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THE ASBESTOS MINING INDUSTRY, 1936

and

THE ASBESTOS PRODUCTS INDUSTRY, 1936.

A. THE ASBESTOS MINING INDUSTRY -

Canadian asbestos production totalled 301,287 short tons valued at \$9,958,183 in 1936, according to finally revised statistics issued by the Dominion Bureau of Statistics, Ottawa. The output of the mineral during the last calendar year represents an increase of 43.2 per cent in quantity and 41.1 per cent in value over the 210,467 short tons worth \$7,054,614 as produced in 1935. The tonnage of shipments in 1936 was only surpassed, in the history of Canadian asbestos mining, by that of 1929 and the total value of sales for the year under review was the highest recorded during the past seven years.

The quantity of asbestos rock mined in 1936 totalled 4,692,004 short tons compared with 2,852,118 short tons in 1935; in 1936 crude rock milled amounted to 3,568,992 tons or an increase of 58.1 per cent over the previous year.

Distinct increases in the value of both imports and exports of asbestos were realized in 1936. The total value of imports, including those for asbestos brake and clutch lining, packing, and various manufactures, totalled \$888,787 in 1936 as against \$712,297 in 1935. Total asbestos exports during 1936, and including manufactures, were appraised at \$10,133,898, an increase of 43.5 per cent over 1935. The value of asbestos exports, other than sand or waste and manufactures, totalled \$7,391,517 in 1936 compared with \$5,300,176 in 1935. Of the total value of all Canadian asbestos exports in 1936, those to the United Kingdom amounted to \$577,012 while those consigned to the United States totalled \$6,403,649.

Expansion in production as experienced during 1936 continued throughout the first six months of 1937 when sales of all grades totalled 197,800 tons valued at \$6,678,083 as compared with 120,437 tons at \$4,016,912 during the corresponding period of the preceding year.

General improvement in the asbestos mining industry in 1936 was strongly reflected in the statistics pertaining to employment. During the year, 2,647 persons were provided with work and \$2,642,924 were distributed in salaries and wages; this represented increases over 1935 of 27.8 per cent and 38.8 per cent, respectively.

Fuel and electricity consumed in the mining and milling of crude asbestos during 1936 amounted to \$979,193, of which the two largest items were electricity and coal, the value of the first named amounting to \$698,067 while that of the latter totalled \$265,816. Explosives, drill steel, and various other process supplies consumed during the year aggregated, in value, \$1,420,282.

The Quebec Bureau of Mines summarized the 1936 asbestos mining operations as follows:- "Asbestos Corporation Ltd. operated its King mine, Thetford, during the whole year to its capacity. The company has started to outline a second set of blocks below the ones which were caved. The block-caving method of mining is continuing to give excellent results.

"The Beaver mine during the first half of the year was worked, by a small shift of men only, for the production of crude fibre and also of chromite. In May, mining of asbestos rock was resumed on a larger scale and continued the rest of the year. The British-Canadian mine, at Black Lake, which had been closed since 1931, was reopened in June, and the Vimy-Ridge mine at Coleraine was brought up to normal operation in March, 1936. The Bennet-Martin mine, at Thetford, closed since 1923, was reopened for the recovery of crude. These mines of Asbestos Corporation are hoisting 9,000 tons of rock per day.

"The Bell mine was operated without interruption by Keasbey and Mattison during the greater part of the year, and latterly by the Bell Asbestos Mines, Ltd., a recently incorporated Canadian company. ...

"All the other asbestos producers, Canadian Johns-Manville at Asbestos, Johnson's Company at Thetford, and Black Lake, and Quebec Asbestos Company at East Broughton also operated their mines with greater activity than had obtained for many years."

During the year milling and diamond drilling operations only, were carried on at Norbestos by Nicolet Asbestos Mines Limited.

In Ontario the Rahn Lake Mines Corp. Ltd., conducted both surface and underground development work at its property located in Bannockburn township; approximately 2,000 tons of asbestos bearing rock were reported as now being on the dump.

Canadian asbestos as produced commercially in Canada at the present time is of the chrysotile or serpentine variety and is of high quality. It is derived entirely from mines operated in the Eastern Townships, Quebec. Reserves of milling grade asbestos rock in this district have been reported as sufficient for many years of commercial fibre production.

World production of asbestos in 1936, as estimated by the League of Nations from latest available figures, totalled 500,000 metric tons, an increase of 36 per cent over 1935. Canada definitely retains a premier position as the world's largest producer of high grade asbestos, the output of the mineral in the Dominion during 1936 comprising approximately 55 per cent of the world's total production.

(x)PRICES - (U.S.A. - September, 1937). Per ton, f.o.b. Quebec mines, tax and bags included: Crude No. 1, \$550 to \$600; Crude No. 2, \$200 to \$225; spinning fibres, \$90 to \$170; magnesia and compressed sheet fibres, \$100 to \$110; various grades shingle stock, \$45 to \$75; various grades paper stock, \$32.50 - \$37.50; cement stock, \$19 to \$23; floats, \$16 to \$18.50; shorts, \$11 to \$14.50.

Per ton, c.i.f. New York: Rhodesian No. 1, \$250; Rhodesian No. 2, \$225.

Per ton, c.i.f. New York: Russian Crude: A. A. \$550; No. 1, \$225; No. 2, \$190; shingle, stock, \$55.

Per ton, f.o.b. mines, Vermont: Shingle stock, \$47.50; paper stock, \$35; cement stock, \$23; shorts, \$11 to \$12.

(x) From the Engineering and Mining Journal Metal and Mineral Markets, New York.

Table 1 - SALES AND SHIPMENTS (x) OF CANADIAN ASBESTOS, 1934, 1935 and 1936.

	1934		1935		1936	
	Tons	\$	Tons	\$	Tons	\$
Crudes	1,663	409,853	2,278	539,558	3,440	790,971
Fibres	77,465	3,456,399	102,270	4,873,255	133,288	6,483,946
Shorts	76,852	1,070,074	105,919	1,641,801	164,559	2,683,266
TOTAL	155,980	4,936,326	210,467	7,054,614	301,287	9,958,183
Sand, gravel, and stone (waste rock only) (a)	4,672	3,480	3,025	2,053	3,103	2,356

(x) All from the province of Quebec.

(a) This production is included under the sand and gravel industry.

