbon and graphite electrodes .....	1,251,411	2,945,511	2,802,932

1. Includes artificial graphite.

TABLE 27. Available Data on the Consumption of Graphite, 1952-1955

—	1952	1953	1954	1955
Pounds				
<b>By industries:</b>				
Polishes and dressings .....	45,415	20,859	22,164	22,536
Paints .....	138,379	108,870	104,703	109,994
Brass and copper products .....	75,495	46,747	48,096	39,846
Electrical apparatus .....	700,619	586,397	711,235	1,369,345
Heavy chemicals .....	617,644	635,134	496,753	687,303
Boilers and platework .....	11,130	6,699	7,021	8,185
Steel ingots and castings .....	2,048,000	2,208,000	1,074,000	1,616,000
Farm implements .....	8,100	5,412	2,700	10,739
Railway rolling stock .....	165,278	103,911	419,598	77,800
Machinery .....	144,085	100,717	118,312	178,246
Iron castings .....	609,155	755,041	506,081	803,313
Cooking and heating equipment .....	33,128	28,769	38,036	29,353
Ferro-alloys .....	358,000	484,000	6,100,000	...
Asbestos products .....	473,882	28,678	14,439	28,714
Explosives .....	2,896	23,269	42,188	2,822
Miscellaneous non-metallics .....	113,556	435,740	192,952	419,951
Miscellaneous iron and steel .....	144,537	51,586	168,827	53,103
Miscellaneous non-ferrous .....	...	10,917	538	725
Petroleum refining .....	...	...	77,090	62,800
Machine tools .....	...	...	6,900	55,000
Clay products .....	...	...	...	200,000
<b>Total for above industries .....</b>	<b>5,689,299</b>	<b>5,640,746</b>	<b>10,151,533</b>	<b>5,726,275</b>
<b>By provinces:</b>				
Newfoundland .....	11,601	9,537	5,372	3,628
Nova Scotia .....	2,119	4,986	5,151	996
New Brunswick .....	943,936	1,220,558	1,166,692	1,226,110
Ontario .....	4,341,686	4,126,939	8,704,037	3,563,490
Manitoba .....	122,856	35,783	118,835	216,659
Saskatchewan .....	2,765	4,300	400	2,195
Alberta .....	41,580	18,300	17,650	565,516
British Columbia .....	222,756	220,343	133,396	147,681
<b>Total accounted for .....</b>	<b>5,689,299</b>	<b>5,640,746</b>	<b>10,151,533</b>	<b>5,726,275</b>

**TABLE 28. World Production of Natural Graphite, by Countries**  
 (Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country <sup>1</sup>	1952	1953	1954	1955	1956
Short tons <sup>2</sup>					
North America:					
Canada .....	2,040	3,466	2,463	—	—
Mexico .....	26,623	33,433	24,013	32,342	32,655
United States .....	5,606	6,281	3	3	3
South America:					
Argentina .....	5	5	5	2	386
Brazil .....	938	648	1,008	859	5
Europe:					
Austria .....	21,728	16,185	19,184	19,637	20,597
Czechoslovakia .....	5	5	5	5	5
Germany, West .....	9,880	8,222	10,448	11,556	12,878
Italy .....	4,837	5,731	4,165	3,035	3,262
Norway .....	4,542	3,255	3,993	5,970	5,562
Spain .....	863	352	451	349	363
Sweden .....	—	—	—	309	5
Yugoslavia .....	757	—	—	1,033	—
Asia:					
Ceylon (exports) .....	8,578	8,084	8,655	11,064	16,787
Hong Kong .....	—	220	2,061	1,722	2,734
India .....	2,405	859	1,657	1,807	1,650 <sup>4</sup>
Japan .....	5,126	4,488	4,515	3,385	3,757
Korea, Republic of .....	16,601	21,416	15,344	99,228	67,367
Taiwan (Formosa) .....	772	—	—	—	2,285
Africa:					
Egypt .....	—	—	—	—	—
French Morocco .....	23	108	—	—	—
Kenya .....	39	205	347	241	619
Madagascar .....	20,368	14,847	13,284	16,194	15,916
Mozambique .....	—	—	—	—	—
South West Africa .....	1,305	—	115	1,011	5
Spanish Morocco .....	19	—	—	129	137
Tanganyika .....	—	21	—	—	26
Union of South Africa .....	389	413	1,396	1,829	1,650 <sup>4</sup>
Australia .....	89	17	78	24	1
<b>Total world (estimate)<sup>1</sup></b> .....	<b>205,000</b>	<b>200,000</b>	<b>185,000</b>	<b>290,000</b>	<b>270,000</b>

1. In addition to countries listed, graphite has been produced in China, North Korea and U.S.S.R., but production data are not available; estimates included in total.
2. This table incorporates a number of revisions of data published in previous graphite chapters.
3. Production included in total; Bureau of Mines not at liberty to publish separately.
4. Estimate.
5. Data not available; estimate included in total.

## 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 Bruns-

wick coast where the stones are removed along the shore area of the Bay of Chaleur. There were 10 tons of grindstones valued at \$1,500 shipped in 1955.

TABLE 29. Production of Grindstones, Pulpstones and Scythestones, 1947-1956

Year	Tons	\$	Year	Tons	\$
1947 .....	335	21,475	1952 .....	42	5,720
1948 .....	220	20,100	1953 .....	15	900
1949 .....	195	12,450	1954 .....	-	-
1950 .....	100	10,000	1955 .....	10	1,500
1951 .....	60	6,000	1956 .....	-	-

TABLE 30. Purchases of Pulpstones by the Canadian Pulp and Paper Industry, 1947-1955

Year	Number for 2 ft. wood	Value	Number for 2.5 ft. wood	Value	Number for 4 ft. wood	Value
		\$		\$		\$
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	378,050
1951 .....	107	111,295	25	34,251	155	511,676
1952 .....	82	104,718	11	21,057	179	605,840
1953 .....	100	107,291	16	33,503	160	588,329
1954 .....	78	120,549	18	41,158	201	703,596
1955 .....	83	130,247	15	35,464	168	665,581

## IRON OXIDES

Ochreous iron oxides shipped during 1956 amounted to 8,803 tons valued at \$186,225 compared with 7,702 tons valued at \$162,512 in 1955. All production came from deposits in Quebec.

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 was used for the purification of illuminating gas.

TABLE 31. Principal Statistics of The Natural Iron Oxides Industry, Significant Years, 1921-1956

Year	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of products	Net value <sup>1</sup> of production
	No.	No.	\$	\$	\$	\$	\$
1921 .....	4	32	42,693	10,858	N.A.	93,610	N.A.
1929 .....	4	48	47,324	13,564	"	115,932	"
1931 .....	4	30	29,194	8,560	"	49,205	"
1933 .....	4	22	15,631	5,755	"	53,450	"
1937 .....	6	50	35,368	13,368	510	83,640	69,762
1939 .....	7	38	26,916	8,094	100	88,418	80,224
1941 .....	4	44	42,152	15,697	5,697	142,069	120,675
1944 .....	6	55	49,876	19,115	6,700	150,250	112,765
1946 .....	5	60	77,727	16,656	4,200	152,268	116,251
1949 .....	8	44	73,111	20,692	4,424	207,887	167,481
1951 .....	5	43	87,233	22,896	3,651	262,277	219,852
1953 .....	4	37	83,095	23,776	2,250	195,801	152,958
1954 .....	3	31	67,564	21,822	3,904	186,856	150,871
1955 .....	4	33	71,731	21,931	3,931	165,928	121,772
1956 .....	3	29	49,669	6,055	545	191,145	152,400

1. Gross value of production, less the value of fuel, electricity, process supplies, containers and freight.

TABLE 32. Production of Natural Iron Oxides, 1947-1956

Year	Quantity	Value	Year	Quantity	Value
	Short tons	\$		Short tons	\$
1947 .....	13,418	258,322	1952 .....	11,487	194,922
1948 .....	13,181	203,391	1953 .....	10,308	195,801
1949 .....	13,625	207,887	1954 .....	5,798	183,507
1950 .....	13,696	262,632	1955 .....	7,702	162,512
1951 .....	13,342	262,277	1956 .....	8,803	186,225

TABLE 33. Imports and Exports of Ochres and Colours, 1955 and 1956

	1955		1956	
	Quantity	Value	Quantity	Value
Imports:	Tons	\$	Tons	\$
Ochres, ochrey earths, siennas and umbers .....	986	66,007	1,162	90,773
Oxides, fireproofs, rough stuff, fillers and colours, dry, n.o.p. ....	5,707	3,831,579	6,237	3,600,975
Exports:				
Iron oxides .....	3,623	448,363	3,203	448,432

TABLE 34. Consumption of Iron Oxides in Specified Canadian Industries, 1951-1955

Year	Coke and gas		Paints and varnishes			
			Iron oxide pigments		Ochres, siennas and umbers	
	Quantity	Value	Quantity	Value	Quantity	Value
	Tons <sup>1</sup>	\$	Tons	\$	Tons	\$
1951 .....	10,310	105,709	2,946	467,059	249	50,851
1952 .....	8,302	81,822	2,442	406,781	227	49,738
1953 .....	7,989	85,579	2,456	450,031	243	54,180
1954 .....	9,167	100,240	2,190	389,588	212	52,691
1955 .....	6,835	70,675	2,298	407,762	221	55,745

1. Oxide and purifying materials.

TABLE 35. Employees and Their Earnings in the Natural Iron Oxides Industry, 1952-1956

	Number of employees						Number of man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total	Office and Adminis-trative		Workmen	Total	
	Male	Female	Male	Female						
								\$	\$	
1952 .....	4	1	40	—	45	82,854	14,489	78,934	93,423	
1953 .....	1	1	35	—	37	72,008	6,273	76,822	83,095	
1954 .....	2	1	28	—	31	55,327	9,661	57,903	67,564	
1955 .....	1	1	31	—	33	55,934	7,473	64,308	71,781	
1956 .....	1	1	27	—	29	44,056	7,473	42,196	49,669	

TABLE 36. Workmen in the Natural Iron Oxides Industry, by Months, 1955 and 1956

Month	1955			1956		
	Quarry	Mill	Total	Quarry	Mill	Total
	Male	Male		Male	Male	
Number						
January .....	7	22	29	2	18	20
February .....	8	19	27	2	17	19
March .....	5	19	24	2	17	19
April .....	5	14	19	3	6	9
May .....	14	11	25	13	18	31
June .....	12	13	25	12	18	30
July .....	13	22	35	12	18	30
August .....	19	20	39	13	19	32
September .....	21	22	43	12	20	32
October .....	18	23	41	14	18	32
November .....	12	25	37	14	17	31
December .....	10	23	33	14	15	29
Average .....	12	19	31	10	17	27
Man-hours of labour .....			51,934			40,056

### LITHIA

Late in 1955 the Quebec Lithium Corporation began milling spodumene to produce lithia concentrates. This might be considered the initial commercial production of lithia on a continuing basis. Heretofore production had been sporadic and partially experimental. Producers' shipments in 1956 amounted to 4,789,380 pounds of lithia valued at \$2,643,950 compared with 114,376 pounds valued at \$61,752 in 1955. These figures on quantities are the lithia or lithium oxide content of spodumene concentrates exported for processing.

