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ASBESTOS

devoted to the International Asbestos Industry

INTERNATIONAL ASBESTOS MINING 1980 INDUSTRY REVIEW

January 1981

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We're helping industry appreciate the "locked in" benefits of asbestos with ads like this one.

We want our customers to continue taking advantage of the unique properties of asbestos. Too often, their ability to do so is hindered by decisions based on emotion rather than factual information. So we're calmly and repeatedly explaining the facts about asbestos-containing products in a series of full page, four-color ads, appearing regularly in the industrial edition of *Business Week*.

The advertising program is designed to let industry management know that in an extensive range of finished products, such as asbestos/cement sheets and pipe, gasketing materials, asphalt-based coatings, latex and resin-bound papers, and friction materials, the asbestos is "locked in" by various binders to form environmentally safe materials. And once "locked in," the release of asbestos into the environment will not be significant during normal product use.

Our investment in advertising is not nearly as large as that directed toward developing safer ways to ship, handle, and use asbestos. But in many ways, it's equally important. We think it's part of our job as the world's leading producer of asbestos. And part of our continuing commitment to the future of asbestos.

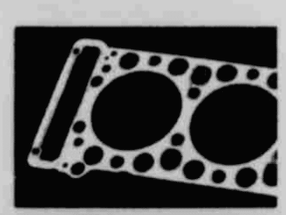
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Asbestos is not a problem when used properly.

It's locked-in to all of these products.

In thousands of finished products, asbestos serves an essential function that has not been duplicated on a cost performance basis. Like other naturally-occurring minerals, asbestos can be a potential health hazard when inhaled. However, with technological advances and established work practices, along with industry and Federal regulations, it can be safely processed, transported, and handled. In addition, there are virtually no hazards associated with the proper end use of products in which the asbestos fibers have been encapsulated or "locked-in" by environmentally safe binders. For this reason, we advocate the elimination of its use in friable products in which it cannot be safely bound. As the world's leading asbestos supplier, we are vitally concerned with its safe handling and application.

For more information, please write to Denis Kelleher, Asbestos Fiber Division, Johns-Manville, Ken-Caryl Ranch, Denver, Colorado 80217.



Gasketing materials made by blending asbestos with elastomeric binders are used in a variety of high temperature, high pressure applications ranging from automotive gaskets to industrial steam lines.



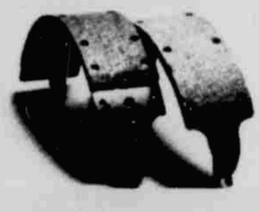
Smooth bore, corrosion resistant pipes utilize asbestos locked into cement to improve water and waste-handling systems throughout the world.



Encapsulated in with varying amounts of polymers, elastomers, or asphalt, asbestos is a major constituent in specialty papers used in commercial roofing felt, pipeline wrapping felt, sheet-goods flooring, and gasketing.



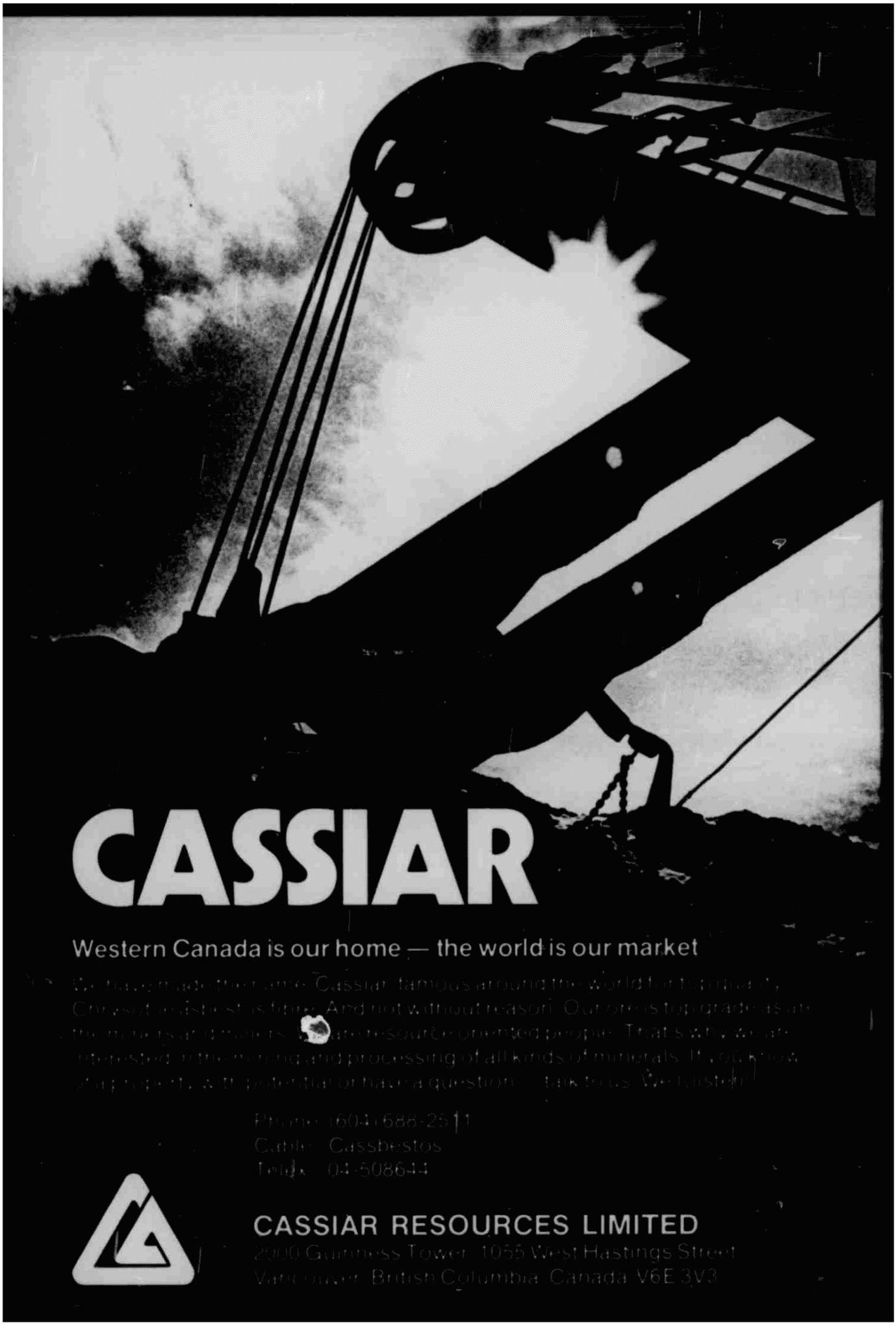
Asbestos is added to cement to form these lightweight, durable, fire resistant building panels.



Because of its thermal resistance, reinforcing properties, and contribution to frictional properties, asbestos plays a major role in truck and automotive brake linings. In this application, the fibers are locked-in with phenolic resin binders.

JM Johns-Manville

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CASSIAR RESOURCES LIMITED

ASBESTOS

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INTERNATIONAL ASBESTOS MINING 1980 INDUSTRY REVIEW

ASBESTOS STOCK QUOTATIONS

On the opposite page are listed the closing stocks of several asbestos related companies for the past three annual periods ending the third Tuesday of November. A quick calculation indicates that the average value per share as of November 18, 1980, was $31.69, an increase of 16.35% over 1979 and 28.85% over 1978.

ASBESTOS PRICES

Quebec—After extreme price stability until 1974, Quebec prices have been steadily on the increase, i.e., an average of 37% in 1974, 23% in 1975, 11% in 1977, 5.6% in 1978, 7.1% in 1979 and 8% in 1980. Effective January 1, 1981, Quebec Group 3 spinning fibers were increased 12%-14%; Groups 4 through 6 asbestos cement, paper and shingle fibers rose 9%-14%; and Group 7 shorts are up between a half a percent and 5%. The latest ranges of prices for Quebec and other asbestos appear on pages 6 and 7.

Cassiar—Following the Quebec pattern, prices for asbestos mined by Cassiar Resources Ltd. have also steadily risen—53% in 1974, 8% in 1975, 15% in 1976, 13% in 1977, 4% in 1978, 6.5% in 1979 and 15.2% in 1980, except for Spinning Grades AAA and AA which remained the same in 1980. Again, except for the latter two grades, Cassiar increased its prices as of January 1, 1981—10% for Grades A and AC nonferrous spinning fiber and 12.2% for Grades AK through AZ asbestos cement fiber.

United States—Based on quantities and values reported by the U.S. Bureau of Mines, we calculate that the average price per short ton of asbestos produced in the United States rose 14% in 1980 to $323.25 compared with $283.20 in 1979, $262.22 in 1978 and $248.44 in 1977. As announced by the Vermont Asbestos Group, Inc., *Vermont* prices were raised January 1, 1981, about 14% for Group 3, 13% for Groups 4-6 and 5% for Group 7. Union Carbide Corporation, Metals Division, announced price increases as of the first of this year for the asbestos products produced at its plant at King City, *California*. The prices for Grades SG-103 through RG-110 rose an average 12% while the resin viscosity control Grades RG-144 and RG-244 were increased some 31%. Jaquays Mining Corporation, Globe, *Arizona*, recently announced new prices for its crude and filter fibers and white shorts which indicate an average increase of 47.5% between July 1, 1976, and January 1, 1981.