	1934 Tons	1935 Tons	1936 Tons
Quantity of rock mined	2,320,750	2,852,118	4,692,004
Quantity of rock milled	1,935,129	2,256,994	3,568,992

Table 2 - SALES AND SHIPMENTS OF ASBESTOS, 1926 - 1936.

Year	Tons	\$	Year	Tons	\$
1926	279,403	10,099,423	1932	122,977	3,039,721
1927	274,778	10,621,013	1933	158,367	5,211,177
1928	273,033	11,238,360	1934	155,980	4,936,326
1929	306,055	13,172,581	1935	210,467	7,054,614
1930	242,114	8,390,163	1936	301,287	9,958,183
1931	164,296	4,812,886			

Table 3 - IMPORTS INTO CANADA AND EXPORTS OF ASBESTOS, 1935 and 1936.

		1935	1936
<u>IMPORTS -</u>			
Asbestos brake and clutch lining	xx	...	...
	\$	235,620	321,163
Asbestos packing	ton	60	84
	\$	56,208	60,978
Asbestos in any form other than crude, and all manufactures of, n.o.p.	xx	...	...
	\$	420,469	506,646
TOTAL IMPORTS	\$	712,297	888,787
<u>EXPORTS -</u>			
Asbestos - TOTAL EXPORTS	ton	100,186	136,547
	\$	5,300,176	7,391,517
To - United Kingdom	ton	4,584	6,817
	\$	290,569	405,712
United States	ton	61,059	77,691
	\$	3,079,366	4,052,187
Australia	ton	2,004	2,055
	\$	99,632	103,271
Belgium	ton	4,814	8,058
	\$	270,606	455,828
France	ton	3,781	6,968
	\$	254,142	473,406
Germany	ton	4,913	12,811
	\$	438,062	987,125
Italy	ton	806	136
	\$	74,435	11,444
Japan	ton	15,597	21,200
	\$	628,597	856,167
Netherlands	ton	1,671	148
	\$	110,725	5,634
Spain	ton	710	201
	\$	57,328	11,182
Poland and Danzig	ton	114	302
	\$	7,325	21,684
Asbestos sand and waste -			
TOTAL EXPORTS	ton	100,025	157,678
	\$	1,585,481	2,567,343
To - United Kingdom	ton	3,595	4,566
	\$	75,516	84,711
United States	ton	92,810	146,081
	\$	1,440,995	2,350,527
Belgium	ton	833	1,606
	\$	14,407	27,364
France	ton	320	967
	\$	6,200	18,747
Germany	ton	1,438	3,547
	\$	28,805	71,365
Netherlands	ton	700	110
	\$	14,776	2,233

Table 3 - IMPORTS INTO CANADA AND EXPORTS OF ASBESTOS, 1935 and 1936. (concluded)

	1935	1936
<u>EXPORTS - (concluded) -</u>		
Asbestos manufactures, including asbestos roofing -		
TOTAL EXPORTS	\$ 175,452	175,038
To - United Kingdom	\$ 119,878	86,589
United States	\$ 444	935
Newfoundland	\$ 6,345	6,818
Australia	\$ 7,529	30,106
Argentina	\$ 3,826	6,536
Brazil	\$ 7,599	11,511
Chile	\$ 3,212	2,331
Colombia	\$ 4,538	2,372
Mexico	\$ 8,577	9,857
Peru	\$ 2,855	2,949
TOTAL ASBESTOS EXPORTS	\$ 7,061,109	10,133,898
To - United Kingdom	\$ 485,963	577,012
United States	\$ 4,520,805	6,403,649

Table 4 - SALES OF ASBESTOS IN CANADA, IMPORTS AND EXPORTS, JANUARY 1 to JUNE 30, 1936 and 1937.

	1936		1937	
	Quan- tity	Sales value at mill \$	Quan- tity	Sales value at mill \$
<u>PRODUCTION(x) - By grades</u>				
Crudes	1,600	357,787	1,974	464,258
Fibres	55,630	2,679,774	90,517	4,483,226
Shorts	63,207	979,351	105,309	1,730,599
TOTAL	120,437	4,016,912	197,800	6,678,083
Sand, gravel and stone (waste rock only)	1,746	1,515	1,709	1,582
Rock mined	1,797,310	...	2,994,545	...
Rock milled	1,392,308	...	2,410,531	...
<u>IMPORTS -</u>				
Asbestos brake and clutch lining ..	...	173,907	...	191,239
Asbestos in any form other than crude and all manufactures of, n.o.p. ..	...	206,276	...	296,160
Asbestos packing	49	34,095	32	28,758
<u>EXPORTS -</u>				
Asbestos	55,454	3,018,649	82,305	4,431,103
Asbestos sand and waste	59,464	958,678	99,613	1,691,207
Asbestos manufactures, including asbestos roofing .....	...	62,585	...	167,356

(x) All from the province of Quebec.

Table 5 - PRINCIPAL STATISTICS OF THE ASBESTOS MINING INDUSTRY IN CANADA, 1935 and 1936.

	1935	1936
Number of firms	8	10
Capital employed	\$ 16,805,583	18,877,326
Number of employees - On salaries	152	195
On wages	1,920	2,452
Total	2,072	2,647
Salaries and wages - Salaries	\$ 302,151	330,565
Wages	\$ 1,601,902	2,312,359
Total	\$ 1,904,053	2,642,924
Selling value of products (a)	\$ 7,056,667	9,960,539
Cost of fuel and electricity (purchased)	\$ 923,483	979,193
Cost of process supplies (b)	\$ 1,134,968	1,420,282
Net value of sales	\$ 4,998,216	7,561,064

(a) Includes value of sand and gravel.

(b) Explosives, drill steel, etc.

Table 6 - WAGE-EARNERS EMPLOYED, BY MONTHS, in the ASBESTOS MINING INDUSTRY IN CANADA, 1933, 1934, 1935 and 1936.