The chief lithium minerals are amblygonite, spodumene and lepidolite; their ores contain respectively, about 8, 6 and 4 per cent of lithia or lithium oxide ( $\text{Li}_2\text{O}$ ). Spodumene is in the greatest supply and is the base raw material for the manufacture of many lithium salts, lithium metal and alloys.

Lithia deposits are being developed in Canada near Val d'Or, northwestern Quebec; also exploratory work has been done in the Winnipeg River-Cat

lake area of southeastern Manitoba and in the Yellowknife-Beaulieu region of the Northwest Territories.

Lithium hydroxide is used to make special greases which are water-resistant and retain lubricating qualities through a wide range of temperature. The electrolyte in the Edison cell storage battery contains lithium hydroxide! Lithium compounds are used as a flux in porcelain enamels for stoves, refrigerators and bathtubs. There is a limited amount of information available regarding the use of lithium compounds in rocket fuels.

Prices for lithium ore are nominal. Quotations on the mineral market are not regularly published. Lithium compounds were priced as follows, lithium metal, \$13 to \$20 per pound; lithium bromide, \$1.80; lithium chloride, \$1.45; lithium carbonate, \$0.85 to \$1.13; lithium hydroxide monohydrate, \$0.80 to \$0.82; lithium stearate, \$0.49 to \$0.50; lithium fluoride, \$2.17 to \$2.40.

### 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 quar-

ried 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 soil conditioner. 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 37. Production of Magnesitic Dolomite, 1947-1956

Year	Value	Year	Value
	\$		\$
1947 .....	1,167,484	1952 .....	2,161,472
1948 .....	1,587,709	1953 .....	2,016,640
1949 .....	1,536,200	1954 .....	1,909,163
1950 .....	1,717,879	1955 .....	2,151,820
1951 .....	2,148,940	1956 .....	2,783,181

Note: Above figures include the value of brucite shipped, dead burned magnesitic dolomite and serpentine used or sold.

TABLE 38. Magnesite and Dolomite Used in the Canadian Primary Iron and Steel Industry, 1951-1955

Year	Calcined dolomite		Dolomite, crude		Magnesite	
	Short tons	Value	Short tons	Value	Short tons	Value
		\$		\$		\$
1951 .....	32,852	755,989	290,052	692,684	18,240	995,071
1952 .....	37,129	870,888	343,241	780,777	24,472	1,506,382
1953 .....	66,586	1,562,163	400,923	817,999	14,184	821,769
1954 .....	48,266	1,165,247	355,505	673,437	9,940	546,026
1955 .....	86,420	2,118,600	388,535	711,310	10,353	12,493

## MINERAL STATISTICS

TABLE 39. World Production of Magnesite, by Countries<sup>1</sup>  
(Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
North America:					
United States .....	670,167	510,750	810,881	376,928	656,874
Total <sup>1,3</sup> .....	940,000	840,000	1,140,000	850,000	1,080,000
South America:					
Brazil <sup>3</sup> .....	11,000	11,000	11,000	11,000	11,000
Venezuela .....	1,800	—	—	—	—
Total <sup>3</sup> .....	12,800	11,000	11,000	11,000	11,000
Europe:					
Austria .....	732,260	818,200	895,971	925,006	1,094,412
Czechoslovakia .....	4	4	4	4	4
Germany, West .....	—	—	—	—	—
Greece .....	70,392	89,939	117,879	84,327	66,980
Italy .....	1,136	1,130	2,269	3,290	4,075
Norway .....	1,602	1,630	2,049	915	874
Spain .....	15,138	13,917	16,653	30,450	28,873
Yugoslavia .....	99,114	41,647	135,052	119,069	129,114
Total <sup>1,3</sup> .....	2,800,000	2,900,000	3,000,000	3,000,000	3,200,000
Asia:					
Cyprus (exports) .....	22	22	22	—	—
India .....	131,562	99,726	103,878	78,968	83,000 <sup>3</sup>
Korea, Republic of .....	4	362	—	—	—
Turkey .....	557	982	386	1,174	4
Total <sup>1,3</sup> .....	300,000	330,000	340,000	420,000	550,000
Africa:					
Egypt .....	961	—	—	—	—
Kenya .....	—	—	—	—	—
Southern Rhodesia .....	16,330	12,072	10,824	7,792	11,610
Tanganyika (exports) .....	2,994	—	64	87	367
Union of South Africa .....	20,694	26,906	25,229	26,874	19,753
Total .....	40,979	38,978	36,117	34,753	31,730
Oceania:					
Australia .....	43,830	47,193	51,965	48,331	60,471
New Zealand .....	649	648	579	807	660 <sup>3</sup>
Total .....	44,479	47,841	52,544	49,138	61,200 <sup>3</sup>
World total (estimate) <sup>1</sup> .....	4,100,000	4,100,000	4,600,000	4,400,000	4,900,000

1. Unless otherwise stated, quantities in this table represent crude magnesite mined. Inaddition to countries listed, magnesite is also produced in Canada, China, Mexico, North Korea, Poland and U.S.S.R., but data on tonnage output are Not available; estimates included in total.

2. This table incorporates a number of revisions of data published in previous magnesite chapters.

3. Estimate.

4. Data not available; estimate included in total.

TABLE 40. Calcined Magnesite Used by the Artificial Abrasives Industry, 1951-1955

Year	Tons	Value
		\$
1951 .....	3,688	407,191
1952 .....	2,396	288,941
1953 .....	3,644	412,281
1954 .....	4,271	511,683
1955 .....	N. A.	589,825

## 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 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 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 41. Production of Natural Magnesium Sulphate<sup>1</sup>, 1941-1956

Year	Tons	Value
		\$
1941 .....	265	7,343
1942 .....	1,140	38,760
1943-1956 .....	-	-

1. Produced entirely in British Columbia

TABLE 42. Imports of Magnesium Sulphate, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947 .....	2,908	108,840	1952 .....	2,186	76,419
1948 .....	2,797	118,792	1953 .....	2,761	80,885
1949 .....	2,783	120,881	1954 .....	2,365	70,374
1950 .....	2,793	100,644	1955 .....	2,376	69,009
1951 .....	3,065	95,005	1956 .....	2,614	69,517

TABLE 43. Available Data on Consumption of Magnesium Sulphate, 1951-1955

Industry	1951	1952	1953	1954	1955
	Tons				
Leather tanneries .....	554	582	642	515	534
Medicinals .....	570	622	649	488	505
Fertilizers .....	81	50	471	21	30
Textiles .....	36	-	-	9	1
Total accounted for .....	1,241	1,254	1,762	1,033	1,070

## MINERAL STATISTICS

## MICA

Amber mica or phlogopite is mined in Quebec and Ontario. The major portion of the output is derived from Quebec mines. Muscovite production

is from Ontario mines. The mica obtained from the schist rock in British Columbia is included for statistical purposes in the muscovite class.

TABLE 44. Principal Statistics of the Mica Mining Industry, Significant Years, 1921-1956

	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of production	Net value <sup>1</sup> of production
	No.	No.	\$	\$	\$	\$	\$
1921 .....	20	104	74,432	4,404	N.A.	70,063	N.A.
1929 .....	14	83	47,362	355	"	118,549	"
1931 .....	11	28	22,556	444	"	54,066	"
1933 .....	15	41	25,007	80	"	49,284	"
1937 .....	34	199	97,547	3,768	13,778	133,731	116,185
1939 .....	61	224	112,653	7,570	11,444	147,321	128,307
1941 .....	81	246	181,800	17,705	21,824	335,288	295,759
1944 .....	70	178	359,797	23,586	33,038	841,026	784,402
1946 .....	27	129	153,616	20,308	17,778	199,039	160,953
1949 .....	34	96	115,667	14,490	6,026	108,458	87,942
1951 .....	31	138	182,033	14,580	18,148	447,650	414,922
1953 .....	44	105	152,284	14,811	11,540	161,128	134,777
1954 .....	32	44	59,194	7,778	6,154	85,139	71,207
1955 .....	33	31	42,495	6,491	5,157	78,375	66,727
1956 .....	23	23	37,673	4,796	4,045	97,049	83,208

1. Gross value of production, less the value of fuel, electricity, process supplies, containers and freight.

TABLE 45. Mica Production (Primary Sales), by Classes, 1955 and 1956

Grade	1955		1956	
	Pounds	Total value f.o.b. shipping point	Pounds	Total value f.o.b. shipping point
Rough, mine-run or rifted .....	25,275	2,272	40,826	841
Mica sold for mechanical splitting .....	8,000	2,080	16,000	4,160
Splittings .....	—	—	2,000	3,480
Ground or powdered .....	943,158	42,837	1,493,410	58,083
Scrap, mine or shop waste and mica mined and sold for grinding .....	639,958	4,313	269,220	2,461
Trimmed mica .....	24,317	26,019	22,355	26,641
<b>Total mica shipments .....</b>	<b>1,640,708</b>	<b>77,541</b>	<b>1,843,811</b>	<b>95,666</b>
Varieties:				
Phlogopite mica (amber) and biotite .....	1,136,390	74,640	1,663,803	94,396
Muscovite mica (white) and schist .....	504,318	2,901	180,008	1,270

TABLE 46. Production of Mica, by Provinces and by Varieties, 1956

Province	Phlogopite and biotite		Muscovite and schist		Total	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Quebec .....	1,617,276	93,761	—	—	1,617,276	93,761
Ontario .....	46,527	635	8	10	46,535	645
British Columbia .....	—	—	180,000	1,260	180,000	1,260
<b>Total Canada .....</b>	<b>1,663,803</b>	<b>94,396</b>	<b>180,008</b>	<b>1,270</b>	<b>1,843,811</b>	<b>95,666</b>

