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**CANADA**  
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**DOMINION BUREAU OF STATISTICS**  
**CENSUS OF INDUSTRY**  
**MINING, METALLURGICAL & CHEMICAL BRANCH**

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**THE MICA INDUSTRY**  
**IN**  
**CANADA**  
**1937**

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OTTAWA  
1939

Price 10 cents



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OTTAWA - CANADA

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THE MICA INDUSTRY, 1937.

Production of new mica in Canada during 1937 totalled 945 short tons valued at \$133,731 compared with 801 short tons at \$74,556 in the preceding year. The tonnage shipped in 1937 was the largest since 1934 and its value the greatest since 1927. Of the 945 short tons comprising the 1937 output, 667 short tons valued at \$10,468 represented scrap and ground mica, 53 tons at \$12,090 rough cobbed grades, 102 short tons at \$66,852 knife-trimmed grades, 87 short tons at \$11,826 thumb-trimmed mica, and 36 tons of splittings valued at \$32,495.

Commercial shipments of new mica in 1937 were reported by producers operating only in Quebec and Ontario; the value of sales credited to Quebec mines in 1937 totalled \$124,594 compared with a corresponding value of \$9,137 recorded for Ontario producers. In addition to the output of mica recorded as produced in Eastern Canada during 1937, there was a relatively small tonnage of flake muscovite unofficially reported as having been produced in British Columbia.

The largest annual output of new mica by the Canadian mica mining industry occurred in 1924 in which year shipments reached a total of 4,091 short tons of which Quebec mines contributed 2,414 tons and those in Ontario, 1,677 tons; the greatest value of any yearly production was that of \$376,022 for 2,203 short tons in 1920.

In 1937 Canadian mica mining firms numbered 34 and of these, 28 were located in the province of Quebec and 6 in Ontario. Capital employed by the entire industry amounted to \$150,569, employees totalled 199, and salaries and wages aggregated \$97,547.

The following information relating to Canadian mica has been abstracted from a report prepared by Mr. H. S. Spence of the Bureau of Mines, Ottawa:

"The production of sheet mica in Canada is almost wholly of the phlogopite, or amber mica, variety. It is derived almost entirely from adjacent sections of Ontario and Quebec, within an area extending roughly from Kingston, on Lake Ontario, northeastward into Hull and Papineau counties, Quebec. The mica-bearing series (pyroxenites) is probably continuous throughout this entire region, but is hidden for some distance south of the Ottawa river by a belt of later, sedimentary rocks. In Quebec, the pyroxenites extend also for some distance both west and east of the main productive area, into Pontiac and Argenteuil counties, respectively, but production from these districts has been comparatively small. A few scattered amber mica occurrences are also known in the Province as far east as Quebec city, but very little mining has been conducted on them.

"Production of muscovite, or white mica, in Canada has been negligible. Small amounts have been recovered occasionally as a by-product from feldspar mining, but, in general, the proportion of sound, merchantable sheet mica in Canadian pegmatites has proved too low for profitable mining for this mineral alone .... Some operations, mostly prospecting, were also reported in 1937 on muscovite deposits in the Saguenay region, on the lower St. Lawrence, Quebec, and a small production of this class of mica came from a deposit in Ryerson Township, near Burk's Falls, Ontario .

"Reference has been made in recent reviews (1935 and 1936) to an unusual kind of deposit of fine flake muscovite, or sericite, at Baker Inlet, near Prince Rupert, B.C., the material of which on account of its extremely friable nature and ease of grinding, should prove eminently suitable for the production of mica powder. The deposit is controlled by P.M. Ray, 23 Besner Block, Prince Rupert, who reports further development during the year.

"Sheet mica is marketed in various classes, depending on the amount of preparation the mine-run material receives. Formerly, much of the Canadian output was sold in the semi-rough form, termed "thumb-trimmed", but owing to stricter trade requirements this practice has now been largely supplanted by knife-trimming, which provides a much higher-grade of product. Scrap mica, representing the waste from mining or trimming, is sold to grinding mills for the production of mica powder, used extensively in the roofing and rubber trades. Most of the scrap so sold is consigned to mills in the United States.

