CANADA

THE MISCELLANEOUS NON-METAL MINING INDUSTRY

1958

DOMINION BUREAU OF STATISTICS
Industry and Merchandising Division

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TABLE OF CONTENTS

SYMBOLS

The interpretation of the symbols used in the tables throughout this publication is as follows:

.. not available.

... not applicable.

– nil.

THE MISCELLANEOUS NON-METAL MINING INDUSTRY

1958

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 1958 included barite, brucite, diatomite, fluorspar, graphite, grindstones, magnesitic dolomite 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.

During 1958 there were 27 firms which made shipments of materials which are grouped as miscellaneous non-metallics. Gross value of the producer's shipments amounted to $11,942,125 in 1958 compared with $14,035,393 in the preceding year. The value of containers was included in these figures. The industry employed an average of 1,223 persons to whom $4,806,084 were paid as salaries and wages. Fuel cost $1,097,831 and 56,551,376 kwh. of electricity were purchased for $583,610. Process supplies cost $969,772 and the containers used were valued at $117,742. Freight paid amounted to $62,758.

The 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,[1] 1921-58

Year	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of production	Net value of production[2]
	number		dollars				
1921	..	..	..	..	..	..	..
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
1957	50	1,571	5,673,243	1,909,893	1,597,660	14,035,393	10,723,739
1958	40	1,223	4,806,084	1,681,441	1,087,514	11,942,125	9,110,412

[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.

TABLE 2. Producers' Shipments of Miscellaneous Non-metallic Minerals, 1957 and 1958

Item		1957		1958	
		Quantity	Value	Quantity	Value
			$		$
Barite	ton	228,048	2,992,913	195,719	2,196,384
Diatomite	"	120	2,400	27	540
Fluorspar	"	...	1,756,841	...	1,542,589
Graphite	"	–	–	–	–
Grindstones	"	–	–	–	–
Magnesitic dolomite, brucite	–	...	3,046,298	...	2,529,161
Lithia	lb.	5,140,257	2,827,143	3,853,322	2,047,880
Mineral waters	Imp. gal.	348,710	185,167	316,727	172,568
Perlite	"	–	–	–	–
Silica brick	M	4,308	655,903	2,815	472,346
Sodium sulphate	ton	157,800	2,568,728	173,217	2,862,915
Total	–	...	**14,035,393**	...	**11,824,383**
Pyrite, pyrrhotite	ton	1,166,416	4,808,228	1,191,731	4,248,668
Sulphur[1] in smelter gases	"	235,123	2,322,067	241,055	2,361,252
Sulphur, elemental[2]	"	...	...	94,377	1,872,832
Arsenious oxide[3]	"	1,849	137,112	1,162	94,542
Titanium dioxide, etc.[3]	"	186,422	9,740,570	...	6,583,921
Iron oxides	"	7,518	187,211	1,632	113,390
Mica	"	641	111,583	752	89,651

[1] Data for 1957 and 1958 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.
[2] Produced from sour natural gas; includes sulphur recovered in processing nickel-copper matte.
[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-metal Mining Industry, 1954-58

	Employees					Man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total		Office and administrative	Workmen	Total
	Male	Female	Male	Female					
	number						dollars		
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
1957	176	20	1,372	3	1,571	3,180,501	914,396	4,758,847	5,673,243
1958	191	21	1,011	–	1,223	2,580,335	1,052,289	3,753,795	4,806,084

TABLE 4. Workmen, by Months, in the Miscellaneous Non-metal Mining Industry, 1957 and 1958

Month	1957						1958			
	Mine			Mill		Total	Mine		Mill	Total
	Surface		Underground				Surface	Underground		
	Male	Female		Male	Female		Male		Male	
	number						number			
January	474	2	443	552	1	1,472	354	323	381	1,058
February	450	2	443	551	1	1,447	310	336	404	1,050
March	458	2	426	574	1	1,461	288	314	404	1,006
April	498	2	425	557	1	1,483	288	283	393	964
May	524	2	405	565	1	1,497	331	268	310	909
June	496	2	403	549	1	1,451	355	250	324	929
July	462	2	354	530	1	1,349	364	253	374	991
August	503	2	347	515	1	1,368	326	270	416	1,012
September	468	2	352	483	1	1,306	341	266	417	1,024
October	442	2	314	461	—	1,219	429	271	427	1,127
November	452	2	319	486	—	1,259	361	222	393	976
December	447	2	248	439	—	1,136	411	258	379	1,048
Average	**476**	**2**	**372**	**524**	**1**	**1,375**	**347**	**277**	**387**	**1,011**
Total man-hours worked	3,180,501						2,141,295			

TABLE 5. Fuel and Electricity Used in the Miscellaneous Non-metal Mining Industry, 1958

Kind		Quantity	Cost at plant
			$
Bituminous coal (a) From Canadian mines	short ton	1,600	24,200
(b) Imported	"	—	—
Sub-bituminous coal (from Alberta mines only)	"	—	—
Anthracite coal	"	—	—
Lignite coal	"	37,234	174,632
Coke (for fuel only)	"	—	—
Gasoline (includes gasoline used in cars and trucks)	Imp. gal.	217,778	79,726
Kerosene or coal oil	"	9,761	2,749
Fuel oil	"	5,945,627	588,132
Wood (cords of 128 cubic feet of piled wood)	cord	24	246
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	2,221	777
(b) Other manufactured gas	M cu. ft.	170,189	40,199
(c) Natural gas	"	884,073	187,170
Other fuel	—	—	—
Electricity purchased for power and lighting	kwh.	56,551,376	583,610
Electricity purchased for other purposes	"	—	—
Total (cost only)	—	...	**1,681,441**
Electricity generated (a) For own use	kwh.	5,966,617	...
(b) For sale	"	49,734	1,365

TABLE 6. Power Equipment Used in the Miscellaneous Non-metal Mining Industry, 1958

Type of equipment	Driving generators	Not driving generators
	horsepower	
A. Prime movers:		
Steam engines	—	—
Steam turbines	—	90
Diesel engines	3,245	2,804
Gasoline, gas and oil engines, other than diesel engines	—	913
Hydraulic turbines or water wheels	—	—
Total	**3,245**	**3,807**
B. Electric motors (one-quarter horsepower and over)	1,200	24,351

ARSENIOUS OXIDE

During 1958 the producers of arsenious oxide (arsenic trioxide) shipped 2,323,320 pounds valued at $94,542. Included in the output was some arsenic which was recovered from foreign ores. The Canadian and foreign ores are mixed for treatment and separate data are not available.

Production in Ontario was at the smelter of Deloro Smelting and Refining Company Limited which treats the cobalt-silver concentrates from Cobalt and Gowganda and imported cobalt ores.

Compounds of arsenic such as lead arsenate and calcium arsenate are used in insecticides, rodenticides and other pesticides. Other uses are: as a decolourizer in glass, as preservatives and depilatories in the tanning of hides, in the chemical debarking of trees; in pyrotechnics: and in paint pigments.

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 7. Production, Imports and Exports of Arsenic, 1957 and 1958

	1957		1958	
	Quantity	Value	Quantity	Value
	lb.	$	lb.	$
Production:				
White arsenic (crude and refined)[1]	3,697,317	137,112	2,323,320	94,542
Imports:				
Arsenic acid	519,631	18,262	507,657	16,011
Arsenious oxide and arsenic sulphide	1,559	420	...	...
Sodium arsenate and sodium biarsenate	156,402	43,885	121,921	31,406
Arsenate of lead	73,056	15,421	130,400	25,854
Arsenate of lime	81,000	4,952	85,500	6,142
Exports:				
Arsenic	3,229,800	119,616	1,703,200	67,731

[1] Includes some arsenic recovered from foreign ores.

TABLE 8. Production, Imports and Exports of White Arsenic, 1949-58

Year	Production, crude and refined, but no duplication	Imports[1]	Exports	
			Refined	Crude
	pounds			
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	–
1957	3,697,317	1,559	3,229,800	–
1958	2,323,320	–	1,703,200	–

[1] Arsenious oxide and arsenic sulphide.

TABLE 9. Consumption of Refined White Arsenic, 1953-57

Industry	1953	1954	1955	1956	1957
	pounds				
Glass	343,279	337,071	356,211	381,547	337,331
Insecticides[1]	[2]	[2]	[2]	[2]	[2]
White metals	50,178	59,385	65,899	81,144	73,668
Miscellaneous chemicals	88,804	13,389	11,163	43,135	49,563
Total accounted for	**482,261**	**409,845**	**433,273**	**433,992**	**460,562**

[1] Does not include arsenic acid (As_2O_5) imported for use in making insecticides, as follows: 1953, 1,002,424 pounds; 1954, 1,397,596 pounds; 1955, 847,413 pounds; 1956, 408,840 pounds; 1957, 519,631 pounds.
[2] Included with miscellaneous chemicals total.

TABLE 10. World Production of White Arsenic, by Countries, 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	short tons[2]				
North America:					
Canada	702	590	786	895	1,693
Mexico	2,204	2,675	3,255	2,913	5,076
United States	10,873	13,167	10,780	12,201	10,493
South America:					
Brazil	522	1,273	1,077	820	[3]
Peru	—	105	—	28	—
Europe:					
Belgium (exports)	1,903	1,979	2,281	3,056	3,300
France	6,217	812	6,369	6,614	[3]
Germany:					
West (exports)	675	239	635	334	220[4]
Greece	68	—	42	44	[3]
Italy	1,179	1,243	1,166	1,173	1,800[4]
Portugal	1,301	1,196	1,973	1,109	1,100[4]
Spain	60	22	—	—	—
Sweden	569	10,762	13,803	13,437	[3]
Asia:					
Iran[5]	—	—	—	—	—
Japan	1,576	1,584	1,910	1,833	1,800[4]
Africa:					
Rhodesia and Nyasaland, Federation of:					
Southern Rhodesia	416	459	508	1,084	950[4]
Union of South Africa	—	—	—	—	—
Oceania:					
Australia	—	—	—	—	—
New Zealand	—	—	—	—	—
World total (estimate) [1,2]	**30,000**	**38,000**	**46,000**	**47,000**	**47,000**

[1] Arsenic is also produced in Argentina, Austria, and East Germany, and estimates are included in the total. There is too little information to estimate production in China, Czechoslovakia, Finland, Hungary, U.S.S.R. and United Kingdom.
[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

The producers of barite in Canada shipped 195,719 tons valued at $2,196,384 in 1958 compared with 228,048 tons worth $2,992,913 in the preceding year. Nova Scotia produced most of the nation's barite. The open pit operation is located near Walton at the head of the Bay of Fundy. Shipments are made by boat from Walton. In British Columbia barite was quarried at Brisco in the East Kootinay district, then shipped to a grinding plant at Lethbridge Alberta. In 1957 the Giant Mascot Mines Limited shipped some barite from the East Kootinay district.

The principal use of barite is in oil-well drilling muds with bentonite and minor conditioning agents. Barite is used also as a pigment and filler in paints, rubber, linoleum, and papers; in the manufacture of barium chemicals; as an additive to glass batches; as an aggregate in concrete where additional weight is required (such as coatings for under water pipes), or where shielding is required against radiation such as in X-ray rooms or atomic energy plants.

Barium compounds are used widely in industry. Barium carbonate is used to reduce "dry house" scum on bricks; in pharmacautials; as a flux in the enamelling and ceramic trades; and in heat-treatment compounds. The chloride is used as a pigment in lithographic inks; in the purification of salt brine and in water treatment; as a mordent in dyeing textiles; and in many other applications. Other compounds include the hydrate, phosphate, oxide, sulphide, stearate and chlorate.

