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# Minerals Yearbook

## 1969

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METALS, MINERALS, AND FUELS



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# Asbestos

By Charles L. Readling

U.S. production (shipments) of asbestos increased 4 percent to establish a record high in output, surpassing the previous high set in 1966. However, overall demand for asbestos in 1969 declined slightly primarily as a result of tight money conditions, and the resulting high interest rates restricted the availability of mortgage funds for home building. Imports decreased 6 percent from those of 1968.

Canada, the largest asbestos producer,

increased its output (shipment) 4 percent over that of 1968.

**Legislation and Government Programs.—**The Tax Reform Act of 1969, signed by the President on December 30, 1969, reduced domestic asbestos depletion rates from 25 percent to 20 percent effective with taxable years beginning after October 9, 1969. The General Services Administration (GSA) in 1969 disposed of 2,294 short tons of amosite, 2,663 tons of chrysotile, and 336 tons of chrysotile from Government inventories.

## DOMESTIC PRODUCTION

Asbestos production in the United States in 1969 increased 4 percent in volume and 2 percent in value. Production was from 46 States; 80 percent from California,

with Vermont second in rank, followed by Arizona and North Carolina.

Mineral Industry Bureau of Mines, Mineral Statistics.

Table 1.—Salient asbestos statistics

|                                                           | 1965      | 1966      | 1967      | 1968      | 1969    |
|-----------------------------------------------------------|-----------|-----------|-----------|-----------|---------|
| <b>Total Shipment</b>                                     |           |           |           |           |         |
| Production (value)..... short tons                        | 119,273   | 127,700   | 125,190   | 129,090   | 135,930 |
| Imports..... thousands                                    | 810,162   | 811,100   | 811,102   | 810,094   | 810,644 |
| <b>Exports and reexports (manufactured)</b>               |           |           |           |           |         |
| Value..... short tons                                     | 63,124    | 67,091    | 67,718    | 61,294    | 64,173  |
| Exports and reexports of asbestos products..... thousands | 63,294    | 65,707    | 66,023    | 64,679    | 64,979  |
| <b>Imports and reimports of asbestos products</b>         |           |           |           |           |         |
| Value..... thousands                                      | 819,180   | 825,400   | 825,767   | 824,327   | 825,143 |
| <b>Imports for consumption (manufactured)</b>             |           |           |           |           |         |
| Value..... short tons                                     | 719,650   | 725,400   | 725,112   | 725,094   | 694,554 |
| Value..... thousands                                      | 870,687   | 875,400   | 875,767   | 875,931   | 876,123 |
| <b>Domestic consumption</b>                               |           |           |           |           |         |
| Value, ton, apparent..... short tons                      | 704,704   | 725,400   | 725,767   | 725,931   | 744,221 |
| <b>Stock Production</b>                                   |           |           |           |           |         |
| Value, ton, apparent..... short tons                      | 2,101,994 | 2,101,994 | 2,101,994 | 2,101,994 | N/A     |

N/A Not available.

\* Measured by quantity produced, plus imports, minus exports.

Table 2.—Stockpile objective and Government inventories as of December 31, 1969

| Mineral       | Stockpile objective | Inventories |              |                        | Total  |
|---------------|---------------------|-------------|--------------|------------------------|--------|
|               |                     | Natural     | Manufactured | Defense Production Act |        |
| Asbestos      | 60,000              | 11,701      | 1,000        | 0                      | 12,701 |
| Chrysotile    | 13,700              | 9,224       | 4,476        | 0                      | 13,700 |
| Amosite       | 0                   | 152         | 2,430        | 0                      | 2,582  |
| Anthophyllite | 0                   | 1,170       | 64,084       | 0                      | 65,254 |