"Canada shares the world market for amber mica with Madagascar, the two countries constituting the principal known sources of this variety. The depression in the Canadian industry in recent years has been largely attributable to the competition of more-cheaply produced Madagascar mica, this being especially pronounced in the case of splittings, a product in which labour costs are particularly vital. The abundant supply of cheap, skilled native labour, both in India (the main world source of muscovite mica) and Madagascar, has reduced the making of all classes of splittings to small proportions on the American continent. There appears, however, to have been some increase in the Canadian production of splittings in 1937. The better grades of Canadian amber mica are considered superior in point of heat-resistance to much of the Madagascar product, and the improvement in trimming practice has resulted in a revived interest by the British trade in Canadian supplies of sheet mica for heaters, as well as for use in heavy-duty spark-plugs for aeroplanes. The recent general improved demand for mica is largely attributable to increased consumption for armaments.

"Four plants now exist in Canada for the expanding by heat-processing of the hydrated variety of mica known as vermiculite. This mineral expands tremendously when heated, yielding an exceedingly light-weight product, which is finding wide application for heat- and sound-insulation. Three of the plants, owned by Gypsum, Lime and Alabastine, Canada, Limited, are situated at Calgary, Alberta, Winnipeg, Man., and Paris, Ont.; the fourth was built in 1937 by the W. E. Phillips Company at Oshawa, Ont., the expanded product being marketed by Dominion Insulation Limited, 57 Bloor Street West, Toronto. All these plants draw their supply of crude vermiculite from a deposit at Libby, Montana. No occurrences of this class of mica are known in Canada, though there have been unconfirmed reports of discoveries in British Columbia."

The value of exports of all mica and its products from Canada during 1937 totalled \$171,770 compared with \$87,300 in 1936. Of the 1937 exports, 2,443,300 pounds valued at \$13,042 represented scrap and waste shipped entirely to the United States; 254,400 pounds valued at \$98,904 was rough cobbled and knife and thumb-trimmed

of which 127,700 pounds at \$77,332 went to the United Kingdom and 113,500 pounds at \$19,675 went to the United States. Exports of splittings totalled 132,600 pounds at \$57,414, practically all of which was consigned to the United States.

Trade agreements between Canada and the United States and between the United Kingdom and the United States were signed at Washington on Thursday, November 17, 1938. The following statement prepared by the United States Tariff Commission shows the former and new rates of duty on mica in schedule 11 (United States concessions to Canada), and the total imports of mica into the United States and the imports from Canada, according to preliminary United States statistics for the year 1937:- Phlogopite mica waste and scrap valued at not more than 5 cents per pound; under tariff act of 1930 rate of duty, 25 per cent; under 1935 agreement, 25 per cent, under new agreement, 15 per cent. Value of all imports (including muscovite) in 1937, \$36,355; from Canada only, \$11,971 in 1937. Mica, ground or pulverized; under tariff act of 1930 rate of duty, 20 per cent; under 1935 agreement, 20 per cent; under new agreement, 15 per cent; value of imports in 1937, \$1,233, all from Canada. Untrimmed phlogopite mica, small pieces, 15 per cent under tariff act of 1930 and 15 per cent under 1935 agreement; under new agreement, 10 per cent; value of all such imports in 1937 totalled \$9,091, all from Canada.

Table 1 - PRINCIPAL STATISTICS OF THE MICA MINING INDUSTRY IN CANADA, 1936 and 1937.

	1936	1937		
		Quebec	Ontario	CANADA(x)
Number of firms .....	22	28	6	34
Capital employed .....	\$ 221,800	116,265	34,304	150,569
Number of employees - On salary ..	3	8	1	9
On wages ...	98	137	3	190
Total ....	101	195	4	199
Salaries and wages - Salaries ...	\$ 3,565	5,591	2,175	7,766
Wages .....	\$ 40,985	88,176	1,605	89,781
Total ....	\$ 44,550	93,767	3,780	97,547
Selling value of products (gross) ..	\$ 74,556	124,594	9,137	133,731
Cost of fuel and electricity .....	\$ 1,351	3,768	...	3,768
Cost of process supplies used .....	\$ 3,473	13,728	50	13,778
Selling value of products (net) ..	\$ 69,732	107,098	9,087	116,185

(x) Does not include data for one operation in British Columbia for which statistics are not available.

Table 2 - NUMBER OF WAGE-EARNERS ON PAYROLL OR TIME RECORD ON 15th OF EACH MONTH OR NEAREST REPRESENTATIVE DATE, 1936 and 1937.