TABLE 47. Production of Mica, 1947-1956

Year	Short tons	\$	Year	Short tons	\$
1947 .....	4,159	200,903	1952 .....	1,007	194,106
1948 .....	3,951	219,948	1953 .....	1,133	161,128
1949 .....	1,745	108,458	1954 .....	853	85,139
1950 .....	1,940	252,611	1955 .....	820	77,541
1951 .....	2,481	447,650	1956 .....	922	95,666

TABLE 48. Imports and Exports of Mica, 1954-1956

	1954		1955		1956	
	Pounds	Value	Pounds	Value	Pounds	Value
Imports:		\$		\$		\$
Mica, unmanufactured .....	232,700	87,215	198,900	105,810	324,900	200,779
Mica, manufactures of, n.o.p. ....	...	365,990	...	482,853	...	538,227
Exports:						
Mica, scrap and waste .....	453,600	6,241	313,000	4,060	119,500	3,236
Mica splittings .....	-	-	-	-	-	-
Mica manufactures .....	...	2,847	...	42	...	1,919
Mica, rough, untrimmed .....	60,200	12,647	2,000	195	24,500	6,059
Mica, trimmed .....	17,400	21,583	46,900	41,318	41,800	39,981
Mica, ground .....	240,000	13,319	900	45	92,000	5,520
Total mica exports reported .....	...	56,637	...	45,660	...	56,715

TABLE 49. Consumption of Mica, in Specified Industries, as Reported to The Annual Census of Industry, 1952-1955

	1952	1953	1954	1955	Pounds
By industries:					
Paints .....	1,503,321	1,686,228	1,802,747	1,721,152	
Electrical apparatus .....	520,957	498,433	473,352	492,589	
Rubber goods .....	308,795	364,685	322,247	484,985	
Roofing .....	782,000	836,000	674,000	480,000	
Paper goods .....	98,000	62,500	56,000	38,000	
Asbestos .....	...	...	...	26,157	
Non-metallic mineral products .....	62,203	106,801	85,000	101,219	
Concrete products .....	...	...	...	4,700	
Miscellaneous .....	148,795	231,674	16,502	8,102	
Total accounted for .....	3,424,071	3,786,321	3,429,848	3,356,904	
By provinces:					
Quebec .....	1,553,133	1,669,777	1,772,025	1,701,766	
Ontario .....	1,358,778	1,517,168	1,214,578	1,361,430	
Manitoba .....	11,222	9,883	8,455	13,392	
British Columbia .....	500,938	589,493	434,790	280,316	
Canada .....	3,424,071	3,786,321	3,429,848	3,356,904	

**TABLE 50. World Production of Mica by Countries<sup>1</sup>**  
 (Taken from the "Minerals Yearbook" published by the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Thousands of pounds <sup>2</sup>					
North America:					
Canada (sales): Block .....	614	182	283	70	
Splittings .....	6	7	8	2	
Ground .....	2,063	988	665	937	
Scrap .....	2,278	838	1,310	697	
United States (sold or used): Sheet .....	595	698	849	662	641
Scrap .....	143,742	150,472	146,518	162,146	190,864
<b>Total</b> .....	<b>149,298</b>	<b>153,185</b>	<b>149,633</b>	<b>164,514</b>	<b>192,691</b>
South America:					
Argentina: Sheet .....	397	485	540	529	
Scrap .....		—	—	—	99
Brazil .....	3,655	4,676	4,347	3,962	3,300 <sup>3</sup>
Peru .....	—	—	—	—	—
Uruguay .....	2	2	2	—	—
<b>Total</b> .....	<b>4,054</b>	<b>5,163</b>	<b>4,889</b>	<b>4,491</b>	<b>3,540<sup>3</sup></b>
Europe:					
Austria .....	677	—	—	—	—
Italy .....	—	—	—	—	—
Norway, including scrap .....	2,172	1,171	2,185	3,968	3,307
Spain .....	24	18	29	18	20
Sweden: Block .....	93	18	7	4	—
Ground .....	381	346	377	331	368
<b>Total<sup>1,3</sup></b> .....	<b>59,000</b>	<b>57,000</b>	<b>59,000</b>	<b>60,000</b>	<b>60,000</b>
Asia:					
Ceylon .....	4	20	13	—	4
India (exports): Block .....	3,609	3,261	3,840	3,609	4,744
Splittings .....	30,730	12,650	12,211	10,855	
Scrap .....	20,615	18,516	11,444	23,031	
Taiwan (Formosa): Sheet .....	33	2	51	44	—
Scrap .....	1,036	29		—	—
<b>Total<sup>1,3</sup></b> .....	<b>57,100</b>	<b>36,700</b>	<b>32,000</b>	<b>48,600</b>	<b>62,700</b>
Africa:					
Angola: Sheet .....	33	64	42	24	33
Scrap and splittings .....	267	441	22	362	518
Eritrea .....	—	—	—	—	—
French Morocco: Sheet .....	26	—	4	11	
Scrap .....	55	13		18	—
Kenya .....	2	4	—	—	—
Madagascar (phlogopite): Block .....	2,112	90	115	101	62
Splittings .....	—	2,266	1,684	1,056	534
Mozambique, including scrap .....	24	4	7	2	29
Northern Rhodesia, sheet .....	13	35	18	7	4
Southern Rhodesia: Block .....	207	209	148	183	141
Scrap .....	560	1,464	201	—	—
South West Africa (scrap) .....	251	—	—	—	—
Tanganyika (exports): Block .....	154	238	165	174	146
Ground .....	—	33	—	—	—
Scrap .....	—	2	115	62	613
Uganda .....	4	4	—	4	—
Union of South Africa: Sheet .....	11	11	11	4	11
Scrap .....	3,911	5,871	4,281	4,107	7,818
<b>Total</b> .....	<b>7,626</b>	<b>10,745</b>	<b>6,838</b>	<b>6,111</b>	<b>9,909</b>
Australia <sup>5</sup> .....	1,182	1,105	1,069	1,316	1,054
<b>World total (estimate)<sup>1</sup></b> .....	<b>280,000</b>	<b>265,000</b>	<b>255,000</b>	<b>285,000</b>	<b>330,000</b>

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

2. This table incorporates a number of revisions of data published in previous mica chapters.

3. Estimate.

4. Less than 0.5 ton.

5. These figures include the following tonnages of damourite produced in South Australia, in thousands of pounds: 1951: 1,131; 1952: 1,032; 1953: 996; 1954: 1,151; 1955: 977.

TABLE 51. Employees and Their Earnings in the Mica Mining Industry, 1952-1956

Year	Number of employees						Number of man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total	Office and administrative		Workmen	Total	
	Male	Female	Male	Female						
1952 .....	1	1	68	45	115	237,064	\$ 2,035	\$ 166,141	\$ 168,141	
1953 .....	3	2	69	31	105	205,419	8,396	143,388	152,284	
1954 .....	1	1	36	6	44	77,423	3,550	55,644	59,194	
1955 .....	1	-	28	3	32	44,117	3,600	38,895	42,495	
1956.....	1	-	22	-	23	39,322	3,600	34,073	37,673	

TABLE 52. Workmen in the Mica Mining Industry, by Months, 1955 and 1956

Month	1955						1956					
	Mine			Mill or shop			Total	Mine			Mill or shop	
	Male	Male	Female	Male	Male	Female		Male	Male	Female	Total	
Number												
January .....	19	3	-	22	14	5	-	19	14	5	-	19
February .....	17	3	2	22	14	5	-	19	14	5	-	19
March .....	14	2	-	16	12	5	-	17	12	5	-	17
April .....	14	2	-	16	13	5	-	18	13	5	-	18
May .....	22	5	-	27	16	9	-	25	16	9	-	25
June .....	22	5	1	28	18	8	-	26	18	8	-	26
July .....	15	4	1	20	19	7	-	26	19	7	-	26
August .....	25	4	-	29	10	9	-	19	10	9	-	19
September .....	20	7	1	28	10	9	-	19	10	9	-	19
October .....	29	4	-	33	11	7	-	18	11	7	-	18
November .....	15	5	-	20	8	6	-	14	8	6	-	14
December .....	11	4	-	15	10	5	-	15	10	5	-	15
Average .....	21	7	2	30	15	7	-	22	15	7	-	22
Total man-hours worked .....				38,395								37,122

## NATURAL MINERAL WATERS

Most of the bottled natural mineral waters are obtained from springs in Quebec. Among the larger producers are Orange Crush Limited at Varennes, Sources Abenakis Ltée at St-Francois du Lac, Eau Minerale Naturelle St-Leon at St-Leon and Usine d'Embouteillage Maski Enrg. At St-Justin.

The directory at the end of this bulletin gives the location of other springs of natural mineral waters.

There were 10 firms reporting production of natural mineral waters in Canada in 1956. Nine of these firms were in Quebec and 1 in Ontario.

TABLE 53. Shipments of Natural Mineral Waters from Canadian Springs, 1947 - 1956

Year	Quebec		Ontario		Canada	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		\$		\$		\$
1947 .....	195,452	116,840	3,500	600	193,952	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 .....	322,300	146,521	2,500	450	325,300	146,971
1952 .....	309,125	165,593	2,370	440	311,495	166,033
1953 .....	309,285	165,334	300	150	309,585	165,484
1954 .....	282,078	147,307	2,000	750	284,073	148,057
1955 .....	303,110	158,495	3,573	2,015	306,683	160,510
1956 .....	290,526	148,167	2,000	1,700	292,526	149,867

## 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 Francois Lake, British Columbia, 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.

Shipments of 1,112 tons of perlite valued at \$11,120 were made from the British Columbia deposits to the expanding plant of Western Gypsum Products Ltd., Calgary, Alberta, during 1953. There was no production reported since.