TABLE 11. Production of Barite, 1949-58

Year	Short tons	Value	Year	Short tons	Value
		$			$
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
1952	136,002	1,521,162	1957	228,048	2,992,913
1953	247,227	2,220,292	1958	195,719	2,196,384

TABLE 12. Imports of Barite, 1949-58

Year	Tons	Value	Year	Tons	Value
		$			$
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
1952	1,445	44,488	1957	1,831	58,009
1953	1,207	40,143	1958	1,382	56,644

TABLE 13. Consumption of Barite, 1953-57

	1953	1954	1955	1956	1957
			tons		
(a) By uses:					
Paints	1,200	1,842	963	869	962
Rubber goods	437	422	537	492	525
Glass	238	237	287	331	301
Oil-well drilling, estimate[1]	2,000	2,639	...	...	1,147
Miscellaneous	279	...	...	...	...
Asbestos products	...	41	39	64	...
Miscellaneous chemicals	...	134	96	93	...
Miscellaneous non-metallics	...	558	...	...	...
Total accounted for	**4,154**	**5,873**	...	...	...
(b) By provinces:					
Newfoundland	—	...	...	...	...
Nova Scotia					
Quebec	780	1,209	...	...	...
Ontario	1,090	1,776	...	...	...
Manitoba	126	103	...	...	...
Saskatchewan	—	—	...	...	...
Alberta	2,099	2,732	...	...	...
British Columbia	59	53	...	...	...
Total accounted for	**4,154**	**5,873**	...	...	...

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

TABLE 14. World Production of Barite, by Countries,[1] 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	short tons[2]				
North America:					
Canada	247,227	221,472	253,736	320,835	216,325
Cuba (exports)	4,904	—	—	—	37,842
Mexico (exports)	63,042	56,871	117,654	235,792	410,000[4]
United States	920,025	926,036	1,114,117	1,351,913	1,304,542
Total	**1,235,198**	**1,204,379**	**1,485,507**	**1,908,540**	**1,968,709**
South America:					
Argentina	16,464	16,500[4]	25,353	19,152	22,000[4]
Brazil	15,863[5]	6,272[5]	5,071[5]	16,378[5]	23,755[5]
Chile	1,556	3,546	3,466	476	1,100[4]
Colombia	8,543	9,921	6,614	8,378	13,228
Peru	17,129	12,348	9,410	56,130	133,356
Total	**59,555**	**48,600[4]**	**49,914**	**100,514**	**193,000[4]**
Europe:					
Austria	2,116	4,802	4,365	3,413	3,902
France	43,869	52,361	70,507	52,911	55,000[4]
East Germany[4]	27,600	27,600	27,600	27,600	27,600
West Germany	334,422	422,589	456,710	453,836	448,144
Greece	29,655	24,249	21,451	38,581	27,600[4]
Ireland	—	3,031	6,134	8,157	8,488
Italy	79,104	81,931	114,635	103,075	113,083
Portugal	347	385	357	346	330[4]
Spain	19,727	11,740	9,833	8,505	19,365
Sweden	—	108	137	—	—
U.S.S.R.[4]	110,000	110,000	110,000	110,000	110,000
United Kingdom[3]	77,175	81,967	92,906	84,670	89,898
Yugoslavia	89,457	114,640	109,129	71,209	86,725
Total[1,4]	**820,000**	**940,000**	**1,030,000**	**970,000**	**1,000,000**
Asia:					
India	10,528	21,048	8,537	7,072	14,462
Japan	19,350	20,815	20,374	20,578	26,372
Korea, Republic of	1,210	336	933	744	8
Phillippines, Republic of	—	—	—	5,045	6,367
Total[1,4]	**42,000**	**53,000**	**46,000**	**55,000**	**69,000**
Africa:					
Algeria	18,821	21,341	33,720	32,843	33,000[4]
Egypt	33	35	67	88	70[4]
French Morocco	55	10,246	27,170	32,622	16,276
Rhodesia and Nyasaland, Federation of:					
Southern Rhodesia	268	—	—	—	—
Swaziland	455	362	449	516	351
Tunisia	—	—	—	—	—
Union of South Africa	2,092	2,342	1,892	2,713	3,369
Total	**21,724**	**34,326**	**63,298**	**68,782**	**53,066**
Australia	6,358	7,696	7,016	6,730	3,390
World total (estimate)[1,2]	**2,200,000**	**2,300,000**	**2,700,000**	**3,100,000**	**3,300,000**

[1] In addition to countries listed, barite is produced in China, Czechoslovakia and North Korea, but production data are not available.
[2] This table incorporates a number of revisions of data published in previous barite chapters.
[3] Includes witherite.
[4] Estimate.
[5] Exports.

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 15. World Production of Corundum, by Countries,[1] 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	short tons[2]				
Argentina	..	..	..	..	..
Australia	—	—	10	—	—
India	363	527	149	395	142
Madagascar	—	—	—	—	—
Malaya, Federation of	—	—	2[3]	100[3]	..
Mozambique	1	1	9	—	—
Rhodesia and Nyasaland, Federation of:					
Nyasaland	—	17	20	—	—
Southern Rhodesia	843	2,840	1,168	4,448	4,506
South West Africa	—	—	—	—	—
Union of South Africa	1,865	1,443	834	2,068	1,547
World total (estimate)[1]	**10,000**	**10,000**	**8,000**	**11,000**	**10,000**

[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] Exports.

DIATOMITE

In 1958 the producers shipped 27 tons of diatomite which was valued at $540. In the preceding year the production was 120 tons valued at $2,400. All the diatomite recovered in the past two years came from deposits in British Columbia. The calcining plant in Nova Scotia was dismantled.

Diatomite, also known as diatomaceous earth and keiselguhr, consists of microscopically small, opaline silica, skeletal remains of organisms known as diatoms. The purest varieties of diatomite are chalklike in appearance, free from grit, porous, and friable and an apparent specific gravity under one when dry.

It is the physical properties of porosity and chemical inertness that account for most of the uses of diatomite. The principal uses are as a filtering medium filler, and as an insulator against heat, cold and sound. Diatomite is important in many industries, such as sugar refining, liquor distilling, dry cleaning and water purification. For filtration the important considerations are size and shape of principal diatoms present, purity, and density of the consolidated material.

Diatomite is used as a filler in rubber, paper, asphalt products, plastics, explosives, insecticides, paints, and many other products. It is used as a contrete admixture and as the mild abrasive in metal polishes and dentrifices. Important properties of diatomite to be considered for such uses include: color, freedom from grit, low density, inertness, and particle size. Diatomite imparts bulk with little increase in weight, along with certain desirable physical properties to the end products.

It is being used successfully as insulation in a wide variety of applications, some of these being: boilers, kilns, furnaces, retorts, anens, fire-resistant safes, chill rooms, ice cellars, cold storage, and building walls. The important properties when used as insulation are porosity and structure and freedom from solid impurities.

Acceptance of diatomite by consumers depends mainly upon the physical properties of the mineral in relation to its intended use. Microscopic examination can determine, in a general way, to what uses any particular material may be put.

The major Canadian use is in the manufacture of fertilizer, where it is used to coat pellets to prevent caking and sticking. The diatomite should be uncalcined, 95 per cent minus 325-mesh, with less than 5 per cent moisture content. The next major use is in filtration in sugar and brewing industries.

TABLE 16. Production of Diatomite, 1949-58

Year	Short tons	Value	Year	Short tons	Value
		$			$
1949	60	1,703	1954	4	192
1950	49	1,665	1955	16	352
1951	92	3,148	1956	2	40
1952	28	1,074	1957	120	2,400
1953	103	12,150	1958	27	540

TABLE 17. Consumption of Infusorial Earth in the Sugar Refining Industry, 1949-57

Year	Tons	Value	Year	Tons	Value
		$			$
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	2,196	165,026
1952	2,020	132,796	1957	2,260	174,677
1953	1,944	128,658			

TABLE 18. Consumption of Diatomaceous Earth in the Manufacture of Fertilizers, 1952-57

Year	Tons	Value
		$
1952	7,683	371,124
1953	8,643	427,881
1954	9,384	448,533
1955	9,166	429,149
1956	8,648	427,684
1957	6,068	314,425

TABLE 19. Imports of Diatomaceous Earth, 1949-58

Year	Tons	Value	Year	Tons	Value
		$			$
1949	16,914	551,954	1954	19,373	664,016
1950	18,247	599,216	1955	22,158	788,503
1951	21,069	709,433	1956	21,078	888,090
1952	15,888	563,950	1957	25,288	1,077,657
1953	19,350	670,610	1958	27,258	1,184,427

TABLE 20. World Production of Diatomite, by Countries,[1] 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	short tons[2]				
North America:					
Canada	103	4	16	2	168
Costa Rica	430	595	3,000	6,737	6,600[3]
Guatemala	11,900[3]	12,900[3]	16,500[3]	16,600[3]	20,600
United States	302,816[4]	368,426[5]	368,426[5]	368,426[5]	368,426[5]
South America:					
Argentina	[6]	[6]	2,750	6,600	6,600[3]
Chile	11	31	550	—	—
Peru	2	2	2	34	30[3]
Europe:					
Austria	3,435	3,532	4,445	5,490	3,823
Denmark:					
Diatomite	12,454	30,337	39,103	22,238[7]	22,238[7]
Moler[8]	39,080	42,990	39,442	39,080[9]	39,080[9]
Finland	1,985	1,367	2,059	2,535	2,800[3]
France[10]	76,235	68,092	70,025	69,440	69,500[3]
Germany, West[10]	54,530	53,666	62,575	72,890	77,000[3]
Italy	10,158	11,160	11,314	13,244	13,000[3]
Portugal[10]	1,089	2,011	2,499	1,985	2,200[3]
Spain[10]	7,975	10,002	15,927	10,915	12,315
Sweden	1,504	1,013	1,625	1,243	1,200[3]
United Kingdom, Great Britain	13,974	10,778	24,656	19,361	22,000[3]
Northern Ireland	8,139	4,675	7,293	6,577	6,842
Yugoslavia	3,901	4,439	4,490	[6]	[6]
Asia:					
Korea, Republic of	245	1,377	3,393	3,912	1,472
Africa:					
Algeria	28,162	35,581	30,384	29,201	11,000[3]
Egypt	353	173	545	320	330[3]
Kenya	4,903	3,649	3,304	5,418	4,737
Union of South Africa	120	1,047	850	635	606
Oceania:					
Australia	4,973	6,091	5,647	6,484	4,900[3]
New Zealand	115	188	623	152	220[3]
World total (estimate)[1,2]	**635,000**	**725,000**	**765,000**	**760,000**	**750,000**

[1] Diatomaceous earth is believed to be produced also in Brazil, Hungary, Japan, Mozambique, Rumania 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. Data do not add to totals shown due to rounding where estimated figures are included in the detail.

[3] Estimate.

[4] Average annual production 1951-53.

[5] Average annual production 1954-56.

[6] Data not available: estimates included in total.

[7] Average annual production 1947-55.

[8] A clay-contaminated diatomite used principally for light weight building brick.

[9] Average annual production 1951-56.

[10] Includes Tripoli.

FLUORSPAR

Shipments of fluorspar were valued at $1,542,589 in 1958 compared with $1,756,841 in the preceding year. Fluorspar was mined in three provinces, Newfoundland, Ontario and British Columbia. The B.C. output was comparatively small. It was a by-product in the operation of a siliceous rock deposit.

In Canada fluorspar is consumed chiefly by the aluminum industry. The fluorspar is used to make hydrofluoric acid, which in turn is used to make a flux (artificial cryolite). The flux, together with a small amount of fluorspar, dissolves alumina, and from this solution aluminum is recovered electrolytically. Fluorspar finds its other major use as a flux in the steel industry. In smaller but increasing amounts, fluorspar is used in the heavy-chemical, glass, enamelling, glazing, white-metal alloy and metal-refining industries.

In the United States the largest consumer is the steel industry, which is followed by the hydrofluoricacid manufacturers. Hydrofluoric acid is used in large amounts by the aluminum, fluorine, chemical and uranium industries. It is worth noting that despite the steel-production increase of recent years, the rate of fluorspar consumption is growing faster in the manufacture of hydrofluoric acid than in the use of fluorspar as a flux in steel plants.

