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DEPARTMENT OF TRADE AND COMMERCE

DOMINION BUREAU OF STATISTICS

CENSUS OF INDUSTRY

MINING, METALLURGICAL & CHEMICAL BRANCH

THE MICA INDUSTRY

IN

CANADA

1938



OTTAWA
1940

Price 25 cents

DEPARTMENT OF TRADE AND COMMERCE
DOMINION BUREAU OF STATISTICS
MINING, METALLURGICAL AND CHEMICAL BRANCH
OTTAWA - CANADA

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THE MICA INDUSTRY, 1938

Production (Producers' Sales) of new mica in Canada during 1938, including sales from stock totalled 1,037,026 pounds valued at \$80,989 compared with 1,890,376 pounds worth \$133,731 in 1937; comprising the 1938 output were 875,415 pounds of scrap and ground mica valued at \$8,388; 81,127 pounds of knife trimmed at \$45,419, 51,434 pounds of splittings at \$22,456; 17,050 pounds of thumb trimmed at \$4,366 and rough cobbled 12,000 pounds worth \$360. Of the 1938 shipments, mines in the Province of Quebec contributed 436,037 pounds valued at \$72,982, Ontario 504,739 pounds at \$6,445 and British Columbia 96,250 pounds worth \$1,562.

In 1938 phlogopite mica was shipped from properties chiefly located in the Hull-Buckingham district of Quebec and in Eastern Ontario from deposits occurring in the Kingston-Perth area. According to 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, Ontario northeastward into Hull and Papineau counties, Quebec; a few scattered amber mica occurrences are also known in the Province of Quebec 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 in general, the proportion of sound, merchantable sheet mica in Canadian pegmatites has proved too low for profitable mining for this mineral alone. In 1937 a small production of this class of mica came from a deposit in Ryerson township near Burk's Falls, Ontario, while in Quebec during 1938 a small quantity was produced at Lac Duclair, Bergeronnes township, Saguenay county and development work conducted on a deposit in Lacoste township, Charlevoix county.

A deposit of fine flake muscovite or sericite schist occurs at Baker Inlet, near Prince Rupert, British Columbia and in 1938 shipments of this material were made to Vancouver where it was prepared for the market by grinding.

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.

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. In 1938, it was reported that all Canadian plants drew 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 Department of Mines of the Union of South Africa reported that a production of vermiculite on a small scale began in 1938. Enquiries from England for this mineral stimulated interest generally, but particularly in the deposits near Palabora in the Leydsdorp district.

Total exports of mica from Canada in 1938 were valued at \$89,259 compared with \$171,770 in 1937; the value of mica imported into the Dominion, exclusive of mica schist, was \$86,803 in 1938 as against \$83,596 in the year immediately preceding.

The number of mica mining firms reported as active in 1938 totalled 40 of which 31 were located in the Province of Quebec, 8 in Ontario and 1 in British Columbia; Capital employed by the industry amounted to \$159,758; employees numbered 156 and salaries and wages paid aggregated \$74,424. The cost of fuel, purchased electricity, and process supplies used was recorded at \$19,247 and the net value of sales was estimated at \$61,742.

Table 1 - PRINCIPAL STATISTICS OF THE MICA MINING INDUSTRY IN CANADA, 1937 and 1938.

	1 9 3 7	1 9 3 8	1 9 3 8	1 9 3 8
	CANADA (x)	Quebec	Ontario	CANADA (x)
Number of firms or operators ..	34	31	8	40
Capital employed \$	150,569	124,942	34,816	159,758
Number of employees - On salary.	9	8	1	9
On wages ..	190	136	11	147
Total ..	199	144	12	156
Salaries and wages - Salaries .. \$	7,766	5,119	1,300	6,419
Wages ... \$	89,781	63,638	4,367	68,005
Total .. \$	97,547	68,757	5,667	74,424
Selling value of products(gross) \$	133,731	72,982	6,445	80,989
Cost of fuel and electricity ... \$	3,768	5,529	...	5,529
Cost of process supplies used .. \$	13,778	13,718	...	13,718
Selling value of products (net). \$	116,185	53,735	6,445	61,742

(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, 1937 and 1938.