Zimbabwe—Based on recent U.S. imports of Zimbabwe (formerly Rhodesia) asbestos in 1980, the United States paid $1262.51 per short ton for Chrysotile crudes, $915.75 per ton for Chrysotile spinning-grade fibers, $1035.15 per ton for other Chrysotile and $1015.89 per ton for other crudes and fibers. When calculating production statistics published by the Chamber of Mines Journal, Salisbury, for the first half of 1980, the value per ton for all types of Zimbabwe asbestos worked out to Z$277.51, up 9.7% over the same period in 1979.

Republic of South Africa—Again basing our calculations on U.S. imports, the cost per short ton for asbestos from South Africa in the year

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Asbestos Stock Quotations—Three-Year History

Comparative Closing Prices	11/18/80	11/20/79	11/21/78
Abitibi Asbestos	C$.94	C$.63	C$.72
Advocate Mines	C$1.33	C$2.20	C$2.70
Armstrong World Ind.	15½	16⅜	16⅛
Armstrong (pfd 3.75)	32½	38¾	41⅜
Asarco	47¾	27¾	14
Asbestos Corporation	C$27.125	C$37.75	C$45.75
Bendix	55⅜	40¼	35¾
Bendix (pfd 3)	48¼	79½	68½
Carlisle	71⅛	24¾	23
Cassiar Resources	C$16.25	C$12.50	C$9.25
CertanTeed	14½	15⅛	18⅝
Charter Consolidated pence	253	172	125
Colt Industries	50⅛	45½	33⅝
Colt Ind (pfd 1.60)	35⅝	35	25½
Colt Ind (pfd 4.25)	107¼	97	70¼
Conwest	..	C$6.375	C$5.00
Conwest-A	C$8.125	..	..
Conwest-B	C$6.875	..	..
GAF Corporation	11⅜	9¾	10¾
GAF (pfd 1.20)	14½	13⅞	15⅛
Gulf & Western	17⅞	17	13⅛
G&W (pfd 2.50)	46¼	34⅝	31
G&W (pfd 3.87)	108½	80⅛	65
IC Industries	31⅛	24⅞	24¾
IC Ind (pfd 3.50)	46½	39⅜	41⅛
Johns-Manville	26	24	23⅞
Kennecott	30⅛	26	22⅛
Lear Siegler	38½	20⅞	16½
Lear Siegler (pfd 2.25)	93¾	52½	40
McAdam Mining	C$.74	C$.30	C$.26
National Gypsum	22⅞	19	17⅞
Pathfinder	C$.50	C$.34	C$.13
Porter, H. K. (pfd. 5.50)	70⅛	75⅞	75⅝
Raybestos-Manhattan	28⅛	21¾	26⅝
Rio Algom	C$38.25	C$26.75	C$34.00
Supradur Bid	5½	5	5
Asked	6¼	5¾	5¾
Union Carbide	49⅞	39¾	35
Walter, Jim	31	30¼	28½
Walter, Jim (pfd 1)	9½	9¾	11
Walter, Jim (pfd 1.60)	33	32½	29⅞
*Transpacific Asbestos	C$.57	C$.39	C$.39

*Formerly: Woodsreef Minerals

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Current Asbestos Prices

QUOTED FROM COMPANY PRICE LISTS

QUEBEC

PER TON OF 2000 LBS., F.O.B. MINE

AS OF JANUARY 1, 1981 — CANADIAN DOLLARS

Grades 3Z to 3F spinning fiber	$ 1202 to $ 1995
Grades 4T to 4A asbestos cement fiber	850 1256
Grades 5Z to 5D paper fiber	497 687
Grade 6D paper and shingle fiber	408 426
Grades 7TS to 7D shorts	125 253
Paperbestos No. 1 to 5 H.D. Blocks	237 782

CASSIAR RESOURCES

PER TON OF 2000 LBS., F.O.B. NORTH VANCOUVER, B.C.

AS OF JANUARY 1, 1981 — CANADIAN DOLLARS

AAA	nonferrous spinning fiber; Canadian Group 3	$ 2000
AA	nonferrous spinning fiber; Canadian Group 3	1600
A	nonferrous spinning fiber; Canadian Group 3	1265
AC	nonferrous spinning fiber; Canadian Group 3	1155
AK	asbestos cement fiber; Canadian Group 4	1075
AS	asbestos cement fiber; Canadian Group 4	1000
AX	asbestos cement fiber; Canadian Group 4	930
AY	asbestos cement fiber; Canadian Group 5	660
AZ	asbestos cement fiber; Canadian Group 6	430

Specialty Grades AK100, AS100, AX100 and AY120 are increased an additional $25.00 per ton above list price of base grade.

VERMONT

PER TON OF 2000 LBS.,F.O.B. MORRISVILLE, VERMONT

AS OF JANUARY 1, 1981 — U.S. DOLLARS

Grade 3Z fiber	$ 1135
Grades 4T to 4D fiber	$ 754 to 833
Grades 5R to 5K fiber	495 to 584
Grade 6D waste	363
Grades 7R to 7D shorts	113 to 215
Hooker No. 1	1520
Hooker No. 2	880

CALIDRIA ASBESTOS

PER TON OF 2000 LBS. F.O.B. KING CITY, CALIFORNIA

AS OF JANUARY 1, 1981 — U.S. DOLLARS

SG-103 pellets in bags; vinyl-asbestos floor tile	$ 136
SG-104 pellets in bulk; vinyl-asbestos floor tile	116
SG-130 open fiber in bags; general	194
SG-200 pellets in bags; rubber	176
SG-210 open fiber in bags; general	250
HPP pellets in bags; rubber reinforcement	224

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CALIDRIA ASBESTOS PRICES—CONTINUED

HPO open fiber in bags; asphalt	250
RG-110 open fiber in bags; roofing	270
RG-144 open fiber in bags; resin viscosity control	700
RG-244 open fiber in bags; resin viscosity control	3300

ARIZONA

AS OF JANUARY 1, 1981

PER TON OF 2000 LBS., F.O.B. GLOBE, ARIZONA

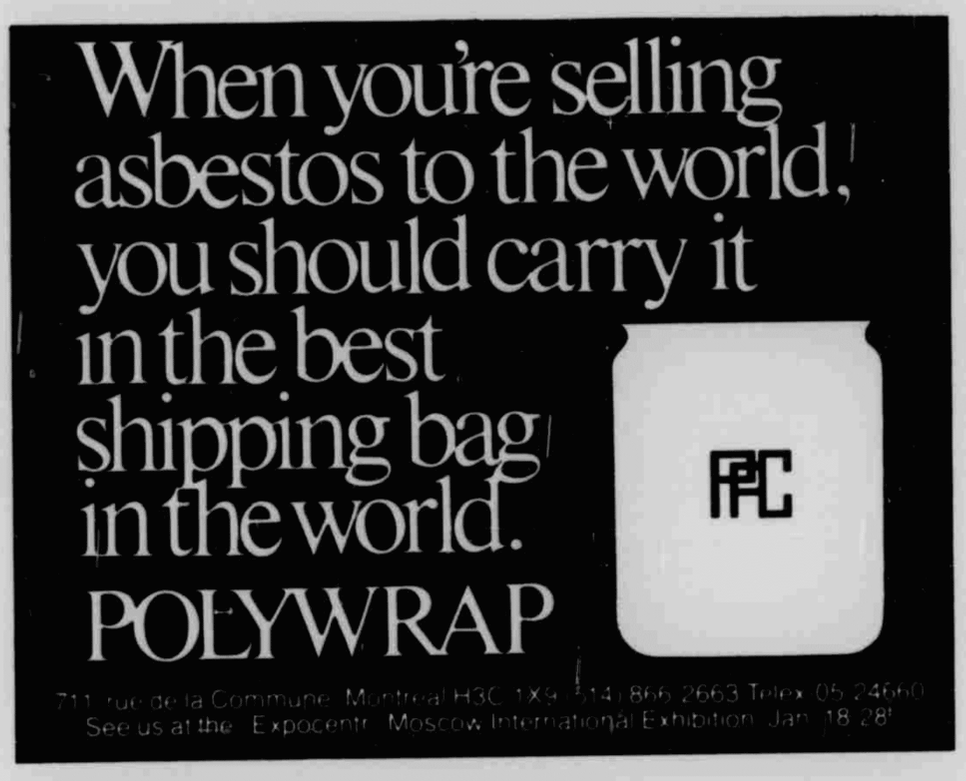
	U.S. DOLLARS
No. 1 crude (soft)	$ 3000
AAA	2000
Grade 3Z nonferrous filtering-plastic	$ 1350 to 1400
Grade 4T nonferrous filtering-plastic	700 1350
Group 7 white shorts	50 200

BRAZIL

AS OF SEPTEMBER 1980

PER TON OF 2000 LBS., F.O.B. MINE

	BRAZILIAN CRUZEIRO $
Grades 4Z to 4K asbestos cement fiber	$20504 to $23011
Grades 5R to 5D asbestos cement fiber	9216 to 17272
Grade 7TF asbestos cement shorts	3641
Grade 8S shorts	1722



ended August 1980 was $804.01 for Amosite (up 59% over the prior year), $621.00 for Crocidolite (up .003%), $1037.57 for Chrysotile crudes (up 64%), $850.52 for Chrysotile spinning fiber and $635.08 for other Chrysotile.