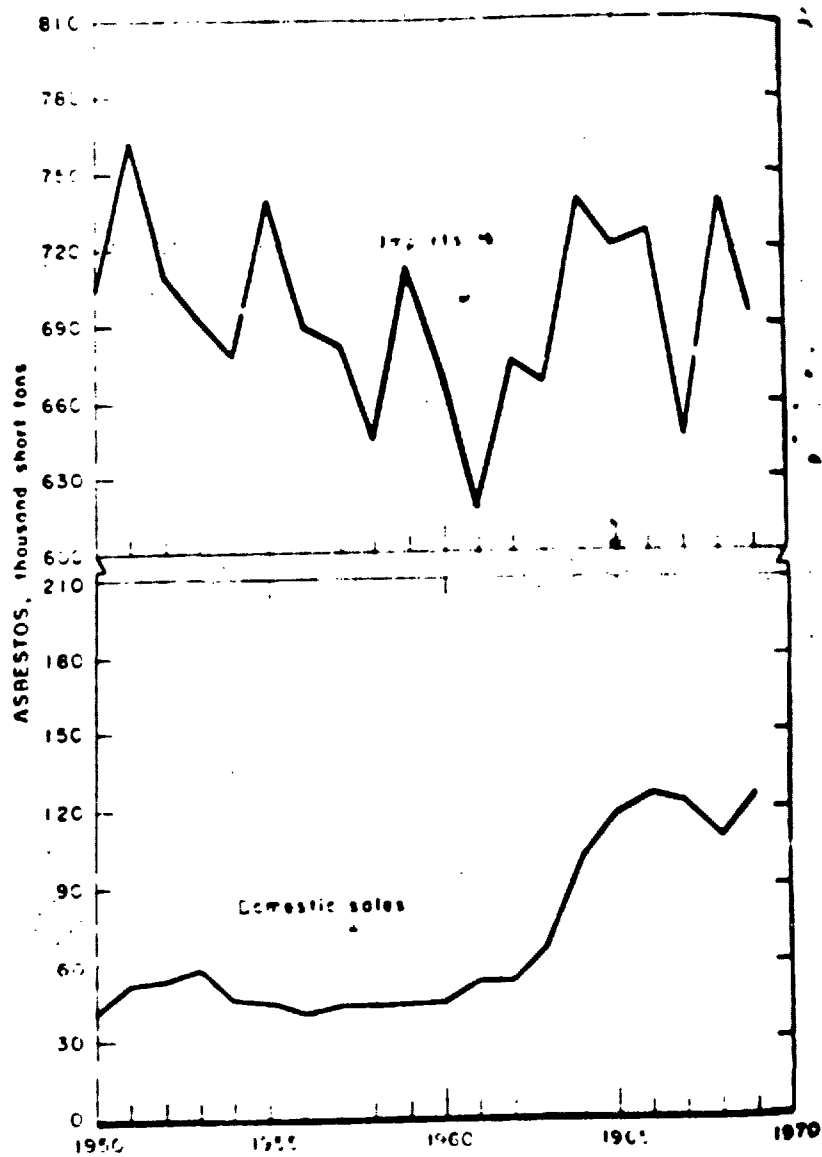
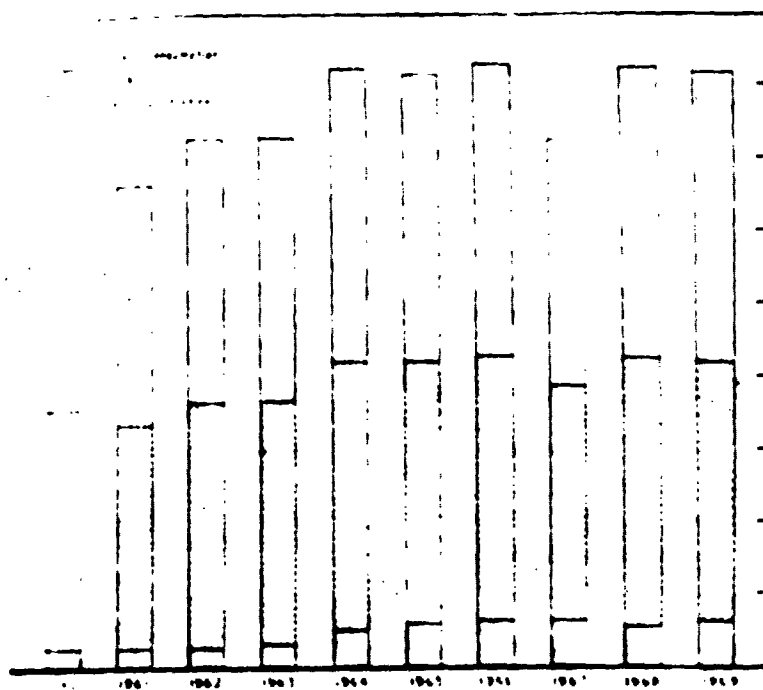


Figure 1—United States production (sales) and imports of asbestos.