Standard fluxing gravel or lump grade for metallurgical purposes is usually sold on a specification of a minimum of 85 per cent CaF_2 and a maximum of 5 per cent SiO_2 (silica) and 0.3 per cent sulphur. Fines should not exceed 15 per cent.

Ceramic or glass and enamel grades call for not less than 94 per cent CaF_2 with a maximum 3.5 per cent $CaCo_3$ (calcium carbonate), 3 per cent SiO_2 and 0.1 per cent Fe_2O_3 (ferric oxide). The material must be in mesh sizes ranging from coarse to extra fine.

Acid grade has the most rigid specifications. It must be over 97 per cent CaF_2 and not over 1 per cent SiO_2. Like ceramic grade, it is used in powdered form.

TABLE 21. Production of Fluorspar, 1949-58

Year	Short tons	Selling value f.o.b. works	Year	Short tons	Selling value f.o.b. works
		$			$
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
1952	82,187	2,523,408	1957	...	1,756,841
1953	88,569	2,670,585	1958	...	1,542,589

TABLE 22. Imports of Fluorspar, 1949-58

Year	Tons	$	Year	Tons	$
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
1952	22,714	684,968	1957	14,547	377,706
1953	20,161	546,915	1958	30,408	763,438

TABLE 23. Consumption of Fluorspar, 1953-57

	1953	1954	1955	1956	1957
	tons				
(a) By uses:					
Steel	22,730	16,002	18,610	18,979	16,935
Glass	672	757	592	669	628
Enamelling and glazing	152	85	97	—	—
Heavy chemicals	59,556	63,751	68,592	76,452	53,198
White metal alloys	6	15	36	26	—
Total accounted for	**83,116**	**80,610**	**87,927**	**96,126**	**70,761**
(b) By provinces:					
Nova Scotia	10,071	7,765	7,808	6,268	6,734
Quebec	57,077	61,338	65,888	74,086	52,074
Ontario	15,566	11,082	13,721	15,241	11,455
Manitoba	247	255	317	295	181
Alberta	100	103	123	191	292
British Columbia	55	67	70	45	25
Total accounted for	**83,116**	**80,610**	**87,927**	**96,126**	**70,761**

TABLE 24. World Production of Fluorspar, by Countries,[1] 1952-57

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

Country[1]	1952	1953	1954	1955	1956	1957
	short tons[2]					
North America:						
Canada	82,187	88,569	118,969	128,114	140,071	68,463
Mexico (exports)	198,680	173,163	146,198	200,220	360,117	389,807
United States (shipments)	331,273	318,036	245,628	279,540	329,719	328,872
Total	**612,140**	**579,768**	**510,795**	**607,874**	**829,907**	**787,142**
South America:						
Argentina (shipments)	7,882	8,000[3]	14,308	14,991	12,983	16,500[3]
Bolivia (exports)	88	21	213	569	300	. . .
Brazil	—	—	487[4]	—	—	—
Total	**7,970**	**8,000[3]**	**15,008**	**15,560**	**13,283**	**16,500[3]**
Europe:						
Belgium	[5]	[5]	[5]	[5]	[5]	[5]
France	78,836	69,702	81,788	94,863	89,287	88,185
Germany, East[3]	90,000	90,000	90,000	90,000	90,000	90,000
West	161,566	177,719	190,916	170,816	160,937	154,323
Italy	63,546	83,544	85,041	110,694	136,675	158,915
Norway	750	777	488	317	198	331
Spain	68,899	56,426	81,032	73,653	81,281	88,200[3]
Sweden (sales)	4,926	4,773	4,140	1,459	976	1,100[3]
United Kingdom	84,922	88,624	92,607	96,235	102,536	104,467
Total[3]	**560,000**	**575,000**	**630,000**	**645,000**	**665,000**	**690,000**
Asia:						
Japan	4,356	7,206	6,771	5,738	8,911	8,404
Korea, Republic of	6,121	12,139	9,360	11,105	3,431	5,644
Turkey	277	110	—	—	—	—
U.S.S.R.[3,6]	90,000	90,000	110,000	110,000	165,000	165,000
Total[1,3]	**110,000**	**140,000**	**170,000**	**180,000**	**245,000**	**245,000**
Africa:						
French Morocco	3,642	3,188	1,188	11	170	—
Rhodesia and Nyasaland, Federation of:						
Southern Rhodesia	—	373	120	480	943	97
South West Africa	4,870	5,641	3,063	675	—	24
Tunisia	2,723	2,249	—	—	—	—
Union of South Africa	11,343	16,029	21,996	32,839	35,065	35,106
Total	**22,578**	**27,480**	**26,367**	**34,005**	**36,178**	**35,227**
Oceania: Australia	96	373	21	316	834	305
World total (estimate)[3,2]	**1,300,000**	**1,330,000**	**1,350,000**	**1,485,000**	**1,790,000**	**1,775,000**

[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] Exports.

[5] Data not available; estimates included in total.

[6] U.S.S.R. in Europe included in U.S.S.R. in Asia as deposits are predominantly in asiatic Russia.

GARNET

No production of garnet was reported in 1958 in Canada. There was intermittent production during 1940 - 1950 from a deposit near River Valley in Dana township, Ontario. The ore was crushed and concentrated at the firm's mill located at Sturgeon Falls.

The garnet group of minerals are aluminum silicates containing variable amounts of iron, magnesium, manganese calcium and chromium. They are common constituents of many rocks, particularly metamorphic types, and some beach sands.

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

During 1958 there was no production of natural graphite. There has been no production since the Black Donald Mine in Renfrew county, Ontario closed in 1954. In recent years there was some development work 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 - 58

Year	Short tons	Value	Year	Short tons	Value
		$			$
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 - 58	—	—

TABLE 26. Imports and Exports of Graphite,[1] 1956 - 58

	1956	1957	1958
	dollars		
Imports:			
Plumbago, not ground	87,926	74,089	53,219
Crucibles, plumbago, and covers	260,000	237,333	166,056
Plumbago, ground, and manufactures of	815,384	748,732	909,226
Exports:			
Graphite, crude and refined	200	160	—
Carbon and graphite electrodes	2,802,932	3,666,570	3,409,139

[1] Includes artificial graphite.

TABLE 27. Available Data on the Consumption of Graphite, 1953-57

	1953	1954	1955	1956	1957
	pounds				
By industries:					
Polishes and dressings	20,859	22,164	22,536	19,810	11,588
Paints	108,870	104,703	109,994	173,520	117,926
Brass and copper products	46,747	48,096	39,846	45,385	69,632
Electrical apparatus	586,397	711,235	1,369,345	616,828	583,488
Heavy chemicals	635,134	496,753	687,303	754,042	637,888
Boilers and platework	6,699	7,021	8,185	16,780	12,064
Steel ingots and castings	2,208,000	1,074,000	1,616,000	2,216,000	2,516,000
Farm implements	5,412	2,700	10,739	—	...
Railway rolling stock	103,911	419,598	77,800	256,041	39,292
Machinery	100,717	118,212	178,246	77,095	166,774
Iron castings	755,041	506,081	803,313	1,014,378	2,200,805
Cooking and heating equipment	28,769	38,036	29,353	7,229	7,738
Ferro-alloys	484,000	6,100,000	...	...	...
Asbestos products	28,678	14,439	28,714	34,678	...
Explosives	23,269	42,188	2,822	3,165	...
Miscellaneous non-metallics	435,740	192,952	419,951	487,382	388,140
Miscellaneous iron and steel	51,586	168,827	53,103	178,630	192,906
Miscellaneous non-ferrous	10,917	538	725	...	...
Petroleum refining	...	77,090	62,800	...	...
Machine tools	...	6,900	5,500	5,000	4,500
Clay products	...	...	200,000	250,000	...
Miscellaneous chemicals	...	...	...	784	...
Total for above industries	**5,640,746**	**10,151,533**	**5,726,275**	**6,156,747**	**6,948,741**
By provinces:					
Newfoundland, Nova Scotia	9,537	5,372	3,628	4,560	16,649
New Brunswick	4,986	5,151	996	1,893	1,189
Quebec	1,220,558	1,166,692	1,226,110	1,177,615	1,312,534
Ontario	4,126,939	8,704,037	3,563,490	4,567,547	5,324,995
Manitoba	35,783	118,835	216,659	150,293	82,820
Saskatchewan	4,300	400	2,195	2,080	1,300
Alberta	18,300	17,650	565,516	161,391	142,520
British Columbia	220,343	133,396	147,681	91,368	56,734
Total accounted for	**5,640,746**	**10,151,533**	**5,726,275**	**6,156,747**	**6,948,741**

TABLE 28. World Production of Natural Graphite, by Countries, 1952-57

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

Country[1]	1952	1953	1954	1955	1956	1957
	short tons[2]					
North America:						
Canada	2,040	3,466	2,463	—	—	...
Mexico	26,623	33,433	24,013	32,342	32,655	25,938
United States	5,606	6,281	[3]	[3]	[3]	[3]
South America:						
Argentina	[3]	[3]	[3]	2	572	550[4]
Brazil	938	648	1,008	859	579	550[4]
Europe:						
Austria	21,728	16,185	19,184	19,637	20,597	20,860
Czechoslovakia	[3]	[3]	[3]	[3]	[3]	[3]
Germany, West	9,880	8,222	10,448	11,556	12,878	13,200[4]
Italy	4,837	5,731	4,165	2,595	3,262	3,649
Norway	4,542	3,255	3,993	5,970	5,562	5,500[4]
Spain	863	352	451	349	331	304
Sweden	—	—	—	309	440	440[4]
U.S.S.R.	[3]	[3]	[3]	[3]	[3]	50,000[5]
Yugoslavia	757	—	—	1,033	—	—
Asia:						
Ceylon (exports)	8,578	8,084	8,655	11,064	10,312	9,172
Hong Kong	—	220	2,061	1,722	2,734	3,703
India	2,405	859	1,657	1,807	1,650[4]	1,650[4]
Japan	5,126	4,488	4,515	3,385	3,757	5,278
Korea, Republic of	16,601	21,416	15,344	99,228	67,367	162,703
Taiwan (Formosa)	772	—	—	—	2,285	[3]
Africa:						
Egypt	—	—	—	—	—	—
Kenya	39	205	347	241	619	1,056
Madagascar	20,368	14,847	13,284	17,443	17,451	17,600
Morocco:						
Northern Zone	13	—	—	129	137	—
Southern Zone	130	108	—	—	—	—
Mozambique	—	—	—	—	—	—
South West Africa	1,305	—	115	1,011	—	—
Tanganyika	—	21	—	—	26	—
Union of South Africa	389	413	1,396	1,829	1,862	1,750
Australia	89	17	78	24	11	[3]
Total world (estimate)[1]	**205,000**	**200,000**	**185,000**	**290,000**	**270,000**	**230,000**

[1] In addition to countries listed, graphite has been produced in China, North Korea 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; estimates 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 Brunswick 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, but none has been reported since.

TABLE 29. Production of Grindstones, Pulpstones and Scythestones, 1948-58

Year	Tons	Value	Year	Tons	Value
		$			$
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	—	—
1952	42	5,720	1957 and 1958	—	—

TABLE 30. Purchases of Pulpstones by the Canadian Pulp and Paper Industry, 1949-57

Year	Number for 2 ft. wood	Value	Number for 2.5 ft. wood	Value	Number for 4 ft. wood	Value
		$		$		$
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
1956	109	152,475	15	37,517	200	841,206
1957	67	157,892	9	23,330	150	660,991

IRON OXIDES

Canadian producers of ochreous iron oxides shipped 1,632 tons valued at $113,390 in 1958 compared with 7,518 tons worth $187,211 in 1957. In 1958 the major portion of the shipments was a higher grade milled calcined material.

