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JM-1202

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II. DESCRIPTION OF DEPOSITS

Asbestos deposits of commercial value are widely distributed throughout the world. The most important are in Canada, Southern Rhodesia, Union of South Africa, and Soviet Russia, but there are smaller deposits in many other countries. The locations of known commercial deposits are indicated in figure 1, prepared by the Department of Geography, University of Maryland, in cooperation with the Bureau of Mines.

Rhodesia Rhodesia

Vermont

The Vermont chrysotile asbestos deposits are regarded as a southward extension of the well-known Canadian belt. They differ in character, however, in that most of the asbestos so far obtained is of the slip-fiber type. Some of the slip fiber is quite long but is not well-adapted for spinning and textile use. Minor quantities of crossfiber occur in veins that are rarely more than 3/4 inch wide. Vermont is, accordingly, a predominantly short-fiber-producing area. The output of 3E, and groups 4 and 7 (Canadian classification) is small. Production of group 5 is large and group 6 largest of all. The fiber is used for asbestos-cement products, asbestos paper, molded brake linings, and pipe and boiler covering and as a paint constituent. The sole producer is Vermont Asbestos Mines, subsidiary of The Ruberoid Co. A new, modern mill has recently been built.

Although the Vermont deposits have great commercial value, they are less important from a strategic standpoint, because there is a very small output of the spinning-grade fibers that are of greatest strategic importance at this time. Furthermore, the fibers, like the Canadian, cannot be classed as low-iron.

Arizona

Chrysotile asbestos occurs in Arizona in numerous localities over an area 60 miles long and 25 miles wide in the Salt River and Cherry Creek Basins, Gila County. The region is more easily accessible than in earlier years. The nearest railway station is Globe, which is 40 or more miles from most of the deposits. Hard-surfaced roads from Globe reach the vicinity of the deposits, and good access roads connect the main highways with most of the mines. Access to some of the undeveloped claims is difficult. Arizona asbestos differs in origin and occurrence from the deposits of Canada, Rhodesia, and Soviet Russia. Here the fibers occur in serpentine associated with dolomitic limestone intruded by diabase. The veins are generally confined to more or less horizontal zones several inches in thickness. They may become lean or peter out within relatively short distances, or may become richer.

Some of the Arizona fiber is soft, flexible, and of excellent quality, but other occurrences are harsh, or semi-harsh. The scattered character of the fiber veins, the high cost of mining, the presence in places of harsh fiber, and long distance from markets have tended to discourage production. Table 1 shows production by years. The urgent demands of World War I failed to stimulate production of more than a few hundred tons in any one year.

TABLE 1. Sales of asbestos in Arizona, 1914-45

Year	Short tons	Year	Short tons
1914	50	1931	184
1915-18 (inc.)	1/1,900	1932-34 (inc.)	1/34
1919	423	1935	-
1920	1,800	1936	464
1921	413	1937	648
1922	93	1938	942
1923	4	1939	904
1924	1/132	1940	1,197
1925	1/80	1941	2,574
1926	100	1942	1,742
1927	1/1,250	1943	1,459
1928	1/1,500	1944	696
1929	934	1945	-
1930	683		

Note.- Data for 1914-44 compiled by Arizona Bureau of Mines. Figures for 1945 and following years are confidential but are of approximately the same range as in the early 1940's.

1/ Estimated.

discussed elsewhere, low-iron chrysotile has great strategic value for electric insulation products, such as electrical tapes and coverings. The C. & G. grades of Rhodesian chrysotile are virtually our sole source of supply of these highly important fibers. The Arizona fiber, however, is low in iron, and the properties are eminently suitable for electrical insulation uses; the Arizona deposits are, in fact, the only low-iron chrysotile occurrences known at present on the American continent.

During the early stages of World War II, it seemed desirable to stimulate production in Arizona as a safeguard against shortage of supply from Rhodesia. To determine the possibilities of the Arizona area, the Bureau of Mines undertook an exploratory project in 1943, the results of which have been published. ^{1/} Mining was conducted in five locations that were regarded as most favorable. "Commercial ore" that could presumably be mined at a profit was found in two of these locations but the exploratory work failed to indicate extensive reserves. However, mining operations extending from one of these exploratory tunnels has uncovered a large area of fiber-bearing rock of much higher quality than that which appeared in the preliminary tunnel. In three of the locations "commercial ore" was not found. In general, the occurrences were found to be erratic, noncontinuous, and limited in area by rather exacting geologic conditions, such as intersecting fissure and fault zones in proximity to diabase sills and dikes.

Another handicap is lack of a profitable market for the shorter grades, the disposal of which is discouraged by the high cost of transportation. Because of the uncertainty of the occurrences and the high cost of mining, only a moderate increase in production is to be expected even with the stimulus of exceptionally high prices. Weaver ^{2/}, who has made a first-hand study of the region, hopes that Arizona can produce up to 1,000 tons a year of grades 1 and 2 that will satisfy the stockpile specification for low-iron chrysotile. Financial assistance in some form may, however, be required before such an objective can be attained.

^{1/} Stewart, Lincoln A., and Haury, P. S., Arizona Asbestos Deposits, Gila County, Ariz.: Bureau of Mines Rept. of Investigations 4100, 1947, 28 pp.

^{2/} Weaver, Jesse H.; Raybestos-Manhattan Inc., personal communication; 1951.