A BRIEF GLOBAL VIEW

World production of all varieties and grades of asbestos, according to the U.S. Bureau of Mines, reached 5,277,591 metric tonnes in 1979, an increase of 2.4% over the 1978 output of 5,153,868, 1.1% over 1977 and 3.6% over 1976. This slow but steady rise bears out the predictions made last year by several authorities in the Asbestos Industry of a 1%-2% annual growth rate in the next several years. Demand, mostly for asbestos cement grades, is highest from the developing countries. However, an Industry spokesman reports that the international market is showing more signs of weakness as some recessions begin to take hold in some of the European nations. Further, Quebec Group 7 fibers had been showing an upswing in U.S. markets although this demand has now leveled off and will probably remain at the present level during the first quarter of 1981. U.S. usage of these grades in 1980 did not reach the level of 1979. As will be noted on the following pages of this Review, expansions and increased production are evident in several nations throughout the world, indicating the Industry expects an upswing in usage of asbestos as the world economy grows more stable.

WORLD ASBESTOS PRODUCTION (METRIC TONNES)

SOURCE: U.S. BUREAU OF MINES

	1979	1978	PERCENTAGE OF 1979 TOTAL
USSR	2,470,000	2,435,000	46.80%
CANADA	1,501,000	1,421,808	28.44%
SOUTH AFRICA	249,187	257,325	4.72%
ZIMBABWE	250,000	225,000	4.74%
MAINLAND CHINA	250,000	250,000	4.74%
ITALY	130,000	135,402	2.46%
BRAZIL	120,000	122,815	2.27%
UNITED STATES	93,354	93,097	1.77%
AUSTRALIA	70,000	62,383	1.33%
ASIA, OTHER	94,000	102,181	1.78%
AFRICA, OTHER	38,350	37,300	0.73%
EUROPE, OTHER	11,000	10,860	0.21%
SOUTH AMERICA, OTHER	700	697	0.01%
	5,277,591	5,153,868	100%

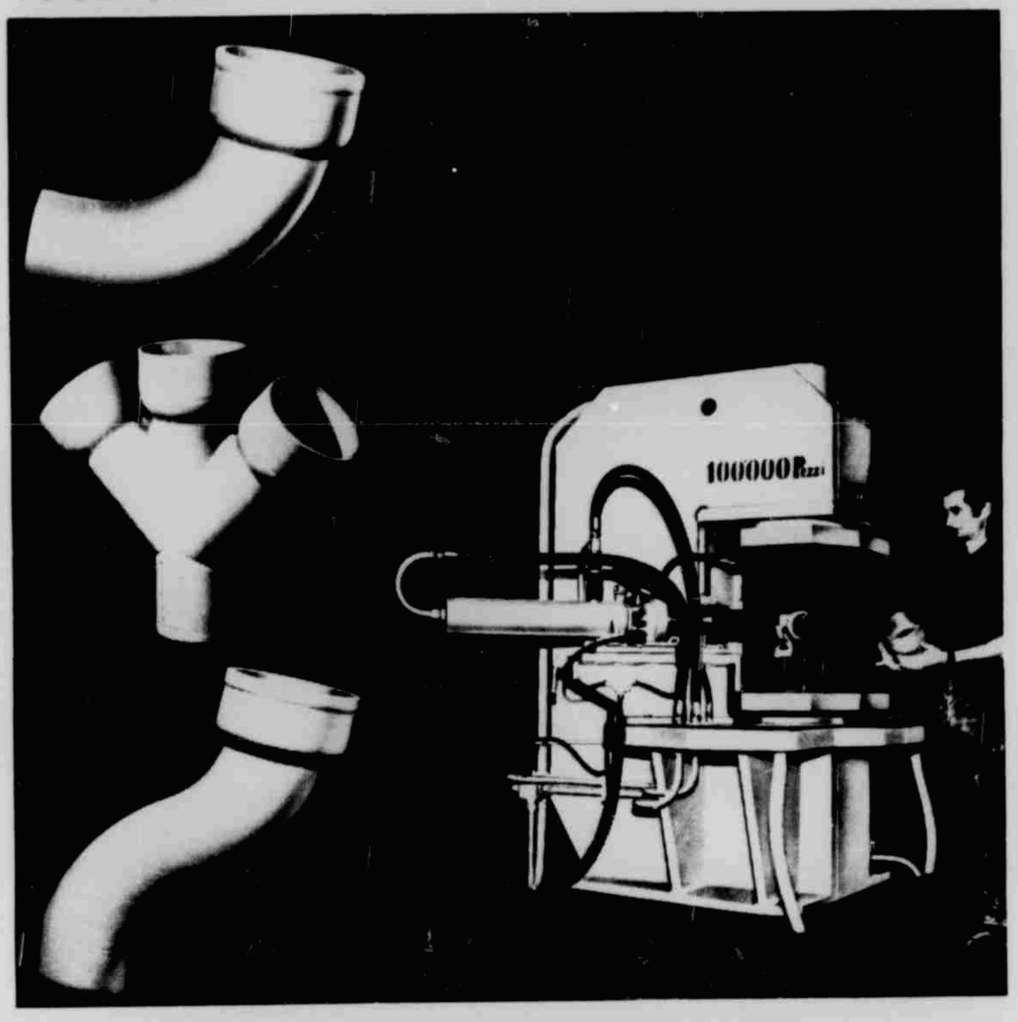
THE UNITED STATES

Chrysotile Released from U.S. Stockpile

The President released 1,000 short tons of high-quality Chrysotile asbestos to the U.S. Department of Defense on November 5, 1979, under the Strategic and Critical Materials Stock Piling Act. Geologic occurrences of these grades are rare, with some located in Zimbabwe. The remaining free world source was the now depleted Clinton Mine in British Columbia. The shortage was delaying the production of some weapons subsystems

ISPRA s.p.a.

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"P 8" Plant — for the production of asbestos-cement fittings for pipes, gutters and similar articles

ispra

Automatic INJECTION Plants

including the Army Tow, Lance, Pershing and the Navy Trident. The original purpose for stockpiling the long fiber Chrysotile was for heat shielding and electrical insulation. These particular defense applications have diminished because substitutes have been found. However, other defense uses have replaced those applications. The very high strength-to-weight and strength-under-high-temperature characteristics of the product make it attractive to missile designers. Electrical and thermal conductivity characteristics qualify the material for use in submarines. In most of these engineering choices, substitutes result in heavy performance penalties. The Defense Department and the Federal Emergency Management Agency were directed to identify alternate materials, processes and designs to end the U.S. dependence on Chrysotile as quickly as possible.

U.S. Imports of Asbestos

For the twelve months ended August 1980, the United States imported 412,868 short tons of asbestos valued at US$104,092,281, down 34.7% in quantity and 29.6% in value from the prior annual period. Of the 1980 total, 94% was of the Chrysotile variety with 99.3% of the 94% being of Canadian origin. Price per ton of all asbestos imported into the U.S. averaged $252.12 per ton in 1980 compared with $233.56 in 1979 and $248.30 in 1978. Imports of Chrysotile crudes amounted to 86 tons valued at $49,600 in 1980, 58.1% via Canada, 25.6% from Zimbabwe and 16.3% from South Africa. The 1980 value was $576.74 per ton and total quantity was 1.6% of that imported in the prior twelve months. Of the 7528 tons of Chrysotile spinning fiber imported into the U.S. in 1980 (down 19.7%), 88.5% was from Canada with the remainder from Zimbabwe, South Africa and Sweden, in that order. The price per ton averaged $759.20, with a total import value of $5,715,284. Imports of other Chrysotile reached 380,749 tons in 1980, valued at $87,365,971, or $229.46 per ton. The quantity imported was 34.3% less than in 1979. Countries of origin were 99.6% from Canada and 0.4% from South Africa, with minimal amounts via several other locations. U.S. imports of Amosite totaled 387 tons valued at $311,153, down 47.5% and all from South Africa. Price per ton averaged $804.01 Tonnage of Crocidolite imported was 9956 in 1980 valued at $6,182,663—51.5% down in quantity from 1979. South Africa supplied 98.9% of the latest tonnage. Price per ton averaged $621.00.

U.S. IMPORTS OF UNMANUFACTURED ASBESTOS (SHORT TONS)

YEAR TO	CHRYSOTILE	CROCIDOLITE	AMOSITE	OTHER	TOTAL QANTITY	TOTAL VALUE
Aug 80	388,363	9,956	387	14,162	412,868	$104,092,281
Aug 79	594,437	20,531	737	17,012	632,717	147,776,880
Aug 78	557,638	14,594	1,091	20,783	594,106	147,517,562
Aug 77	587,087	13,049	824	26,822	627,782	148,431,168
Aug 76	591,667	9,174	1,809	33,308	635,958	132,375,509
Aug 75	558,630	11,483	5,616	14,472	590,201	117,254,264
Aug 74	739,231	12,436	7,644	28,362	787,673	113,294,848

U.S. Asbestos Exports

The total amount of asbestos exported from the United States in the year ended August 1980 reached 55,107 tons valued at $21,048,550, or

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$381.96 per ton. This was up 39.3% in quantity and 50.7% in value over the prior like annual period.

U.S. EXPORTS OF UNMANUFACTURED ASBESTOS (SHORT TONS)

YEAR TO	FIBERS	WASTE & REFUSE	TOTAL QUANTITY	TOTAL VALUE
Aug 80	41.561	13,546	55,107	$21,048,550
Aug 79	25,857	13,694	39,551	13,971,336
Aug 78	24,135	19,801	43,936	12,335,894
Aug 77	17,370	19,719	37,089	11,329,884
Aug 76	21,736	24,160	45,896	12,752,021
Aug 75	14,953	18,832	33,785	9,308,660
Aug 74	36,503	35,281	71,784	9,752,917

U.S. Asbestos Mines

According to Robert A. Clifton, Asbestos Specialist with the U.S. Bureau of Mines, production of asbestos in the United States during 1980 decreased to 87,000 metric tonnes valued at $31-million, 6% less in quantity but 11% higher in value compared with the year 1979. Average value per tonne rose from $301.00 in 1979 to $356.00 in 1980. The United States produces less than 1.8% of total world production of all grades and varieties of asbestos. Apparent consumption reached 369,000 tonnes in 1980, 34% below that of the previous year and reflecting the slowdown in the economy and possibly a continuing market loss. U.S. asbestos production was derived from three States: California, Vermont and Arizona, in that order.