Month	1936		1937		
	Mine	Shop	Mine	Shop	
				Male	Female
January .....	54	31	63	48	2
February .....	56	33	87	53	2
March .....	65	37	88	59	2
April .....	56	27	90	61	3
May .....	71	29	103	66	9
June .....	75	33	100	73	9
July .....	65	35	117	94	11
August .....	63	26	111	94	12
September .....	60	25	108	101	20
October .....	65	24	101	105	11
November .....	59	24	106	99	6
December .....	62	27	88	81	4

Table 3 - PRODUCTION OF MICA IN CANADA, BY GRADES, 1936 and 1937.

	1936			1937		
	Quantity	Value, f.o.b. shipping point	Price per pound	Quantity	Value, f.o.b. shipping point	Price per pound
	Pounds	\$	\$	Pounds	\$	\$
Rough cobbled ...	10,940	2,615	0.24	106,917	12,090	0.11
Knife-trimmed ..	113,169	48,086	0.42	203,961	66,852	0.33
Thumb-trimmed ..	35,289	3,233	0.09	173,519	11,826	0.07
Splittings .....	24,376	9,780	0.40	72,500	32,495	0.45
Scrap (x) .....	1,417,783	10,842	0.008	1,333,479	10,468	0.008
<b>TOTAL .....</b>	<b>1,601,557</b>	<b>74,556</b>	<b>...</b>	<b>1,890,376</b>	<b>133,731</b>	<b>...</b>

(x) Includes ground mica.

Table 4 - PRODUCTION OF MICA IN CANADA, BY PROVINCES, IMPORTS and EXPORTS, 1936 and 1937.

	1936		1937	
	Pounds	Value \$	Pounds	Value \$
<b>PRODUCTION (SALES) -</b>				
Quebec .....	544,214	63,123	1,092,105	124,594
Ontario .....	1,057,343	11,433	798,271	9,137
British Columbia .....	...	...	(a)	(a)
<b>TOTAL .....</b>	<b>1,601,557</b>	<b>74,556</b>	<b>1,890,376</b>	<b>133,731</b>
<b>IMPORTS -</b>				
Mica and manufactures of, n.o.p. -				
From - United Kingdom .....	...	15,491	...	9,298
United States .....	...	45,790	...	52,654
British India .....	...	12,412	...	21,165
Germany .....	...	3,761	...	408
Other countries .....	...	368	...	71
<b>TOTAL .....</b>	...	<b>77,822</b>	...	<b>83,596</b>
Chalk, China, Cornwall or cliff stone and mica schist .....	...	32,253	...	55,558
<b>EXPORTS -</b>				
Mica, rough, cobbled, knife-trimmed and thumb-trimmed -				
To - United Kingdom .....	103,200	52,350	127,700	77,332
United States .....	61,200	7,659	113,500	19,675
Other countries .....	3,900	1,465	13,200	1,897
Mica, scrap and waste -				
To - United States .....	2,473,600	14,152	2,443,300	13,042
Mica splittings -				
To - United Kingdom .....	5,100	1,415	...	...
United States .....	21,800	8,916	131,600	56,970
Other countries .....	...	...	1,000	444
Mica plate and manufactures of (micanite) .....	...	1,343	...	2,410
<b>TOTAL .....</b>	...	<b>87,300</b>	...	<b>171,770</b>

(a) 70 tons of fine flake muscovite was reported by the Department of Mines and Natural Resources as being shipped in 1937 but no official statistics are available.

Table 5 - PRODUCTION (SALES) OF MICA IN CANADA, BY PROVINCES, and EXPORTS OF MICA, JANUARY 1 to JUNE 30, 1937 and 1938.

	1937		1938	
	Pounds	\$	Pounds	\$
<b>PRODUCTION (SALES)-</b>				
Quebec .....	670,635	61,553	194,345	40,043
Ontario .....	656,845	4,184	211,556	1,423
British Columbia .....	(a)	(a)	...	...
TOTAL .....	1,327,480	65,737	405,901	41,466

	Tons		Tons	
Rough cobbled and thumb-trimmed .....	58	41,620	27	29,272
Mica splittings .....	34	28,758	19	16,975
Mica scrap and waste .....	618	6,685	253	3,123
Mica plate and manufactures of (micanite) .	...	916	...	658

(a) Data not available.