**Figure 2.—Domestic supply and consumption of asbestos**

in California increased only  
slightly from 1934 to 1935  
after decreased 512,000 bush  
from its output in 1934  
Productions in Arizona in  
the present South Carolina

prices of a domestic trend to gain 10 per cent over 1966 production. Nearly all the U.S. production was short film, which supplied 75 per cent of domestic requirements. Television production in the U.S. are listed in the following table.

[illegible]

## CONSUMPTION AND USES

Direct and indirect uses for asbestos number about 50, but most of the consumption is in a few applications. An estimated 70 percent of the world's production of all types of asbestos was used in asbestos-cement building materials and asbestos-cement pipes. The second largest use was in the floor tile industry, with U.S. consumption estimated at about 200,000 tons. Other significant uses were in the manufacture of brake linings, gaskets, clutch facings, playties, roofing compounds, electrical and heat

insulations, and textiles.

A slow decline in the building and construction industries during 1969 was reflected in a 4 percent drop in apparent consumption from the 1968 level. Chrysotile accounted for 95 percent of the total amount consumed in the United States in 1969. Amphibole accounted for slightly less than 2 percent, and crocidolite accounted for less than 1 percent.

Minerals Yearbook (London), No. 22, 1969, p. 10.

PRICES<sup>1</sup>

Effective January 1, 1969, quoted prices for Vermont, Quebec, and British Columbia asbestos were increased from 4 percent to 12 percent across grades. The increases reportedly were needed to offset higher costs of materials, labor, and equipment. Prices were not published for California chrysotile and North Carolina anthophyllite asbestos.

Quotations for Canadian (Quebec) chrysotile, L.L. mine, were as follows, as of January 1, 1969:

| Grade       | Description    | Per short ton |
|-------------|----------------|---------------|
| Group No. 1 | Grade          | Can\$1,400    |
| Group No. 2 | Spinning fiber | 800           |
| Group No. 3 | Spinning fiber | 300-400       |
| Group No. 4 | Spinning fiber | 210-300       |
| Group No. 5 | Spinning fiber | 120-180       |
| Group No. 6 | Spinning fiber | 110           |
| Group No. 7 | Spinning fiber | 80-90         |

Prices for British Columbia, Canada chrysotile asbestos, L.L. Vancouver, were as follows, as of January 1, 1969:

| Grade | Description    | Per short ton |
|-------|----------------|---------------|
| AAA   | Spinning fiber | Can\$1,400    |
| AA    | Spinning fiber | 800           |
| A     | Spinning fiber | 300-400       |
| AL    | Spinning fiber | 210-300       |
| AR    | Spinning fiber | 120-180       |
| CT    | Spinning fiber | 110           |
| AS    | Spinning fiber | 80-90         |
| CT    | Spinning fiber | 110           |
| AS    | Spinning fiber | 110           |
| CT    | Spinning fiber | 110           |
| AY    | Spinning fiber | 110           |

Prices for Arizona chrysotile asbestos have remained unchanged since August 1, 1968. Quotations for Idaho were as follows:

| Grade       | Description    | Per short ton |
|-------------|----------------|---------------|
| Group No. 1 | Grade          | \$1,400-1,500 |
| Group No. 2 | Spinning fiber | 800           |
| AAA         | Spinning fiber | 300-400       |
| Group No. 3 | Spinning fiber | 210-300       |
| Group No. 4 | Spinning fiber | 120-180       |
| Group No. 5 | Spinning fiber | 110           |
| Group No. 6 | Spinning fiber | 80-90         |
| Group No. 7 | Spinning fiber | 80-90         |