Month	1 9 3 7			1 9 3 8		
	Mine	Shop		Mine	Shop	
		Male	Female		Male	Female
January	63	48	2	96	68	..
February	87	53	2	100	55	..
March	88	59	2	89	38	..
April	90	61	3	83	37	..
May	103	66	9	101	38	..
June	100	73	9	103	43	..
July	117	94	11	108	33	..
August	111	94	12	104	51	..
September ...	108	101	20	116	42	..
October	101	105	11	112	35	..
November	106	99	6	108	31	..
December	88	81	4	74	30	..

Table 3 - WAGE-EARNERS WORKING NUMBER OF HOURS SPECIFIED DURING ONE WEEK IN MONTH OF NORMAL EMPLOYMENT, 1938

Number of Hours Worked	Number of Employees	Number of Hours Worked	Number of Employees
30 hours or less	7	49 - 50 hours	40
31 - 43 hours	6	51 - 54 hours	10
44 hours	10	55 hours	20
45 - 47 hours	1	56 - 64 hours	19
48 hours	19	65 hours and over .....	..
Grand Total number of employees in week specified			132
Total wages Paid in week specified			\$ 1,191

Table 4 - POWER EQUIPMENT REPORTED, 1938.

	Ordinarily in use		In reserve or idle	
	Number of units	Total horse-power (according to manufacturers' rating)	Number of units	Total horse-power (according to manufacturers' rating)
Steam engines and steam turbines	4	94	..	..
Diesel engines .....	..	..	..	..
Gasoline, gas and oil engines, other than Diesel engines ..	9	260	1	21
Hydraulic turbines or water wheels	1	145	..	..
Electric motors - Operated by purchased power.	..	..	..	..
Total	14	499	1	21
Electric motors - Operated by power generated by the establishment	3	115	..	..
Stationary boilers	1	50	..	..

Table 5 - PRODUCTION OF MICA IN CANADA, BY GRADES, 1937 and 1938.

	1937			1938		
	Quantity	Value, f.o.b. shipping point	Price per pound	Quantity	Value, f.o.b. shipping point	Price per pound
	Pounds	\$	\$	Pounds	\$	\$
Rough cobbed ..	106,917	12,090	0.11	12,000	360	0.03
Knife-trimmed ..	203,961	66,852	0.33	81,127	45,419	0.56
Thumb-trimmed ..	173,519	11,826	0.07	17,050	4,366	0.26
Splittings ...	72,500	32,495	0.45	51,434	22,456	0.44
Scrap (x)	1,333,479	10,468	0.008	875,415	8,388	0.009
TOTAL	1,890,376	133,731	...	1,037,026	80,989	...

(x) Includes ground mica.

Table 6 - PRODUCTION OF MICA IN CANADA, BY PROVINCES, IMPORTS AND EXPORTS, 1937 and 1938.

	1 9 3 7		1 9 3 8	
	Pounds	Value \$	Pounds	Value \$
PRODUCTION (SALES) -				
Quebec	1,092,105	124,594	436,037	72,982
Ontario	798,271	9,137	504,739	6,445
British Columbia	(a)	(a)	96,250(b)	1,562
TOTAL	1,890,376	133,731	1,037,026	80,989
IMPORTS -				
Mica and manufactures of, n.o.p. -				
From - United Kingdom .....	...	9,298	...	11,603
United States .....	...	52,654	...	53,602
British India .....	...	21,165	...	21,583
Germany .....	...	408	...	1
Other countries .....	...	71	...	14
TOTAL .....	...	83,596	...	86,803
Chalk, China, Cornwall or cliff stone and mica schist .....	...	55,558	...	22,572
EXPORTS -				
Mica, rough cobbed, knife-trimmed and thumb trimmed -				
To - United Kingdom	127,700	77,332	68,800	46,784
United States	113,500	19,675	24,900	3,864
Other countries	13,200	1,897	24,500	7,312
Mica, scrap and waste -				
To - United States	2,445,300	13,042	1,288,600	7,649
Mica splittings -				
To - United Kingdom .....	...	...	...	...
United States	131,600	56,970	13,200	5,810
Japan	1,000	444	35,800	16,333
Mica plate and manufactures of (micanite)	...	2,410	...	1,507
TOTAL .....	...	171,770	...	89,259

(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.

(b) Ground mica schist.

Table 7 - PRODUCTION (SALES) OF MICA IN CANADA, BY PROVINCES, AND EXPORTS OF MICA, JANUARY 1 to JUNE 30, 1938 and 1939.