Months	1933	1934	1935	1 9 3 6		
				MINE		
				Surface	Underground	MILL
	TOTAL	TOTAL	TOTAL			
January	1,218	1,577	1,605	933	125	953
February	1,048	1,587	1,650	914	129	921
March	1,016	1,595	1,640	878	124	948
April	1,119	1,587	1,739	862	125	954
May	1,399	1,780	1,813	1,060	138	1,153
June	1,392	1,928	1,938	1,135	139	1,174
July	1,543	1,902	2,036	1,198	147	1,210
August	1,564	1,806	1,953	1,278	148	1,261
September	1,920	1,623	1,957	1,398	164	1,265
October	2,059	1,688	2,148	1,413	192	1,318
November	1,819	1,762	2,237	1,420	202	1,317
December	1,754	1,653	2,304	1,264	222	1,334

Table 7 - NUMBER OF WAGE-EARNERS IN MONTH OF HIGHEST EMPLOYMENT, 1936, WHOSE REGULAR HOURS PER WEEK WERE AS FOLLOWS -

Hours	Number
40 hours or less	8
44 hours	127
48 hours	1,378
49 - 50 hours	802
54 hours	13
56 - 59 hours	453
60 hours	242
Over 60 hours	6

Table 8 - FUEL AND ELECTRICITY USED IN THE ASBESTOS MINING INDUSTRY IN CANADA, 1935 and 1936.

Kind	Unit of measure	1 9 3 5		1 9 3 6	
		Quantity	Value \$	Quantity	Value \$
Bituminous coal - From Canadian mines	short ton	22,598	152,116	21,391	151,741
Imported	short ton	...	...	...	...
Anthracite coal - From United States	short ton	8,560	59,472	12,992	96,346
Other	short ton	1,781	10,844	2,827	17,729
Coke (for fuel only)	short ton	100	1,193	56	672
Gasoline (exclusive of that used in motor cars or trucks)	Imp. gal.	27,745	5,934	54,492	12,356
Kerosene or coal oil	Imp. gal.	4,004	771	6,087	867
Fuel oil and diesel oil	Imp. gal.	6,633	716	12,106	1,350
Wood (cords of 128 cubic feet of piled wood)	cord	10	40	65	65
Electricity purchased, including service charges	k.w.h.	72,825,928	692,397	87,310,604	698,067
TOTAL .....	\$	...	923,483	...	979,193

Table 9 - POWER EQUIPMENT (including stand-by or emergency equipment), 1936.

Description	Ordinarily in use		In reserve or idle	
	Number of units	Total horse power(x)	Number of units	Total horse power(x)
Steam engines and steam turbines ...	7	235	...	...
Gasoline, gas and oil engines, other than diesel engines	1	6	2	10
Electric motors - Operated by purchased power	801	44,449	44	3,205
TOTAL	809	44,690	46	3,215
All boilers	4	115	4	300

(x) According to manufacturers' rating.

Table 10 - CONSUMPTION OF ASBESTOS IN SPECIFIED CANADIAN INDUSTRIES, 1934 and 1935.

Industry		1 9 3 4		1 9 3 5	
		Quantity	Cost at works \$	Quantity	Cost at works \$
Electrical Apparatus and Supplies -					
Board	pound	96,757	16,093	122,111	20,175
Yarn	pound	57,174	20,589	61,018	18,040
Tape	pound	1,577	1,645	8,481	5,738
Boilers, Tanks and Engines	xxx	...	2,534	...	3,077
Asbestos Products -					
Fibre		See Table 20 - Asbestos Products Industry			
Other forms					
Roofing paper	ton	1,540	47,466	2,061	76,833
Cotton goods, n.e.s.	pound	12,576	633	17,248	841
Woollen goods, n.e.s.	pound	211,816	63,545	147,533	41,012

NOTE - Complete data for 1936 not yet available.

Table 11 - WORLD'S PRODUCTION OF ASBESTOS, 1933-1936.

(Taken from the Statistical Year-Book of the League of Nations, 1936/37).

NOTE - This table refers to the production of non-fabricated asbestos, obtained from asbestos-bearing rock and commercially divided into spinning and non-spinning fibre. The former is represented mainly by chrysotile, $H_4Mg_3Si_2O_9$; also by crocidolite or blue asbestos, $NaFe(SiO_3)_2 \cdot FeSiO_3$, and by amosite, an iron-rich anthophyllite, both of which are found exclusively in the Union of South Africa. Amphibole (anthophyllite) $(FeMg)SiO_3$, is the principal non-spinning variety.

(Production in metric tons (000's omitted))

Country	1933	1934	1935	1936(x)
AFRICA	42.8	45.6	57.1	73.2
Southern Rhodesia (1)	27.4	29.2	38.6	51.1
Union of South Africa (2)	15.4	16.4	18.5	22.1
NORTH AMERICA	148.0	146.1	199.0	283.3
Canada (3)	143.7	141.5	190.9	273.3
United States (4)	4.3	4.6	8.1	10.0
ASIA (excl. U.S.S.R.)	3.9	7.6	8.0(x)	10.0
China: excl. Manchuria	0.2	0.3	...	...
Manchuria	0.1	0.1	...	...
Cyprus (5)	3.6	7.2	7.6	9.3
India .....	...	...	0.1	...
U.S.S.R.	71.7	92.2	95.5	125.1
EUROPE (excl. U.S.S.R.)	4.5	6.0(x)	7.0(x)	...
Finland (6)	1.3	1.7	1.7	...
France	0.4	0.4	0.5	...
Italy (6)	1.5	...	...	...
Czechoslovakia	1.2	2.1	2.6	...
Turkey	0.1	...	0.1	...
OCEANIA (Australia)	0.3	0.2	0.2	...
TOTAL	271	298(x)	367(x)	500

Sources: National official statistics. Imperial Institute (London) : Statistical Summary.

(x) Estimate or provisional figure.

(1) Southern Rhodesia: chrysotile.

(2) Union of S. Africa: Chrysotile, amosite and blue asbestos.

(3) Canada: Chrysotile. Sand and gravel, by-products, have been excluded; they amounted in 1933-1936 to (metric tons, 000's): 6, 4, 3 and 3 respectively. Actinolite, $Ca(Mg, Fe)_3(SiO_3)_4$, the annual production of which is considerably less than 100 metric tons, has been also excluded. The figures refer to shipments and sales.

(4) United States: both chrysotile and amphibole.

(5) Cyprus: Chrysotile, but not of the spinning quality.

(6) Finland, Italy: excluding asbestos powder, the production of which was (metric tons): Finland, 1935, 1,652; Italy, 1933, 1,790.