Table 6 - CANADIAN DEALERS' QUOTATIONS AT THE END OF 1937 WERE AS FOLLOWS -

Knife trimmed sheet		Splittings	
	Per pound		Per pound
	\$		\$
1 x 3 inches .....	0.50	1 x 1 inches .....	0.45
2 x 3 inches .....	0.75	1 x 2 inches .....	0.50
2 x 4 inches .....	1.00		
3 x 5 inches .....	1.75		
4 x 8 inches .....	2.25		
5 x 8 inches .....	3.00		

Ground mica, 20 mesh, \$25 per ton; 60 mesh, \$30; 120 mesh, \$45; all prices f.o.b. Ottawa, in ton lots. (Bureau of Mines, Ottawa).

The Engineering and Mining Journal, New York (Metal and Mineral Markets) quoted United States mica prices, November, 1938, as follows:- per ton, f.o.b. New Mexico, scrap, white, \$14; off color, \$10. Punch, white, for disks, per pound, 12 cents; for washers, 9 cents. Per ton, f.o.b. New Hampshire, roofing mica, \$23; snow, \$34; 40 mesh white, \$40; 60 mesh, \$48; 100 mesh, \$60; 200 mesh, \$75. Clean dry mixed bench and mine scrap, \$13. Per pound, f.o.b. North Carolina, punch, 3 to 5 cents; 1½ x 2 inch, 15 to 40 cents; 2 x 2, 30 to 60 cents; 3 x 3, 75 cents to \$1.20; 3 x 4 inch, \$1 to \$1.40; 3 x 5, \$1.25 to \$1.60; 4 x 6, \$2 to \$2.50; 6 x 8, \$2.50 to \$3.50; 8 x 10, \$3.50 to \$5; these prices apply to No. 1 and No. 2 quality stock. Stained qualities take from 10 to 25 per cent discount. White North Carolina mica, 70 mesh, \$60 to \$80 per ton. Biotite or black mica, \$15 a ton unground. White, Georgia, 300 mesh, \$19.50; sericite, 300 mesh, \$15; mica schist, 20 mesh, \$14.

Table 7 - PRODUCTION(x) OF MICA IN CANADA, 1928 - 1937.

Year	Short tons	\$	Year	Short tons	\$
1928 .....	3,660	87,168	1933 .....	944	49,284
1929 .....	4,053	118,549	1934 .....	998	97,071
1930 .....	1,170	96,004	1935 .....	628	82,038
1931 .....	1,339	54,066	1936 .....	801	74,556
1932 .....	309	6,828	1937 .....	945	133,731

(x) Sales

Table 8 - CONSUMPTION OF MICA IN THE CANADIAN ELECTRICAL APPARATUS AND SUPPLIES INDUSTRY, 1931 - 1937.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	150,561	101,531	1935 .....	73,621	58,016
1932 .....	102,410	68,747	1936 .....	109,003	77,336
1933 .....	35,098	27,129	1937 .....	(a)	(a)
1934 .....	93,297	60,520			

(a) Data not yet complete.

Table 9 - CONSUMPTION OF GROUND MICA IN THE MANUFACTURE OF CANADIAN COMPOSITION ROOFINGS, 1931 - 1937.

Year	Short tons	\$	Year	Short tons	\$
1931 .....	(not available)		(x)1935 .....	60	1,844
1932 .....	21	683	1936 .....	90	2,522
1933 .....	48	1,849	1937 .....	(a) 152	4,425
1934 .....	71	2,086			

(x) In addition, 40 tons of mica valued at \$1,750 were also consumed in the pulp and paper industry.

(a) Includes 9 tons at \$284 used by the coal tar distillation industry.

Table 10 - CONSUMPTION OF GROUND MICA IN THE CANADIAN RUBBER INDUSTRY, 1931 - 1937.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	103,177	6,265	1935 .....	124,350	6,297
1932 .....	73,600	4,111	1936 .....	123,597	5,358
1933 .....	89,165	4,769	1937 .....	(a)	(a)
1934 .....	135,424	6,792			

(a) Not yet complete

Table 11 - CONSUMPTION OF MICA IN THE CANADIAN MICA PRODUCTS INDUSTRY, 1931 - 1937.