UNITED STATES PRODUCTION & CONSUMPTION OF ASBESTOS (METRIC TONNES)

SOURCE: U.S. BUREAU OF MINES

YEAR	PRODUCTION	VALUE OF PRODUCTION	AVERAGE VALUE PER TONNE	APPARENT CONSUMPTION
1980	87,000	$31-million	$356.32	369,000
1979	93,000	28-million	301.08	560,588
1978	93,000	27-million	290.32	618,706
1977	92,264	25-million	270.97	609,157
1976	104,183	24-million	230.37	658,847
1975	89,497	14-million	156.42	551,188
1974	98,966	14-million	141.45	768,000

California—Approximately 75% of total U.S. asbestos output comes from California. Copperopolis, in Calaveras County, is the site of the largest California mine, owned and operated by *Calaveras Asbestos Ltd.* and producing Grades 4-7, mainly used in the manufacture of asbestos-cement pipes and sheets. An ambitious waste rock removal program has been underway at the Calaveras open-pit operation since the final quarter of 1979 to expand the mine. New ore reserves should be reached by March 1982. "Calidria" asbestos products are produced by *Union Carbide Corporation, Metals Division*, from short fibers mined at San Benito County and processed at King City. UCC's plant has been operating at near capacity for most of the year and is expected to continue to do so in 1981. Grade 7 shorts have been mined by *Atlas Asbestos Company*, near Coalinga, for use in vinyl-asbestos floor tile. However, we do not believe there is much, if any, asbestos currently being mined at that site.

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U.S. MINES—CONTINUED

Vermont—An asbestos mine and mill at Belvidere Mountain, Lowell, is owned and operated by *Vermont Asbestos Group, Inc.*, for the production of Chrysotile Grades 3-7. A major, 15-year expansion program is underway which entails the moving of large quantities of barren rock to gain access to a 17-year supply of high-quality asbestos ore. VAG had a seven-week shut-down at mid-year due to a recession in the automotive and construction industries.

Arizona—An underground, low-iron Chrysotile mine in the Tonto National Forest and a mill some 30 miles distant, near Globe, are operated by *Jaquays Asbestos Corporation.* At current output of 55-100 tons per month, Jaquays could operate for another 10-15 years.

North Carolina—A minimal amount of the amphibole known as Anthophyllite is sporadically produced from the Hippy Mine at Newdale, Yancey County, by *Powhatan Mining Corporation*, of Baltimore, Maryland.

Alaska—Investigations had been undertaken the last couple of years at the potentially-large Chrysotile deposit near Eagle, some 60 miles west of the now-closed Clinton Mine in the Yukon Territory. The program was a joint venture between *General Crude Oil Company, McIntyre Mines (Nevada) Ltd., Tanana Asbestos Corporation and WGM Inc.* The U.S. Geological Survey reports it is expanding its presence in Alaska to study that State's vast storehouse of energy and mineral resources. Hopefully the program will include a study of the asbestos-containing deposits in the area in an endeavor to meet the expected asbestos shortages which are being predicted by many in the Industry.

CANADA

Lean Now But Future Bright

Canada's asbestos industry is facing tightening government regulations and a soft market demand and producers have cut back fiber production to the lowest level in five years. The largest factor in the downturn is the general recession, which has slowed construction activity in North America and in much of Europe. Long-term prospects, however, are brighter, with the expectation of increased export market demands and because of the practicality of asbestos in an energy-short world. Some analysts predict that U.S. and European consumption of asbestos will level off after a partial rebound in 1981. Therefore, Canadian producers are seeking new customers in the developing nations. Maurice E. Taschereau, President of *Asbestos Corporation Ltd.*, states, "We know of new asbestos cement plants either in operation or being installed in Tunisia, the Middle East, the Philippines, Nigeria, Malaysia and Sri Lanka, to name only a few. There is no more appropriate product than asbestos cement for a developing country to supply its needs for pipe, siding and roofing." J. R. M. Hutcheson, Chairman of *Johns-Manville Canada Inc.*, says there is also a growing market for asbestos cement in countries which have a more advanced economy, especially in the Far East. He sums up the future for asbestos as follows: "In a world where energy is getting scarce and very expensive, our industry is fortunate in having a low degree of energy dependency, so that the faster energy prices grow the more competitive asbestos-containing products become." Asbestos is strong and durable and resists heat, acids, fungus growth, corrosion and vermin. It insulates against vibration, electricity and sound and it can be

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ASBESTOS

Lac d'Amiante du Québec, Ltée is the second largest producer of asbestos in Canada, with sales representatives on every continent of the world. LAQ's two mines produce a full range of grades, from the long 3 group for spinning and weaving, to the short 7's for paper, brake linings and floor tiles. Western Hemisphere representatives below can provide prompt service and local warehousing as required.

SALES REPRESENTATIVES

California: A.J. Lynch & Co.
Los Angeles, Oakland

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spun, sprayed or mixed into many separate uses. It also requires less energy than other materials when processing fibers into products. For example, asbestos-cement pipes require only 20% of the energy input needed to produce polyvinyl chloride (PVC) pipes or ductile iron pipes. [Excerpted from Asbestos Under Pressure, by Brian Nolk, The Northern Miner, 11/27/80]

Canada's Mineral Output

Statistics just issued by the Department of Energy, Mines and Resources, Ottawa, indicate that total value of all minerals produced in Canada in 1980 rose 19.4% to C$32,368,943,000. An increase of 32.8% in the value of the nonmetal group provided a gross value of $2480-million. Asbestos accounted for 2% of the total value for all minerals and 26% of the value of the nonmetal sector. The quantity of asbestos shipped in 1980 dropped 10.6% to 1.3-million tonnes while the value rose 5.6% to $642-million.

Producers' Shipments

Primary producers' shipments of asbestos (including tonnage for own use and concentrate shipped from Asbestos Hill) totaled 1,373,979 tonnes for the year ended August 1980, down 7.7% from the prior like period. The *Quebec Asbestos Mining Association (QAMA)* projects that the vigor of the fibrocement industry in Europe and a mistrust of the effectiveness and safety of some asbestos substitutes are likely to favorably affect future demand. Of interest is the fact that total shipments for the latest annual period were 2.3% less than that exported in the same time frame, indicating the probability that some of the exports were from producers' inventories.

Following is a breakdown of shipments of Quebec grades for the latest twelve months, with percentage differences from the prior year: Group 3 spinning fibers—12,464 tonnes, down 25.4%; Group 4 shingle fibers—391,684 tonnes, up 4.8%, Group 5 paper fibers—146,316 tonnes, down 12.2%; Group 6 stucco fibers—229,508 tonnes, up 3.7%; and Group 7 refuse—428,494 tonnes, down 24.9%. No Group 8 sand was shipped in 1980 vs. one tonne a year earlier. Total Quebec shipments were down 10.4% from the year earlier and were 88% of total Canadian shipments of asbestos vs. 90.6% in 1979. Shipments from the Provinces of British Columbia and Newfoundland reached 165,523 tonnes to August 1980, up 18.6% over 1979. QAMA reports that the geographical distribution of total Canadian shipments for the calendar year 1979 was 42% to North America, 27.3% to Europe, 17.7% to Asia, 5% to South America, 4.8% to Central America, 1.7% to Africa, 1% to Oceania and 0.5% to the Middle East.

CANADIAN ASBESTOS PRODUCERS' SHIPMENTS (METRIC TONNES)

YEAR TO	QUEBEC	OTHER	TOTAL METRIC TONNES
Aug 80	1,208,466	165,523	1,373,989
Aug 79	1,348,798	139,593	1,488,391
Aug 78	1,220,788	233,488	1,444,276
Aug 77	1,240,051	302,364	1,542,415
Aug 76	1,143,284	267,569	1,410,852
Aug 75	1,401,374	327,027	1,728,401
Aug 74	1,423,139	269,933	1,693,972

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Canadian Exports

Canadian exports of asbestos amounted to 1,275,683 tonnes for the twelve months ended August 1980, valued at C$626,606,000, 15.6% less in quantity and 0.4% down in value from the year to August 1979. Price per ton for all varieties and grades of Canadian asbestos exports is calculated at $445.60 vs. $416.11 a year earlier. By categories, exports of Milled 3 fibers dropped 31.2% in quantity, Milled 4 and 5 fibers were down 9.9% and Shorts 6-9 decreased 20.3%. There were no exports of Crude in 1980 compared with 21 tonnes a year earlier. A geographical breakdown of destinations for the latest annual period, in order of importance, shows 34.1% to Western Europe, 28.1% to the United States, 19.4% to Asia, 10.4% to South and Central America, 2.5% to Africa, 2.2% to Eastern Europe, 1.7% to Oceania and 1.6% to the Middle East. The order by importance in the prior year was the United States, Western Europe, Asia, South and Central America, Eastern Europe, Oceania, the Middle East and Africa.