As of January 1, 1969, Vermont chrysotile asbestos, L.L. Morrisville, was priced as follows:

| Grade       | Description    | Per short ton |
|-------------|----------------|---------------|
| Group No. 1 | Spinning fiber | \$1,400-1,500 |
| Group No. 2 | Spinning fiber | 800           |
| Group No. 3 | Spinning fiber | 300-400       |
| Group No. 4 | Spinning fiber | 210-300       |
| Group No. 5 | Spinning fiber | 120-180       |
| Group No. 6 | Spinning fiber | 110           |
| Group No. 7 | Spinning fiber | 80-90         |

Market quotations were unavailable for African asbestos because sales were negotiated privately. The Cape Asbestos group produces nine grades of crocidolite (blue) asbestos and 17 grades of amosite. The following values were calculated from U.S. Department of Commerce import data:

|            | Per short ton |      |
|------------|---------------|------|
|            | 1964          | 1969 |
| Amosite    |               |      |
| Chrysotile | 100           | 100  |
| Amosite    | 100           | 100  |
| Chrysotile | 100           | 100  |
| Amosite    | 100           | 100  |
| Chrysotile | 100           | 100  |

<sup>1</sup>Values in U.S. dollars, December 1969, p. 24.

## FOREIGN TRADE

of manufactured asbestos increased 15 percent in 1969. Shipments were from the countries Canada, percent of the total value; percent and Venezuela. United Kingdom each percent. Canada received percent of asbestos products. United Kingdom accounted percent and Mexico accounted percent. Though imports for consumption in 1969 declined at

most 6 percent in quantity from the 1968 level, value increased almost \$5.5 million. Imports of amosite from the Republic of South Africa in 1969 were almost 29 percent less than the previous year, crocidolite from the same source declined 24 percent. Imports of low iron spinning length chrysotile from British Columbia increased to 6,192 tons from 6,066 tons in 1968 and imports of all grades from this source increased from 20,915 tons to 21,111 tons during the same period.

Table 1.—U.S. exports and reimports of asbestos and asbestos products

| Product                                              | 1968     |                   | 1969     |                   |
|------------------------------------------------------|----------|-------------------|----------|-------------------|
|                                                      | Quantity | Value (thousands) | Quantity | Value (thousands) |
| <b>EXPORTS</b>                                       |          |                   |          |                   |
| Asbestos, all grades, short tons                     | 872      | 8198              | 1,439    | 9314              |
| Chrysotile, short tons                               | 17,644   | 2,368             | 14,407   | 2,274             |
| Crocidolite, short tons                              | 23,279   | 2,176             | 14,494   | 2,068             |
| Amosite, short tons                                  | 41,817   | 4,677             | 84,522   | 4,624             |
| Asbestos, all grades, including millings, short tons | 2,433    | 6,895             | 2,319    | 6,917             |
| Chrysotile, including millings, short tons           | 4,374    | 5,724             | 6,619    | 4,804             |
| Crocidolite, including millings, short tons          | 2,434    | 5,819             | 5,749    | 2,966             |
| Amosite, including millings, short tons              | 2,680    | 1,402             | 4,972    | 2,429             |
| Asbestos, all grades, including millings, number     | 10,811   | 1,944             | 1,974    | 1,900             |
| Chrysotile, including millings, number               | 5,798    | 1,024             | 5,149    | 1,179             |
| Crocidolite, including millings, number              | NA       | 8,188             | NA       | 6,678             |
| Amosite, including millings, number                  | NA       | NA                | NA       | NA                |
| Total                                                |          | 24,864            |          | 29,154            |
| <b>REIMPORTS</b>                                     |          |                   |          |                   |
| Asbestos, all grades, short tons                     | 19       | 2                 | 1,451    | 122               |
| Chrysotile, short tons                               | 19       | 2                 | 1,451    | 122               |
| Crocidolite, short tons                              | 3        | 1                 | 2        | 4                 |
| Amosite, short tons                                  | 17       | 2                 | 2        | 4                 |
| Asbestos, all grades, including millings, short tons | 47       | 8                 | 72       | 14                |
| Chrysotile, including millings, short tons           | 42       | 8                 | 72       | 14                |
| Crocidolite, including millings, short tons          | NA       | 0                 | NA       | 0                 |
| Amosite, including millings, short tons              | NA       | 0                 | NA       | 0                 |
| Total                                                |          | 27                |          | 24                |

Asbestos received from Southern Africa having been embargoed since January 5, 1967. NA means not available through this

probably were entered from bonded warehouses or shipped from stocks in other countries which were exported from South Africa prior to December 1966.