GENERAL NOTES

TURKEY - Production of asbestos in 1936 totalled 119 tons or 15 tons greater than in 1935, exports of the mineral are diminishing. Exports in 1935 totalled 12.5 tons worth 600 pounds Turkish, those of 1936 amounted to 900 kilos and were appraised at 100 pounds Turkish. (Henri Turcot - Canadian Government Trade Commissioner, Cairo).

CHINA - Little definite information is available regarding China's production of raw asbestos. In a number of provinces deposits are known to exist, of which several at least have been worked for a long time, but the total production seems to be small compared with that of other producing countries. One authority states: "Some remarkably high-grade asbestos has been mined in Central China and deposits have been found in many places throughout the country, in many of which, however, the fibre is too short and brittle to make the export a profitable undertaking."

Up to 1936 Central China has not offered a market of any importance for imported asbestos fibre. Imports of the fibre are not shown separately in the customs returns, but are included under the heading "asbestos, lump, powder, and fibre," and the figures are available for the whole of China only, and not by individual ports. It is only since 1934 that this much detail has been given. Previously the raw material was grouped with a wide variety of articles, made wholly or partly from it, under the general heading "asbestos and manufactures thereof." Imports of "asbestos, lump, powder, and fibre" were as follows in 1934 and 1935:-

China's Imports of Asbestos, Lump, Powder and Fibre

	<u>1 9 3 4</u>		<u>1 9 3 5</u>	
	Pounds	Can. \$	Pounds	Can. \$
Total	42,900	1,419	22,200	1,409
Great Britain	1,500	442	1,100	176
Italy	33,500	615	2,700	680
Japan	5,400	209	17,800	514
Other countries	2,400	152	450	38

There is some evidence to suggest that the above returns include very little fibre. It is suggested that the apparent discrepancy in the figures for Italy are due to large imports of cheap lump in 1934 and some import of higher-priced amianthus in 1935. No imports are shown from Rhodesia, but it is possible that small quantities came in via Great Britain. Nor are any shipments from Russia indicated although they may be included under "other countries." In any case it will be apparent that the imports of high-grade fibre are negligible, if indeed they exist. (H. A. Scott - Canadian Government Trade Commissioner, Shanghai).

"The North China Mining Co. produces at its mines in Hopei Province, China, an asbestos fibre which is very white, of good spinning length, silky and strong, if the specimen we (Asbestos) have from this deposit is a fair sample of most of the asbestos mined.

"The mines are situated at Lai Yuen Hsien and at Chang Ping Hsien, both in Hopei Province, and the annual output of these two mines amounts to 1,500 tons, which according to the producers can be easily disposed of in the domestic market.

"The fibre runs from 1/4 in. to 1 1/2 in. in length. Another large deposit owned by the same company is located in Szechuan Province, where according to information received, the fibre runs up to one foot in length and is silky and lustrous. However, because of transportation difficulties this deposit has not yet been worked." (From "Asbestos" - Philadelphia, Pa., U.S.A.).

UNION OF SOUTH AFRICA - "Chrysotile is the ordinary type of asbestos fibre most commonly used in industry for asbestos textile, brake linings, etc., Crocidolite or Blue Asbestos of commercial grade works up easily into a mass of fibres that are flexible and have a silky feel, its tensile strength is greater than that of chrysotile and it withstands acid and sea-water better, but fuses at lower temperatures; it is used principally in the manufacture of filter cloth, boiler mattresses, etc.; it is graded according to quality and length and marketed in various grades from 1 3/4 inch in length to 1/8 inch in length under the producers' own marks. Amosite asbestos is white to yellowish-grey and pale green, working up to a white fibre; the fibre is not on the whole as fine as in chrysotile; its tensile strength and resistance to acids and sea water are better than those of chrysotile; it fuses less readily than crocidolite. Amosite is not graded according to length as in the case of other varieties but is graded on colour and quality of fibre; the best grades sold are from 1 1/2 inch upwards in length and of ash grey colour and good tensile strength.

"The Union of South Africa is unique among the asbestos-producing countries of the world in that it can supply these three types of asbestos, each of which possesses certain favourable properties for specific industrial applications." (Department of Mines - Union of South Africa).

Production of Asbestos by Kinds in the Union of South Africa, 1935 and 1936.

	<u>1 9 3 5</u>		<u>1 9 3 6</u>	
	<u>Tons</u>	<u>£</u>	<u>Tons</u>	<u>£</u>
Amosite	4,683	46,170	4,823	80,701
Chrysotile	15,483	136,268	16,149	159,156
Blue	2,541	43,729	4,264	97,372
TOTAL	22,707	226,167	25,236	337,229

CYPRUS - "The Amiandos mine is included in a lease area held formerly by the Cyprus and General Asbestos Co. Ltd. and was transferred during the year under report to the Tunnel Asbestos Cement Co. Ltd.

"Operations were intensified, and several new quarries were opened. The output of graded fibres amounted to 9,506 tons, an increase of nearly 2,000 tons compared to the previous year. During the first half of 1936 production was hindered owing to an abnormally wet spring, the asbestos-bearing rock being only amenable to treatment when in a dry condition.

"Six primary mills and one fibre mill were in operation during the year, the tonnage of rock treated amounting to 290,472 tons while 1,421,229 tons of rock was actually quarried. The company contemplated the re-conditioning of two more primary mills which are expected to be in operation in 1937." (J. A. Bevan - Inspector of Mines and Labour, Cyprus).

GERMANY -

German Imports of Asbestos from Principal Countries, 1932-35.

	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
	(In Thousands of Reichsmarks)			
Total	2,349	3,651	5,146	5,535
Soviet Russia	691	1,040	2,505	2,796
Canada	972	1,160	1,270	1,287
British South Africa	573	1,183	1,163	1,261
Other	113	268	208	191

"A point of outstanding interest in the above table is the concentration of purchases of asbestos in the three important supplying countries. The trade is, on this account, subject to much more complete analysis than that in many other commodities. It is also to be noted that, although Canadian sales of asbestos to the German market during the four years shown have been reasonably well maintained, their proportion to total German imports has declined perceptibly. Imports from British South Africa have shown an almost precisely similar trend, but the trade from Soviet Russia has undergone marked expansion." (Paul Sykes, - Canadian Government Trade Commissioner, Hamburg).

It will be noted in Table 3 of this report that exports of Canadian asbestos to Germany during 1936 showed a decided increase.