	1 9 3 8		1 9 3 9	
	Pounds	\$	Pounds	\$
PRODUCTION (SALES) -				
Quebec	194,345	40,043	459,352	50,307
Ontario	211,556	1,423	90,846	4,352
British Columbia .....	...	...	...	...
TOTAL	405,901	41,466	550,198	54,659
EXPORTS -				
Rough cobbed and thumb-trimmed	27	29,272	22	14,185
Mica splittings	19	16,975	42	38,383
Mica scrap and waste	253	3,123	350	5,322
Mica plate and manufactures of (micanite)	...	658	...	498

Imports of mica and manufactures of, n.o.p., into Canada during the first six months of 1939 were valued at \$25,274 compared with \$51,686 in the corresponding period of 1938.

Table 8 - CANADIAN DEALERS' QUOTATIONS AT THE END OF 1937 WERE AS FOLLOWS -

<u>Knife trimmed sheet</u>			<u>Splittings</u>		
		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; $\frac{1}{2}$ 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. Prices for corresponding grades, early in 1939 remained approximately the same as those quoted above.

Table 9 - PRODUCTION (x) OF MICA IN CANADA, 1929 - 1938.

Year	Short tons	\$	Year	Short tons	\$
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
1933	.... 944	49,284	1938	.... 519	80,989

(x) Sales.

The total value of mica produced in Canada from the first official recording of mica statistics in 1886 to the end of 1938 amounted to \$7,694,349 and the greatest annual value was that of \$376,022 for the year 1920.

Table 10 - MICA PRODUCTION IN CANADA (MINE SHIPMENTS), 1913 to 1922.

Year	Tons	\$	Year	Tons	\$
1913	.... 1,104	194,304	1918	.... 747	271,550
1914	.... 595	109,061	1919	.... 2,754	273,788
1915	.... 417	91,905	1920	.... 2,203	376,022
1916	.... 1,208	255,239	1921	.... 702	70,063
1917	.... 1,166	358,851	1922	.... 3,349	152,263

Table 11 - EXPORTS OF MICA FROM CANADA, 1913 to 1920.

Year	Tons	\$	Year	Tons	\$
1913	409	240,775	1917	636	451,345
1914	335	178,940	1918	433	410,000
1915	440	236,124	1919	2,741	641,962
1916	654(+)	379,720	1920	3,303	824,107

(+) 119 tons valued at \$81,913 were exported to Great Britain; 535 tons valued at \$296,221 to the United States and 2 tons valued at \$1,586 to other countries.

In preparation for the market, a considerable proportion of the crude mine tonnage sold is cobbled out and the mica split, trimmed and otherwise manufactured, with the result that the exports, though usually of smaller tonnage than the shipments from the mines, exceed them in value.

Table 12 - CONSUMPTION OF MICA IN THE CANADIAN ELECTRICAL APPARATUS AND SUPPLIES INDUSTRY, 1931 - 1938.

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)	87,829
1934	93,297	60,520	1938	(b)	(b)

(a) Quantity not published.

(b) Not yet complete for 1938.

In 1938 it was reported that laboratory research in the United States had indicated that a product (alsifilm) made from bentonite (clay) might compete successfully with mica in the important electrical field, if it could be produced commercially. The Research Corporation states that the specific resistance, the dielectric constant and the breakdown resistance of the product are about the same as for mica but the power factor is substantially higher.

Table 13 - CONSUMPTION OF GROUND MICA IN THE CANADIAN RUBBER INDUSTRY, 1931 - 1938.

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	142,000	6,190
1934	135,424	6,792	1938	(a)	(a)

(a) Not yet complete for 1938.

Table 14 - CONSUMPTION OF MICA IN THE CANADIAN MICA PRODUCTS INDUSTRY, 1931 - 1938.

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	1938	(a)	(a)

(x) Not available.

(a) Not shown separately and includes considerable foreign mica.

Table 15 - CONSUMPTION OF GROUND MICA IN THE MANUFACTURE OF CANADIAN COMPOSITION ROOFINGS, 1931 - 1938.

Year	Short tons	\$	Year	Short tons	\$		
1931	(not available)	1935	.....	60	1,844	
1932	21	683	1936	.....	90	2,522
1933	48	1,849	1937	..... (a)	152	4,425
1934	71	2,086	1938	..... (b)	215	13,040

- (a) Includes 9 tons at \$284 used by the coal tar distillation industry.
- (b) Includes mica used in manufacture of wall paper and 13 tons valued at \$445 used by the coal tar distillation industry.