Table 4—U.S. imports for consumption of asbestos (manufactured), by class and country

| Year and country          | 1948       |                              | Textile class |                              | All other  |                              | Total |
|---------------------------|------------|------------------------------|---------------|------------------------------|------------|------------------------------|-------|
|                           | Short tons | Value (thousands of dollars) | Short tons    | Value (thousands of dollars) | Short tons | Value (thousands of dollars) |       |
| 1948                      |            |                              |               |                              |            |                              |       |
| Bolivia                   | 1          | 82                           |               |                              | 0          | 82                           |       |
| Canada                    | 47         | 15,810                       | 47            | 15,810                       | 0          | 0                            |       |
| Cyprus                    | 16         | 3                            |               |                              |            |                              |       |
| Finland                   | 670        | 22                           | 670           | 22                           | 0          | 0                            |       |
| France                    | 2          | 1                            |               |                              |            |                              |       |
| Italy                     | 160        | 27                           |               |                              |            |                              |       |
| Mozambique                | 16         | 14                           |               |                              |            |                              |       |
| Portugal                  | 16         | 14                           |               |                              |            |                              |       |
| Rhodesia, Southern        | 16         | 14                           |               |                              |            |                              |       |
| South Africa, Republic of | 37,240     | 4,774                        | 37,240        | 4,774                        | 0          | 0                            |       |
| Southern Africa, n.e.c.   | 16         | 14                           |               |                              |            |                              |       |
| Yugoslavia                | 1          | 1,453                        | 1             | 1,453                        | 0          | 0                            |       |
| Total                     | 39,214     | 4,942                        | 39,214        | 4,942                        | 0          | 0                            |       |
| 1949                      |            |                              |               |                              |            |                              |       |
| Angola                    | 1          | 82                           |               |                              | 0          | 82                           |       |
| Canada                    | 2,233      | 15,974                       | 2,233         | 15,974                       | 0          | 0                            |       |
| Finland                   | 1,877      | 22                           | 1,877         | 22                           | 0          | 0                            |       |
| France                    | 30         | 1                            |               |                              |            |                              |       |
| Italy                     | 1          | 1                            |               |                              |            |                              |       |
| Mozambique                | 16         | 14                           |               |                              |            |                              |       |
| Portugal                  | 16         | 14                           |               |                              |            |                              |       |
| Rhodesia, Southern        | 16         | 14                           |               |                              |            |                              |       |
| South Africa, Republic of | 28,026     | 4,774                        | 28,026        | 4,774                        | 0          | 0                            |       |
| Southern Africa, n.e.c.   | 245        | 14                           | 245           | 14                           | 0          | 0                            |       |
| United Kingdom            | 81         | 1                            | 81            | 1                            | 0          | 0                            |       |
| Yugoslavia                | 200        | 1,453                        | 200           | 1,453                        | 0          | 0                            |       |
| Total                     | 32,814     | 4,800                        | 32,814        | 4,800                        | 0          | 0                            |       |

<sup>1</sup> Less than 1/2 unit.

Table 5—U.S. imports for consumption of asbestos from specified countries, by grade

| Grade             | 1948           |              |                          | 1949           |               |
|-------------------|----------------|--------------|--------------------------|----------------|---------------|
|                   | Canada         | Rhodesia     | Republic of South Africa | Canada         | Rhodesia      |
| Chrysotile        | 87             | 63           | 2,827                    | 2,851          | 2,851         |
| Spinning class    | 15,810         | 2,734        | 1,233                    | 15,974         | 1,233         |
| All other         | 670,004        | 1,453        | 1,453                    | 670,004        | 1,453         |
| Chrysotile - like | 16             | 14           | 14                       | 16             | 14            |
| Amosite           | 16             | 14           | 14                       | 16             | 14            |
| <b>Total</b>      | <b>690,943</b> | <b>2,819</b> | <b>50,647</b>            | <b>690,943</b> | <b>50,647</b> |

## WORLD REVIEW

**Australia.**—Australian asbestos output has been less than 1,000 tons annually since the creation of chrysotile production at Wittenoom, Western Australia at the end of 1946. However, Pacific Asbestos Ltd., plans a mining and milling operation at the company's

property near Barraba, New South Wales, to produce 15,000 tons of short ton chrysotile annually. Mining was begun in 1947.