FRANCE - "Asbestos being a raw material necessary to certain industries, enters France free of duty. Furthermore, unlike certain raw materials in which there is over-production in a number of countries, sources of supply are not controlled by quota restrictions or allotments. Rhodesia, Canada, South Africa, and the Soviet Union are the main producers. There is thus little choice among supplying countries, more especially as certain grades are produced in one country and not in another.

"In 1936 French import statistics show total imports of 15,343 metric tons. Rhodesia (6,560 tons) was the chief source of supply, followed by Canada (4,428 tons), South Africa (2,427 tons), and the Soviet Union (1,389 tons). Imports from these four sources amounted to 97 per cent of the total trade.

"About 60 per cent of imported asbestos is used for shingles, pipes, and other industrial products of that nature. This accounts for 9,000 tons of the total imports, and is followed by 2,400 tons for making into asbestos yarn and thread. Asbestos paper and board use about 2,000 tons of imported material yearly, and other uses account for approximately 1,700 tons.

"Because Rhodesian supplies are of the higher qualities, the value of imports from that source was about 15,000,000 francs, or slightly less than \$1,000,000. About 30 per cent of imports from Rhodesia were for yarn-making, and nearly the whole of the remaining 70 per cent was for slate, etc., with only 200 tons coming in for board.

"Canada is credited with about 250 tons in the form of crude asbestos, 700 tons for unclassified uses, and of the remainder only 12½ per cent was for yarns, 55 per cent for slate, and 32½ per cent for board.

"The Russian supplies were entirely destined for slate and pipe manufacture, and the supplies of other countries were mainly for unclassified uses.

"While imports of raw asbestos totalled 15,000 tons, imports of manufactures only amounted to 261 tons, showing that French industry works up itself over 98 per cent of the asbestos products in use in France.

"The duty on asbestos products is in general high, and in each category there is the additional protection of a quota restriction; in addition to the rates of duty, there is a six per cent circulation tax, which although it is in effect an internal sales tax, is collected upon customs entry." (Commercial Intelligence Journal - Department of Trade and Commerce, Ottawa).

BELGIUM - Imports of asbestos, raw or in fibre, amounted to 17,635 metric tons valued at 37,807,000 fr. in 1936. Consignments were mainly from Canada (8,660 tons, 16,053,000 fr.), and France (4,565 tons, 12,717,000 fr.). The Union of South Africa is credited with 956 tons, 2,052,000 fr. compared with 3,791 tons, 9,927,000 fr. in 1935, and Russia with 1,819 tons, 3,301,000 fr. against 1,195 tons, 2,295,000 fr. in 1935. Shipments of 886 tons, 1,661,000 fr. are attributed to the United States, which in 1935 was credited with 2,551 tons, 5,161,000 fr. Imports from Portuguese East Africa amounted to 405 tons, 1,030,000 fr. Exports were valued at 1,831,000 fr., mainly to Switzerland and France.

The average rate of exchange in 1936 - one dollar = 29.6 Belgian francs. (Commercial Intelligence Journal - Department of Trade and Commerce, Ottawa).

SOUTHERN RHODESIA - "Southern Rhodesia asbestos is all of the chrysotile variety and occurs in various parts of the country although the two principal districts are in the Mashaba Hills in the Victoria district and in the Shabani mineral belt in the Beilingswe district. The Shabani mine produces high-grade asbestos fibre and contributes 75 per cent of the total production of the country. King and King A mines in the Mashaba Hills produce 15 per cent of the total output, but the product is mainly shingle fibre. The Nil Desperandum mine near Shabani produces 8 per cent of the total output, and the remaining 2 per cent is accounted for by several small mines in the Vukwe mountains, the Umvukwe range and near Filabusi. All the larger producers are under the control of Turner and Newall Ltd., who also control the bulk of the asbestos manufacturing industry of the United Kingdom. There is only a small local consumption of short fibre for asbestos-cement goods and the bulk of the output is exported, mainly through the Port of Beira in Portuguese territory. About 17 per cent of the total output consists of textile fibre. The output in 1936 amounted to 50,309 tons." (Imperial Institute - London).

UNITED STATES - "Domestic consumption of asbestos has regained the volume of pre-depression years, although the value is considerably lower. This probably does not indicate a lowering of prices, but a larger use of the lower-priced short fibres. Domestic production of asbestos (unmanufactured) amounted to 10,845 short tons in 1936 compared with 9,415 in 1935, an increase of 15.2 per cent. The quantity sold or used by producers in 1936 (11,012 tons valued at \$309,994) increased 25.5 per cent in quantity and 5.8 per cent in value over 1935. Most of that sold was short fibre chrysotile from Vermont. Amphibole asbestos was mined in Maryland, Montana and North Carolina.

"Imports of unmanufactured asbestos amounted to 243,602 tons valued at \$7,524,937, a gain of about 46 per cent in quantity and nearly 47 per cent in value compared with 1935. Exports were 3,744 tons valued at \$310,197 ... As in previous years domestic deposits furnished in 1936 only a small percentage of the requirements of raw asbestos. Small quantities of high grade chrysotile of spinning quality are obtained in Arizona, and short fibre chrysotile is produced in increasing tonnages in Vermont. Foreign supplies were obtained chiefly from Canada, South Africa and Russia. Of the 243,602 tons imported during 1936 Canada supplied 209,303." (Advance Summary Report - United States Bureau of Mines).

RUSSIA - "A number of new factories for manufacturing various asbestos products have been built in the U.S.S.R. The asbestos slate industry has been entirely reorganized and production of asbestos-cement pipes has been started. All the newly built and modernized plants now produce almost every known asbestos article including brake lining, etc.

"The growth of output in the Bazhenov District in the Urals may be gauged from the fact that already in 1930 it produced 54,000 tons of asbestos, two and a half times as much as in 1913, while in 1936 the output reached 125,117 tons. Second place is held by Eastern Siberia. Asbestos is also found in the north Caucasus, the South Urals, Kazakhstan, Central Asia and elsewhere. In 1936 exports of Ural asbestos amounted to 28,317 tons compared with 12,389 tons in 1913. The Soviet asbestos industry is taking measures to improve the quality of the asbestos produced; production in the Bazhenov mines has been completely mechanized and new concentration plants have been built." (American-Russian Chamber of Commerce).