NOTE: Mica standards and specifications of the National Association of United States purchasing agents are contained in the 1936 Annual Mineral Production Report of the Dominion Bureau of Statistics.

Table 16 - MICA IMPORTED FOR CONSUMPTION IN THE UNITED STATES IN 1937 and 1938, BY KINDS. (Source - United States Bureau of Mines)

	1 9 3 7		1 9 3 8	
	Pounds	Value	Pounds	Value
		\$		\$
Unmanufactured:				
Waste and scrap, valued at not more than 5 cents per pound	13,446,411	36,355	8,900,958(+)	28,590
Untrimmed phlogopite mica from which no rectangular piece exceeding in size 1 inch by 2 inches may be cut ...	89,230	9,091	100	12
Other:				
Valued at not above 15 cents per pound	323,742	38,189	110,706	13,147
Valued at above 15 cents per pound ..	591,978	248,955	280,319(a)	100,244
TOTAL	14,451,361	332,590	9,292,083	141,993
Manufactured:				
Cut mica (duty 40 per cent)	138,773	70,810	43,938(c)	44,926
Films and splittings:				
Not cut or stamped to dimensions:				
Not above 12 ten-thousands of an inch in thickness (duty 25 per cent) ...	7,551,999	1,443,083	1,825,520(b)	372,312
Over 12 ten-thousands of an inch in thickness (duty 40 per cent)	371,353	140,695	146,182	67,828
Cut or stamped to dimensions: (duty 45 per cent)				
Mica plates and built-up mica (duty 40 per cent)	67,307	60,240	37,516	29,551
All manufactures of which mica is the component material of chief value ...	5,639	3,757	...	...
Mica, ground or pulverized	82,200	1,233	169,025	2,626
TOTAL	8,226,786	1,735,009	2,229,641	522,426
GRAND TOTAL	22,678,147	2,067,599	11,521,724	664,419

- (x) 6,340,848 pounds at \$17,331 from British India, 1,473,550 pounds at \$6,282 from Union of South Africa and 1,084,360 pounds at \$4,962 from Canada.
- (a) 175,930 pounds at \$54,853 from British India and 76,666 pounds at \$28,714 from Brazil.
- (b) 1,571,926 pounds at \$318,546 from British India, and 239,483 pounds at \$47,740 from Madagascar. (c) 33,343 pounds at \$34,531 from British India.

Table 17 - MICA SPLITTINGS CONSUMED IN THE UNITED STATES, 1933 - 1938, 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	235,075	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
1938 ..	1,446,349	511,674	41,100	20,401	180,357	80,390	1,667,806	612,465

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

In September 1939 a United States Bureau of Mines report refers to the strategic uses of mica as follows: "Military authorities list mica as a strategic material. Domestic mines in North Carolina, New Hampshire, Connecticut, and South Dakota may be depended upon to supply a great deal more mica than they do now, but probably never enough for our needs ... particularly of certain kinds. One of the largest uses for sheet mica (excluding splittings) is for radio tube bridges and supports. Most of the mica so used is small, being punched from irregular sheets less than two square inches in area; only one-third of this mica emerges as stamped products, and the remaining two-thirds as cuttings, which cannot be used for any purpose except the manufacture of ground mica used chiefly for coating roofing material to prevent sticking in the roll.

"The electrical appliance field takes a somewhat larger ranges of sizes. Electric mica, so-called, is chiefly the quality known as black-stained, which is somewhat less expensive than the good-stained material used in radio tubes. Probably 75 per cent of the mica used in household appliances is of domestic origin, and we could become self-sufficient in respect to this material if need arose -- partly by increasing production and partly by eliminating non-military uses such as household cooking appliances. In respect to radio mica, savings also could be made, particularly in household sets, although such savings might be offset to some extent by the expansion of necessary communications.

"There are other fields, however, wherein the United States Bureau of Mines anticipates that war emergency would increase our requirements in mica, and unfortunately, it is these uses that require the highest qualities of mica, which we definitely cannot produce in anything like sufficient amount in the United States. From a military standpoint, supplies of mica for making condensers and spark plugs are especially important. Practically all mica used for all types of mica condensers is imported, principally from India. Mica for use in all kinds of condensers must not only be a good insulator and possess high dielectric strength, or break-down resistance but also must have a low-power factor. Of the 170,000 pounds or more of rough block mica used in 1937 for the manufacture of condensers, about 130,000 pounds was fair-stained or better, and 40,000 pounds was good-stained quality ... very little mica of condenser quality can be obtained for less than \$1.25 a pound, and material for some purposes costs upwards of \$5 a pound.