<sup>1</sup> Industrial Minerals No. 20, January 1948.

**Table 6.-World production of asbestos, by country**

| Country                                  | 1961      | 1962      | 1963      |
|------------------------------------------|-----------|-----------|-----------|
| <b>North America:</b>                    |           |           |           |
| Canada (excl.)                           | 1,452,104 | 1,565,707 | 1,678,474 |
| United States (incl. of and by products) | 123,152   | 12,000    | 123,000   |
| <b>South America:</b>                    |           |           |           |
| Argentina                                | 500       | 500       | NA        |
| Brazil                                   | 2,000     | 4,000     | NA        |
| <b>Europe:</b>                           |           |           |           |
| France                                   | 11,000    | 11,000    | 11,000    |
| Germany                                  | 11,000    | 11,000    | 11,000    |
| Italy                                    | 11,000    | 11,000    | 11,000    |
| U.S.S.R.                                 | 11,000    | 11,000    | 11,000    |
| Yugoslavia                               | 11,000    | 11,000    | 11,000    |
| <b>Asia:</b>                             |           |           |           |
| Japan                                    | 11,000    | 11,000    | 11,000    |
| South Korea                              | 11,000    | 11,000    | 11,000    |
| South Africa, Republic of                | 11,000    | 11,000    | 11,000    |
| Taiwan                                   | 11,000    | 11,000    | 11,000    |
| United Arab Republic                     | 11,000    | 11,000    | 11,000    |
| <b>Africa:</b>                           |           |           |           |
| Algeria                                  | 11,000    | 11,000    | 11,000    |
| Libya                                    | 11,000    | 11,000    | 11,000    |
| Tunisia                                  | 11,000    | 11,000    | 11,000    |
| <b>Oceania:</b>                          |           |           |           |
| Australia                                | 11,000    | 11,000    | 11,000    |
| <b>Total</b>                             | 1,585,256 | 1,585,707 | 1,678,474 |

\* Preliminary. \* Revised. NA Not available.  
 \* Highlights quantities also produced in Bolivia, Cambodia, Laos, E. Iran, Malaysia, North Korea, and  
 Sumatra.  
 \* Data and Ceres only for 1947, Ceres only for 1948.  
 \* Includes soyabean flour.  
 \* Total is of total Ceres only.

**Table 7.—Canada: Shipments<sup>1</sup> of asbestos, by grades**

| Grade                                        | Short tons |           |           |           |           |
|----------------------------------------------|------------|-----------|-----------|-----------|-----------|
|                                              | 1945       | 1946      | 1947      | 1948      | 1949      |
| Crude, mixed group:                          |            |           |           |           |           |
| (continuing):                                | 21 246     | 26 714    | 27 251    | 32 267    | 29 291    |
| (Change):                                    | 222 772    | 271 437   | 250 154   | 233 467   | 225 164   |
| (over):                                      | 190 720    | 190 720   | 167 436   | 174 406   | 194 606   |
| (under):                                     | 284 672    | 229 824   | 264 351   | 233 449   | 222 174   |
| (over):                                      | 266 697    | 212 871   | 247 097   | 242 122   | 222 619   |
| (under):                                     | 6 974      | 16 953    | 169       | 6 327     | 2 923     |
| Northwest, Ontario, and<br>British Columbia: | 153 491    | 124 200   | 174 245   | 167 300   | 225 660   |
| Total:                                       | 1,307,555  | 1,479,201 | 1,661,611 | 1,569,690 | 1,576,974 |

1. Include message for each use.  
2. Indicate grade No. 1, No. 2, and other.  
Source: Dominion Bureau of Statistics.

Source: Dominion Bureau of Statistics.