JAPAN - "The Miyoshi Asbestos Mining Co. is now in a position to make the first shipment of 100 tons of asbestos from Manchuria to Japan, to be followed by another shipment of the same amount, according to the press (November, 1936). Operating at present 2 mining areas, the daily output of the company is about 7 tons." (United States Department of Commerce).

"It is of interest to note that shipments to Japan from Russia decreased during the year 1935 when compared with those of the two previous years. Manchukuo is a new source of supply, and although the length of fibre compares favourably with Canadian top grades, at the same time it is very harsh and suitable only for use in the manufacture of low grade products The demand in Japan for asbestos fibre has increased annually during the past five years, rising from 8,385 short tons in 1932 to 23,792 tons in 1935." (Commercial Intelligence Journal, Department of Trade and Commerce, Ottawa).

SWAZILAND - "There has been much activity recently in connection with the exploitation of chrysotile asbestos deposits on the Havelock and Kobolongo concessions in the north-west of the Territory. So far only a small output of 4 tons from development work has been recorded, but a mill, grading plant and aerial ropeway to Barberton are under construction. It is intended that the Havelock mine shall take the place of the Amianthus mine near Barberton, as the deposits there are practically exhausted." (Imperial Institute - London).

KENYA - According to a report issued by the Imperial Institute, London (The Mineral Position of the British Empire), a company has been formed to reopen old asbestos workings beside the railway at Mtito Andei, about midway between Nairobi and Mombasa.

UNITED KINGDOM

Imports of Asbestos, Raw and Fibre, and Manufactures, into the United Kingdom during the calendar years 1934, 1935 and 1936.

	1	9	3	4	1	9	3	5	1	9	3	6
	Long ton				Long ton				Long ton			
From -												
Union of South Africa ...	6,449		118,587		10,932		156,168		12,047		177,176	
Southern Rhodesia	11,264		238,350		11,910		274,312		16,679		382,274	
Other British countries .	6,605		104,763		7,273		90,975		9,395		125,065	
Foreign countries	2,264		35,883		1,944		37,267		2,199		36,206	
TOTAL	26,582		497,583		32,059		558,722		40,320		720,721	
	Cwt.		£		Cwt.		£		Cwt.		£	
Asbestos manufactures	373,888		135,797		403,509		137,917		368,581		137,253	

USES

The consumption of asbestos in industry is ever growing and its diversified employment steadily expanding throughout the world. Spinning fibre is utilized in the manufacture of theatre curtains, blankets, wick, clothing, conveyor belts for carrying hot materials, tape, rope, gaskets, clutch facings, brake-band linings and a variety of other manufactures.

Large quantities of the non-spinning fibre are consumed in the production of roofing materials and asbestos paper for pipe coverings, heaters, automobile mufflers, etc. Cement and asbestos compressed in sheets is utilized extensively as millboard, floor tile, corrugated sheeting, lumber, and as lining for electric switch boxes, garages, safes, etc. Non-corrosive, acid resisting pipes made of cement and asbestos are being employed extensively for water and gas mains and sewers. A standard European pipe consists of 80 per cent cement and 20 per cent asbestos. Large quantities of short fibres are consumed in the manufacture of plastic fireproof cements used for boiler, pipe and furnace lining. Short fibres are also used in fireproof paints and as a constituent of asphalt-roofing coatings. Asbestos-cement ducts are now being widely used in laboratory construction.

New uses for asbestos are referred to in recent issues of "Asbestos", Philadelphia, Pa., U.S.A., as follows:- "A British firm has evolved a building material incorporating asbestos which, it is claimed, is fireproof, dampproof and bombproof; it is now (1936) undergoing secret tests at the National Physical Laboratory, Teddington, England An asbestos silo is being constructed in the United States from asbestos-cement corrugated sheathing and is described by the manufacturers as permanent, airtight, frostproof, windproof and vermin proof.... During the past year or two the London Passenger Transport Board has been experimenting with asbestos shields for the reduction of subway noises and it is reported that a point has now been reached where it is possible to eliminate 80 per cent of all mechanical noise ...

"A new colored asbestos cloth has been designed for many household uses - aprons, oven cloths, gloves for use around the stove, kettle holders, hearth rugs, blankets and curtains.... A layer of cellophane is being applied under the asbestos next to the copper in a new electric wire construction used by a United States manufacturer; since the cellophane adds the needed dielectric strength to the composite material, this laminated wire construction permits the use of inexpensive short-fibre asbestos stock."

CANADIAN RESEARCH

At the National Research Laboratories, Ottawa, microscopic studies of asbestos fibre have been undertaken by Messrs. D. Wolchow and A. Van Winsen with a view of obtaining further information on the physical nature of fibre masses. A survey of the various uses of asbestos has also been commenced, the purpose of which is to further the uses of asbestos and to provide a means of closer co-operation between the producers and users of asbestos fibre. A comprehensive investigation of the effects of heat on asbestos fibre and asbestos textiles is also being conducted at the Ottawa Research Laboratories.

DIRECTORY OF FIRMS IN THE CANADIAN ASBESTOS MINING INDUSTRY, 1936.

<u>Name of Firm</u>	<u>Head Office Address</u>	<u>Location of Plant</u>
<u>QUEBEC -</u>		
Asbestos Corporation Ltd.	Canada Cement Bldg., Montreal	Thetford Mines, Black Lake, Coleraine.
Bell Asbestos Mines Ltd.	Thetford Mines	Thetford Tp.
Canadian Johns-Manville Co. Ltd.	Sun Life Bldg., Montreal	Asbestos.
Johnson's Company	Thetford Mines	Thetford Mines, Coleraine.
Keasbey and Mattison Co. (a)	Ambler, Pa., U.S.A.	Thetford Tp.
La Cie d'Amiante de Thetford, Ltd. (c)	Thetford Mines	Adstock
Nicolet Asbestos Mines Ltd.	820 Transportation Bldg., Montreal	Norbestos
Northern Asbestos Co. Ltd. (b)	Thetford Mines	Thetford Mines
Quebec Asbestos Corp. Ltd.	East Broughton Station	East Broughton Station
<u>ONTARIO -</u>		
Rahn Lake Mines Corp. Ltd.	8½ Main St. W., North Bay	Bannockburn Tp., Montrose Tp.