## 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 but there were no shipments in subsequent years.

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 54. Production of Phosphate Rock, 1947-1956

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1947.....	—	—	1952 .....	—	—
1948 .....	—	—	1953 .....	—	—
1949 .....	20	291	1954 .....	—	—
1950 .....	129	1,070	1955 .....	—	—
1951 .....	6	94	1956 .....	—	—

TABLE 55. Imports of Phosphate Rock, 1947-1956

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1947 .....	485,391	2,857,522	1952 .....	470,913	3,130,306
1948 .....	482,008	2,911,168	1953 .....	576,500	3,951,318
1949 .....	620,808	3,879,523	1954 .....	644,860	4,577,633
1950 .....	491,026	3,296,341	1955 .....	588,209	4,512,833
1951 .....	499,711	3,178,899	1956 .....	627,648	5,185,597

TABLE 56. Consumption of Phosphate Rock, 1952-1955

	1952	1953	1954	1955
	Tons			
<b>(a) By uses:</b>				
Fertilizers .....	418,495	416,714	506,241	465,129
Chemicals .....	65,394	78,408	100,642	97,716
Steel and iron .....	—	532	1,081	128
Refractories .....	—	—	—	—
Stock and poultry feeds .....	17,615	15,986	19,582	21,919
Miscellaneous .....	9,582	450	515	434
<b>Total .....</b>	<b>511,086</b>	<b>512,090</b>	<b>628,061</b>	<b>585,326</b>
<b>(b) By provinces:</b>				
Prince Edward Island .....	}	489	410	476
Nova Scotia .....		433	674	509
New Brunswick .....		127,330	122,206	148,254
Quebec .....		93,197	89,694	105,507
Ontario .....		846	798	1,031
Manitoba .....		289	165	208
Saskatchewan .....		607	625	697
Alberta .....		287,895	297,518	371,379
British Columbia .....		511,086	512,090	628,061
<b>Canada .....</b>		<b>511,086</b>	<b>512,090</b>	<b>628,061</b>

TABLE 57. World Production of Phosphate Rock, by Countries  
(Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country <sup>1</sup>	1952	1953	1954	1955	1956
Thousand long tons <sup>2</sup>					
North America:					
Canada .....	—	—	—	—	—
United States .....	12,065	12,504	13,821	12,265	15,747
West Indies:					
Jamaica (guano) .....	1	1	1	3	3
Netherlands Antilles (exports) .....	105	95	124	109	104
Total .....	12,171	12,600	13,946	12,374	15,851
South America:					
Brazil .....	18	12 <sup>5</sup>	64 <sup>5</sup>	123 <sup>5</sup>	123 <sup>5</sup>
Chile (apatite) .....	45	58	54 <sup>5</sup>	54 <sup>5</sup>	54 <sup>5</sup>
(guano) <sup>5</sup> .....	30	30	30	30	30
Peru .....	295 <sup>5</sup>	295 <sup>5</sup>	289	285	327
Total .....	388	395	437	492	534
Europe:					
Austria .....	—	—	—	—	—
Belgium .....	58	35	26	19	13
France .....	100	86	117	80	66
Ireland .....	4	—	—	—	—
Spain .....	23	22	22	23	11
Sweden (apatite) .....	21	9	—	—	—
U.S.S.R.: Apatite <sup>5</sup> .....	2,460	2,760	3,100	3,445	3,690
Sedimentary rock <sup>5</sup> .....	1,130	1,205	1,330	1,425	1,575
Total <sup>5</sup> .....	3,820	4,120	4,600	5,000	5,360
Asia:					
British Borneo (guano) .....	1	1	1	3	3
China <sup>5</sup> .....	98	148	197	246	246
Christmas Island (exports) (Indian Ocean) .....	349	280	351	390	341
India (apatite) .....	3	4	2	6	9
Indonesia .....	—	1	6	6 <sup>5</sup>	6 <sup>5</sup>
Israel .....	17	23	54	84	118
Japan .....	—	—	—	—	—
Jordan .....	23	39	74	161	205
Philippines (guano) .....	4	1	2	3	8
Total <sup>5</sup> .....	490	510	710	910	950
Africa:					
Algeria .....	691	609	761	746	596
Angola (guano) .....	—	—	—	—	—
British Somaliland (guano) <sup>6</sup> .....	1	3	3,5	3	3,5
Egypt .....	514	477	526	636	605
French Morocco .....	3,891	4,090 <sup>7</sup>	4,940 <sup>7</sup>	5,245, <sup>7</sup>	5,435, <sup>7</sup>
French West Africa (aluminum phosphate) .....	64 <sup>7</sup>	93 <sup>7</sup>	77 <sup>7</sup>	111 <sup>7</sup>	72
Madagascar .....	1	2	1	2	3
Seychelles Islands (exports) .....	11	9	12	4	4
Southern Rhodesia .....	—	—	—	—	—
South West Africa (guano) .....	2	2	1	2	1 <sup>5</sup>
Tanganyika Territory .....	3	3	3	3	3,5
Tunisia .....	2,229	1,691	1,795	2,067	2,044
Uganda .....	5	5	3	3	3
Union of South Africa .....	95	79	93	134	187 <sup>5</sup>
Total .....	7,504	7,057	8,209 <sup>5</sup>	8,950	8,950 <sup>5</sup>
Oceania:					
Angaur Island (exports) .....	83	111 <sup>5</sup>	122	137	— <sup>5</sup>
Australia .....	6	3	6	6	6 <sup>5</sup>
Makatea Island (French Oceania) <sup>6</sup> .....	210	247	225	216	250
Nauru Island (exports) .....	1,146	1,160	1,178	1,401	1,333
New Zealand .....	—	—	—	—	—
Ocean Island (exports) .....	246	282	292	309	297
Total .....	1,691	1,803 <sup>5</sup>	1,823	2,069	1,886 <sup>5</sup>
World total (estimate) <sup>1</sup> .....	26,000	26,500	29,700	29,800	33,500

1. In addition to countries listed, North Korea and Poland produce phosphate rock; but date of output are not available; an estimate for North Korea has been included in the total.

2. This table incorporates a number of revisions of data published in previous phosphate rock chapters. Data do not add to totals shown due to rounding where estimated figures are included in the detail.

3. Less than 500 tons.

4. Data not available; estimate included in total.

5. Estimate.

6. Exports.

7. Includes calcium phosphate, production of which is reported as follows: 1952, 21,400 tons; 1953, 41,800 tons; 1954, 5,500 tons.

## POTASH

There was no commercial production of potash in Canada during 1956. In recent years many millions of dollars have been expended in developing the extensive potash deposits in Saskatchewan. Core drilling has indicated that these beds of sylvite and carnallite extend westward from the Manitoba border

through the Saskatoon area to Unity, a distance of nearly 400 miles. Firms which are experienced potash producers were sinking shafts to mine these deposits which lie at depths of from 2,550 to 3,500 feet.

TABLE 58. World Production of Potash (marketable, unless otherwise stated) in Equivalent K<sub>2</sub>O, by Countries<sup>1</sup>, 1952-1956, in Short Tons<sup>2</sup>

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

Country <sup>1</sup>	1952	1953	1954	1955	1956
North America:					
United States .....	1,665,113	1,911,891	1,948,721	2,080,311	2,171,584
Crude (including Brines) <sup>3</sup> .....	1,841,118	2,098,736	2,170,969	2,340,551	2,479,463
South America:					
Chile .....	13,200	330	550	11,000	12,000
Europe:					
France (Alsace) .....	1,022,539	996,575	1,192,087	1,307,042	1,455,000 <sup>4</sup>
Crude <sup>3</sup> .....	1,162,750	1,135,657	1,361,734	1,490,764	1,653,465
Germany: East <sup>4</sup> .....	1,440,000	1,488,000	1,488,000	1,522,000	1,598,000
Crude <sup>3,4</sup> .....	1,670,000	1,720,000	1,720,000	1,820,000	1,840,000
West .....	1,445,128	1,459,309	1,783,394	1,870,848	1,823,221
Crude <sup>3</sup> .....	1,712,659	1,742,752	2,134,072	2,226,666	2,166,039
Spain .....	199,613	202,764	243,166	242,539	256,525
Sweden <sup>5</sup> .....	772	551	1,213	661	1,814
U.S.S.R. <sup>4</sup> .....	414,900	480,700	593,700	870,500	983,600
Asia:					
Israel .....	—	3,415	12,000 <sup>4</sup>	12,000 <sup>4</sup>	29,000 <sup>4</sup>
Japan .....	173	283	454	461	435
Africa: Eritrea .....	1,323	—	—	—	—
Oceania: Australia .....	26	—	—	—	—
World total (marketable estimate) <sup>1</sup> .....	6,200,000	6,500,000	7,300,000	7,900,000	8,300,000

1. In addition to countries listed, China, Ethiopia, Italy and Korea, are reported to produce potash salts, but statistics of production are not available; estimates included in totals.

2. This table incorporates a number of revisions of data published in previous potassium salts chapters. Data do not add to totals shown due to rounding where estimated figures are included in the detail.

3. To avoid duplication of figures, data on crude potash are not included in the total.

4. Estimate.

5. Year ended June 30 of year stated.

## PYRITE, PYRRHOTITE

Pyrite and pyrrhotite are by-products which are produced from the processing of the metal sulphide ores of Noranda, Quebec, Waite Amulet, Normetal, West MacDonald, East Sullivan and Weedon Pyrite Mines in Quebec and Britannia mine in British Columbia. Buchans mine in Newfoundland shipped pyrite to the paper mills in that province. At Kimberley the waste iron sulphides are used to produce acid for the fertilizer plant. Shipments of pyrite were made to pulp and paper mills and chemical plants in Canada and abroad.

At Port Robinson, Ontario the pyrite and pyrrhotite concentrates from Noranda Mines are treated to produce sulphur dioxide which is sold to acid plant and the iron residue is sold as feed for iron and steel furnaces. At Copper Cliff a plant of the International Nickel Co. of Canada Ltd. treats pyrrhotite, containing some nickel, to produce iron oxide pellets and nickel carbonate. It is expected that the sulphur content of the pyrrhotite will be recovered.