CANADA ASBESTOS EXPORTS (METRIC TONNES)

YEAR TO	CRUDE	MILLED 3	MILLED 4 & 5	SHORTS 6-9
Aug 80	..	18,047	638,557	619,079
Aug 79	21	26,215	708,972	776,626
Aug 78	1	21,496	597,439	660,226
Aug 77	19	25,495	731,911	752,025
Aug 76	176	20,265	633,770	689,647
Aug 75	275	24,002	641,267	591,852
Aug 74	15	29,672	775,181	810,023

Total quantities and values of Canadian exports of asbestos for the above seven years were: 1980—1,275,683 tonnes, valued at C$626,606,000; 1979—1,511,834 tonnes, $629,082,000; 1978—1,279,162 tonnes, $527,216,000; 1977—1,509,450 tonnes, $548,925,000; 1976—1,343,858 tonnes, $415,064,000; 1975—1,257,396 tonnes, $309,125,000; 1974—1,614,891 tonnes, $303,806,000.

Canadian Mining Companies

There are several moves underway by the Province of Quebec, its National Asbestos Corporation (Societe National de l'Amiante; SNA) and the Institute for Research and Development of Asbestos (IRDA) toward increasing the amount of asbestos-containing products manufactured within the Province (using Quebec-mined fiber) and establishing new, lucrative markets for fiber and products. The projects involving asbestos fiber will be incorporated in the following brief accounts of the activities this past year of asbestos mining companies. Those involving manufacturing and asbestos-based products will be included in our annual Review of the Asbestos Products Industry, to be published in the March 1981 issue of ASBESTOS. For background information on the following mines and on others not mentioned in this Review, please consult past Review issues of ASBESTOS.

Abitibi Asbestos Mining Co. Ltd., 60.4% owned by *Brinco Ltd.*, has an asbestos project near Amos, in Northwestern Quebec. The property has been explored and interest in development has been expressed, most notably by Brinco and *Asarco Inc.* Cost estimates for mine/mill develop-

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ment are in excess of C$400-million. Proven and probable ore reserves in three orebodies have been determined sufficient for 40 years of production at a peak yearly rate of 226,800 tonnes of fiber.

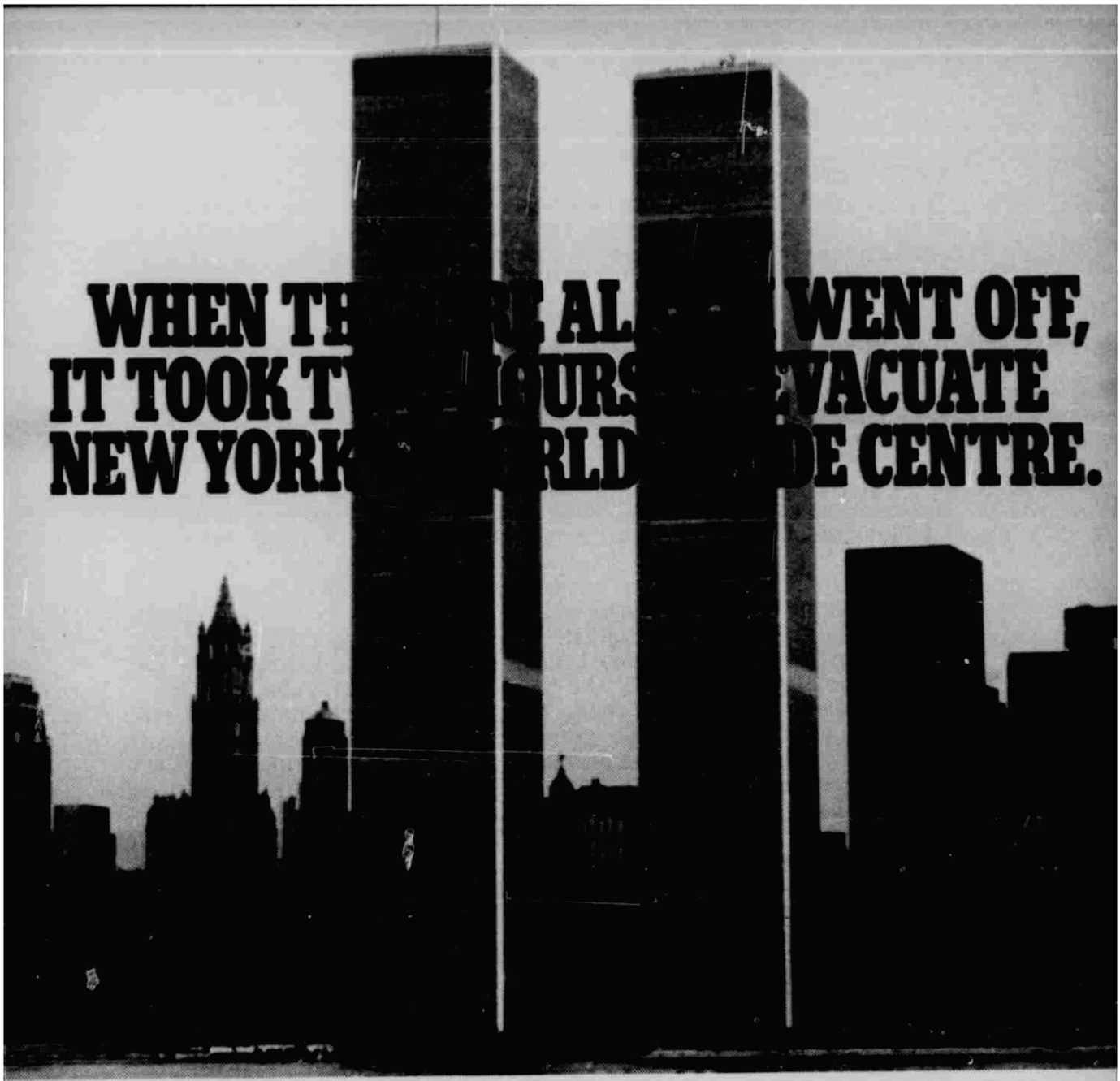
Advocate Mines Ltd., Baie Verte, Newfoundland, earned C$990,000 in the nine months to September 30, 1980, compared with a net loss of $6.6-million for the same 1979 period. Increased fiber recoveries, cost reductions and profit participation received from *Consolidated Rambler Mines Ltd.* contributed to the improvement. Ore crushed during the nine-month period amounted to 1,583,000 tonnes (1,546,300 tonnes to September 30, 1979) and fiber produced reached 52,514 tonnes (43,944 tonnes). Percent recovery from ore crushed was 3.32% (2.84%), fiber shipped totaled 49,172 tonnes (54,563 tonnes) and waste-to-ore ratio was 6.1:1 (5.1:1). The value of fiber produced was $34,894,000 against $23.5-million tonnes. Certain shareholders and customers of Advocate agreed to advance $10-million to the company, repayable December 31, 1985. At June 30, 1980, $3.75-million had been advanced with the balance to be received prior to the end of the year.

Asbestos Corporation Ltd., Montreal, Quebec, is the second largest asbestos producer in Canada. Some 220,000 short tons of asbestos fiber are produced annually at its mining/milling operations at Thetford Mines. The facilities consist of three mines, three complete primary and secondary finishing mills and four integrated ore preparation and storage plants. The Asbestos Hill mine and plant are located at Putuniq, on the Ungava Peninsula, Quebec, 1130 miles north of Montreal. The operation consists of an open-pit mine, an ore preparation and storage plant and a primary mill which annually produces about 263,000 tons of Group 4 ungraded fiber for processing at the finishing mill at Nordenham, West Germany. Some 92,000 tons of finished fiber are processed there for customers in Eastern and Western Europe, North Africa and the Middle East. Asbestos Corporation has been evaluating the possibility of going underground at Asbestos Hill and has been studying the feasibility of mining below the now-closed Normandie property at Black Lake, Quebec. The company's mills produce predominantly asbestos cement grades, 85% of which are Groups 4-6. All mills are also capable of producing Groups 3 and 7. Proven ore reserves at year-end 1979 totaled 229,131,000 tons.

Earnings for the first nine months of 1980 showed a loss of $2.5-million on sales of $67.9-million compared with a net income of $12.8-million on sales of $126.3-million in the like 1979 period. . . . Twelve weeks of production were lost from March 4 to May 26, 1980, when some 1450 blue collar workers went on strike. At settlement, the workers ratified a three-year contract calling for wage increases tied to the cost of living plus a first-year, across-the-board boost of 30¢ an hour and 2% and 3% increases in the second and third years. Average hourly wage will climb to about C$10.90 at the end of the first year. . . . On December 21, 1980, Asbestos Corporation laid off 180 Thetford employees and suspended all operations there until January 26, 1981. Also, the work week was reduced from six to five days for a period not to exceed six months. . . . Reportedly there were some 530 mine and mill workers out of work in the Eastern Townships of Quebec at the end of 1979.

On May 26, 1980, the Quebec Superior Court ruled that Bill 121, the law giving the Quebec Government the right to expropriate assets of Asbestos Corporation was valid, a decision which was appealed by ACL.

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The appeal is scheduled to be heard this month. At mid-June 1980 a judge of the Court of Appeal was asked by the Quebec Government to lift the interlocutory injunction granted in December 1979. On July 18th that request was refused; thus the injunction, which prevents any expropriation action before the final judgment as to the validity of Bill 121, remains in effect. The company has two new projects in mind at Thetford costing at least C$10-million but it does not propose to proceed with either of them until the expropriation matter is settled. The first is a specialized insulation for the aerospace industry. The second project is a new wet technology for producing flooring felt.