- (a) Discontinued business in 1936 - property now operated by Bell Asbestos Mines Ltd.
 (b) Discontinued business in November, 1936.
 (c) Carried on exploration only.

B. THE ASBESTOS PRODUCTS INDUSTRY, 1936.

Manufactures of asbestos products in Canada were valued at \$1,293,909 in 1936 compared with \$1,130,282 in 1935. The chief products in 1936 were: woven and moulded brake linings, \$392,309; boiler and pipe coverings, \$162,216; packings, \$113,821; clutch facings, \$91,147, and gaskets, \$21,216. Asbestos shingles, blackboards, paper, millboard, yarn, dryer felts, etc., were also manufactured but as there were only one or two producers in each case, the output figures cannot be shown separately.

A total of 13 plants reported in this industry in 1936; 6 were located in Quebec, 6 in Ontario, and 1 in Nova Scotia. Capital employed in manufacturing operations amounted to \$1,955,676, the number of workers was 372, and salaries and wages totalled \$376,574. Purchased materials for manufacturing cost \$622,530.

Detailed statistics for the asbestos manufacturing plants are recorded below for 1935 and 1936.

Table 12 - PRINCIPAL STATISTICS OF THE ASBESTOS PRODUCTS INDUSTRY, 1925 - 1936.

Years	Number of plants	Capital employed	Average number of em- ployees	Salaries and wages	Cost of fuel and elec- tricity at works	Cost of materials at works	Gross selling value of products at works
		\$		\$	\$	\$	\$
1925	12	2,624,260	256	282,382	62,640	783,063	1,344,097
1926	14	2,773,433	270	321,865	64,288	750,907	1,530,094
1927	13	2,860,945	300	358,959	73,495	797,975	1,663,300
1928	14	3,064,164	345	421,448	72,421	925,661	2,050,432
1929	12	2,949,712	351	359,433	80,902	1,348,460	2,286,638
1930	11	2,316,645	306	401,490	77,082	1,327,025	2,301,924
1931	13	1,112,141	240	302,638	57,339	729,771	1,308,183
1932	13	2,682,882	279	280,953	67,732	559,673	1,067,801
1933	11	1,777,975	222	208,580	55,031	331,062	757,626
1934	11	1,391,873	228	233,379	46,488	387,074	910,983
1935	13	1,703,301	327	323,854	66,793	518,994	1,130,282
1936	13	1,955,676	372	376,574	79,290	622,530	1,293,909

Table 13 - PRINCIPAL STATISTICS, BY PROVINCES, 1935 and 1936.

Provinces	Number of plants	Capital employed	Average number of em- ployees	Salaries and wages	Cost of fuel and elec- tricity at works	Cost of materials at works	Gross selling value of products at works
		\$		\$	\$	\$	\$
<u>1935</u>							
Quebec	7	1,259,101	244	216,741	54,313	318,303	641,819
Nova Scotia 1)		444,200	83	107,113	12,480	200,691	488,463
Ontario 5)							
CANADA ...	13	1,703,301	327	323,854	66,793	518,994	1,130,282
<u>1936</u>							
Quebec	6	1,440,159	271	257,264	64,588	449,272	853,334
Nova Scotia 1)		515,517	101	119,310	14,702	173,258	440,575
Ontario ... 6)							
CANADA ..	13	1,955,676	372	376,574	79,290	622,530	1,293,909

Table 14 - CAPITAL EMPLOYED, BY PROVINCES, 1935 and 1936.

Provinces	Present value of land, build- ings, fixtures, machinery and tools	Inventory value of materials on hand, finished products and stocks in process	Cash, bills and accounts receivable, prepaid ex- penses, etc.	TOTAL CAPITAL EMPLOYED
	\$	\$	\$	\$
<u>1935</u>				
Quebec	874,362	317,994	66,745	1,259,101
Other provinces.	251,660	125,765	66,775	444,200
CANADA	1,126,022	443,759	133,520	1,703,301
<u>1936</u>				
Quebec	925,653	263,769	250,737	1,440,159
Other provinces.	281,696	147,205	86,616	515,517
CANADA	1,207,349	410,974	337,353	1,955,676

Table 15 - EMPLOYEES, SALARIES AND WAGES, BY PROVINCES, 1935 and 1936.

Provinces	Average number of employees					Salaries	Wages	TOTAL SALARIES and WAGES
	On salaries		On wages		TOTAL			
	Male	Female	Male	Female				
	No.	No.	No.	No.				
<u>1935</u>						\$	\$	\$
Quebec	27	5	190	22	244	53,925	162,816	216,741
Other provinces.	15	9	59	...	83	54,778	52,335	107,113
CANADA	42	14	249	22	327	108,703	215,151	323,854
<u>1936</u>								
Quebec	35	6	210	22	271	68,034	189,230	257,264
Other provinces.	17	9	74	1	101	57,186	62,124	119,310
CANADA	52	15	284	23	372	125,220	251,354	376,574

Table 16 - WAGE-EARNERS, BY MONTHS, 1935 and 1936.
(On the 15th or nearest representative date)

Months	1 9 3 5			1 9 3 6		
	Male	Female	TOTAL	Male	Female	TOTAL
January	177	20	197	260	19	279
February	183	22	205	266	19	285
March	219	22	241	268	20	288
April	234	22	256	280	22	302
May	257	21	278	291	25	316
June	248	21	269	292	27	319
July	254	22	276	270	23	293
August	274	21	295	269	23	292
September	278	22	300	299	23	322
October	286	22	308	310	23	333
November	294	23	317	300	26	326
December	267	22	289	307	26	333
AVERAGE	249	22	271	284	23	307

Table 17 - HOURS OF LABOUR IN MONTH OF HIGHEST EMPLOYMENT, DISTRIBUTED ACCORDING TO
REGULAR HOURS WORKED PER WEEK, 1936. (Overtime not included).

Regular hours worked per week	Number of wage-earners
40 hours or less	26
41 - 43 hours	6
44 hours	88
45 - 47 hours	1
49 - 50 hours	26
55 hours	59
60 hours and over	155
TOTAL	361

Table 18 - FUEL AND ELECTRICITY USED, 1935 and 1936.