"Ordinary spark plugs such as are used in automobiles are unsafe in airplane work or for other services where their cores might be cracked by the splash of oil or rapid changes in temperature. In a typical mica spark plug, the centre wire or electrode is insulated by a wrapping of thin sheet mica known as a "cigarette",

outside of which mica washers are fitted and pressed tightly together. The washers that go inside of the engine cylinder, exposed to the full heat of the explosion, are generally made of phlogopite or amber mica, which has to be imported from Canada or Madagascar. Those in the cooler part of the plug, however, are muscovite and can be made from sizes small enough so that their procurement affords no serious supply problem, even in war time. The four manufacturers of spark plugs in 1937 reported to the United States Bureau of Mines a consumption of 12,580 pounds of fair-stained mica of cigarette quality and 9,725 pounds of amber mica for nose washers. Unless ceramic or other types of spark plug cores can be further perfected, however, war-time needs would be much greater. To make a thousand spark plugs, at least 11 pounds of high-grade mica are needed for cigarettes, the Bureau of Mines finds, and this figure must be increased to 16 pounds or more to cover the need for similar quality mica for shielded sleeve linings on such proportion of the plugs as are made with this added feature. In terms of rough block mica, the figure may be as high as 45 pounds, including waste. Cut mica for spark plug cigarettes is worth at least \$2.50 a pound and some manufacturers pay \$7 a pound. For nose washers the consumption of phlogopite is of the order of 20 to 25 pounds per thousand plugs. The best estimate of our war-time needs is 25,000 to 50,000 pounds of cigarette mica, worth on the average at least \$3 a pound, and a similar quantity of small amber mica for making spark plug washers and valued at, say 70 cents a pound which probably can be had from Canada if Madagascar supplies were cut off. For top washers, around 20,000 pounds of muscovite are needed, but this offers no serious procurement problem as it can be obtained domestically or from South America.

"We are virtually dependent upon British India for our high grade condenser and spark plug cigarette mica. It would seem quite impossible to attempt to cover any large proportion of our needs of such mica from domestic or other foreign mines. Even in British India not more than 10 per cent of the sheet mica mined comes up to the rigid requirement of such material. Moreover, in India, the opportunity for selection is far greater than it would be under American conditions, because in that country the mica is given far more careful inspection in the mines. Skilled labour is cheap, and the small books of mica are repeatedly handled and examined during the laborious process of sorting and manufacturing mica films and splittings. In the splitting operation, as leaf after leaf is removed, stained or spotted laminae are laid bare and can be eliminated and sold separately. In the United States only about one-fifth as much sheet mica is mined as in India, no splitting is done, and even the trimming is far less complete because more irregular pieces can be marketed."

Table 18 - EXPORTS OF MICA FROM INDIA, 1936 - 1938.

		1936	1937	1938
In blocks	Cwt.	27,235	30,003	18,831
	Rupees	4,572,240	5,747,478	4,384,730
Splittings	Cwt.	150,429	267,340	156,278
	Rupees	4,604,271	8,612,558	6,940,616
Total of Mica				
To - United Kingdom	Cwt.	43,049	65,784	53,690
	Rupees	4,360,558	6,493,335	4,647,477
Germany	Cwt.	19,053	18,854	30,831
	Rupees	787,952	1,079,055	1,717,986
France	Cwt.	7,743	2,698	2,905
	Rupees	374,845	206,555	186,939
Japan	Cwt.	9,125	11,815	22,298
	Rupees	575,736	1,255,366	2,118,001

Table 18 - EXPORTS OF MICA FROM INDIA, 1936 - 1938. - Concl'd.

		1936	1937	1938
Total of Mica - concl'd.				
To - United States	Cwt.	93,080	185,143	49,445
	Rupees	2,790,668	4,367,799	1,356,311
Other countries	Cwt.	5,614	13,049	15,940
	Rupees	286,752	957,926	1,298,632
<hr/>				
TOTAL	Cwt.	177,664	297,343	175,109
	Rupees	9,176,511	14,360,036	11,325,346
<hr/>				
Value of Rupee in Canadian funds		37.55 cents	37.30 cents	36.8 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 report on the Canadian mica industry as issued by the Dominion Bureau of Statistics.