Year	Pounds	\$	Year	Pounds	\$
1931 .....	(x)	10,099	1935 .....	17,320	7,018
1932 .....	10,100	4,290	1936 .....	16,227	7,790
1933 .....	16,025	6,553	1937 .....	42,068	16,675
1934 .....	16,553	7,040			

(x) Not available.

According to the "Minerals Yearbook" of the United States Bureau of Mines, the total production of uncut sheet, scrap and by-product mica in the United States rose to 26,043 short tons valued at \$639,981 in 1937 compared with 21,615 tons valued at \$464,473 in 1936. The bulk of the domestic production is scrap, ground mica schist, and by-product mica, although American mines also produce almost enough punch and circle mica (large enough to use for making washers and small radio stampings) to meet domestic needs. Of the mica sold or used by United States producers in 1937, 1,312,900 pounds valued at \$70,493 represented uncut punch and circle mica; 381,638 pounds of uncut mica, larger than punch and circle, valued at



\$214,751 and 25,196 short tons of scrap mica valued at \$354,737.

The United States Bureau of Mines, in "Mineral Trade Notes" states - "No single development in the mica industry is more important at present than the increasing use of wet-ground mica in paint. Potentialities of this use are enormous. In 1936 some ten times as much mica was used in making paint as was used in predepression years, but the quantity was only 1,307 short tons, whereas enthusiasts visualize requirements as high as 100,000 tons annually as a reasonable possibility. In this field, mica supplements as well as replaces asbestine or fibrous talc and is preferably used to the extent of 10 per cent of the pigment. Specifications call for 90 per cent ground through 325 mesh and smoothly rounded edges...

"Higher prices for mica combined with changes in the nature of its uses have increased the demand for small sizes of mica. Until fairly recently the demand was mainly for large unflawed sheets, difficult to find and correspondingly expensive but the United States Bureau of Mines studies show that the modern trend is toward using progressively smaller sizes and that such sizes accordingly have increased in price much more than larger sizes. Important economies were effected by the introduction of splittings which are pasted together with shellac and molded into plates of any desired size ...

"For many years it has seemed that mica was one of the very few substances for which no substitute could be found. Efforts to replace mica with other materials in most of its important electrical uses were invariably unsuccessful. Recent developments forecast that at last a material can be made by centrifuging bentonite that has virtually all the needed characteristics of mica and that the cost will be so low as to eliminate our former dependence upon British India for an essential raw material. Little information is available as yet, but the research is being prosecuted actively by a well-known, capable, private organization, and further developments will be noted with interest by consumers as well as by mica miners."

Table 12 - MICA IMPORTED FOR CONSUMPTION IN THE UNITED STATES IN 1936 and 1937, BY KINDS. (Source - United States Bureau of Mines)

	1 9 3 6		1 9 3 7	
	Pounds	Value \$	Pounds	Value \$
Unmanufactured:				
Waste and scrap, valued at not more than 5 cents per pound .....	7,786,193	22,666	13,446,411	36,355
Untrimmed phlogopite mica from which no rectangular piece exceeding in size 1 inch by 2 inches may be cut.	30,131	2,593	89,230	9,091
Other:				
Valued at not above 15 cents per pound .....	290,209	34,315	323,742	38,189
Valued at above 15 cents per pound.	539,913	202,470	591,978	248,955
TOTAL .....	8,646,446	262,044	14,451,361	332,590

Table 12 - MICA IMPORTED FOR CONSUMPTION IN THE UNITED STATES IN 1936 and 1937, BY KINDS. (concluded) (Source - United States Bureau of Mines)

	1936		1937	
	Pounds	Value \$	Pounds	Value \$
Manufactured:				
Cut mica .....	58,496	51,698	138,773	70,810
Films and splittings:				
Not cut or stamped to dimensions:				
Not above 12 ten-thousands of an inch in thickness .....	3,877,310	622,309	7,551,999	1,443,085
Over 12 ten-thousands of an inch in thickness .....	586,777	218,384	371,353	140,695
Cut or stamped to dimensions ..	3,201	7,825	9,515	15,191
Mica plates and built-up mica ...	47,801	38,242	67,307	60,240
All manufactures of which mica is the component material of chief value .....	2,844	2,784	5,639	3,757
Mica ground or pulverized .....	132,712	2,282	82,200	1,233
TOTAL .....	4,709,141	943,524	8,226,786	1,735,009
GRAND TOTAL .....	13,355,587	1,205,568	22,678,147	2,067,599