Bell Asbestos Mines Ltd.—In May 1980 it was announced that *Turner & Newall Ltd.*, Manchester, England, had sold most of its Canadian asbestos interests to SNA, the Quebec government agency, for C$35.5-million. The transaction included $32.3-million for Bell Asbestos, Thetford Mines (100% owned by T&N), and $3.2-million for *Atlas Turner Inc.*, Montreal, and its sister company, *Turners Building Products Ltd.*, Mission, British Columbia. Marcel Dorais, Bell Chairman of the Board, President and General Manager, stressed that the transaction was strictly a business deal, with no political pressure. He emphasized that Bell would continue to be administered by the current management team and that no changes were contemplated in the terms and conditions of employment. Yves Berube, Quebec Minister of Energy and Resources, stated the purchase of the three companies was an excellent investment. The new SNA subsidiaries, from May 19 to September 30, 1980, have generated net profits of $3.5-million, surpassing the cost of the loans which were necessary for the acquisitions and permitting an increase in SNA's research efforts to develop new uses for asbestos. Reportedly the purchase will not affect Quebec's continuing attempts to expropriate the assets of Asbestos Corporation. . . . Bell Asbestos has 600 employees and annual sales of some $35-million. Production capacity at the underground operation is 77,000 short tons per year of asbestos textile Grade 3 fiber, friction material Grades 5-7 and cement Grades 4-6.

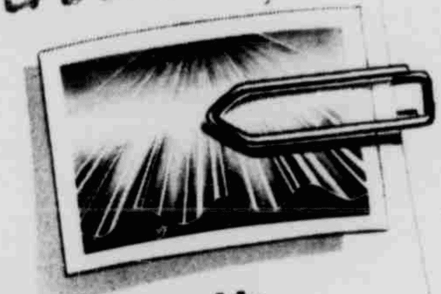
During the past decade, Bell facilities have been modernized and mechanized and production increased. Following are some of the projects completed or ongoing in 1980. The unique underground cafeteria is now in use 600 meters below the surface of the earth. New laboratory facilities for quality control of fiber and the evaluation of deposits is now completed. The unit includes a filtering system which produces the pure water required in the quality control test on the fiber, stainless steel counters which do not absorb fibers or impurities and a general ventilation system which prevents dust emission. The sampling tables are equipped with exhaust hoods and are covered with glass panels to prevent the spreading of dust while allowing light to penetrate. Samples are sent directly from the mill to the laboratory via a pneumatic tube system in just 35 seconds. A quality control program for the environment has been established for the analysis of emissions from mill chimneys and the monitoring of noise levels. Also new is a $225,000 test room which serves as a communications and control center for the entire processing plant. Every 45 minutes samples of different grades of fiber taken before and during bagging are sent to the test room. Within minutes, control technicians are able to detect, report and correct any production defect. A special vacuum system then returns the analyzed fiber directly to the production circuit with minimal handling or dust emission. The test room is equipped with

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continuous temperature control and a ventilation system which filters, sterilizes and replenishes 5000 cubic feet of air per minute. Lastly, Bell recently implemented a new method of ore extraction designed by company engineers to increase productivity while improving safety and comfort for workers underground. The project brings Bell one step closer to the block caving system which it intends to implement in two years, primarily for ore extraction at subterranean levels below 1000 feet.

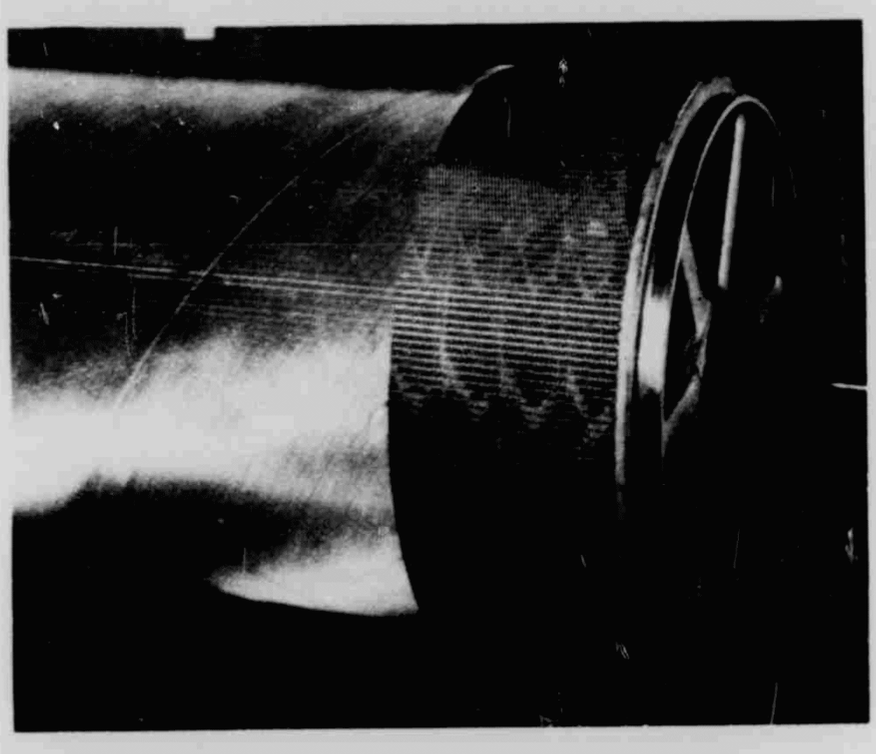
Carey Canada Inc., a wholly-owned subsidiary of *Jim Walter Corporation*, Tampa, Florida, produces Chrysotile slip fiber at its open pit mine and mill at East Broughton, Quebec. Ore reserves are 45-million tons of proven ore plus 75-million tons of probable and possible ore. In August, some 100 workers were laid off and reports indicated they would not return to work until after Christmas. The company currently has an inventory of 15,000 tons of fiber. Michael Prus, President and General Manager, announced ongoing programs geared to reduce costs, to make a major shift in product mix and to introduce new grades to meet various nuances of market demands. Carey Canada is working toward developing export markets outside North America and is responding to softened demand for short fibers by increasing production of medium and long fibers. Some $11-million has been spent in 1979 and 1980 to upgrade environmental controls at the mine.

Cassiar Resources Ltd.—At mid-year it was announced that *Brinco Ltd.*, Montreal, Quebec, would propose change in control and a plan to acquire Cassiar Resources, Vancouver, British Columbia. The moves meant a repatriation of foreign control for both companies. Successful negotiations were finalized whereby *Olympia & York Developments*, a large real estate firm headquartered in Toronto, Ontario, became the controlling shareholder in Brinco. Brinco then became a 71% Canadian-owned company, with principal shareholders being Olympia & York (51%) and Rio Tinto-Zinc Corporation, London (24%). In December Brinco reported it had acquired 98% of the outstanding shares of Cassiar Resources from *Turner & Newall Ltd., J. H. Industries (U.K.) Ltd., Newmont Mining Corporation, Raybestos-Manhattan, Inc., and James Hardie Industries Ltd.* Brinco is now taking steps to acquire the remaining Cassiar shares. When T&N sold its 23.4% interest in Cassiar for C$20.6-million it relinquished all of its Canadian operations. In the past, Canada had been T&N's main source of asbestos fiber for its operations in England but with renewed access to T&N's subsidiaries in Zimbabwe and Swaziland it is no longer strategically necessary for the company to hold shares in Cassiar. . . . Brinco intends to consolidate the mining and exploration activities of Cassiar with those of its wholly-owned subsidiary Brinex Ltd., which will change its name to Brinco Mining Ltd. and operate out of Vancouver. J. D. Little, Cassiar President and Chief Executive Officer, will fill the same position with Brinco Mining. J. C. O'Rourke, Brinco Vice President-Mining, will become Executive Vice President of Brinco Mining.

Cassiar Asbestos Corporation Ltd. officially changed its name, effective August 1, 1980, to Cassiar Resources Ltd. The Cassiar Mine, capable of producing 110,000 tons of Chrysotile fiber each year, is located on McDame Mountain in British Columbia, 200 miles southeast of Whitehorse, near the Yukon border. Of the total annual mill output (135,000-ton-per-year capacity), approximately 85% is asbestos cement grade fibers, with Group 4 dominating up to two-thirds of Cassiar's annual fiber production. Cassiar accounts for about 7% of total Canadian asbestos

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production and is Canada's fourth largest producer of asbestos. On a global scale, Cassiar's fiber sales are 2% of world supplies. For asbestos cement fibers the company is the Free World's fourth largest diversified supplier. Cassiar is Canada's largest producer of Group 3 spinning grade fibers, up to 14,000 tons per annum. Under a 1980 exploration budget of $1-million, Cassiar is involved in exploration projects involving several metals and minerals. Included is a joint venture asbestos exploration program in the Yukon and Northern British Columbia. The asbestos venture at Dease Lake, Northern British Columbia, has been dropped. . . . Cassiar's net earnings for the nine months to September 30, 1980, were $8.3-million compared with $9.6-million for the like 1979 period. Sales for the third quarter were 28,481 tons, exceeding production by approximately 1000 tons. Included in the sales revenue was $860,000 received from the sale of jade, a byproduct in the mining of asbestos ores. Diamond drilling from the exploration adit indicates a faulted extension or a separate ore lens containing over 5-million tons of asbestos-bearing material.

Johns-Manville Canada Inc., wholly-owned subsidiary of *Johns-Manville Corporation*, Denver, Colorado, is the leading asbestos mining company in Quebec, producing some 37% of all the asbestos produced in Canada. J-M Canada's Jeffrey Mine, at Asbestos, is the largest open-pit asbestos deposit in the Western World, producing Chrysotile grades 4, 6 and 7. The five-year, $77-million capital expenditure program is continuing on schedule and is to be completed this year. When finished, production capacity is anticipated at 700,000 tons per year. Proven ore reserves are estimated to exceed 441-million tons.