Table 19 - IMPORTS OF MICA INTO THE UNITED KINGDOM, 1931 - 1938.

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	4,184	638,019
1934	2,421	300,530	1938	3,779	558,048

Table 20 - EXPORTS OF IMPORTED MICA FROM THE UNITED KINGDOM, 1936 - 1938.

Year	Long tons	Value
		£
1936	786	154,942
1937	1,394	272,094
1938	1,059	263,528

It was reported in 1938 that a plant in England was producing ground mica of a quality admirably suited to the needs of industry and 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 21 - EXPORTS OF MICA FROM BRAZIL, 1937 and 1938.

Country	1937	1938
To -	Kilos	Kilos
United States	136,748	77,984
Germany	52,475	161,292
France	32,907	10,019
Great Britain	59,003	73,759
Netherlands .....	...	700
Italy	13,744	14,323
Japan	3,744	89,336
India	29,265	92,625
Sweden .....	...	975
Czechoslovakia	2,090	...
TOTAL	329,976 (a)	521,013 (b)

(a) Value - milreis 3,476:591\$000.

(b) Value - milreis 5,140:665\$000

Commercial mica in Brazil is the muscovite that occurs in the pegmatite dikes in the states of Sao Paulo, Goias, Minas Gerais, Baia, Paraiba, Rio Grande do Norte and others; the greatest number of deposits are to be found in the state of Minas Gerais. The best quality comes from Goias, but the principal exportation in the past has been from Minas Gerais; the average size of the plates are 6 x 6 x 3 inches. Beryl, tourmaline and kaolin occur with the mica.

(Economic Division - Ministry of Foreign Affairs - Brazil).

Madagascar

"Shipments of block mica over 97 square centimeters in area (first series, No. 2 and over) from Madagascar totalled 17,113 kilograms for 1938 and 5,880 kilograms for the last quarter of 1938, the latter having been divided between England (4,673 kg.) and France (1,207 kg.) Shipments of mica of the second series, including No. 3 and smaller sizes of block mica (40 to 97 sq. cm.) as well as splittings, totalled 608,769 kilograms for the year and 166,465 kilograms for the quarter, the United States having been credited with 88,950 kilograms, England with 59,326 kilograms, France 17,939 kilograms, and Germany 250 kilograms. Mica of the third series (mica waste in bags and powdered) totalled 507 kilograms for the year. Mica of all classes exported during 1938 aggregated 626 tons and in the last quarter of 1938 totalled 172 tons.

(Mineral Trade Notes - United States Dept. of the Interior).

"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.

Table 22 - WORLD PRODUCTION OF MICA, 1935 - 1937. (Imperial Institute, London)

Producing Country	1935	1936	1937
<u>British Empire</u> (Long tons)			
Northern Rhodesia	2	3	4
Southern Rhodesia	4	9	16
Tanganyika Territory -			
Sheet	25	10	33
Waste	21	23	40
Union of South Africa (b)	573	488	1,712
Canada -			
Knife trimmed	50	50	91
Thumb trimmed	5	16	78
Splittings	15	11	32
Rough cobbled	14	5	48
Scrap	477	633	595
Ceylon (exports)	2	...	1
India (exports) -			
Sheet	1,189	1,362	1,500
Splittings	5,902	7,521	13,367
Australia	44	21	84
<u>Foreign Countries</u>			
Italy	33	12	(a)
Norway (exports)	56	43	41
Roumania	(c)	81	26
Sweden	31	123	67
U. S. S. R.	8,143	(a)	(a)
Madagascar -			
Muscovite	(1,917 lb.)	...	...
Phlogopite, etc.	513	404	601
United States (sales) -			
Sheets (uncut)	418	589	756
Scrap	16,832	18,710	22,496
Argentina	221	206	(a)
Bolivia (exports)	2	...	9
Brazil (exports)	108	233	325
Korea	86	69	(a)

(a) Information not available. (b) Nearly all scrap. (c) 10 cubic metres.

The following amounts of lithia mica were produced:

	1935	1936	1937
South West Africa	489	852	1,030 long tons
France	350	400	(a) "
Portugal	8	...	109 "
United States (lithium minerals) ..	1,030	1,106	1,212 "
Argentina .....	...	60	(a) "
Canada .....	...	...	(£ 342)

(a) Information not available.

DIRECTORY OF OPERATORS IN THE CANADIAN MICA MINING INDUSTRY, 1938.

(x) Active, but no shipments made.