Table 13 - MICA SPLITTINGS CONSUMED IN THE UNITED STATES, 1935-37, BY SOURCES, as REPORTED BY THE CONSUMERS. (Source- United States Bureau of Mines)

Year	INDIA		CANADA		MADAGASCAR		TOTAL (x)	
	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$
1933 ...	1,088,796	233,075	84,494	24,412	255,039	85,674	1,428,329	343,161
1934 ...	1,423,635	350,561	94,422	37,903	244,978	101,684	1,763,035	490,148
1935 ...	2,150,593	492,161	129,272	42,897	253,119	96,007	2,532,984	631,065
1936 ...	3,051,824	649,982	102,766	44,566	363,468	151,845	3,518,058	846,393
1937 ...	3,721,594	965,418	98,618	51,960	527,223	240,267	4,347,435	1,257,645

(x) Exclusive of a nominal quantity of splittings produced in South America and the United States.

Table 14 - EXPORTS OF MICA FROM INDIA, 1935 - 1937.

		1935	1936	1937
In blocks .....	Cwt.	23,774	27,235	30,003
	Rupees	4,334,680	4,572,240	5,747,478
Splittings .....	Cwt.	118,040	150,429	267,340
	Rupees	3,700,001	4,604,271	8,612,558
Total of Mica -				
To - United Kingdom .....	Cwt.	37,448	43,049	65,784
	Rupees	3,836,105	4,360,558	6,493,335
Germany .....	Cwt.	12,813	19,053	18,854
	Rupees	618,839	787,952	1,079,055
France .....	Cwt.	3,713	7,743	2,698
	Rupees	386,253	374,845	206,555
Japan .....	Cwt.	8,274	9,125	11,815
	Rupees	428,068	575,736	1,255,366

Table 14 - EXPORTS OF MICA FROM INDIA, 1935 - 1937. (concluded).

		1935	1936	1937
Total of Mica (concluded)				
To - United States.....	Cwt.	69,397	93,080	185,143
	Rupees	1,994,942	2,790,668	4,367,799
Other countries .....	Cwt.	10,169	5,614	13,049
	Rupees	770,474	286,752	957,926
TOTAL .....	Cwt.	141,814	177,664	297,343
	Rupees	8,034,681	9,176,511	14,360,036
Value of Rupee in Canadian funds .....		37.17 cents	37.55 cents	37.30 cents

According to the Imperial Institute, London, the output of mica in India consists almost entirely of muscovite from pegmatites in the Monghyr, Hazaribagh and Gaya districts of Bihar, from the Nellore district of Madras, and from Ajmer-Merwara and Jaipur, Rajputana. It is generally accepted that the export figures give a more accurate representation of the India mica industry than do the production figures as very little mica is consumed in India. The discrepancy between the production and export figures is usually attributed to theft at the mines but the true explanation apparently lies in the growing demand by the electrical industries for splittings; this has led to the exploitation of old mines and factory dumps for small-sized block mica suitable for conversion into splittings and which was formerly discarded; such factory production does not appear in the output returns.

For particulars relating to the grading of Indian mica, see the 1936 annual bulletin on the Canadian mica industry as issued by the Dominion Bureau of Statistics.

Table 15 - IMPORTS OF MICA INTO THE UNITED KINGDOM, 1931 - 1936.

Year	Long tons	Value £	Year	Long tons	Value £
1931 .....	1,984	244,994	1935 .....	2,625	378,495
1932 .....	1,634	172,926	1936 .....	3,239	410,681
1933 .....	1,879	218,247	1937 .....	4,193	639,518
1934 .....	2,421	300,530			

"Foreign Metals and Minerals"-United States Department of Commerce publication - reported: "England's new industry, the grinding of mica, may free it of its dependence on the United States product and possibly open up a new line in British exports. The United States heretofore dominated world markets in ground or powdered mica. A mica grinding process submitted by Mr. A. A. C. Dickson some years ago to the Imperial Institute has successfully undergone all tests and a plant now in operation is producing ground mica of a quality admirably suited to the needs of industry. In addition to relieving the British industry of its dependence on the foreign product through this new enterprise, an outlet has been found for Indian mica scrap."