**TABLE 59. Producers' Shipments Pyrite and Pyrrhotite, 1947-1956**

Year	Gross weight	Sulphur content	Value	Year	Gross weight	Sulphur <sup>1</sup> content	Value
	Tons	Tons			Tons	Tons	
1947 .....	178,264	82,637	431,427	1952 .....	553,987	263,241	2,245,713
1948 .....	184,070	87,126	412,988	1953 .....	408,257	186,650	1,450,698
1949 .....	250,476	117,581	596,154	1954 .....	687,928	311,159	2,663,499
1950 .....	312,614	150,487	682,810	1955 .....	878,452	403,986	3,740,383
1951 .....	444,948	215,363	1,556,510	1956 .....	1,046,740	473,605	4,538,785

1. Data for 1952-1955 include sulphur content of acid made from roasting zinc sulphide concentrates at Arvida.

**TABLE 60. World Production of Pyrites (Including Cupreous Pyrites), by Countries<sup>1</sup>**  
(Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country <sup>1</sup>	1953		1954		1955	
	Gross weight	Sulphur content	Gross weight	Sulphur content	Gross weight	Sulphur content
Long tons <sup>2</sup>						
North America:						
Canada .....	364,515	166,651	517,856	277,820	739,968	355,185
Cuba .....	50,000 <sup>3</sup>	24,200 <sup>3</sup>	118,105	56,690	127,497	62,473
United States .....	922,647	379,545	908,715	405,310	994,443	395,576
South America: Brazil .....	...	...	...	...	...	...
Europe:						
Austria .....	69	26	...	...	...	...
Czechoslovakia .....	4	4	4	4	4	4
Finland .....	255,095	108,263	248,528	105,310	298,064	126,963
France .....	293,293	132,395	294,966	123,885	300,176	126,074
Germany, West .....	506,375	180,073	555,480	193,868	579,796	206,021
Greece .....	233,576	102,000 <sup>3</sup>	205,503	90,200 <sup>3</sup>	229,127	100,000 <sup>3</sup>
Italy .....	1,215,072	546,827	1,212,007	545,449	1,268,331	568,480
Norway .....	733,095	332,105	782,362	343,697	836,600	363,200
Poland .....	4	4	4	4	4	4
Portugal .....	709,810	288,385	641,803	258,822	659,174	296,641
Romania <sup>4</sup> .....	4	4	4	4	4	4
Spain .....	1,773,374	860,000 <sup>3</sup>	1,864,233	913,100 <sup>3</sup>	2,289,606	1,099,000 <sup>3</sup>
Sweden .....	382,848	189,178	392,896	193,563	387,852	190,823
United Kingdom .....	10,244	3,900 <sup>3</sup>	7,011	2,950 <sup>3</sup>	6,900 <sup>3</sup>	2,900 <sup>3</sup>
Yugoslavia .....	170,271	77,000 <sup>3</sup>	159,718	71,300 <sup>3</sup>	223,103	116,014
Asia:						
China .....	4	4	4	4	4	4
Cyprus .....	994,345	477,342 <sup>3</sup>	1,103,367	529,500	1,318,363	632,800
India .....	277	120 <sup>3</sup>	...	...	...	...
Japan .....	2,306,260	963,938	2,635,564	1,106,281	2,692,466	1,136,270
Korea, Republic of .....	765	350 <sup>3</sup>	...	...	...	...
Philippines .....	1,945	680	5,205	2,080	30,296	10,600 <sup>3</sup>
Taiwan (Formosa) .....	24,892	8,961 <sup>3</sup>	23,857	9,543	28,559	11,400 <sup>3</sup>
Turkey <sup>4</sup> .....	22,727	11,300 <sup>3</sup>	33,935	16,928	16,137	8,100 <sup>3</sup>
Africa:						
Algeria .....	29,290	12,893	33,020	14,517	21,328	9,380
French Morocco .....	2,005	799	1,537	575	4,007	600
Southern Rhodesia .....	36,086	15,517	36,387	15,283	21,268	8,933
Tunisia .....	92,362	36,259	225,534	86,809	351,650	137,882
Australia .....	167,008	77,812	195,459	44,102	245,886	116,841
Total (estimate) <sup>1</sup> .....	13,500,000	5,650,000	14,400,000	6,000,000	16,000,000	6,700,000

1. In addition to countries listed, East Germany, Kenya, Korea, and U.S.S.R. produce or have produced pyrites, but production data are not available; estimates are included in total.

2. This table incorporates a number of revisions of data published in previous pyrite chapters.

3. Estimate.

4. Data not available; estimate included in total.

## 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 61. Production of Silica Brick, 1947-1956

Year	M	Value	Year	M	Value
		\$			\$
1947 .....	3,094	193,998	1952 .....	3,544	606,394
1948 .....	3,464	393,821	1953 .....	3,720	712,271
1949 .....	3,663	453,797	1954 .....	3,578	465,157
1950 .....	3,126	408,813	1955 .....	4,763	602,625
1951 .....	3,510	465,229	1956 .....	5,799	736,817

Note: Quantities are shown as 'g' 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 neighbourhood 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 62. Production of Sodium Carbonate (Natural), 1945-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1945 .....	286	3,146	1950 .....	-	-
1946 .....	-	-	1951 .....	-	-
1947 .....	163	1,793	1952 .....	-	-
1948 .....	-	-	1953 .....	-	-
1949 .....	47	513	1954-1956 .....	-	-

## SODIUM SULPHATE (NATURAL)

All the natural sodium sulphate produced in Canada was obtained from the brine lakes in Saskatchewan. Producers shipped 181,053 tons valued at \$2,838,186 in 1956 compared with 178,888 tons valued at \$2,799,715 in the preceding year.

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 63. Principal Statistics of the Sodium Sulphate Mining Industry, Significant Years, 1921-1956

Year	Establishments	Employees	Salaried and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of production	Net value <sup>1</sup> of production
			No.	No.	\$	\$	\$
1921 .....	2	N.A.	N.A.	N.A.	N.A.	18,850	N.A.
1929 .....	3	29	46,637	32,038	"	64,112	"
1931 .....	5	83	101,026	144,512	"	267,863	"
1933 .....	7	116	92,065	135,546	"	485,416	"
1937 .....	6	122	153,181	159,673	26,459	618,028	431,896
1939 .....	7	102	136,416	146,692	32,917	628,151	448,542
1941 .....	7	125	193,298	231,964	50,128	931,554	649,462
1944 .....	6	158	264,004	253,043	39,722	987,842	695,077
1946 .....	4	167	251,887	254,450	66,423	1,118,783	797,910
1949 .....	5	212	492,277	399,355	58,891	1,616,631	1,158,385
1951 .....	5	225	671,878	662,601	113,306	2,391,813	1,615,406
1953 .....	4	157	478,374	291,639	77,923	1,685,148	1,315,586
1954 .....	4	173	553,911	449,207	78,819	2,394,473	1,866,447
1955 .....	5	235	824,393	577,842	124,552	2,805,507	2,093,113
1956 .....	5	207	721,432	600,182	175,828	2,841,816	2,065,806

1. Gross value of production, less the value of fuel, electricity, process supplies, containers and freight.

TABLE 64. Production of Natural Sodium Sulphate, 1947-1956

Year	Short tons	Selling value f.o.b. shipping point	Year		Short tons	Selling value f.o.b. shipping point
			\$	\$		
1947 .....	163,290	1,793,043	1952 .....		122,590	1,708,807
1948 .....	153,698	2,136,276	1953 .....		115,565	1,631,258
1949 .....	120,259	1,614,731	1954 .....		158,417	2,385,573
1950 .....	130,730	1,615,867	1955 .....		178,888	2,799,715
1951 .....	192,371	2,388,770	1956 .....		181,053	2,838,186

TABLE 65. Production of Manufactured Sodium Sulphate<sup>1</sup>, 1946-1956

Year	Salt cake		Year	Salt cake	
	Tons	Value		Tons	Value
	\$			\$	
1946 .....	2,584	33,333	1951 .....	3,297	72,206
1947 .....	3,175	51,047	1952 .....	2,382	54,956
1948 .....	3,198	69,876	1953 .....	2,345	59,793
1949 .....	3,738	83,996	1954-1956 .....		not available
1950 .....	3,674	74,555			

1. Salt cake produced as a by-product is not included.

TABLE 66. Imports of Sodium Sulphate, 1947-1956

Year	Salt cake		Glauber's salt	
	Tons	Value	Tons	Value
1947.....		\$		\$
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
1952.....	19,576	313,739	4,577	122,294
1953.....	32,802	516,863	5,493	150,263
1954.....	30,235	482,652	5,134	144,979
1955.....	29,928	574,440	3,888	131,447
1956.....	30,319	558,656	2,768	91,330

TABLE 67. Exports of Sodium Sulphate, 1947-1956

Year	Long tons	Value	Year	Long tons	Value
		\$			\$
1947.....	41,906	530,388	1952 .....	24,236	382,274
1948.....	26,439	468,561	1953 .....	17,975	298,374
1949.....	18,830	294,367	1954 .....	58,972	1,039,284
1950.....	25,335	302,329	1955 <sup>1</sup> .....	67,762	1,263,911
1951.....	56,416	735,902	1956 <sup>1</sup> .....	60,579	985,801

Note. Exports from Canada were not recorded separately prior to 1955 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.

1. Source — Trade of Canada, Exports — quantity is shown in short tons.

TABLE 68. Available Data on Consumption of Sodium Sulphate (Salt Cake) in Canada, by Industries, 1952-1955

Industry	1952	1953	1954	1955
Net tons				
Pulp and paper.....	113,322	125,332	134,533	137,575
Glass, including glass wool .....	1,976	2,662	2,276	2,722
Medicinals .....	25	20	17	37
Soaps .....	1,463	1,504	1,264	1,555
Total accounted for .....	116,786	129,518	138,090	141,889

TABLE 69. Employees and Their Earnings in the Sodium Sulphate Mining Industry, 1952-1956

Year	Number of employees						Number of man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total	Office and administrative		Workmen	Total	
	Male	Female	Male	Female						
1952 .....	31	7	194	1	223	432,861	70,618	548,639	619,257	
1953 .....	12	-	144	1	157	341,265	56,296	422,078	478,374	
1954 .....	12	2	158	1	173	335,078	45,670	508,241	553,911	
1955 .....	18	2	214	1	235	544,272	93,012	731,381	824,393	
1956 .....	19	3	184	1	207	439,105	100,812	620,620	721,432	

## SULPHUR

Native sulphur deposits of commercial grade have not been found in Canada, but large tonnages of metal sulphide ores are smelted. In smelting these ores sulphur dioxide gas is produced, some of which is recovered to make sulphuric acid or liquid sulphur dioxide. At Trail, British Columbia the sulphur dioxide generated by smelting lead-zinc sulphide ores is converted into sulphuric acid. At Copper Cliff, Ontario, the Canadian Industries Limited uses the smelter gases from the International Nickel plant to make sulphuric acid and sulphur dioxide. Zinc sulphide concentrates are shipped to Arvida where the concentrates are

calcined to produce sulphur dioxide which is used to make sulphuric acid. The roasted material is exported to smelters for the recovery of zinc and other metals.