Kinds	Unit of measure	1 9 3 5		1 9 3 6	
		Quantity	Cost at works \$	Quantity	Cost at works \$
Anthracite coal	short ton	33	328	6	64
Bituminous coal - Canadian ..	short ton	5,452	32,383	3,557	21,233
Coke	short ton	...	...	6	60
Gasoline	Imp. gal.	2,780	650	156	39
Fuel oil	Imp. gal.	198,100	12,188	316,147	20,813
Kerosene	Imp. gal.	...	...	225	38
Wood	cord	10	65	...	...
Gas - Manufactured	M cu.ft.	200	177	286	278
Electricity purchased	K.W.H.	1,640,578	21,002	2,293,636	36,765
TOTAL .....	\$	...	66,793	...	79,290

Table 19 - POWER EQUIPMENT, 1935 and 1936.

	1	9	3	5		1	9	3	6
	Number of					Number of			
	units					units			
	Total rated					Total rated			
	horse power					horse power			
Electric Motors -									
Ordinarily in use	169			2,301		286			2,825
In reserve or idle	5			103		5			103
Total	174			2,404		291			2,928
Boilers -									
Ordinarily in use	6			608		8			918
In reserve or idle	1			200		1			200
Total	7			808		9			1,118

Table 20 - MATERIALS USED IN THE MANUFACTURE OF ASBESTOS PRODUCTS, 1935 and 1936.

		1	9	3	5		1	9	3	6
	Unit of	Quantity					Quantity			
	measure	Cost at					Cost at			
		works					works			
		\$					\$			
Asbestos fibre	lb.	5,321,075			75,147	9,084,553			149,649	
Asbestos cloth and strips	lb.	47,121			19,233	35,096			14,207	
Asbestos paper, corrugated or plain.	lb.	350,623			14,940	147,136			6,947	
Asbestos yarn	lb.	347,039			87,513	216,992			58,214	
Portland cement	lb.	463,803			3,754	467,185			2,634	
Cotton cloth, yarn and waste	xx	...			37,647	...			51,893	
Rubber	lb.	47,939			7,639	36,071			3,152	
Containers, boxes, etc.	xx	...			41,168	...			69,842	
All other materials	xx	...			231,953	...			265,992	
TOTAL .....	\$	...			518,994	...			622,530	

Table 21 - PRODUCTS MANUFACTURED IN THE ASBESTOS PRODUCTS INDUSTRY, 1935 and 1936.

		1	9	3	5		1	9	3	6
	Unit	Gross					Gross			
	of	selling					selling			
	measure	value					value			
		at works					at works			
		\$					\$			
Asbestos brake linings - Moulded (ft.)		2,927,962			439,904	1,603,835			252,417	
- Woven (ft.)						954,357			139,892	
Asbestos boiler and pipe coverings	ft.	1,477,121			136,157	1,757,708			162,216	
Asbestos clutch facings	no.	416,311			78,131	560,871			91,147	
Asbestos gaskets	lb.	46,289			24,501	33,655			21,216	
Asbestos packings	lb.	229,724			107,824	257,780			113,821	
Other asbestos products (1)	xx	...			172,647	...			255,872	
All other products (2)	xx	...			171,118	...			257,328	
TOTAL .....	\$	...			1,130,282	...			1,293,909	

(1) Includes asbestos blackboards, millboard, paper, shingles, yarn, cloth, cements, dryer felts, etc.

(2) Includes packings of rubber, duck and flax; brass rivets, rock wool and eel grass insulation.



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Table 22 - PRODUCTION OF ASBESTOS BRAKE LININGS, PIPE COVERINGS AND PACKINGS,
1925 - 1936.

Years	Asbestos brake linings	Asbestos boiler and pipe cover- ings	Asbestos packings
	\$	\$	\$
1925	272,217	179,717	187,916
1926	279,783	232,963	184,515
1927	326,072	277,339	204,376
1928	439,431	376,399	218,904
1929	555,739	406,395	234,595
1930	459,616	283,312	197,601
1931	321,664	178,611	144,983
1932	309,942	83,964	87,682
1933	316,938	65,725	91,597
1934	458,147	99,948	78,860
1935	439,904	136,917	107,824
1936	392,309	162,216	113,821

DIRECTORY OF FIRMS IN THE ASBESTOS PRODUCTS INDUSTRY, 1936.

Names of firms and
location of plants

Main Products, 1936.

Guildfords Limited,
June St., Halifax, N.S.
Asbestonos Corporation Limited,
St. Lambert, Montreal, P.Q.
Asten-Hill Ltd., Valleyfield, P.Q.
Modern School Furniture Ltd.,
6450 Hutchison St., Montreal, P.Q.
Atlas Asbestos Company Limited,
110 McGill St., Montreal, P.Q.
Canadian Johns-Manville Co. Ltd.,
Asbestos, P.Q.

Philip Carey Company Limited, The
Lennoxville, P.Q.
Realbestos Corporation Limited,
Disraeli, P.Q.
Beldam's Asbestos Packing & General
Mfg. Co. Ltd., 37 Britain St.,
Toronto, Ont.
Canadian Raybestos Co. Ltd.
280 Perry St., Peterboro, Ont.
Eureka Mineral Wool & Asbestos Co.,
102 Adelaide St. W., Toronto, Ont.
Garlock Packing Company,
200 Queen St. N., Hamilton, Ont.
Hamilton Engine & Packing Co.,
56 Alanson St., Hamilton, Ont.
Wild, Arthur C.,
38 Hiron Ave., Toronto, Ont.

Asbestos boiler and pipe coverings, packings,
gaskets, and cements; oil grass insulation.
Asbestos brake linings, clutch facings, pack-
ings and brake blocks.
Asbestos dryer felts.
Asbestos blackboards.

Asbestos gaskets and cloth.

Asbestos brake linings, boiler and pipe cover-
ing, millboard, gaskets, clutch facings, pack-
ings, paper, shingles, sheets, refractory
cements, brake block sheets, yarn, etc., and
mineral wool.
Asbestos boiler and pipe covering, paper,
millboard.
Asbestos brake linings.

Asbestos gaskets.

Asbestos brake linings, clutch facings,
packings and gaskets; brass rivets.
Asbestos boiler and pipe covering and
gaskets.
Asbestos packings and gaskets; rubber, duck
and flax packings.
Asbestos boiler and pipe covering and
gaskets.
Asbestos boiler and pipe covering, corrugated
paper.