Canada.—Production as measured by sales increased 4 percent to 1,775,974 tons in 1969.

At Thorndon Mines, Quarter Astoria Corporation Ltd. continued development of the Peabody orebody on the company's Vims and property. Shaft sinking, begun in 1950, reaching a depth of 400 feet in the

ent of 1.2. At the King Beaver mine, a new ore preparation and storage plant was being constructed at a cost of Can\$2.5 million. The company also announced that new sales contracts were as follows:

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| Mine                  | Thousand short tons |
|-----------------------|---------------------|
| King-Hebert Mine      | 61,662              |
| British Canadian Mine | 51,547              |
| Noranda Mine          | 19,526              |
| Asbestos Hill         | 12,719              |
| Other Properties      | 10,711              |
| Total                 | 156,165             |

Drilling by Montre Asbestos Mining Ltd. on property in Maricopa Township, in Quebec has indicated an estimated 192.8 million tons of ore containing medium length chrysotile fibers. Survey work, bulk sampling tests, and feasibility studies were still in progress at year-end, but an annual output of 75,000 tons of fiber is envisaged.

Canmar Asbestos Corp. Ltd. announced plans to expand mill capacity at its Cowley, British Columbia, mine from 75,000 tons of fiber annually to 100,000 tons. Total cost for the one-third increase in capacity was estimated at Can\$4.3 million; completion was scheduled for December 1970.

At the Canadian Johns-Manville Co. Ltd. Jeffrey open pit mine at Asbestos, Quebec, capacity is being expanded from 600,000 to 700,000 tons of fiber annually with completion scheduled next year. The company also increased output at its Reeves mine in Ontario. Underground exploration of an asbestos prospect located in Garrison Township, about 25 miles east of Matheson, northern Ontario, also was conducted by the company.

Greece.—A tentative agreement between Cerro Corporation of New York and Hellenic Asbestos S.A., an operating company of Hellenic Industrial Development Bank (HIDB), was announced for development of the latter's asbestos mines at Zidani Kastritis. If further studies indicate commercial feasibility, the mines would be put into production through establishment of a 40,000-ton-per-year capacity fiber plant. Total cost of the project was placed at \$15 million, of which Cerro Corp. was to contribute \$3.8 million, the balance made available by HIDB. Exploration, studies, and equipping of an existing small plant for asbestos processing were to be completed in 1970.

Mexico.—A deposit of an estimated 12 million tons of vermiculite, fibrous asbestos fiber was discovered near Ciudad Victoria, Tamaulipas. A new company to be known as Cia. Nacional de Vermiculita has been established to develop the deposits.

The Federal government was to own a 51-percent share in the company. Private interests will own the remaining 49 percent. A 300-ton-per-day plant is scheduled to begin operation in 1971. Mexico currently has no domestic production of asbestos, and imports 100,000 tons from Canada and the United States, averaging about 30,000 short tons monthly. However, completion of the Cia. Nacional de Vermiculita project would reduce the first production of short fiber asbestos to 10,000 tons and could reduce imports to one-third.

Another deposit of asbestos, which had been discovered during routine exploration by Freeport S.A., a wholly owned subsidiary of Freeport Sulphur Co. and Esso Mexicana Petrolera. The deposit, which ranges in thickness from 95 to 245 feet and contains substantial tonnages of commercial material.

South Africa, Republic of.—The Republic of South Africa again ranked third among the asbestos-producing countries of the world, with an estimated output of 201,000 short tons. Cape Province contributes comprised approximately 50 percent of the output; amosite, one-third, chrysotile about 15 percent, the remainder Tremolite Blue from the Northern Transvaal.

Construction of the Mount Asbestos Ltd. milling plant near Barberton, Eastern Transvaal, was completed the latter part of the year. The \$6 million complex will increase production capacity to 1,000,000 tons of fiber annually, 75 percent of which will be exported via the port of Durban to Marquaria. The new mill can treat 1,000 tons of ore per day and will produce 1,000 tons of fiber per day. Crude ore is obtained from the best chrysotile mine in South Africa. An article describing the operation of the plant is included. Late in the year, Asbestos (Pty) Ltd. began a deposit of asbestos in the Northern Transvaal.