The ocherous 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, 1921-58

Year	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of products	Net value of production[1]
	number		dollars				
1921	4	32	42,693	10,858	..	93,610	..
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	87,283	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	71,781	21,931	3,931	165,928	121,772
1956	3	29	49,669	6,055	545	191,145	152,400
1957	3	26	64,011	22,402	450	192,388	141,288
1958	3	17	31,916	14,718	275	116,343	98,397

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

TABLE 32. Production of Natural Iron Oxides, 1949-58

Year	Quantity	Value	Year	Quantity	Value
	short tons	$		short tons	$
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
1952	11,487	194,922	1957	7,518	187,211
1953	10,308	195,801	1958	1,632	113,390

TABLE 33. Imports and Exports of Ochres and Colours, 1957 and 1958

	1957		1958	
	Quantity	Value	Quantity	Value
	tons	$	tons	$
Imports:				
Ochres, ochrey earths, siennas and umbers	946	75,309	680	57,544
Oxides, fireproofs, rough stuff, fillers and colours, dry, n.o.p.	4,826	3,352,422	4,923	3,375,490
Exports:				
Iron oxides	3,440	397,484	2,401	371,287

TABLE 34. Consumption of Iron Oxides in Specified Canadian Industries, 1953-57

Year	Coke and gas		Paints and varnishes			
			Iron oxide pigments		Ochres, siennas and umbers	
	Quantity	Value	Quantity	Value	Quantity	Value
	tons[1]	$	tons	$	tons	$
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
1956	8,745	89,107	2,166	430,797	220	52,053
1957	5,999	64,854	1,895	427,289	263	88,103

[1] Oxide and purifying materials.

TABLE 35. Employees and their Earnings in the Natural Iron Oxides Industry, 1954-58

	Employees					Man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total		Office and administrative	Workmen	Total
	Male	Female	Male	Female					
	number						dollars		
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
1957	1	1	16	—	18	56,185	8,460	55,551	64,011
1958	2	1	13	1	17	23,744	8,740	23,176	31,916

TABLE 36. Workmen in the Natural Iron Oxides Industry, by Months, 1957 and 1958

Month	1957			1958			
	Quarry	Mill	Total	Quarry	Mill		Total
	Male	Male		Male	Male	Female	
	number			number			
January	2	114	16	1	13	—	14
February	2	18	20	1	3	—	4
March	2	17	19	1	9	—	10
April	1	13	14	—	3	—	3
May	8	18	26	—	3	1	4
June	12	19	31	—	12	1	13
July	10	17	27	—	14	1	15
August	14	22	36	—	3	1	4
September	14	20	34	—	14	1	15
October	12	16	28	7	12	1	20
November	8	19	27	5	15	1	21
December	—	13	13	6	14	1	21
Average	**7**	**17**	**24**	**3**	**10**	**1**	**14**
Total man-hours worked	52, 185			19, 744			

TABLE 37. Fuel and Electricity Used in the Natural Iron Oxides Industry, 1958

Kind		Quantity	Cost at plant
			$
Pituminous coal (a) From Canadian mines	short ton	—	—
(b) Imported	"	598	10, 554
Sub-bituminous coal (from Alberta mines only)	"	—	—
Anthracite coal	"	—	—
Lignite coal	"	—	—
Coke (for fuel only)	"	—	—
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	2, 400	876
Kerosene or coal oil	"	—	—
Fuel oil	"	1, 910	615
Wood (cords of 128 cubic feet of piled wood)	cord	—	—
Gas (a) Liquefied petroleum gasses (propane, etc.)	Imp. gal.	—	—
(b) Other manufactured gas	M cu ft.	—	—
(c) Natural gas	"	—	—
Other fuel	—	—	—
Electricity purchased for power and lighting	kwh.	147, 456	2, 673
Electricity purchased for other purposes	"	—	—
Total (cost only)	—	...	**14, 718**
Electricity generated (a) For own use	kwh.	—	—
(b) For sale	"	—	—

TABLE 38. Power Equipment Used in the Natural Iron Oxides Industry, 1958

Type of equipment	Driving generators	Not driving generators
	horsepower	
A. Prime movers:		
Steam engines	—	—
Steam turbines	—	—
Diesel engines	—	45
Gasoline, gas and oil engines, other than diesel engines	—	85
Hydraulic turbines or water wheels	—	—
Total	—	130
B. Electric motors (one-quarter horsepower and over)	—	113

LITHIA

During 1958 the producers of lithia shipped 3,853,322 pounds valued at $2,047,880 compared with 5,140,257 pounds worth $2,827,143 in 1957. These figures on quantities are the lithia or lithium oxide content of spodumene concentrates exported for processing.

Lithium compounds find their most important applications in the ceramic industry and in the manufacture of lubricating greases. Practically all lithium concentrates are converted chemically to lithium carbonate or hydroxide, the usual basic compounds used in industry. For chemical processing, the only specification available is for the spodumene that Quebec Lithium Corporation is exporting. Four and a half per cent lithia is required as a minimum in the concentrate. However, practically all producers of lithium compounds either own or have a share in mining properties from which they obtain concentrates; standard specifications have, therefore, not been established and grades are a matter of individual negotiation.

Lithium greases, first evolved in 1943, came to play an important role in lubrication wherever operational extremes of temperature were experienced, as they maintain their lubricating qualities between -60°F and +320°F and, moreover, have excellent water-insolubility characteristics. In wartime, lithium greases were invaluable for aircraft engines. Since the war their industrial use has grown rapidly, as their unique properties make possible the production of multi-purpose greases, simplifying both manufacture and application.

In ceramics, lithia serves primarily as a flux, permitting the development of low-temperature ceramic bodies with the attendant benefits of refractoriness, fuel economies and wider colour use. It also makes possible the production of glass transparent to ultravoilet light for use in germicidal lamps. Lithium compounds reduce the maturing temperature and increase the fluidity and gloss of glass, glazes and enamels, facilitate production of certain glasses of high electrical resistance and have many other desirable effects that render them of great benefit in the field of ceramics.

Lithium as a metal has so far had limited application. Its principal use appears to be as a scavenger of impurities in refining non-ferrous metals and as a grain-refining agent. Only very small amounts are added for these purposes. Lithium alloys of magnesium, aluminum, copper, lead and zinc are under development and have promise. The Aluminum Company of America announced during the year the development of a lithium-aluminum alloy which will maintain high strength up to 400°F.

The use of lithium in nuclear-energy production and as a source of fuel for rockets and guided missiles has received much publicity, and speculation as to its exact function has been widespread. Little information is available in either case, but from scientific publications it has become generally known that tritium, a reported constituent of the hydrogen bomb, is obtained by bombarding the lithium-6 isotope with neutrons. The association of lithium with solid fuels is in the form of lithium hydride. The chemical compound furnishes a readily available source of hydrogen, which is a high-energy fuel.

Other common applications include the use of lithium hydroxide as a constituent of the electrolyte in alkaline storage batteries; of lithium chloride and bromide in air-conditioning units, and in refrigeration systems; of lithium fluoride as a flux in the welding and brazing of aluminum; and of compounds in the production of single-crystal optical units, in the control of reactions leading to the formation of alkyd resins for use in paints and in the manufacture of dry-cell batteries which will function at extremely low temperatures where normal cells are inoperative.

TABLE 39. Producers' Shipments of Lithia, 1954-58

Year	Pounds	Value	Year	Pounds	Value
		$			$
1954	17,052	6,300	1957	5,140,257	2,827,143
1955	162,512	114,376	1958	3,853,322	2,047,880
1956	4,789,380	2,643,950			

MAGNESITE AND BRUCITE

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

Brucitic limestone, a rock composed of granules of the mineral brucite (magnesium hydroxide) thickly distributed throughout a matrix of calcite, is quarried from large deposits near Wakefield, Quebec, by Aluminum Company of Canada, Limited, and is processed there for the recovery of magnesia and lime. The magnesia was used in part by the company for making magnesium metal at Arvida, Quebec, but the major part of the output is sold for the manufacture of basic refractories and for use as 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 40. Production of Magnesitic Dolomite, 1949-58

Year	Value	Year	Value
	$		$
1949	1,536,200	1954	1,909,163
1950	1,717,879	1955	2,151,820
1951	2,148,940	1956	2,783,181
1952	2,161,472	1957	3,046,298
1953	2,016,640	1958	2,529,161

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

TABLE 41. Magnesite and Dolomite Used in the Canadian Primary Iron and Steel, 1953-57

Year	Calcined dolomite		Dolomite, crude		Magnesite	
	Short tons	Value	Short tons	Value	Short tons	Value
		$		$		$
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	619,131
1956	95,703	2,407,384	422,888	803,730	10,784	676,943
1957	99,402	2,560,630	399,156	796,434	9,062	607,987

TABLE 42. World Production of Magnesite, by Countries,[1] 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	short tons[2]				
North America:					
United States	553,147	284,015	486,088	686,569	678,489
Total[1,3]	**880,000**	**760,000**	**720,000**	**990,000**	**970,000**
South America:					
Brazil[3]	11,000	11,000	11,000	11,000	11,000
Venezuela	—	—	—	—	—
Total[3]	**11,000**	**11,000**	**11,000**	**11,000**	**11,000**
Europe:					
Austria	895,971	925,006	1,093,173	1,194,502	1,292,567
Czechoslovakia	[4]	[4]	[4]	[4]	[4]
Germany, West	—	—	—	—	—
Greece	117,879	114,410	66,980	71,650	71,650[3]
Italy	2,269	3,348	4,527	5,448	8,512
Norway	2,049	915	874	880[3]	880[3]
Spain	16,653	32,399	29,973	26,891	42,355
Yugoslavia	168,121	153,572	129,114	214,260	233,983
Total[1,3]	**3,100,000**	**3,100,000**	**3,200,000**	**3,400,000**	**3,500,000**
Asia:					
Cyprus (exports)	22	—	—	—	—
India	102,878	78,968	64,470	102,717	96,161
Korea, Republic of	—	—	—	—	—
Turkey	386	1,174	—	937	998
Total[1,3]	**340,000**	**420,000**	**530,000**	**570,000**	**670,000**
Africa:					
Egypt	—	—	—	—	—
Kenya	—	—	—	—	117
Rhodesia and Nyasaland, Federation of:					
Southern Rhodesia	10,824	7,792	11,610	8,611	2,910
Tanganyika (exports)	64	87	367	272	284
Union of South Africa	25,229	26,874	19,753	33,485	35,414
Total	**36,117**	**34,753**	**31,730**	**42,368**	**38,725**
Oceania:					
Australia	51,965	48,331	64,595	72,447	88,200[3]
New Zealand	579	807	434	818	770
Total	**52,544**	**49,138**	**65,029**	**73,265**	**88,970[3]**
World total (estimate)[1,2]	**4,400,000**	**4,400,000**	**4,600,000**	**5,100,000**	**5,300,000**

[1] Unless otherwise stated, quantities in this table represent crude magnesite mined. In addition 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.

[2] This table incorporates a number of revisions of data published in previous Magnesium Compounds chapters.

[3] Estimate.

[4] Data not available; estimates included in total.

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 43. Production of Natural Magnesium Sulphate,[1] 1941-58

Year	Tons	Value
		$
1941	265	7,343
1942	1,140	38,760
1943-58	—	—

[1] Produced entirely in British Columbia.