Lac d'Amiante du Quebec Ltee, wholly-owned subsidiary of *Asarco Inc.*, produces Chrysotile Grades 4-6 from combined open-pit mine and milling facilities in Quebec at Black Lake and at National Mines in Thetford. Record production levels and asbestos fiber sales were achieved in 1979, surpassing the 1978 record output of 280,000 tons. Markets in 1980 were expected to be strong for most grades, especially for the asbestos cement grades used in sheets and pipes. Between 1976 and 1981 some $10-million will have been spent for improvements in the workplace environment at Black Lake and to modernize and initiate an air purification program at National. At Black Lake, LAQ planted pine and spruce saplings to cover a waste dump and a hydraulic sowing truck was developed to spread a mixture of grass, weeds, clover, mulch and fertilizers on the terrain. The program provides for the covering , within 20 years, of a total of 145 acres. To quote LAQ President Michael J. Messel: "The past year has been a difficult one for our Industry due to economic problems in most countries, together with the controversy and differences of opinion that still continue to plague us on health and environmental issues. I think the facts are now well known that asbestos is a very useful mineral to mankind and can be used safely. The emphasis should now be placed on making better use of existing asbestos-containing products and development of new ones that will help to save lives and contribute further to our industrial development."

United Asbestos Ltd., Montreal, Quebec, is a joint operator with *Asarco* of the asbestos mine at Black Lake. Mine and mill capacity is 170,000 tons of fiber per year and cement grade fibers make up 70% of production. At January 1980, estimated ore reserves were in excess of

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100-million tons grading 3.7% asbestos, with a 25-year life. Annual production exceeds 150,000 tons of cement grade fibers, mainly Groups 4-6. Black Lake operations for 1980 resulted in production of 160,057 tons against shipments of 162,010 tons in 1979. For the year ended March 31, 1980, net income rose 37% to $9.3-million or $1.31 per share. For the year ended March 31, 1981, earnings per share are estimated at $1.55. . . . United Asbestos also owns the Midlothian, an asbestos mine in Ontario. At the end of 1979 the company refinanced its debt with the Toronto-Dominion Bank, executing a formal loan agreement for C$35-million. Proceeds have enabled United to regain possession of its assets in Ontario and prepare for the eventual reopening of the Midlothian Mine. A Royal Commission has been ordered to study asbestos-related matters in the Province. This could be a year or more away and United will await the findings of the Commission before proceeding with the Midlothian operation. Meanwhile, the plant is supervised by a maintenance crew and some ore testing and other work is being done. [Portions of this section on United Asbestos were taken from institutional research progress reports of Midland Doherty Ltd. and Gardiner Watson Ltd.]

UNION OF SOVIET SOCIALIST REPUBLICS

For the sixth consecutive year, the USSR has surpassed Canada as the leading world producer of asbestos. The Soviet Union appears to be exporting increased quantities of asbestos to the West, making sales at prices which undercut Canadian prices in some cases, reports Roskill Information Services Ltd. The Mining Annual Review—1980 reveals that Russian exports of asbestos rose from 385,000 metric tonnes in 1970 to an estimated 450,000 tonnes in 1979, with about two-thirds going to Western markets. USSR asbestos production was some 2,470,000 tonnes in 1979, 46.8% of the world total. Estimated output for 1980 is 2,640,000 tonnes, a tonnage which is projected to double within the next few years.

In late 1979 a Soviet delegation, comprised of representatives of the government and the USSR asbestos industry, made an official tour of the Quebec asbestos region at the invitation of the Quebec Asbestos Mining Association and its five member companies. It was part of a program of reciprocal visits which began in 1960 when Canadian asbestos delegates were guests of the Russian government. A. Y. Anpilov, Deputy Minister of Building Materials of the USSR, stressed the importance to the Soviets of the mutually-beneficial program. He remarked that in terms of mechanization and automation of production, Canadian and Soviet methods and equipment seem to be essentially the same, although they differ considerably when it comes to the transporting of the ore and the tailings. In the Soviet Union, the processing plants are located 5-10 miles from the mines and waste dumps are some distance from the mills. He also noted that the ore mined in the USSR is much harder than that produced in Quebec, causing more frequent breakdowns of machinery. According to Mr. Anpilov, the USSR is currently using 80% of its total production, particularly in asbestos-cement materials, insulation products and industrial machinery parts. [QAMA Bulletin]

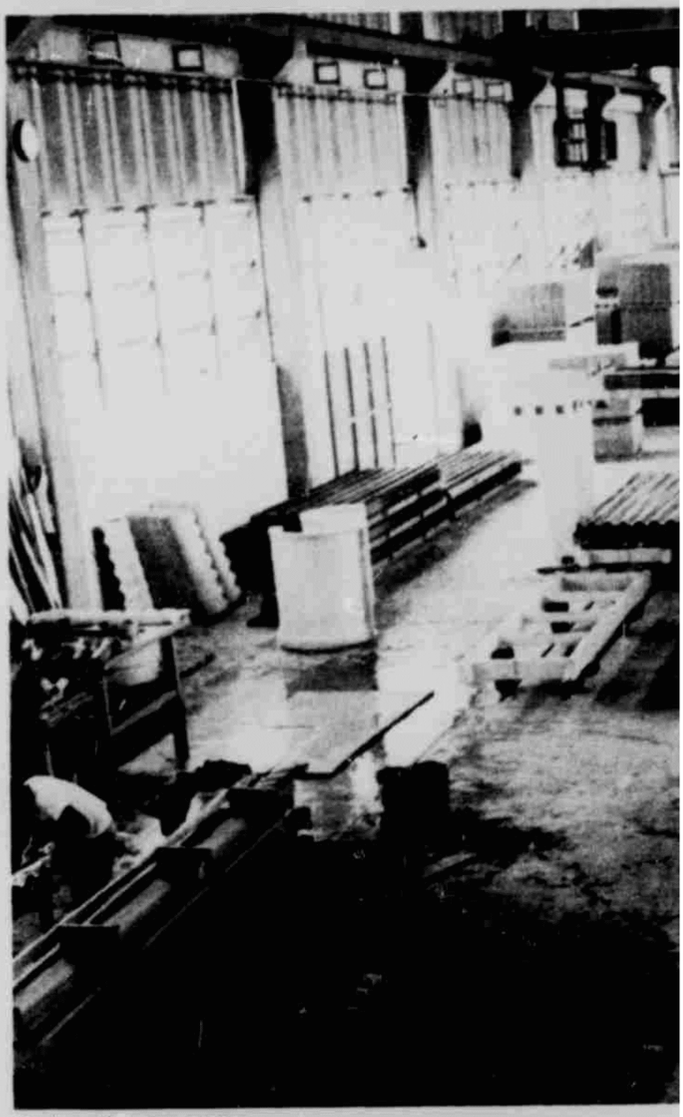
USSR Asbestos Combines

Uralasbest—Three adjacent open-pit asbestos mines are operating at Uralasbest, near Sverdiovsk in the Ural Mountains, producing

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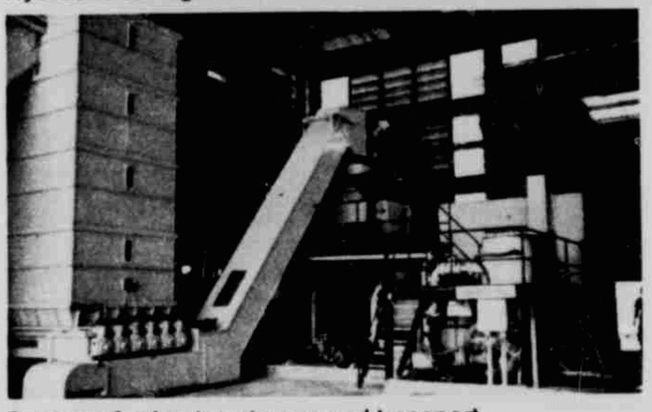
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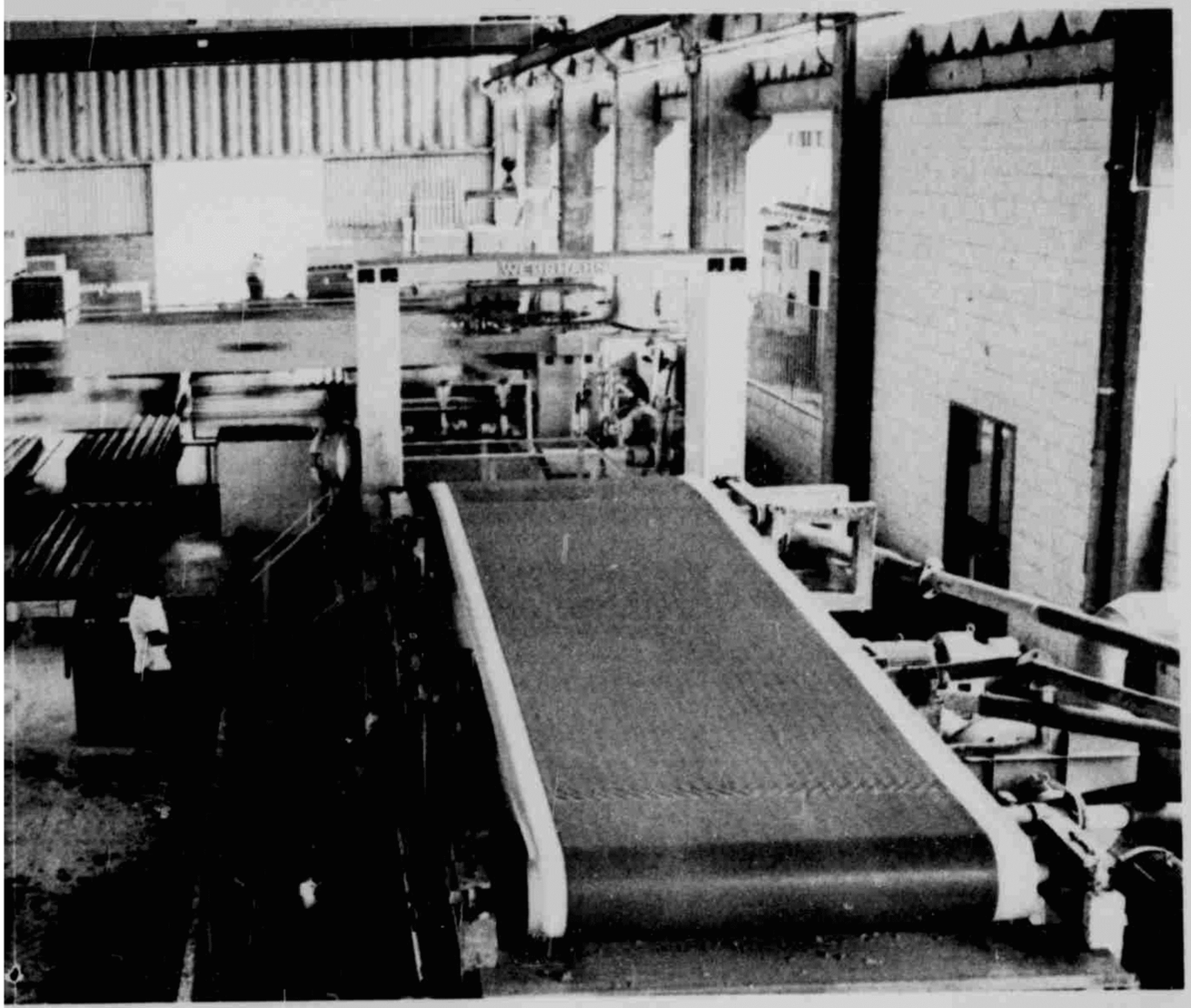