Table 16 - EXPORTS OF MICA FROM BRAZIL, 1936 and 1937. (Source - United States Department of Commerce)

Country	1 9 3 6	1 9 3 7
	Kilos	Kilos
To -- France .....	24,698	32,907
Belgium .....	1,017	...
Japan .....	859	3,744
Italy .....	23,415	13,744
Great Britain .....	49,029	59,003
United States .....	86,328	136,748
Germany .....	51,531	52,475
British India .....	...	29,265
Czechoslovakia .....	...	2,090
<b>TOTAL .....</b>	<b>236,877</b>	<b>329,976</b>

"Both commercial varieties of mica are produced in Brazil - muscovite and phlogopite. By far the greater quantities of mica exported from Brazil are of the muscovite variety. Mica mining in Brazil is centred chiefly in the State of Minas Geraes; the mica deposits occur in the Archean rocks of gneiss and pegmatite, mining in the mica mines, all of which are open pit, is entirely by hand labour, and no scientific methods are employed. The Indian methods of grading and qualifying are used for determining the value of mica.

"After preparing the sheets, the mica is trimmed or left in semi-trimmed condition, accomplished by hand knife, following the natural shape or contour of the sheet. It is classified by size into grades. A scale is used showing the grade areas to determine the grade or size. The waste is sold as scrap for grinding." (United States Bureau of Mines).

In August, 1937, the office of the American Commercial Attache, Tokyo, announced that the Ryujin Mining Company was reported to have completed preparations to take over a rich mica mine in Jehol; the mica reserves are estimated at 20,000,000 metric tons; monthly production at this mine is schedule at 7,000 tons.

Table 17 - EXPORTS OF MICA FROM MADAGASCAR, BY DESTINATION, 1935, 1936 and 1937. (Source - United States Department of the Interior)

Country	1 9 3 5		1 9 3 6		1 9 3 7
	Metric tons	Value francs	Metric tons	Value francs	Metric tons(a)
France .....	175	1,956,000	90	1,267,000	111
England .....	67	641,000	207	1,865,000	180
United States .	156	1,327,000	148	1,273,000	311
Germany .....	10	92,000	7	64,000	1
Others .....	1	3,000	...	...	3(x)
<b>TOTAL .....</b>	<b>409</b>	<b>4,019,000</b>	<b>452</b>	<b>4,469,000(b)</b>	<b>611</b>

NOTE - 1 metric ton - 1.102 short tons.

(a) Values not yet available.

(x) Japan.

(b) Since the devaluation of French currency, the value has been about 21.50 francs to the United States dollar.

"There are two marketable grades of mica produced in Madagascar; muscovite, a normal element of the pegmatites, and phlogopite, occurring in the parapyroxenites, which forms an important element in the basic pegmatites, masses, and dikes.

"These deposits are mined for the most part by surface trench excavations, some of which are vast, and to a small extent by underground methods. Most of the larger companies have mechanical cutting plants to prepare the mica for the market. The production of muscovite started in 1921 and averaged about 40 tons annually until 1928, when it gradually decreased. The output of phlogopite reached 238 tons in 1924 and in 1936 was 410 tons."

Phlogopite-mica is not produced anywhere in South Africa. Muscovite-mica of good quality is found in the Letaba area, North Eastern Transvaal. The mica occurs in great dykes, and irregular lenses of coarse grained pegmatite; as a rule the distribution of the mica within the pegmatite is quite irregular.... Owing to the increased prices commanded by the various grades of mica, more interest has been taken in the mica fields. The corresponding increase in transport costs, however, still leaves only a small margin of profit on "waste mica" which constitutes the principal product. The small percentage of sheet mica produced is readily absorbed by the local market. Mica production in the Transvaal during 1937 totalled 1,529 short tons valued at £4,180 compared with 378 short tons at £1,098 in 1936.

Promising deposits of vermiculite have been located in Northern Transvaal. Technical tests conducted by the Minerals Research Laboratories on the material show that its quality is equal to that of the American product.

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DIRECTORY OF OPERATORS IN THE CANADIAN MICA MINING INDUSTRY, 1937.