TABLE 44. Imports of Magnesium Sulphate, 1949-58

Year	Tons	Value	Year	Tons	Value
		$			$
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
1952	2,186	76,419	1957	2,558	71,295
1953	2,761	80,885	1958	2,453	71,209

TABLE 45. Available Data on Consumption of Magnesium Sulphate, 1953-57

Industry	1953	1954	1955	1956	1957
	tons				
Leather tanneries	642	515	534	533	474
Medicinals	649	488	505	568	635
Fertilizers	471	21	30	43	49
Textiles	—	9	1	7	2
Total accounted for	**1,762**	**1,033**	**1,070**	**1,194**	**1,160**

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 46. Principal Statistics of the Mica Mining Industry, Significant Years, 1921-58

	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of production	Net value added[1]
	number		dollars				
1921	20	104	74,432	4,404	..	70,063	..
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	88,208
1957	25	47	66,283	5,585	7,411	113,458	100,462
1958	25	28	44,848	5,039	4,483	90,643	81,121

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

TABLE 47. Mica Production (Primary Sales), by Classes, 1957 and 1958

Grade	1957		1958	
	Pounds	Total value f.o.b. shipping point	Pounds	Total value f.o.b. shipping point
		$		$
Rough, mine-run or rifted	2,577	1,085	4,608	573
Mica sold for mechanical splitting	65,612	17,946	54,717	14,413
Splittings	16,385	3,568	—	—
Ground or powdered	911,138	37,226	1,380,530	44,298
Scrap, mine or shop waste and mica mined and sold for grinding	243,193	4,252	35,244	375
Trimmed mica	40,165	47,231	29,834	29,992
Unspecified	3,346	275	—	—
Total mica shipments	**1,282,416**	**111,583**	**1,504,933**	**89,651**
Varieties:				
Phlogopite mica (amber) and biotite	1,265,929	107,642	1,061,972	85,781
Muscovite mica (white) and schist	16,487	3,941	442,961	3,870

TABLE 48. Production of Mica, by Provinces and by Varieties, 1958

Province	Phlogopite and biotite		Muscovite and schist		Total	
	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$
Quebec	1,044,382	85,045	—	—	1,044,382	85,045
Ontario	17,590	736	6,961	1,370	24,551	2,106
British Columbia	—	—	436,000	2,500	436,000	2,500
Total Canada	**1,061,972**	**85,781**	**442,961**	**3,870**	**1,504,933**	**89,651**

TABLE 49. Production of Mica, 1949-58

Year	Short tons	Value	Year	Short tons	Value
		$			$
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
1952	1,007	194,106	1957	641	111,583
1953	1,133	161,128	1958	752	89,651

TABLE 50. Imports and Exports of Mica, 1956-58

	1956		1957		1958	
	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$
Imports:						
Mica, unmanufactured	324,900	200,779	501,900	234,004	1,047,700	217,436
Mica, manufactures of, n.o.p.	...	538,227	...	438,782	...	384,496
Exports:						
Mica, scrap and waste	119,500	3,236	184,700	6,403	170,200	11,243
Mica splittings	—	—	—	—	—	—
Mica manufactures	...	1,919	...	11,400	—	—
Mica, rough, untrimmed	24,500	6,059	87,500	28,666	—	—
Mica, trimmed	41,800	39,981	66,000	79,266	51,900	51,335
Mica, ground	92,000	5,520	24,000	1,455	78,000	4,253
Total mica exports reported	...	**56,715**	...	**127,190**	...	**66,831**

TABLE 51. Consumption of Mica, in Specified Industries, as Reported to the Annual Census of Industry, 1953-57

	1953	1954	1955	1956	1957
	pounds				
By industries:					
Paints	1,686,228	1,802,747	1,721,152	1,652,031	2,196,612
Electrical apparatus	498,433	473,352	492,589	515,960	642,608
Rubber goods	364,685	322,247	484,985	543,940	574,706
Roofing	836,000	674,000	480,000	1,220,000	518,000
Paper goods	62,500	56,000	38,000	494,000	18,000
Asbestos	...	...	26,157	16,800	...
Non-metallic mineral products	106,801	85,000	101,219	79,719	79,000
Concrete products	...	...	4,700	...	...
Miscellaneous	231,674	16,502	8,102	2,360	...
Total accounted for	**3,786,321**	**3,429,848**	**3,356,904**	**4,524,810**	**4,028,926**
By provinces:					
Quebec and Nova Scotia	1,669,777	1,772,025	1,701,766	1,662,528	1,946,033
Ontario	1,517,168	1,214,578	1,361,430	1,779,940	1,545,913
Manitoba	9,883	8,455	13,392	14,556	27,085
Alberta	—	—	—	762,000	420,000
British Columbia	589,493	434,790	280,316	305,786	89,895
Canada	**3,786,321**	**3,429,848**	**3,356,904**	**4,524,810**	**4,028,926**

TABLE 52. World Production of Mica by Countries,[1] 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	thousands of pounds[2]				
North America:					
Canada (sales): Block	280	71	57	79	
Splittings	9	2	—	2	1,426
Ground	666	937	944	1,493	
Scrap	1,312	699	639	269	
United States (sold or used): Sheet	849	669	642	888	690
Scrap	146,518	162,146	190,884	172,618	184,956
Total	**149,634**	**164,524**	**193,146**	**175,349**	**187,072**
South America:					
Argentina: Sheet	540	529	99	322	310[3]
Scrap			139	2	—
Brazil	4,347	3,962	3,051	2,926	3,100[3]
Uruguay	2	—	—	—	—
Total	**4,889**	**4,491**	**3,289**	**3,250**	**3,410**
Europe:					
Austria	—	—	—	—	—
Italy	—	—	—	—	—
Norway, including scrap	2,185	3,968	3,086	2,646	2,205
Spain	29	260	443	227	26
Sweden: Block	7	4	—	—	—
Ground	379	331	368	392	400[3]
Total[1,3]	**59,000**	**60,000**	**60,000**	**60,000**	**60,000**
Asia:					
Ceylon	13	—	[4]	—	—
India (exports): Block	3,840	3,609	4,802	6,065	
Splittings	12,211	10,855	16,479	14,663	67,988
Scrap	11,444	23,031	25,699	27,282	
Taiwan (Formosa): Sheet	53	44	—	29	11
Scrap					
Total[1,3]	**32,000**	**48,600**	**62,400**	**63,500**	**90,000**
Africa:					
Angola: Sheet	42	24	33	53	46
Scrap and splittings	243	362	518	968	844
Kenya	—	—	—	—	—
Madagascar (phlogopite): Block	115	101	62	77	2,100[3]
Splittings	1,684	1,056	534	1,109	
Morocco: Sheet	[4]	11	...	...	...
Scrap	29	18			
Mozambique, including scrap	7	2	29	26	66
Rhodesia and Nyasaland, Federation of:					
Northern Rhodesia: Sheet	18	7	4	7	[4]
Southern Rhodesia: Block	148	183	141	123	71
Scrap	201	—	—	—	—
South West Africa: Scrap:	—	—	—	—	—
Tanganyika (exports): Block	165	174	146	128	150
Ground	—	—	—	—	—
Scrap	115	62	613	280	—
Uganda	—	[4]	—	—	—
Union of South Africa: Sheet	11	4	11	[4]	2
Scrap	4,284	4,107	7,818	5,038	4,226
Total	**7,062**	**6,111**	**9,911**	**7,809**	**7,505**
Oceania: Australia[5]	1,069	1,316	1,054	1,087	1,371
World total (estimate)[1,2]	**255,000**	**285,000**	**330,000**	**310,000**	**350,000**

[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: 1953, 996; 1954, 1,151; 1955, 977; 1956, 1,058; 1957, 1,294.

TABLE 53. Employees and their Earnings in the Mica Mining Industry, 1954-58

Year	Employees					Man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total		Office and administrative	Workmen	Total
	Male	Female	Male	Female					
	number						dollars		
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
1957	2	—	32	13	47	78,251	4,500	61,783	66,283
1958	1	—	27	—	28	42,821	4,800	40,048	44,848

TABLE 54. Workmen in the Mica Mining Industry, by Months, 1957 and 1958

Month	1957					1958		
	Mine		Mill or shop		Total	Mine	Mill or shop	Total
	Male	Female	Male	Female		Male	Male	
	number							
January	9	—	1	—	10	11	4	15
February	9	—	1	1	11	11	4	15
March	9	—	5	4	18	11	4	15
April	15	—	10	7	32	14	4	18
May	32	3	11	9	55	23	3	26
June	32	3	14	16	65	23	3	26
July	43	3	10	15	71	23	4	27
August	43	3	8	10	64	25	4	29
September	37	3	8	10	58	21	4	25
October	42	3	6	9	60	17	7	24
November	27	—	9	8	44	15	4	19
December	14	—	5	3	22	15	4	19
Average	**26**	**2**	**7**	**8**	**43**	**21**	**6**	**27**
Total man-hours worked	75,951					41,071		

TABLE 55. Fuel and Electricity Used in the Mica Mining Industry, 1958

Kind		Quantity	Cost at plant
Bituminous coal (a) From Canadian mines	short ton	103	2,018
(b) Imported	"	—	—
Sub-bituminous coal (from Alberta mines only)	"	—	—
Anthracite coal	"	—	—
Lignite coal	"	—	—
Coke (for fuel only)	"	—	—
Gasoline, (includes gasoline used in cars and trucks)	Imp. gal.	2,425	1,071
Kerosene or coal oil	"	—	—
Fuel oil	"	—	—
Wood (cords of 128 cubic feet of piled wood)	cord	—	—
Gas (a) Liquefied petroleum gases (propane, etc.)	Imp. gal.	—	—
(b) Other manufactured gas	M cu ft.	—	—
(c) Natural gas	"	—	—
Other fuel	—	—	—
Electricity purchased for power and lighting	kwh.	86,352	1,950
Electricity purchased for other purposes	"	—	—
Total (cost only)	—	...	**5,039**
Electricity generated (a) For own use	kwh.	—	—
(b) For sale	"	—	—

TABLE 56. Power Equipment Used in the Mica Mining Industry, 1958

Type of equipment	Driving generators	Not driving generators
	horsepower	
A. Prime movers:		
Steam engines	—	—
Steam turbines	—	—
Diesel engines	—	—
Gasoline, gas and oil engines, other than diesel engines	—	20
Hydraulic turbines or water wheels	—	—
Total	**—**	**20**
B. Electric motors (one-quarter horsepower and over)	127	75

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-François du Lac, Eau Minérale Naturelle St-Léon at St-Léon 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 9 firms reporting production of natural mineral waters in Canada in 1958. Eight of these firms were in Quebec and 1 in Ontario.

TABLE 57. Shipments of Natural Mineral Waters from Canadian Springs, 1949-58

Year	Quebec		Ontario		Canada	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		$		$		$
1949	304,216	145,830	2,475	410	306,691	146,240
1950	316,654	158,457	2,175	440	318,829	158,897
1951	322,800	146,521	2,500	450	325,300	146,971
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	284,078	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
1957	346,210	183,155	2,500	2,012	348,710	185,167
1958	314,294	170,622	2,433	1,946	316,737	172,568

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 58. Production of Phosphate Rock, 1947-58

Year	Short tons	Value	Year	Short tons	Value
		$			$
1947	—	—	1952	—	—
1948	—	—	1953	—	—
1949	20	291	1954	—	—
1950	129	1,070	1955	—	—
1951	6	94	1956-58	—	—

TABLE 59. Imports of Phosphate Rock, 1949-58

Year	Short tons	Value	Year	Short tons	Value
		$			$
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
1952	470,913	3,130,306	1957	723,220	5,897,784
1953	576,500	3,951,318	1958	744,164	6,854,243

TABLE 60. Consumption of Phosphate Rock, 1953-57

	1953	1954	1955	1956	1957
			tons		
(a) By uses:					
Fertilizers	416,714	506,241	465,129	417,910	584,216
Chemicals	78,408	100,642	97,716	109,524	114,265
Steel and iron	532	1,081	128	276	...
Stock and poultry feeds	15,986	19,582	21,919	24,596	24,234
Miscellaneous	450	515	434	340	...
Total	**512,090**	**628,061**	**585,326**	**552,646**	**722,715**
(b) By provinces:					
Prince Edward Island	410	476	319	278	293
Nova Scotia	674	509	455	631	800
New Brunswick	122,206	148,254	140,602	160,536	175,260
Quebec	89,694	105,507	106,579	97,484	88,129
Ontario	798	1,031	765	802	815
Manitoba	165	208	311	240	333
Saskatchewan	625	697	655	6,604	99,692
Alberta	297,518	371,379	335,640	286,071	357,393
British Columbia	**512,090**	**628,061**	**585,326**	**552,646**	**722,715**
Canada					