Sour natural gas in Alberta contains varying percentages of hydrogen sulphide. Before the distribution of natural gas the hydrogen sulphide is removed and it is converted into elemental sulphur. Statistical data for these operations are included in the manufacturing industries under sub-group classification of absorption gasoline industry.

TABLE 70. Sulphur in Smelter Gases 1947-1956

Year	Quantity	Value	Year	Quantity <sup>1</sup>		Value
				Tons	\$	
1947 .....	139,144	1,391,440	1952 .....			160,547
1948 .....	142,337	1,423,370	1953 .....			172,200
1949 .....	144,290	1,442,900	1954 .....			221,247
1950 .....	150,685	1,506,850	1955 .....			224,457
1951 .....	156,427	-	1956 <sup>2</sup> .....			236,088
						2,323,590

1. Does not include in 1952-1955 sulphur in acid made from roasting zinc sulphide concentrates at Arvida.  
2. Includes sulphur in acid made from zinc sulphide at Arvida.

TABLE 71. Sulphur (elemental) Made from Natural Gas 1952-1956

Year	Jumping pound	Redwater	Turner Valley	Total
Short tons				
1952 .....	5,650	-	3,281	8,931
1953 .....	8,954	-	9,344	18,298
1954 .....	11,986	-	10,334	22,320
1955 .....	17,842	-	11,251	29,093
1956 .....	21,672	152	11,640	33,464

TABLE 72. Imports of Sulphur, 1947-1956

Year	Tons	Value	Year	Tons	Value
		\$			\$
1947 .....	361,424	5,466,201	1952 .....	415,185	8,376,824
1948 .....	354,622	5,528,740	1953 .....	359,205	8,526,804
1949 .....	280,557	5,213,921	1954 .....	310,127	7,816,301
1950 .....	390,333	7,730,126	1955 .....	373,373	9,386,983
1951 .....	395,928	8,959,677	1956 .....	474,117	11,857,556

TABLE 73. Available Data on the Consumption of Sulphur (Brimstone), 1952-1955

—	1952	1953	1954	1955
Tons of 2,000 pounds				
(a) By industries:				
Pulp and paper .....	290,607	258,172	268,607	300,899
Heavy chemicals .....	88,332	85,479	80,871	82,947
Rubber goods .....	2,269	2,475	2,360	2,783
Explosives .....	1	1	1	1
Medicinal .....	...	...	21	27
Adhesives .....	72	85	73	29
Starch .....	328	256	328	340
Fruit and vegetable preparations .....	5	4	5	6
Sugar refining .....	171	358	168	168
Petroleum refining .....	258	190	287	255
Steel and iron .....	95	101	50	65
Miscellaneous chemicals .....	5,464	5,329	6,155	5,591
Asbestos products .....	16	17	5	8
Miscellaneous non-metallics .....	...	...	23	24
Glass .....	...	...	...	6
Total accounted for .....	387,617	352,466	358,953	393,148
(b) By provinces:				
Newfoundland .....	17,082	18,078	20,492	20,088
Nova Scotia .....	6,505	6,092	5,865	6,567
New Brunswick .....	35,819	34,718	41,459	42,671
Quebec .....	136,077	111,891	110,439	124,762
Ontario .....	145,861	136,988	125,597	129,836
Manitoba and Saskatchewan .....	2,378	2,288	2,618	6,099
Alberta .....	91	78	201	2,344
British Columbia & Northwest Territories .....	43,404	42,333	52,282	60,781
Canada .....	387,617	352,466	358,953	393,148

1. Included in miscellaneous chemical industry.

**TABLE 74. World Production of Native Sulphur, by Countries<sup>1</sup>**  
 (Taken from the "Minerals Yearbook" of the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Long tons <sup>2</sup>					
<b>North America:</b>					
Mexico.....	11,375	11,784	5,900	52,407	475,487
United States .....	5,279,614	5,295,342	5,193,599	5,578,973	5,799,880
<b>South America:</b>					
Argentina .....	7,560	15,000	16,000	17,000	22,000
Bolivia (exports) .....	9,100	5,497	2,458	2,565	3,975
Chile .....	29,752	47,821	32,275	39,075	54,132
Colombia .....	2,479	2,974	2,657	5,118	5,413
Ecuador .....	1	2,353	100	64	1,550
Peru .....	2,251	5,066	4,916	...	...
<b>Europe:</b>					
France (content of ore).....	10,905	17,692	10,710	...	...
Italy (crude) <sup>3</sup> .....	197,382	232,706	224,161	200,215	176,917
Spain <sup>4</sup> .....	6,700	4,800	5,100	5,400	6,500
<b>Asia:</b>					
Japan.....	140,181	176,652	186,556	184,244	199,219
Philippines .....	...	...	1,089	761	3,700 <sup>4</sup>
Taiwan (Formosa) .....	2,732	5,001	3,423	5,873	4,854
Turkey .....	7,273	8,232	9,626	9,862	11,318
<b>Total (estimate)<sup>1</sup></b> .....	<b>5,900,000</b>	<b>6,000,000</b>	<b>5,800,000</b>	<b>6,300,000</b>	<b>7,000,000</b>

1. Native sulphur believed to be produced also in U.S.S.R., but complete data are not available; estimates are included in the total.

2. This table incorporates a number of revisions of data published in previous sulphur chapters. Data do not add to totals shown due to rounding where estimated figures are included in the detail.

3. In addition, the following tonnages of ground sulphur rock (30 percent S) were produced and used as an insecticide: 1951, 22,120 tons; 1952, 221,482 tons; 1953, 16,940 tons; 1954, 22,803 tons; 1955, 21,560 tons.

4. Estimate.

### 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 inter-growth 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.

At Perth, Ontario the Northern Vermiculite Co. Ltd. was treating some test lots of vermiculite with the expectation of commercial production in the near future.

Known deposits of vermiculite in Canada are located at Stanleyville, near Perth, Ontario and

at 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-powdered forms, for oil-less bearings.

In 1956 there were 8 plants in Canada making insulation aggregates, etc., from imported vermiculite.

TABLE 75. World Production of Vermiculite, by Countries<sup>1</sup>

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

Country <sup>1</sup>	1951	1952	1953	1954	1955	Short tons <sup>2</sup>
Argentina .....	—	—	—	—	—	551
Australia .....	62	69	32	—	—	—
Egypt .....	702	66	100 <sup>3</sup>	—	—	—
India .....	260	24	—	3	138	—
Japan .....	—	—	—	882	1,300 <sup>3</sup>	—
Kenya .....	3	—	82	807	380	—
Rhodesia, Nyasaland, Fed. of: Southern Rhodesia ..	553	—	—	—	—	—
Tanganyika .....	—	—	—	—	—	—
Union of South Africa .....	27,014	39,918	33,844	45,633	57,482	—
United States (sold or used by producers) .....	209,008	208,906	189,535	195,538	204,040	—
Total <sup>1</sup> .....	237,602	248,983	223,593	242,863	263,891	—

1. In addition to countries listed, vermiculite is produced in Brazil and U.S.S.R., but data are not available, and no estimates are included in the total.

2. This table incorporates a number of revisions of data published in previous vermiculite chapters.

3. Estimate.

## VOLCANIC DUST

Volcanic dust (pumic or pumic 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.

TABLE 76. World Production of Pumice, by Countries<sup>1</sup>  
(Taken from the "Minerals Yearbook" published by the United States Bureau of Mines)

Country <sup>1</sup>	1951	1952	1953	1954	1955
Short tons <sup>2</sup>					
Egypt .....	408	441	761	441	154
France:					
Pumice .....	16,535	12,621	11,464	11,574	9,921
Pozzuolana .....	155,921	172,560	232,903	259,043	242,508
Greece <sup>3</sup> .....	71,650	34,133	91,271	72,989	73,304
Italy:					
Pumice .....	88,057	95,017	192,132	141,039	198,614
Pumicite .....	48,502	53,517	37,148		
Pozzuolana .....	1,324,789	1,379,936	1,392,703	1,399,650	1,452,282
New Zealand .....	9,827	10,765	2,254	9,916	8,670
Spain .....	1,229	732	612	—	—
United States (sold or used) .....	749,942	597,044	1,348,136 <sup>4</sup>	1,647,397 <sup>4</sup>	1,804,488 <sup>4</sup>
Total (estimate) <sup>1</sup> .....	2,500,000	2,400,000	3,400,000	3,600,000	3,800,000

1. Pumice is also produced in Argentina, Canada, Germany, Japan, U.S.S.R. and a few other countries, but data on production are not available; estimates are included in total.

2. This table incorporates a number of revisions of data published in previous pumice chapters.

3. These figures include the following tonnages of Santorini earth: 1951, 49,604 tons; 1952, 20,424 tons; 1953 44,092 tons; 1954, 38,581 tons; 1955, 40,234 tons.

4. Includes in 1953, 560,502 tons; in 1954, 690,056 tons and in 1955, 961,526 tons of volcanic cinder and scoria, used for railroad ballast or similar purposes, not previously included in this chapter.