- <sup>1</sup> Industrial Minerals (London), 1970, p. 21.
- <sup>2</sup> Asbestos Corporation Ltd., 1969, Toronto, 1969, p. 12.
- <sup>3</sup> Mining Journal (London), Vol. 102, No. 25, 1970, p. 79.
- <sup>4</sup> J. A. Embury, Athens State [?], from 4-55, Feb. 11, 1970.
- <sup>5</sup> Mining Magazine (London), Vol. 102, December 1969, p. 101.
- <sup>6</sup> Industrial Minerals (London), Vol. 102, January 1970, p. 12.
- <sup>7</sup> Mining and Minerals Engineer, South Africa, Vol. 2, Jan. 2, February 67, p. 9.

conducting drilling operations there at year end.<sup>12</sup>

**Iceland.**—Although 1969 data are not available, production continued from the Hvalfjord mine. Swastonia's sole producer, London Rhoksan Mining & Land Co. Ltd. (London) conducted exploration on an asbestos property at Fimbasta adjacent to Turner & Newall's Hvalfjord mine.<sup>13</sup>

**U.S.S.R.**—The U.S.S.R. continued to be one of the world's leading asbestos suppliers with an estimated output of 1.1 million short tons, 25 percent more than in 1968. The No. 6 plant at the Ural's asbestos complex was completed.<sup>14</sup> The plant which has a rated annual capacity of 12

million tons will process low grade material produced locally as a by-product of other operations capable of utilizing only higher grade ore.

Exports in 1969 totaled \$34 million, an increase of 10 percent over the \$31.7 million reported for the previous year. Principal markets were Eastern Europe, France, Germany, East and West, and Japan. The U.S.S.R.'s Soviet production however was retained for domestic use in manufacturing a variety of asbestos products.

Over 85 percent of the total Soviet tonnage came from the Ural's and Kazakhstan and the remainder mostly in Eastern Siberia.

## TECHNOLOGY

Technological advances in 1969 related mainly to development of new asbestos products and uses. A new aluminized asbestos cloth having an extremely high reflectivity and good wear properties became available for the production of fire resistant clothing. The use of asbestos in banking products and plastics continued to expand. Research-based development of asbestos products was discussed.<sup>15</sup>

Medical research on the effects of asbestos on human health continued in 1969. The outcome of current endeavors to solve the problems of air, water, and soil pollution will have great impact on workers in the mining, manufacturing, and construction industries as well as the general public. Dust control and respiratory equipment from many companies were described.<sup>16</sup>

Two types of containers designed to provide dust-free mixing of asbestos insulating cement were submitted to Insulation Industry Hygiene Research Program (IIHRP). Field testing of them started in September. Both containers are waterproof plastic bags in which the materials will be packed at the factory. Both provide means for

introducing water into the bag and mixing the cement to the desired consistency before opening the bag. The bags differ mainly in the manner in which water is introduced. They will be tested to determine optimum bag size and worker acceptability.<sup>17</sup>

A two-year grant of \$15,818 was made by the U.S. Department of Health, Education and Welfare to Dr. Ross W. Smith, associate professor of metallurgy, Mackay School of Mines, University of Nevada, for a study of the aqueous surface chemistry of asbestos minerals.<sup>18</sup> The significance of the study is its possible use in medical research on the known hazards of various species of asbestos on human health. The Mackay study was to continue through August 1972.

<sup>12</sup> *U.S. Embassy, Johannesburg State Department Cable*, 9-10-69, Dec. 9, 1969.  
<sup>13</sup> *U.S. Embassy, London*, V-274, No. 7011, December 1, 1969, p. 21.  
<sup>14</sup> *U.S. Embassy, Moscow*, V-274, No. 7011, December 1, 1969, p. 21.  
<sup>15</sup> *U.S. Embassy, Moscow*, V-274, No. 7011, December 1, 1969, p. 21.  
<sup>16</sup> *U.S. Embassy, Moscow*, V-274, No. 7011, December 1, 1969, p. 21.  
<sup>17</sup> *U.S. Embassy, Moscow*, V-274, No. 7011, December 1, 1969, p. 21.