TABLE 61. World Production of Phosphate Rock, by Countries,[1] 1953 - 57

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

Country[1]	1953	1954	1955	1956	1957
	thousand long tons				
North America:					
United States	12,504	13,821	12,265	15,747	13,976
West Indies:					
Jamaica: Guano	1	1	[3]	[3]	[3]
Netherlands Antilles (exports)	95	124	109	104	105
Total	**12,600**	**13,946**	**12,374**	**15,851**	**14,081**
South America:					
Brazil	12[4]	64[4]	123[4]	123[4]	123[4]
Chile: Apatite	58	41	52	58	54[4]
Guano	30[4]	30[4]	30[4]	30[4]	30[4]
Peru	257	289	285	331	280
Venezuela	—	—	—	30	30
Total[4]	**357**	**424**	**490**	**572**	**517**
Europe:					
Belgium	35	26	19	13	16
France	86	117	101	66	69[4]
Spain	22	22	23	8	1
Sweden: Apatite	9	—	—	—	—
U.S.S.R.: Apatite[4]	2,760	3,100	3,445	3,690	3,940
Sedimentary rock[4]	1,205	1,330	1,425	1,575	1,720
Total[1,4]	**4,370**	**4,850**	**5,260**	**5,600**	**6,000**
Asia:					
British Borneo: Guano	1	1	[3]	[3]	[3]
China[4]	150	200	250	250	300
Christmas Island (exports) (Indian Ocean)	280	351	390	341	336
India: Apatite	4	2	6	9	9
Indonesia	1	6	6[4]	6[4]	6[4]
Israel	23	54	84	118	148
Jordan	39	74	161	205	258
Philippines: Guano	1	2	[3]	8	4
Total[1,4]	**510**	**710**	**910**	**960**	**1,080**
Africa:					
Algeria	609	761	746	596	596
Egypt	477	526	636	605	590[4]
French West Africa: Aluminum phosphate	93[6]	77[6]	111[6]	72[6]	89[6]
Madagascar	2	1	2	3	3[4]
Morocco	4,090	4,940	5,245	5,435	5,480
Seychelles Islands (exports)	9	12	4	4	6
South West Africa: Guano	2	1	2	1	3
Tunisia	1,691	1,795	2,067	2,644	2,035
Uganda	5	3	3	3	3
Union of South Africa	79	93	134	154	166
Total	**7,057**	**8,209[4]**	**8,944**	**8,917**	**8,970[4]**
Oceania:					
Angaur Island (exports)	111[4]	122	137	—	—
Australia	3	6	6	7	10[5]
Makatea Island (French Oceania) (exports)	247	225	216	250	300
Nauru Island (exports)	1,160	1,178	1,401	1,333	1,105
Ocean Island (exports)	282	292	309	297	292
Total	**1,803**	**1,823**	**2,069**	**1,887**	**1,707**
World total (estimate)[1,2]	**26,750**	**29,950**	**30,050**	**33,750**	**32,350**

[1] In addition to countries listed a negligible amount is produced in Angola, British Somaliland, Canada, Japan, Southern Rhodesia and Tanganyika. Estimate for Austria, Ireland, North Korea and Poland are included in the total.

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

[3] Less than 500 tons.

[4] Estimate.

[5] Exports.

[6] Includes calcium phosphate, production of which is reported in thousand long tons as follows: 1953, 41; 1954, 5; 1955, 5; 1956, 5; 1957, 1.

POTASH

Near Saskatoon, Saskatchewan the Potash Company of America Ltd. completed construction of a concentrator. During the latter part of the year the mill was started and tests were carried out but no shipments of products were made. 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 62. World Production of Potash (Marketable, Unless Otherwise Stated) in Equivalent K_2O, by Countries,[1] 1954 - 58

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

Country[1]	1954	1955	1956	1957	1958
	short tons[2]				
North America:					
United States	1,948,721	2,066,706	2,171,584	2,266,481	2,147,670
Crude (including Brines)[3]	2,170,969	2,326,946	2,479,463	2,615,808	2,478,724
South America:					
Chile	550	11,000	12,000	11,000[4]	11,000[4]
Europe:					
France	1,192,083	1,310,961	1,463,006	1,545,267	1,613,000[4]
Crude[3]	1,361,734	1,490,764	1,653,465	1,736,800	1,832,039
Germany: East[4]	1,488,000	1,582,000	1,598,000	1,653,000	1,700,000
Crude[3,4]	1,720,000	1,820,000	1,840,000	1,900,000	1,960,000
West	1,783,394	1,870,848	1,823,221	1,862,000	1,892,000
Crude[3]	2,134,072	2,226,666	2,166,039	2,190,000	2,222,000
Spain	243,166	242,539	263,468	251,460	236,000[4]
U.S.S.R.[4]	593,700	870,500	983,600	1,040,000	1,100,000
Asia:					
Israel	12,000[4]	12,000[4]	31,000[4]	50,000[4]	80,000[4]
Japan	454	461	475	1,650[4]	1,900[4]
Africa:					
Eritrea	–	–	–	–	–
Oceania:					
Australia	–	–	–	–	–
World total (marketable estimate)[3]	**7,300,000**	**8,000,000**	**8,300,000**	**8,700,000**	**8,800,000**

[1] In addition to countries listed, China, Ethiopia, Italy, Korea and Poland 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.

PYRITE, PYRRHOTITE

Pyrite and pyrrhotite are by-products which are produced from the processing of the metal sulphide ores of Noranda, Quemont, Waite Amulet, Normetal, West MacDonald, and Weedon Pyrite Mines in Quebec and Britannia mine in British Columbia. 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. Pyrite mined in the Beaverlodge area of Saskatchewan is used to produce acid which is used in the treatment of uranium ores.

At Cutler, Ontario the pyrite and pyrrhotite concentrates from Noranda Mines are treated to produce sulphuric acid which is sold to the uranium mines in the Elliot Lake area. 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 63. Producers' Shipments Pyrite and Pyrrhotite, 1949-58

Year	Gross weight	Sulphur[1] content	Value	Year	Gross weight	Sulphur[1] content	Value
	tons		$		tons		$
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
1952	553,987	263,241	2,245,713	1957	1,166,416	515,096	4,808,228
1953	408,257	186,650	1,450,698	1958	1,191,731	512,427	4,248,668

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

TABLE 64. World Production of Pyrites (Including Cupreous Pyrites), by Countries,[1] 1954-57

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

Country[1]	1954		1955		1956		1957	
	Gross weight	Sulphur content	Gross weight	Sulphur content	Gross weight	Sulphur content	Gross weight	Sulphur content
	long tons[2]							
North America:								
Canada	614,221	277,820	784,331	360,701	934,588	422,861	1,106,789	553,571
Cuba	118,105	56,690	127,497	62,473	65,230	31,832	35,638	16,782
United States	908,715	405,310	1,006,943	409,826	1,069,904	431,687	1,067,396	436,012
South America:								
Venezuela	...	...	...	...	59,053	14,173	49,211	11,811
Europe:								
Austria	...	...	...	...	...	...	...	...
Finland	248,528	105,310	298,064	126,963	289,440	127,554	292,462	125,800[3]
France	294,612	135,264	300,532	133,240	299,054	125,603	318,506	133,773
Germany: East	128,046	46,300[3]	140,742	48,200[3]	151,600[3]	53,100[3]	147,600[3]	49,200[3]
West	556,480	193,868	579,796	206,021	634,241	253,405	596,226	237,167
Greece	206,503	90,200[3]	229,127	100,000[3]	232,274	102,200	226,000[3]	98,000[3]
Italy	1,231,193	562,988	1,291,212	592,494	1,349,384	634,225	1,444,909	680,000[3]
Norway	782,362	343,697	830,453	361,776	827,327	364,158	818,178	350,000[3]
Poland	150,379	60,000[3]	154,127	55,608	168,000[3]	60,800[3]	167,000[3]	59,000[3]
Portugal	641,803	258,822	724,693	297,071	659,200	296,641	656,771	295,547
Spain	1,864,233	903,505	2,289,606	1,110,008	2,259,373	1,084,499	2,181,923	1,047,199
Sweden	392,896	193,563	387,852	191,009	485,672	238,939	492,000[3]	246,000[3]
United Kingdom	7,011	2,756	5,514	2,165	4,207	1,673	3,597	1,476
Yugoslavia	159,718	71,800[3]	223,103	116,014	251,906	130,990	308,058	160,190
Asia:								
Cyprus	1,103,367	529,500[3]	1,318,363	632,800[3]	1,603,340	769,700[3]	1,080,088	523,872
India	...	...	800	300[3]	—	—	—	—
Japan	2,635,564	1,106,281	2,692,939	1,131,034	3,048,576	1,295,676	2,993,701	1,289,458
Korea, Republic of	...	...	...	...	...	...	541	217
Philippines	5,202	2,080	30,296	13,600	...	...	17,566	6,100
Taiwan (Formosa)	23,857	9,543	28,559	10,700	29,914	11,122	32,746	12,401
Turkey[4]	33,935	16,928	16,137	8,100[3]	18,793	9,400[3]	47,767	22,735
Africa:								
Algeria	33,012	14,668	21,328	9,380	5,968	2,507	18,503	7,771
French Morocco	1,537	575	4,007	600	1,524	451	6,191	2,031
Rhodesia and Nyasaland Federation of:								
Southern Rhodesia	36,387	15,283	21,268	8,933	18,674	7,843	19,985	8,400[3]
Tunisia	...	...	...	...	...	...	...	...
Union of South Africa	225,534	86,809	351,650	137,882	429,964	163,400[3]	388,216	155,300[3]
Oceania:								
Australia	206,780	97,649	223,477	105,837	187,394	88,137	239,033	113,876
Total (estimate)[1]	**14,700,000**	**6,200,000**	**16,300,000**	**6,800,000**	**17,300,000**	**7,300,000**	**17,000,000**	**7,100,000**

[1] In addition to countries listed, Brazil, China, Czechoslovakia, Kenya, Korea, Rumania 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 Sulphur and Pyrites chapters. Data do not add to totals shown due to rounding where estimated figures are included in the detail.

[3] Estimate.

SILICA BRICK

The manufacture of silica brick for refractory use was confined to the plants of the Dominion Steel and Coal Company, Limited, Sydney, Nova Scotia, and the Algoma Steel Corporation Limited, Sault Ste-Marie, Ontario. The brick manufactured by both these firms are processed from crushed silica rock and are utilized in furnace construction and repairs.

TABLE 65. Producers' Shipments of Silica Brick, 1949-58

Year	M	Value	Year	M	Value
		$			$
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
1952	3,544	606,394	1957	4,308	655,903
1953	3,720	712,271	1958	2,815	472,346

Note: Quantities are shown as 9" equivalent.

SODIUM CARBONATE (NATURAL)

Deposits of natural sodium carbonate in the form of "natron" (sodium carbonate with 10 molecules of water) and of brine occur in a number of small "lakes" throughout the central part of British Columbia, chiefly in the Clinton mining division and in the 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 66. Production of Sodium Carbonate (Natural), 1945-58

Year	Tons	Value	Year	Tons	Value
		$			$
1945	286	3,146	1950	—	—
1946	—	—	1951	—	—
1947	163	1,793	1952	—	—
1948	—	—	1953	—	—
1949	47	513	1954-58	—	—

SODIUM SULPHATE (NATURAL)

All the natural sodium sulphate produced in Canada was obtained from the brine lakes in Saskatchewan. Producers shipped 173,217 tons valued at $2,862,915 in 1958 compared with 157,800 tons valued at $2,568,728 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 67. Principal Statistics of the Sodium Sulphate Mining Industry, Significant Years, 1921-58

Year	Establishments	Employees	Salaries and wages	Cost of fuel and electricity	Cost of process supplies and containers	Gross value of production	Net value[1] of production
	number		dollars				
1921	2	..	..	..	..	18,850	..
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	113,806	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
1957	5	180	628,876	469,756	84,663	2,574,152	2,014,309
1958	5	146	589,759	458,363	75,290	2,869,760	2,329,262

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

TABLE 68. Production of Natural Sodium Sulphate, 1949-58

Year	Short tons	Selling value f.o.b. shipping point	Year	Short tons	Selling value f.o.b. shipping point
		$			$
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
1952	122,590	1,708,807	1957	157,800	2,568,728
1953	115,565	1,631,258	1958	173,217	2,862,915

TABLE 69. Production of Manufactured Sodium Sulphate,[1] 1946-58

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	1954-58	..	..
1950	3,674	74,555			

[1] Salt cake produces as a by-product is not included.