## Directory of Firms in the Miscellaneous Non-metal Mining Industry, 1956

Name of operator	Head office address	Plant or mine location
<b>BARITE</b>		
<b>Nova Scotia:</b> Fluor-Bar Mines Ltd. <sup>1</sup> ..... Magnet Cove Barium Corp. .....	1980 Sherbrooke St. W., Montreal, Quebec Walton .....	Lake Ainslie Pembroke
<b>Quebec:</b> Beach, Mahlon W. <sup>2</sup> ..... Roy, Phillippe <sup>2</sup> .....	Box 9, Barrie, Ontario ..... 62A L'Evêche, Rimouski .....	Woodbridge Twp. St-Fabien
<b>British Columbia:</b> Mountain Minerals Ltd. .....	Box 273, Lethbridge, Alberta .....	Bolden M. D.
<b>BRUCITE</b>		
<b>Quebec:</b> Aluminum Company of Canada Ltd. .....	Sun Life Bldg., Montreal .....	Wakefield
<b>DIATOMITE</b>		
<b>Nova Scotia:</b> Wightman, Mrs. G.W. <sup>1</sup> .....	Smith's Cove .....	Digby Co.
<b>Ontario:</b> P.B.S. Organic Minerals Ltd. <sup>2</sup> .....	153 Sheridan Ave., Toronto .....	McKee Twp.
<b>British Columbia:</b> Fairey and Co. .....	661 Taylor St., Vancouver .....	Cariboo M.D., Vancouver
<b>FLUORSPAR</b>		
<b>Newfoundland:</b> Newfoundland Fluorspar Ltd. .... St. Lawrence Corporation of Nfld., Ltd. ....	Bank of Montreal Bldg., St. John's ..... 120 Broadway, New York, U.S.A. ....	St. Lawrence St. Lawrence
<b>Ontario:</b> Huntingdon Fluorspar Mines Ltd. .....	Madoc .....	Huntingdon Twp.
<b>Quebec:</b> Yates Uranium Mines Inc. <sup>1</sup> .....	132 St. James St. W., Montreal .....	Huddersfield Twp.
<b>GARNET</b>		
<b>Ontario:</b> Niagara Garnet Co. <sup>2</sup> .....	c/o Wm. A. Yarwood, 8373 Krull Parkway, Niagara Falls, New York, U.S.A.	River Valley
<b>GRAPHITE</b>		
<b>Quebec:</b> Ametal Mining Corp. <sup>2</sup> ..... Holland, A.A. <sup>1</sup> ..... Quebec Graphite Corp. <sup>1</sup> .....	5451 Durocher, Outremont ..... 1705 North 12 Ave., Pensacola, Florida, U.S.A. .... 233 Notre Dame ouest, Montreal .....	St. Remi d'Amherst McGill Twp. Labelle
<b>Ontario:</b> Krefeld Graphite Gold Mines Ltd. <sup>2</sup> .....	R.R. No. 2, Walton .....	Vogt Twp.
<b>GRINDSTONES</b>		
<b>New Brunswick:</b> Read, H.C. <sup>2</sup> ..... Bay of Chaleur Grindstone Co. <sup>2</sup> .....	Bathurst ..... 1434 Ste-Catherine St. W., Montreal, Quebec .....	Stonehaven Gloucester Co.
<b>IRON OXIDE</b>		
<b>Quebec:</b> Argall, Mrs. Thomas H. .... Gelinas, Bruno <sup>1</sup> ..... Girardin, Chas. D. .... Leveille, Oscar <sup>2</sup> .....	1695 boul. St-Louis, Trois-Rivières ..... 1521 Notre Dame, Trois Rivières ..... Yamachiche ..... 2948 boul. du Carmel, Shawinigan ..... 2875 Centre St., Montreal .....	Pointe-du-Lac Portneuf Co. Almaville en Haut Shawinigan Sud Red Mill, Champlain Co.

1. Active but not producing.  
2. Holds dormant property.

## Directory of Firms in the Miscellaneous Non-metal Mining Industry, 1956 — Continued

Name of operator	Head office address	Plant or mine location
<b>LITHIUM MINERALS</b>		
<b>Quebec:</b>		
American Lithium Co. Ltd. <sup>1</sup>	200, ouest rue St-Jacques, Montreal .....	Lacorue
Beaumont Mining Corp. Ltd. <sup>1</sup>	159, ouest rue Craig, Montreal .....	Lacorue
Canadian Lithium Co. Ltd. <sup>1</sup>	100 Adelaide St. W., Toronto, Ontario .....	Landrienne Twp.
Clearside Exploration Ltd.	510 McGill St., Montreal .....	Lamotte Twp.
Consolidated Lithium Corp. of Can. Ltd. <sup>1</sup>	Edifice Paré, Amos .....	Lacorue
Consolidated Negus Mines Ltd.	85 Richmond St. W., Toronto .....	Lamotte Twp.
Glennmar Lithium Mines Ltd.	100 Adelaide St. W., Toronto, Ontario .....	Lamotte Twp.
International Lithium Mining Corp. <sup>1</sup>	25 Adelaide St. W., Toronto, Ontario .....	Lamotte Twp.
Iso Uranium Mines Ltd.	100 Adelaide St. W., Toronto, Ontario .....	Lacorue
La Corne Lithium Mines Ltd. <sup>1</sup>	25 King St. W., Toronto, Ontario .....	Lamotte Twp.
Magnet Consolidated Mines Ltd.	185 Bay St., Toronto, Ontario .....	Figuery Twp.
Martin McNeely Mines Ltd. <sup>1</sup>	67 Yonge St., Toronto, Ontario .....	Landrienne Twp.
Massberyl Lithium Co. Ltd. <sup>1</sup>	100 Adelaide St. W., Toronto, Ontario .....	Lacorue Twp.
New Delhi Mines Ltd.	25 Adelaide St. W., Toronto, Ontario .....	Pressiac Twp.
New Laquerre Mines Ltd. <sup>1</sup>	67 Yonge St., Toronto, Ontario .....	Landrienne Twp.
Northern Québec Explorers <sup>1</sup>	Première ave ouest, Amos .....	Canton Piedmont
Quebec Lithium Corp.	1403 Edifice Aldred, Montreal .....	Barraute
Romac Mines Ltd. <sup>1</sup>	23 St. James St. West, Montreal .....	Lacorue
Société d'Exploration Minière Cossette-Martel <sup>1</sup>	Première ave ouest, Amos .....	La.notte Twp.
Tide Lake Lithium Mines Ltd. <sup>1</sup>	100 Adelaide St. W., Toronto, Ontario .....	Figuery Twp.
United Lithium Corp. <sup>1</sup>	23 St. James St. W., Montreal .....	Lacorue Twp.
Vallee Lithium Mining Corp. <sup>1</sup>	80 Richmond St. W., Toronto, Ontario .....	Fredmont Twp.
Valor Lithium Mines Ltd. <sup>1</sup>	100 Adelaide St. W., Toronto, Ontario .....	Vauquelin Twp.
Western Ashly Minerals Ltd. <sup>1</sup>	62 Richmond St. W., Toronto, Ontario .....	Landrienne Twp.
Whitney Uranium Mines Ltd.	445 St-Nicholas St., Montreal .....	Vassan Twp.
<b>Ontario:</b>		
Alba Exploration Ltd. <sup>1</sup>	119 Adelaide St. W., Toronto .....	Barbara Lake
Capital Lithium Mines Ltd.	100 Adelaide St. W., Toronto .....	Kenora
Jean Lake Lithium Mines Ltd.	44 King St. W., Toronto .....	Cosgrave Lake
Lun Echo Gold Mines Ltd.	57 Yonge St., Toronto .....	Nipigon
Dunvegan Mines Ltd. <sup>1</sup>	357 Bay St., Toronto .....	Cosgrave Lake
Nama Creek Mines Ltd. <sup>1</sup>	330 Bay St., Toronto .....	Beardmore
<b>Manitoba:</b>		
Lithium Corp. of Canada Ltd. <sup>1</sup>	25 Adelaide St. W., Toronto, Ontario .....	Lac du Bonnet
Viola Mac Mines Ltd. <sup>1</sup>	25 Adelaide St. W., Toronto, Ontario .....	Cat Lake
Green Bay Minining & Exploration Ltd.	100 Royal Trust Bldg., Edmonton .....	Herb Lake
<b>Northwest Territories:</b>		
Boreal Rare Metals	414 St. James St. W., Montreal, Quebec ..	Hearn Channel
<b>MAGNESITE DOLOMITE</b>		
<b>Quebec:</b>		
Canadian Refractories Ltd.	1050 Canada Cement Bldg., Montreal .....	Kilmar and Harrington
<b>MINERAL WATERS</b>		
<b>Quebec:</b>		
Brevages Lazure .....	1395 Choquette, St-Hyacinthe .....	St-Hyacinthe
Eau Minérale Naturelle St-Leon .....	Louiseville .....	St-Leon
Eau Minérale Etoile .....	Ste-Geneviève de Batiscan .....	Batiscan
Gauthier, Chas.	1, rue St-Laurent, Louiseville .....	Maskinongé
King's Court Beverages Co. Ltd.	2901 Sherbrooke St. E., Montreal .....	Chambly
Orange Crush Ltd.	1590 O'Connor Drive, Toronto, Ontario .....	Varennes
Montclair-Richelieu Spring Water Co. Ltd.	1521 Mountain St., Montreal .....	Chambly
Pellerin, Rolland Mme.	St. Barnabé Nord .....	St-Maurice
Sources Abenakis Ltee	St-Francois-du-Lac .....	St-Francois-du-Lac
Radnor Beverages	St-Maurice .....	St-Maurice
Usine d'Embouteillage Maski Enrg.	400 rue Mailhot, Trois Rivieres .....	St-Justin
<b>Ontario:</b>		
Carlsbad Springs, The	Carlsbad Springs .....	Gloucester Twp.
Excel Beverages Ltd.	Bourget .....	Bourget
<b>MICA</b>		
<b>Quebec:</b>		
Blackburn Bros. Ltd.	85 Sparks St., Ottawa, Ontario .....	Cantley
Cameron, P.U., & Sons .....	Box 806, Buckingham .....	Portland West
Cross, W.C.	209 Bridge St., Hull .....	
Cote, W.R. & Cartier, J.	62 Filiatrault, Ville St-Laurent .....	Wentworth