PLANNED NORTH PURCHASE PROGRAM
Metals and Minerals Branch
1 JAN 1944

metals + Ores Gen

General etc: All the figures below are estimates based on known production potentials of the different countries under present economic and price conditions and under presently authorized purchase recommendations. They are susceptible to a considerable reduction but only to a slight increase by changes in these factors. Prices subject where variations are noted are those presently paid f.o.b. point where title passes usually a foreign port.

Symbols and Abbreviations: O = Ores contained in ores or concentrates.
 F = Cost f.o.b. point where title passes usually foreign port or U.S. border point, actual for metal purchases, actual plus estimated treatment charge for ores and concentrates. P = Price subject to wide variation according to quality delivered. Car = Carats (200 milligrams). Fl = Flask (76 lb). LT = Long ton (2240 lb). MT = Metric ton (2204.6 lb). ST = Short ton (2000 lb).

	Unit of Quantity	Estimated Purchases For U.S. Account (Public and Private)		Estimated Purchase By U.S. Government Agencies	
		Quantity	Cost in \$1,000	Quantity	Cost in \$1,000
ASCOIA					
Beryllium O or C	ST	25	2.5	25	2.5
Mica Black (Mss.)		(See unassigned purchases at end)			
ARGENTINA			10,028		8,778
Beryllium O or C	ST	100	10	100	10
Cadmium O or C	1,000 Lbs	28	28	28	28
Columbium O or C	ST	4	2	4	2
Fluorspar	1,000 MT	2	36	2	36
Mica Black (Mss.)	1,000 Lb	1,000	1,250	0	0
Scrap Metals	1,000 LT	25	500	25	500
Tantalum O or C	ST	3	4	3	4
Ungsten O or C	1,000 Lbs	5,000	4,280	5,000	4,280
Zinc O or C	1,000 STS	28.8	3,938 R	28.8	3,938 R
AUSTRALIA (Incl. Tasmania)			9,251.8		7,644.8
Beryllium O or C	ST	250	25	250	25
Cadmium	1,000 Lb	120 2/	50	120 2/	50
Lead O or C	1,000 STS	29	2,175 R	29	2,175 R
Covindium	Os.T	100	9.8	100	9.8
Rutile	ST	7,000	910	0	0
Scrap Metals	1,000 LT	20	400	20	400
Tantalum O or C	ST	80	128	80	128
Zinc	1,000 STS	89	3,647 R	89	3,647 R
BELGIAN CONGO			28,924.5		28,970.5
Cadmium	1,000 Lb	80	55.5	80	55.5
Cobalt	1,000 Lbs	4,220	3,884	0	0
Columbium O or C	ST	200	128	200	128
Copper	1,000 STS	4	639 R	4	639 R
Manganese O or C	1,000 LT	18	288	18	288
Tantalum O or C	ST	170	227	170	227
Tantalum Slag	ST	1,880	210	1,880	210
Tin	1,000 Lbs	19.8	22,880	19.8	22,880
Zinc O or C	1,000 STS	14	1,618 R	14	1,618 R

Foreign Economic Administration
 Metals and Minerals Branch
 Analysis and Reports Section
 December 1, 1943.

- 1/ About 2000 STS of Mt. Is. will be stockpiled abroad.
 2/ Purchase contingent to processing of Mt. Is. dump which is somewhat doubtful

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Country	Commodity	Quantity	Unit	Value	Weight	Volume
CHINA						
	Aluminum	1,000	ST	24.0	6,370	
	Asbestos (Strategic)	1,000	ST	24.0	6,370	
	Barite	1,000	ST	30	25	
	Bismuth O or O ₂	1,000	ST	11	64	
	Copper	1,000	ST	26.7	1,820	
	Corundum	1,000	LT	1,000	225	
	Iron Ore	1,000	LT	1,000	12	
	Lead	1,000	ST	1,144		
	Mercury	1,000	LT	18,600		
	Black Block (M)	1,000	LT	40		
	Black Block (Split)	1,000	LT	40		
	Fluorite	1,000	Lbs	191,000		
	Graphite	1,000	LT	1,000		
	Graphite (Strategic)	1,000	LT	1,000		
CHILE						
	Asbestos O or O ₂	1,000	Lbs	30		
	Copper	1,000	ST	26.7	1,820	
	Gold O or O ₂	1,000	ST	35	2,300	
	Iron Ore	1,000	LT	600	2,750	
	Lead	1,000	ST	1	60	
	Manganese O or O ₂	1,000	LT	40	70	
	Mercury	1,000	LT	2,100		
	Polyethylene O or O ₂	1,000	Lbs	1,200	400	
	Quartz	1,000	LT	10	200	
CHINA						
	Aluminum	1,000	LT	16,250		
	Asbestos	1,000	LT	5,500	6,770	
	Asbestos O or O ₂	1,000	Lbs	8,000	8,820	
COLOMBIA						
	Aluminum	1,000	LT	2,400		
	Asbestos	1,000	LT	47,500	1,300	
	Asbestos O or O ₂	1,000	LT	60	500	
	Asbestos O or O ₂	1,000	LT	27	300	
	Asbestos O or O ₂	1,000	LT	22,212		
	Asbestos O or O ₂	1,000	ST	12	125	
	Asbestos O or O ₂	1,000	LT	300	10	
	Asbestos O or O ₂	1,000	ST	4,000	1,525	
	Asbestos O or O ₂	1,000	LT	300	8,310	
	Asbestos O or O ₂	1,000	LT	30	40	

9/1/54 that 1,000 ST will be absorbed abroad.
 Assuming completion of Strategic contract.
 1/1/55 (assuming 1,000 ST will be absorbed abroad.)
 1/1/55 (assuming 1,000 ST will be absorbed abroad.)

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