TABLE 70. Imports of Sodium Sulphate, 1949-58

Year	Salt cake		Glauber's salt	
	Tons	Value	Tons	Value
		$		$
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
1957	28,086	511,457	1,512	50,527
1958	25,812	478,215	1,217	38,798

TABLE 71. Exports of Sodium Sulphate, 1949-58

Year	Long tons	Value	Year	Long tons	Value
		$			$
1949	18,830	294,367	1954	58,972	1,039,284
1950	25,335	302,329	1955[1]	67,762	1,263,911
1951	56,416	735,902	1956[1]	60,579	985,801
1952	24,236	382,274	1957[1]	37,023	593,390
1953	17,975	298,374	1958[1]	39,763	645,670

[1] **Source**: "Trade of Canada, Exports" — Quantity is shown in short tons.

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.

TABLE 72. Available Data on Consumption of Sodium Sulphate (Salt Cake) in Canada, by Industries, 1953-57

Industry	1953	1954	1955	1956	1957
	short tons				
Pulp and paper	125,332	134,533	137,575	156,698	160,042
Glass, including glass wool	2,662	2,276	2,722	2,922	2,111
Medicinals	20	17	37	54	67
Soaps	1,504	1,264	1,555	1,335	1,252
Stone products	180	185	166	264	271
Total accounted for	**129,698**	**138,275**	**142,055**	**161,273**	**163,743**

TABLE 73. Employees and their Earnings in the Sodium Sulphate Mining Industry, 1954-58

Year	Employees					Man-hours worked (all employees)	Earnings		
	Office and administrative		Workmen		Total		Office and administrative	Workmen	Total
	Male	Female	Male	Female					
	number						dollars		
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
1957	19	2	159	—	180	353,219	104,569	524,307	628,876
1958	14	3	129	—	146	305,494	97,178	492,581	589,759

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. Statisticsl data for these operations are included in the manufacturing industries under sub-group classification of absorption gasoline industry.

Elemental sulphur is also produced in the processing of nickel sulphides at the nickel refinery.

TABLE 74. Sulphur in Smelter Gases, 1949-58

Year	Quantity[1]	Value	Year	Quantity[1]	Value
	tons	$		tons	$
1949	144,290	1,442,900	1954	221,247	2,212,470
1950	150,685	1,506,850	1955	224,457	2,244,570
1951	156,427	—	1956[2]	236,088	2,323,590
1952	160,547	1,605,470	1957[2]	235,123	2,322,067
1953	172,200	1,722,000	1958[2]	241,055	2,361,252

[1] Does not include in 1952-55 sulphur in acid made from roasting zinc sulphide concentrates at Arvida.
[2] Includes sulphur in acid made from zinc sulphide at Arvida.

TABLE 75. Sulphur (Elemental)[1] Made from Natural Gas and Nickel Sulphide, 1952-58

Year	Output	Sales
	short tons	
1952	8,931	4,225
1953	18,298	16,072
1954	22,320	18,665
1955	29,093	25,976
1956	33,464	34,784
1957[2]	107,478	93,338
1958[2]	—	94,377

[1] Does not include sulphur made from imported crude petroleum.
[2] Includes sulphur produced at nickel refinery.

TABLE 76. Imports of Sulphur, 1949-58

Year	Tons	Value	Year	Tons	Value
		$			$
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
1952	415,185	8,376,824	1957	416,930	9,752,368
1953	359,205	8,526,804	1958	380,331	8,324,191

TABLE 77. Available Data on the Consumption of Sulphur (Brimstone), 1953-57

—	1953	1954	1955	1956	1957
	tons of 2,000 pounds				
(a) By industries:					
Pulp and paper	258,172	268,607	300,899	313,851	284,561
Heavy chemicals	85,479	80,871	82,947	108,300	189,911
Rubber goods	2,475	2,360	2,783	2,905	2,687
Medicinal	...	21	27	126	43
Adhesives	85	73	29	41	77
Starch	256	328	340	27	43
Fruit and vegetable preparations	4	5	6	7	6
Sugar refining	358	168	168	140	144
Petroleum refining	190	287	255	225	225
Steel and iron	101	50	65	86	83
Miscellaneous chemicals	5,329	6,155	5,591	5,473	3,161
Asbestos products	17	5	8	10	...
Miscellaneous non-metallics	...	23	24	...	...
Glass	...	...	6	11	...
Total accounted for	**352,466**	**358,953**	**393,148**	**431,202**	**480,941**
(b) By provinces:					
Newfoundland	18,078	20,492	20,088	21,440	19,886
Nova Scotia	6,092	5,865	6,567	6,105	6,753
New Brunswick	34,718	41,459	42,671	41,304	38,933
Quebec	111,891	110,439	124,762	136,909	134,528
Ontario	136,988	125,597	129,836	145,309	174,633
Manitoba and Saskatchewan	2,288	2,618	6,099	15,753	18,699
Alberta	78	201	2,344	5,660	39,105
British Columbia and Northwest Territories	42,333	52,282	60,781	58,722	48,404
Canada	**352,466**	**358,953**	**393,148**	**431,202**	**480,941**

TABLE 78. Exports of Sulphur and Pyrite, 1954-58

Year	Pyrite	Sulphur	
	$	tons	$
1954	1,566,571	3,339	90,158
1955	2,001,575	3,051	94,141
1956	2,852,753	12,364	293,042
1957	2,649,349	4,331	128,116
1958	1,879,251	7,608	170,966

TABLE 79. World Production of Native Sulphur by Countries,[1] 1953 - 58

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

Country[1]	1953	1954	1955	1956	1957	1958
	long tons[2]					
North America:						
Mexico	5,900	52,407	475,487	758,415	1,007,915	1,236,929
United States	5,193,599	5,578,973	5,799,880	6,484,285	5,578,525	4,645,577
South America:						
Argentina	16,000	17,000	17,651	27,298	28,788	30,000[3]
Bolivia (exports)	2,458	2,565	3,975	3,418	783	392
Chile	32,275	43,100	56,338	37,272	18,492	24,015
Colombia	2,657	5,118	5,413	4,921	5,000[3]	6,693
Ecuador	100	64	1,550	—	—	21,200
Peru	4,916	—	—	—	—	—
Europe:						
France (content of ore)	10,710	—	—	—	—	—
Greece (content of ore)	1,200	2,507	3,600	1.322	2,826	3,000
Italy (crude)[4]	224,161	194,064	181,629	170,094	171,730	158,665
Spain[3]	5,100	5,400	6,500	6,200	3,410	3,700
Asia:						
Japan	186,556	184,745	199,676	243,312	253,548	177,175
Philippines	1,089	761	3,700[3]	—	1,300[3]	1,300[3]
Taiwan (Formosa)	3,423	5,873	4,854	7,864	9,433	6,178
Turkey	9,626	9,862	11,318	13,681	12,893	12,622
Ryuku Islands	—	—	—	254	1,003	[5]
Total (estimate)[1]	**5,800,000**	**6,300,000**	**7,000,000**	**8,000,000**	**7,300,000**	**6,500,000**

[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] Estimate.

[4] In addition the following tonnages of ground sulphur rock (30 per cent) were produced and used as insecticide: 1953, 16,940 tons; 1954, 22,803 tons; 1955, 21,560 tons; 1956, 22,219 tons; 1957, 19,904 tons; 1958, 18,656 tons.

[5] Negligible.

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 accoustic 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 1958 there were 8 plants in Canada making insulation aggregates, etc., from imported vermiculite.

TABLE 80. World Production of Vermiculite, by Countries,[1] 1952-57

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

Country[1]	1952	1953	1954	1955	1956	1957
	short tons[2]					
Argentina	—	—	—	551	1,323	1,100[3]
Australia	69	32	—	—	1	—
Egypt	66	100[3]	—	—	—	—
India	24	—	3	138	1,038	1,100[3]
Kenya	—	82	807	380	497	33
Morocco	—	—	—	—	—	147
Rhodesia and Nyasaland, Federation of:						
Southern Rhodesia	—	—	—	—	305	460
Union of South Africa	39,918	33,844	45,633	57,482	58,717	62,619
United States (sold or used by producers)	208,906	189,535	195,538	204,040	192,628	183,987
Total[1] [2]	**248,983**	**223,593**	**241,981**	**262,591**	**254,509**	**249,446**

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

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

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

TABLE 81. World Production of Pumice, by Countries,[1] 1953-57

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

Country[1]	1953	1954	1955	1956	1957
	short tons[2]				
Argentina[3]	—	—	49,604	15,708	22,000[4]
Austria:					
Trass	44,100[4]	51,601	52,935	37,499	38,875
Egypt	761	441	181	170[4]	170[4]
France:					
Pumice	11,464	11,133	9,921	14,330	11,000[4]
Pozzolan	232,903	296,207	242,508	243,611	242,500[4]
Germany, West (marketable)	2,489,378	2,218,950	3,105,207	3,966,111	3,261,735
Greece:					
Pumice	47,179	34,409	33,069	27,558	28,000[4]
Santorini earth	44,092	38,581	40,234	44,000[4]	44,000[4]
Iceland	—	12,125	14,600[4]	19,000[4]	19,000[4]
Italy:					
Pumice	192,132	166,915	198,614	168,969	2,800,000[4]
Pumicite	37,148	40,400		17,196	
Pozzolan	1,392,703	1,657,290	1,452,282	2,567,280	
Kenya	—	—	—	1,831	2,319
New Zealand	2,254	9,916	8,670	8,527	16,991
Spain (Canary Islands)	612	529	944	—	—
United States (sold or used)	1,348,136[5]	1,647,397[5]	1,804,488[5]	1,482,214[5]	1,826,978[5]
World total (estimate)[1,2]	**5,900,000**	**6,200,000**	**7,100,000**	**8,700,000**	**8,400,000**

[1] Pumice is also produced in Canada, Mexico, 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] Includes volcanic ash and cinders, and pozzolan.
[4] Estimate.
[5] Includes in 1953, 560,502 tons; 1954, 690,056 tons; 1955, 961,526 tons; 1956, 594,661 tons; and in 1957, 772,384 tons of volcanic cinder and scoria, used for railroad ballast or similar purposes.