<u>Name of Operator</u>	<u>Head Office Address</u>	<u>Location of Mine or Plant</u>
<u>QUEBEC -</u>		
Ambermica of Canada Ltd.	493 Gladstone Ave., Ottawa, Ont.	Thorne Twp.
Big Four Mica Synd. Reg. (x)	1959 Rosemont Blvd., Montreal	Wentworth Twp.
Bernatchy, Louis (x)	Ste. Therese de Gatineau Que.	Kensington Twp.
Blackburn Bros. Ltd. (a) (b)	301 Blackburn Bldg. Ottawa, Ont.	Cantley & Ottawa.
Carroll Creek Mica Mines Ltd. (x)	107 Front St. E., Toronto, Ont.	Templeton Dist.
Charlevoix General Mining Company Ltd. (x)	111 Cote de la Montagne, Quebec	Charlevoix Co.
Cross, Walter C. (b)	209 Bridge Street, Hull	Hull
Deschenes, Pierre	Wilson's Corners	Wilson's Corners
Emond, Arthur	R. R. 1, Wright	White Fish Lake
Ericksen, Erik J.	Alcove,	Denholm
Gagnon, Edmond	4901 Ste. Emelie St., Montreal	Argenteuil Co.
Gauthier, J. B. (x)	Box 226, Buckingham	Portland W. Twp.
Kelley, W (x)	Grand Lac Ste. Agnes	Sagard Twp.
Mallon, R. & Sons	Box 434, Poltimore	Portland W. Twp.
Marcil, E. (c)	445 rue Gilford, Montreal	Bergeronnes Twp.
Martin, A. G. (b)	236 Besserer St., Ottawa Ont.	Wilson's Corners
McGary, Edward	Wilson's Corners	Wakefield
Mica Company of Canada Ltd. (d)	Hull	Hull
Mines d'Huiles & Petrole (c)	26 St. James St. E., Montreal	Bergeronnes Twp.
Morris, M.	Wilson's Corners	Hull S. Twp.
O'Brien & Fowler Ltd.,	Box 340, Buckingham	
Perkins Mining Company	Pointe Gatineau	Templeton Twp.
Poirier, Adelard	Wilson's Corners	Hull, N. Twp.
Poirier, J. H. (x)	Maniwaki	Bouchette Twp.
Sergeant & Poirier	Wilson's Corners	Wright Co.
Societe Godin & Martin		
Exploration (x) (c)	St. Agnes	Lacoste Twp.
Spratt, R. E.	12 Chamberlain Ave., Ottawa, Ont.	White Fish Lake
Syndicate de Mica de Quebec (x)	1540 Guy St. Apt. 2a, Montreal	Bergeronnes Twp.
Tidewater Minerals & Mines Company Ltd. (x)	1218 Bell Telephone Bldg., Montreal	Bergeronnes Twp.
Trudeau, Wm.	Old Chelsea	Old Chelsea
Wallingford, Edward	Perkins	Templeton Twp.
Wallingford, E. B.	Perkins	N. Templeton Twp.
Wilson, Neil	Cantley	E. Wakefield Twp.
<u>ONTARIO</u>		
Bennett, H. V.	Perth	Perth Dist.
Houghian, Frank	Perth	Perth Dist.
Kent Bros. (b)	114 Gore Street, Kingston	Kingston
Kingston Mica Mining Co. Ltd.,	Godfrey, Ont.	Godfrey
Lee, W. W.	Bedford Mills,	Burgess Twp.

DIRECTORY OF OPERATORS IN THE CANADIAN MICA MINING INDUSTRY, 1938. (Concluded)

(x) Active, but no shipments made.

<u>Name of Operator</u>	<u>Head Office Address</u>	<u>Location of Mine or Plant</u>
<u>ONTARIO - (concl'd.)</u>		
The Loughborough Mining Co. Ltd., Martin, A. G. (b)	Sydenham, 236 Besserer St., Ottawa	Sydenham Ottawa
Orser, S. H.	Verona	Eastern Ontario
Thirty Island Lake Mica Co.	Verona	Eastern Ontario

BRITISH COLUMBIA

Ray, Philip M. (e) 23 Besner Block, Prince Rupert Baker Inlet

-
- (a) Operates a grinding plant.
 - (b) Operates trimming shop.
 - (c) Produces muscovite mica.
 - (d) Operates manufacturing plant.
 - (e) Mines mica schist for grinding.

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