<u>Name of Operator</u>	<u>Head Office Address</u>	<u>Location of Mine or Plant</u>
<u>QUEBEC -</u>		
Ahearn, W.	538 MacLaren St., Ottawa, Ont.	Hull Co.
Blachford, H. L. (a)	977 Aqueduct St., Montreal, P.Q.	Montreal
Blackburn Bros. Ltd.(b) (c)	Blackburn Bldg., Ottawa, Ont.	Cantley and Templeton Tps.
Blais, F. X. (A)	Chateau Champlain, P.Q.	Wentworth Tp.
Cameron, Peter	Buckingham, P.Q.	Ottawa Tp.
Chartier & Lanciault (x)	8262 Lajeunesse St., Montreal, P.Q.	Montcalm Co.
Charlevoix Radium General Mining Co. (x)	111 Cote de la Montagne, Quebec, P.Q.	Charlevoix-Saguenay Co.
Cheslock, Isidore	Poltimore, P.Q.	Poltimore
Cross, Walter C. (b)	209 Bridge St., Hull, P.Q.	Hull
De Rainville, Jos.	Wilsons Corners, P.Q.	Wilsons Corners
Dechenes, Pierre	Wilsons Corners, P.Q.	Gatineau Dist.
Duquette, W., & Lorrain, R. (x)	Gatineau, P.Q.	Hull Co.
Eriksen, Erik J.	Alcove, P.Q.	Denholm
Gauthier, J. B. (a)	Buckingham, P.Q.	Buckingham
Kilfoyle, R. H.	Old Chelsea, P.Q.	Old Chelsea
Laurel Mining Co. Ltd.	Edifice Ameau, Trois Rivieres, P.Q.	Wentworth Tp.
Laurentian Mica Mine & Products Ltd. (x)	1962 Galt Ave., Montreal, P.Q.	Labelle Co.
Martin, A. G. (b)	236 Besserer St., Ottawa, Ont.	Wilsons Corners
McGarry, Edward	Wakefield, P.Q.	Wakefield
Mica Company of Canada, Ltd. (b)	Hull, P.Q.	Hull

DIRECTORY OF OPERATORS IN THE CANADIAN MICA MINING INDUSTRY, 1937. (concluded)

<u>Name of Operator</u>	<u>Head Office Address</u>	<u>Location of Mine or Plant</u>
Morris, J. and M.	Wilson's Corners, P.Q.	Wakefield Tp.
O'Brien & Fowler, Ltd. (a)	Box 340, Buckingham, P.Q.	Buckingham
Perkins Mining Co.	Gatineau Pointe, P.Q.	Templeton Tp.
Routhier, Rev. Daniel	c-o Chas. Marlot, Low, P.Q.	Low
Sergeant & Poirier Co.	Wilson's Corners, P.Q.	Wilson's Corners.
St. Lawrence Mica Mines Ltd. (x)	105 Cote de la Montagne, Quebec, P.Q.	Montmorency
Trudeau, Narcisse	Old Chelsea, P.Q.	Old Chelsea
Trudeau, W.	Old Chelsea, P.Q.	Old Chelsea
Toutloff, Frank (a)	Gatineau Pointe, P.Q.	Gatineau Pointe
Wallingford, Ed. B.	St. Pierre de Wakefield, P.Q.	N. Templeton Tp.
Wallingford, Ed.	Perkins, P.Q.	Gatineau Dist.
Wallingford, G. E.	63 Pinhurst Ave., Ottawa, Ont.	Gatineau Dist.
Wallingford, W.A., and J.N.	Perkins Mills, P.Q.	Templeton Tp.
Williams, J. H., and Miller, L. (✓)	3427 Notre Dame St. W., Montreal, P.Q.	Argenteuil Co.
Winning, Bush	Buckingham, P.Q.	W. Portland Tp.

ONTARIO -

Bennet, H. V.	Perth	N. Burgess Tp.
Jeffery, Arthur	Burks Falls	Ryerson Tp.
Haughian, Frank	Perth	Burgess Tp.
Kent Bros. (a)	114 Gore St., Kingston	Kingston
Lee, W. W.	Bedford Mills	Bob's Lake
Loughborough Mining Co. Ltd.	Sydenham	Sydenham
Martin, A. G. (a) (b)	236 Besserer St., Ottawa	Ottawa
Van Luven, A.	Portland	Eastern Ontario

BRITISH COLUMBIA -

Ray, P. M.	23 Besner Block, Prince Rupert	Baker Inlet.
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- (x) Active but not producing.
- (a) Dealer.
- (b) Operates trimming plant.
- (c) Operates grinding plant.
- (✓) Operated mine of Laurel Mining Co. Ltd.

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