Directory of Firms in the Miscellaneous Non-metal Mining Industry, 1958

Name of operator	Head office address	Plant or mine location
BARITE		
Nova Scotia:		
Fluor-Bar Mines Ltd.	1980 Sherbrooke St. W., Montreal, Quebec	Lake Ainslie
Magnet Cove Barium Corp.	Walton	Pembroke
Quebec:		
Beach, Mahlon W.[2]	Box 9, Barrie, Ontario	Woodbridge Twp.
Roy, Phillippe[2]	62 L'Evéché, Rimouski	St-Fabien
British Columbia:		
Mountain Minerals Ltd.	Box 273, Lethbridge, Alberta	Brisco
Larrabee Mining Exploration Ltd.[1]	221-A-8th Ave. W. Calgary, Alberta	Athalmer
Giant Mascot Mines Ltd.	908 Royal Bank Bldg., Vancouver	Spillimacheen
BRUCITE		
Quebec:		
Aluminum Company of Canada Ltd.	Sun Life Bldg., Montreal	Wakefield
DIATOMITE		
Nova Scotia:		
Wightman, Mrs. G.W.[2]	Smith's Cove	Digby Co.
Ontario:		
P.B.S. Organic Minerals Ltd.[2]	153 Sheridan Ave., Toronto	McKee Twp.
British Columbia:		
Fairey and Co.	661 Taylor St., Vancouver	Quesnel
FLUORSPAR		
Newfoundland:		
Newfoundland Fluorspar Ltd.	Bank of Montreal Bldg., St. John's	St. Lawrence
St. Lawrence Corporation of Nfld., Ltd.[2]	120 Broadway, New York, U.S.A.	St. Lawrence
Ontario:		
Huntingdon Fluorspar Mines Ltd.	Madoc	Huntingdon Twp.
Quebec:		
Yates Uranium Mines Inc.[1]	132 St. James St. W., Montreal	Huddersfield Twp.
Lake Otter Uranium Mines Ltd.[1]	132 St. James St. W., Montreal	Sandy Creek
White River Exploration Ltd.[1]	507 Place d'Armes, Montreal	St. Ubald
British Columbia:		
Pacific Sileca Ltd.	Oliver	Oliver
GARNET		
Ontario:		
Niagara Garnet Co.[2]	c/o Wm. A. Yarwood, 8373 Krull Parkway Niagara Falls, New York, U.S.A.	River Valley
GRAPHITE		
Quebec:		
Holland, A.A.[1]	1705 North 12th Ave., Pensacola, Florida, U.S.A.	McGill Twp.
Quebec Graphite Corp.[1]	233 Notre Dame ouest, Montreal	Labelle
Italia Copper Ltd.	2548 Pie IX, Montreal	Labelle
Ontario:		
Krefeld Graphite Gold Mines Ltd.[2]	R.R. No. 2, Malton	Vogt Twp.
GRINDSTONES		
New Brunswick:		
Read, H.C.[2]	Sackville	Stonehaven
Bay of Chaleur Grindstone Co.[2]	1434 Ste-Catherine St.W., Montreal, Quebec	Gloucester Co.

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

Directory of Firms in the Miscellaneous Non-metal Mining Industry, 1958 — Continued

Name of operator	Head office address	Plant or mine location
IRON OXIDE		
Quebec:		
Gelinas, Bruno	1521 Notre Dame, Trois-Rivières	Portneuf Co.
Girardin, Chas. D.	Yamachiche	Shawinigan
The Sherwin-Williams Co. of Canada	2875 Centre St., Montreal	Red Mill, Champlain Co.
LITHIUM MINERALS		
Quebec:		
American Lithium Co. Ltd.[1]	200, ouest rue St-Jacques, Montreal	Lacorne
Consolidated Negus Mines Ltd.[1]	85 Richmond St. W., Toronto	Lamotte Twp.
Glenmar Lithium Mines Ltd.[1]	100 Adelaide St. W., Toronto, Ontario	Lamotte Twp.
International Lithium Mining Corp.[1]	25 Adelaide St. W., Toronto, Ontario	Lamotte Twp.
Iso Uranium Mines Ltd.[1]	100 Adelaide St. W., Toronto, Ontario	Lacorne
La Corne Lithium Mines Ltd.[1]	25 King St. W., Toronto, Ontario	Lamotte Twp.
Major Lithium Mines Ltd.[1]	67 Yonge St., Toronto, Ontario	Lacorne Twp.
Massberyl Lithium Co. Ltd.[1]	100 Adelaide St. W., Toronto, Ontario	Lacorne Twp.
Quebec Lithium Corp.	1403 Edifice Aldred, Montreal	Barraute
Société d'Exploration Minière Cossette-Martel[1]	Première ave ouest, Amos	Lamotte Twp.
Tide Lake Lithium Mines Ltd.[1]	100 Adelaide St. W., Toronto, Ontario	Figuery Twp.
Vallee Lithium Mining Corp.[1]	80 Richmond St. W., Toronto, Ontario	Fredmont Twp.
Valor Lithium Mines Ltd.[1]	100 Adelaide St. W., Toronto, Ontario	Vauquetin Twp.
Ontario:		
Alba Exploration Ltd.[1]	119 Adelaide St. W., Toronto	Barbara Lake
Lun Echo Gold Mines Ltd.	67 Yonge St., Toronto	Nipigon
Dunvegan Mines Ltd.[1]	357 Bay St., Toronto	Cosgrave Lake
Manitoba:		
Lithium Corp. of Canada Ltd.[1]	25 Adelaide St. W., Toronto, Ontario	Lac du Bonnet
Viola Mac Mines Ltd.[1]	25 Adelaide St. W., Toronto, Ontario	Cat Lake
Green Bay Mining & Exploration Ltd.[1]	100 Royal Trust Bldg., Edmonton	Herb Lake
Northwest Territories:		
Boreal Rare Metals[2]	414 St. James St. W., Montreal, Quebec	Hearn Channel
MAGNESITIC DOLOMITE		
Quebec:		
Canadian Refractories Ltd.	540 Canada Cement Bldg., Montreal	Kilmar
MINERAL WATERS		
Quebec:		
Brevages Lazure	1395 Choquette, St-Hyacinthe	St-Hyacinthe
Eau Minérale Etoile	Ste-Geneviève de Batiscan	Batiscan
Eau minérale naturelle, St. Leon	1, rue St-Laurent, Louisville	Maskinongé
King's Court Beverages Co. Ltd.	2901 Sherbrooke St. E., Montreal	Chambly
Orange Crush Ltd.	1590 O'Connor Drive, Toronto, Ontario	Varennes
Sources Abenakis Ltée	St-Francois-du-Lac	St-Francois-du-Lac
Radnor Beverages	St-Maurice	St-Maurice
Usine d'Embouteillage Maski Enrg.	400 rue Mailhot, Trois-Rivières	St-Justin
Ontario:		
Carlsbad Springs, The	Carlsbad Springs	Gloucester Twp.
Excel Beverages Ltd.	Bourget	Bourget
MICA		
Quebec:		
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	Hull
Caron & Fileon Mica Mine Enrg.	St. Michel de Wentworth	Wentworth
Dubois, Adrien	Box 60, Cantley	Cantley

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

Directory of Firms in the Miscellaneous Non-metal Mining Industry, 1958 — Continued

Name of operator	Head office address	Plant or mine location
MICA — Concluded		
Quebec — Concluded:		
Gagne, C.	St. Michel de Wentworth	Wentworth
Hogan, A.	Cantley	Cantley
Holt, R.J.	Cantley	East Wakefield
Joanise, L.	31 Graham St., Hull	Gatineau
Lawler, Pat	St. Michel de Wentworth	Wentworth
Holt, R.J.	674 Cooper St., Ottawa, Ontario	Wakefield
Lavigne, E.	St-Pierre de Wakefield	Wakefield
Law & Co.	209 Eddy St., Hull	Hull, Twp.
Mica Co. of Canada Ltd.	2 Lois St., Hull	Hull
Poirier, C.	St-Pierre de Wakefield	Portland West
Renaud, E.	Eddy St. Hull	Wilson's Corners
Sargent, Fred	Cascades	Hull
Trudeau & Boland	Old Chelsea	Gatineau
Wallingford, J.H.	15 Main St. Hull	Papineau
Wallingford, E., Ltd.	Perkins	Templeton
Wallingford, G.E.	63 Pinehurst Ave., Ottawa	Templeton
Ontario:		
Armstrong, Percy	Nobal	Parry Sound
Buchanan, Geo.	31 South St., Perth	Lanark
Bedard, M.	Maberly	Bathurst
Donnelly, J.C.	R R #1 Stanleyville	Lanark
Duggari & Auld	Dunchurch	Hagerman
Green, W.E. and E.C.	Perth Road	North Burgess
Mahon, Joseph	10 N. Burgess St., Perth	North Burgess
Mid Bay Mica Syndicate	North Bay	Nipissing
McGlade, W.A.	8 Church St., Perth	Burgess Twp.
Robinson, H.L.	Manor Hotel, North Bay	Nipissing
Watts, R.W.	21 Isabella St., Perth	Lanark
Woodruff R.H.	Hartington	Bedford
British Columbia:		
Fairey & Co.	661 Taylor St., Vancouver	Vancouver
PERLITE		
British Columbia:		
Western Gypsum Products Ltd.[2]	Childs Building, Winnipeg, Manitoba	Francois Lake
Perlite Mining Corp. Ltd.[2]	44 King St. W., Toronto, Ontario	Uncha Lake
PHOSPHATE		
Quebec:		
Bigelow, Robert[2]	Buckingham	Bowman Twp.
Blackburn Bros. Ltd.[2]	85 Sparks St., Ottawa, Ontario	Perkins
Quebec Smelting & Refining Ltd.[2]	215 St. James St. W., Montreal	Notre Dame de la Salette
Industrial Phosphate Mines Ltd.[2]	18 Toronto St., Toronto, Ontario	Portland East Twp.
Ontario:		
Ontario Phosphate Industries Ltd.[2]	Room 1101 — 62 Richmond St. W., Toronto	Bedford Twp.
McGlade, W.A.[2]	8 Church St., Perth	Burgess Twp.
POTASH		
Saskatchewan:		
Continental Potash Corp. Ltd.[1]	508 Credit Foncier Bldg., Vancouver	Unity
Duval Sulphur and Potash Co.[2]	Mellie Esperson Bldg., Houston Texas	Saskatoon
International Minerals & Chemical Corp.[1]	1540 Winnipeg St., Regina	Yarbo
Southwest Potash Corp.[1]	61 Broadway, New York 6	Saskatoon
United States Borax & Chemical Corp.[1]	630 Shatlo Place, Los Angles, Calif.	Saskatoon
Potash Co. of America Ltd.	Box 509 Saskatoon	Patience Lake
S.A.M. Explorations Ltd.	1168 Albert St., Regina	Riddle-Tidewater
PYRITE, PYRRHOTITE		
Newfoundland:		
Buchans Mining Co. Ltd.[1]	Water St., St. John's	Buchans
New Brunswick:		
Middle River Mining Co. Ltd.[2]	42 Princess St., Saint John	Gloucester
Texas Gulf Sulphur Co.[2]	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, 1958 – Concluded

Name of operator	Head office address	Plant or mine location
PYRITE, PYRRHOTITE – Concluded		
Quebec:		
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.[1]	744 W. Hastings St., Vancouver, British Columbia	Ascot Twp.
Ontario:		
International Nickel Company of Canada Ltd.	Copper Cliff	Copper Cliff
Saskatchewan:		
Lorado Uranium Mines Ltd.	80 Richmond St. W., Toronto, Ont.	Beaverlodge
British Columbia:		
Consolidated Mining & Smelting Company of Canada Ltd.	Trail	Kimberley
Britannia Mining & Smelting Co. Ltd.	Britannia Beach	Britannia Beach
SILICA BRICK		
Nova Scotia:		
Dominion Steel & Coal Corp. Ltd.	Sydney	Sydney
Ontario:		
Algoma Steel Corp. Ltd.	Sault Ste. Marie	Sault Ste. Marie
SODIUM CARBONATE (Natural)		
British Columbia:		
Bishop, V.C. (Mrs.)[2]	c/o Boyd's Garage, Clinton	Clinton area
SODIUM SULPHATE (Natural)		
Saskatchewan:		
Ormiston Mining & Smelting Co. Ltd.	Ormiston	Ormiston
Midwest Chemicals Ltd.	Box 446, Edmonton, Alberta	Palo
Sybouts Sodium Sulphate Co. Ltd.	Gladmar	Gladmar
Saskatchewan Minerals (Sodium Sulphate Div.)	Chaplin	Chaplin, Bishoperic
SULPHUR (in smelter gas)		
Quebec:		
Aluminum Co. of Canada Ltd.[3]	Sun Life Bldg., Montreal	Arvida
Ontario:		
Canadian Industries Ltd.	Box 10, Montreal, Quebec	Copper Cliff
British Columbia:		
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.