1. Active but not producing.

## Directory of Firms in the Miscellaneous Non-metal Mining Industry, 1956 — Continued

Name of operator	Head office address	Plant or mine location
<b>MICA — Concluded</b>		
<b>Quebec — concluded:</b>		
Déziel, Alexandre .....	Wilson's Corners, R.R. No. 1 .....	Wakefield East
Gratton, Ferrier .....	Wilson's Corners, R.R. No. 1 .....	Wakefield East
Holt, R. J. .....	674 Cooper St., Ottawa, Ontario .....	Wakefield
Lavigne, E. .....	St-Pierre de Wakefield .....	Wakefield
Larmond, Ed. .....	Buckingham .....	Buckingham
Mica Co. of Canada Ltd. .....	2 Lois St., Hull .....	Gatineau
Mongon, O. .....	Gatineau Mills .....	Wakefield Nord
Poirier, A. .....	Wilson's Corners .....	Portland West
Poirier, C. .....	St-Pierre de Wakefield .....	Hull
Rainville, A. .....	Perkins Mills .....	Portland
Sabourin, V. .....	Perkins Mills .....	Hull
Sargent, Fred .....	Cascades .....	Suzar Twp.
Siscoe Vermiculite Mines Ltd. .....	Cornwall, Ontario .....	Templeton
Wallingford, J. .....	Perkins Mills .....	South Hull
Wallingford, A. .....	Pointe Gatineau .....	Templeton
Wallingford, E., Ltd. .....	Perkins .....	
<b>Ontario:</b>		
Armstrong, Percy .....	Nobel .....	Parry Sound
Buchanan, Geo. .....	31 South St., Perth .....	Lanark
Bedard, M. .....	Maberly .....	Bathurst
Green, W.E. and E.C. .....	Perth Road .....	North Burgess
McGlade, W.A. .....	8 Church St., Perth .....	Burgess Twp.
Watts, R.W. .....	21 Isabella St., Perth .....	Lanark
<b>British Columbia:</b>		
Fairey & Co. .....	661 Taylor St., Vancouver .....	Vancouver
McKechnie, J.S. .....	605 Dominion St., Kamloops .....	Kamloops
<b>PERLITE</b>		
<b>British Columbia:</b>		
Western Gypsum Products Ltd. <sup>2</sup> .....	Childs Building, Winnipeg, Manitoba .....	Francois Lake
Perlite Mining Corp. Ltd. <sup>2</sup> .....	44 King St. W., Toronto, Ontario .....	Uncha Lake
<b>PHOSPHATE</b>		
<b>Quebec:</b>		
Bigelow, Robert <sup>2</sup> .....	Buckingham .....	Bowman Twp.
Blackburn Bros. Ltd. <sup>2</sup> .....	85 Sparks St., Ottawa, Ontario .....	Perkins
Quebec Smelting & Refining Ltd. <sup>2</sup> .....	215 St. James St. W., Montreal .....	Notre Dame de la Salette
Industrial Phosphate Mines Ltd. .....	18 Toronto St., Toronto, Ontario .....	Portland East Twp.
<b>Ontario:</b>		
Ontario Phosphate Industries Ltd. <sup>2</sup> .....	Room 1101 — 62 Richmond St. W., Toronto .....	Bedford Twp.
McGlade, W.A. <sup>2</sup> .....	8 Church St., Perth .....	Burgess Twp.
<b>POTASH</b>		
<b>Saskatchewan:</b>		
Continental Potash Corp. Ltd. <sup>1</sup> .....	508 Credit Foncier Bldg., Vancouver .....	Unity
Duval Sulphur and Potash Co. .....	Mellie Esperson Bldg., Houston Texas .....	Saskatoon
International Minerals & Chemical Corp. .....	1540 Winnipeg St., Regim .....	Yarbo
Southwest Potash Corp. .....	61 Broadway, New York 6 .....	Saskatoon
United States Borax & Chemical Corp. .....	630 Shatio Place, Los Angles, Calif. ....	Saskatoon
Potash Co. of America Ltd. .....	Box 509 Saskatoon .....	Patience Lake
<b>PYRITE, PYRRHOTITE</b>		
<b>Newfoundland:</b>		
Buchans Mining Co. Ltd. .....	Water St., St. John's .....	Buchans
<b>New Brunswick:</b>		
Middle River Mining Co., Ltd. <sup>1</sup> .....	42 Princess St., Saint John .....	Gloucester
Texas Gulf Sulphur Co. .....	75 East 45th St. New York 17 .....	Gloucester

1. Active but not producing.  
2. Holds dormant property.

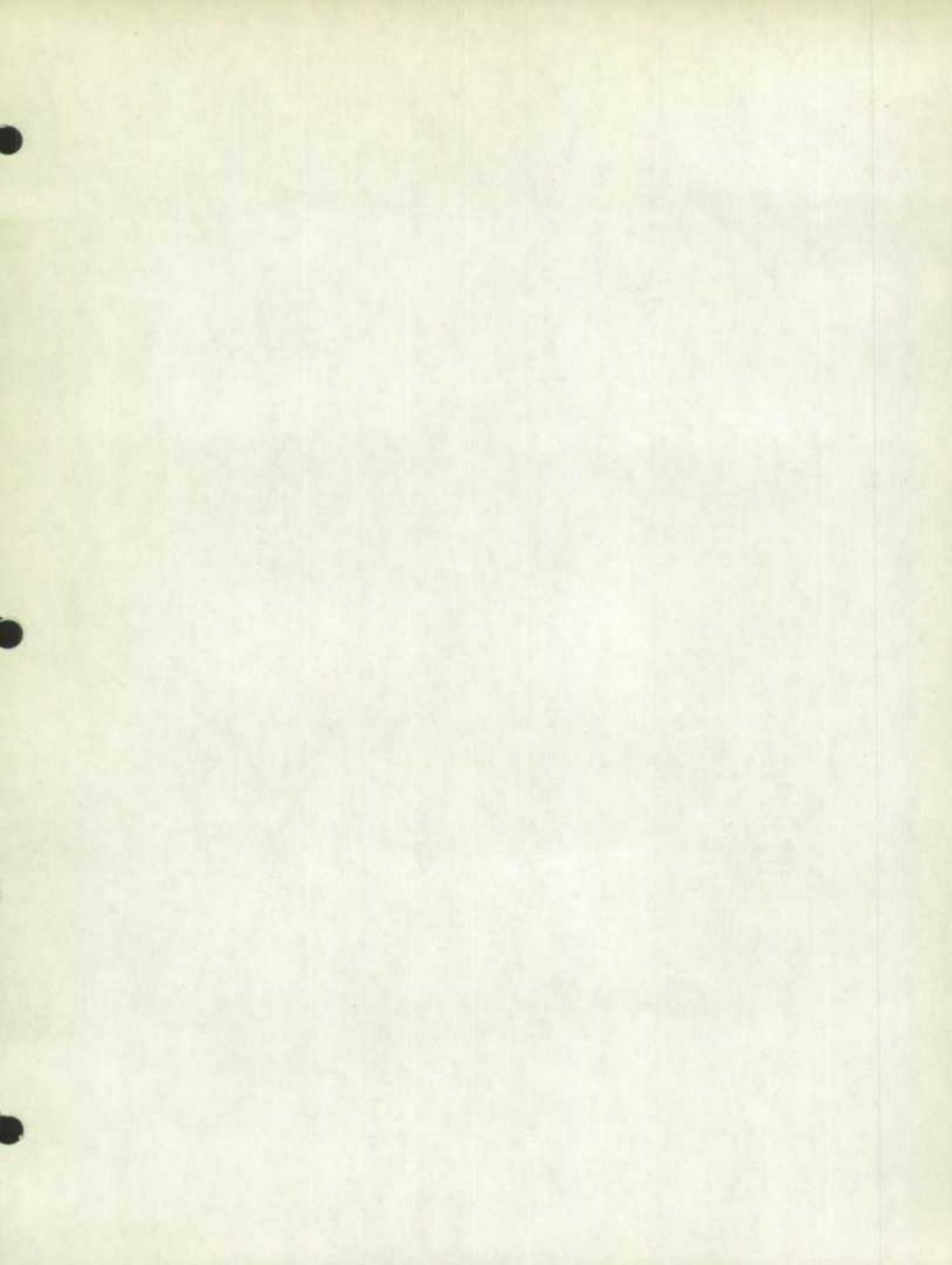
## Directory of Firms in the Miscellaneous Non-Metal Mining Industry, 1950 — Concluded

Name of operator	Head office address	Plant or mine location
<b>PYRITE, PYRRHOTITE — Concluded</b>		
<b>Quebec:</b>		
East Sullivan Mines Ltd. ....	1604 Aldred Bldg., Montreal .....	Bourlamaque Twp.
Quemont Mining Corp. Ltd. ....	350 Bay St., Toronto, Ontario .....	Rouyn Twp.
Noranda Mines Ltd. ....	Royal Bank Bldg., Toronto, Ontario .....	Noranda
Normetal Mining Corp. Ltd. ....	44 King St. W., Toronto, Ontario .....	Normetal
Waite-Amulet Mines Ltd. ....	Noranda .....	Duprat Twp.
Weedon Pyrite & Copper Corp. Ltd. ....	507 Place d'Armes, Montreal .....	Weedon
West MacDonald Mines Ltd. ....	1434 Ste-Catherine St. W., Montreal .....	Dufresnoy
Sulgas Properties Ltd. <sup>1</sup> ....	744 W. Hastings St., Vancouver, British Columbia	Ascot Twp.
<b>Ontario:</b>		
International Nickel Company of Canada Ltd....	Copper Cliff.....	Copper Cliff
<b>British Columbia:</b>		
Consolidated Mining & Smelting Company of Canada Ltd.	Trail .....	Kimberley
Britannia Mining & Smelting Co. Ltd. ....	Britannia Beach .....	Britannia Beach
<b>SILICA BRICK</b>		
<b>Nova Scotia:</b>		
Dominion Steel & Coal Corp. Ltd. ....	Sydney .....	Sydney
<b>Ontario:</b>		
Algoma Steel Corp. Ltd. ....	Sault Ste. Marie .....	Sault Ste. Marie
<b>SODIUM CARBONATE (Natural)</b>		
<b>British Columbia:</b>		
Bishop, V.C. (Mrs.) <sup>2</sup> ....	c/o Boyd's Garage, Clinton .....	Clinton area
<b>SODIUM SULPHATE (Natural)</b>		
<b>Saskatchewan:</b>		
Ormiston Mining & Smelting Co. Ltd. ....	Ormiston .....	Ormiston
Midwest Chemicals Ltd. ....	Palo .....	Whiteshore Lake
Sybouts Sodium Sulphate Co. Ltd. ....	Gladmar .....	Gladmar
Saskatchewan Minerals (Sodium Sulphate Div.)..	Chaplin .....	Chaplin, Bishoperic
<b>SULPHUR (in smelter gas)</b>		
<b>Quebec:</b>		
Aluminum Co. of Canada Ltd. <sup>3</sup> ....	Sun Life Bldg., Montreal .....	Arvida
<b>Ontario:</b>		
Canadian Industries Ltd. ....	Box. 10, Montreal .....	Copper Cliff
<b>British Columbia:</b>		
Consolidated Mining & Smelting Company of Canada Ltd.	Trail .....	Trail

1. Active but not producing.

2. Holds dormant property.

3. Produces acid by calcining zinc sulphide concentrates.







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