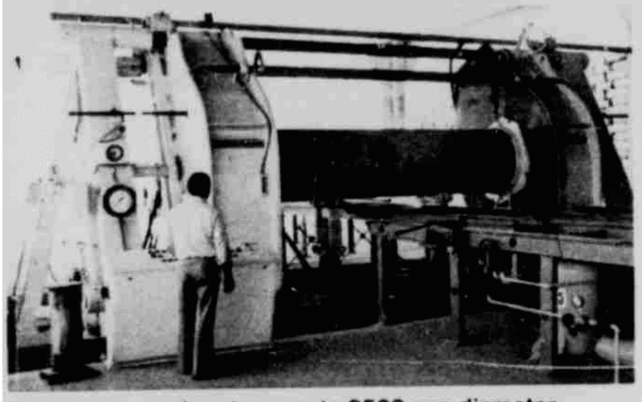
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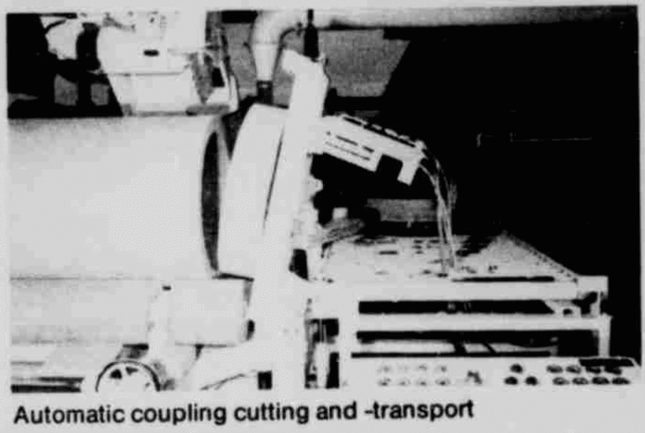
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Chrysotile Grades 1-7. Production is expected to remain unchanged at about 1.54-million tonnes per annum. . . . *Dzhetygara*—The second largest USSR asbestos operation is situated at the Dzhetygara deposit in Kazakhstan, Kustaney Oblast'. The first mill has been renovated which resulted in increased production from 259,000 tonnes in 1970 to an estimated 350,000 tonnes in 1979. The No. 2 mill, with annual capacity of 400,000 tonnes, produced an estimated 290,000 tonnes in 1979. . . . *Tuvaasbest*—The Tuvaasbest Combine at Ak-Dovurak, near Krasnoyarsk in the Tuva Autonomous Republic in South Central Siberia, is the third largest Russian asbestos complex. Its first mill produced over 60,000 tonnes in 1979 and a second an estimated 200,000 tonnes. Total output is to be increased to 265,000 tonnes in 1981 and 300,000 tonnes by 1986. . . . *Kiembay*—The Kiembay asbestos deposit is located at Orenburg Oblast', on the eastern slopes of the southern Urals. Design capacity is 500,000 tonnes per year of Grades 3-6. The initial 250,000-tonne stage was completed in November 1979 and some 10,000 tonnes were produced in February 1980, with full production expected by 1982. From 1980 through 1991, some 170,000 tonnes of asbestos will be supplied annually to the Comecon member countries which contributed to the cost of building the complex. . . . *Moladezhnoye*—Prospecting at the Moladezhnoye asbestos deposit in North Buryatia was completed in 1979. Reportedly the property contains about 18-million tonnes of asbestos ore and mine construction is planned when the western section of the Baykal-Amur railway is built. . . . *Sayan/Lenin*—The Sayan asbestos deposit is situated at the border of Krasnoyarsk Kray and Tuva ASSR, in East Siberia, with ore reserves estimated at 7-million tonnes. The Lenin complex is to be built at this site, with a planned annual capacity of 200,000 tonnes. Soviet geologists completed a survey of the deposit in the first half of 1980 and approved a state commission for their supplies. The deposit, the largest in Siberia, is sufficient to support a large enterprise for 40 years.

REPUBLIC OF SOUTH AFRICA

The Republic of South Africa is hovering just ahead of Zimbabwe as the third largest asbestos producer in the world. South Africa supplies nearly all of the Crocidolite and Amosite used internationally, and also mines and markets Chrysotile. All of South Africa's asbestos mines are located in the Transvaal and Cape Province. Reserves have been estimated at 8.5-million tons, ranking the nation second in the Western world (8%) and fourth globally (5%). The South African Minerals Bureau reports that the value of sales of South African asbestos rose from R101-million in 1979 to R-120-million in 1980. Cape Crocidolite accounted for 47.62% of the total production, Chrysotile 36.45% and Amosite 15.93%.

South African Exports

The value of exports of all types and grades of South African asbestos dropped 6.8% in the year ended March 1980, to R99,500,604. Since production is up even though current exports are down, it appears reasonable to assume that South African producers expect demand to rise in the near future. Breakdown for the latest year, by variety of asbestos, is R64,389,763 for Cape Crocidolite (down 5.1%), R17,097,768 for Chrysotile (down 0.3%) and R18,013,073 for Amosite (down a substantial

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17.5%). Cape Crocidolite accounted for 64.7% of the export value in 1980, Amosite 18.1% and Chrysotile 17.2%.

VALUE OF SOUTH AFRICA EXPORTS OF ASBESTOS

YEAR TO	CROCIDOLITE	CHRYSOTILE	AMOSITE	TREMOLITE
Mar 80	R64,389,763	R17,097,768	R18,013,073	R
Mar 79	67,835,146	17,144,308	21,824,468	
Mar 78	87,572,031	15,154,558	21,958,900	
Mar 77	82,559,619	17,013,381	24,190,185	104,834
Dec 75	50,168,317	10,454,554	25,974,773	208,036

Total export values for the above five annual periods were: 1980—R99,500,604, 1979—R106,803,922, 1978—R124,685,489, 1977—R123,868,019 and 1975—R86,805,690.

South African Production

Comparing the year ended March 1980 with that of March 1979, South Africa produced 124,771 metric tonnes of Cape Crocidolite (down 1.5%), 95,499 tonnes of Chrysotile (up 20.4%) and 41.742 tonnes of Amosite (up 2.5%). Total production of all varieties and grades reached 262,012 tonnes, 6.2% above the prior twelve months.

SOUTH AFRICAN ASBESTOS PRODUCTION (METRIC TONNES)

YEAR TO	CAPE BLUE	CHRYSOTILE	AMOSITE	TREMOLITE	TVL BLUE
Mar 80	124,771	95,499	41,742		
Mar 79	126,682	79,317	40,704		87
Mar 78	188,651	104,317	58,193	1,726	100
Mar 77	189,241	113,834	78,244	1,855	
Mar 76	161,139	101,241	85,017	769	
Mar 75	160,854	87,697	93,829	640	
Mar 74	149,521	72,087	102,419		1,597

Total tonnages for the above seven years were: 1980—262,012 tonnes, 1979—146,790 tonnes, 1978—351,261 tonnes, 1977—383,045 tonnes, 1976—349,252 tonnes, 1975—343,149 tonnes, 1974—362,264 tonnes.

South African Asbestos Mines

General Mining and Finance Corporation Ltd., a part of *Union Corporation*, is South Africa's second largest mining house. Together, its two producers, *Msauli Asbes Ltd.* and *Griqualand Exploration and Finance Co. Ltd.* dominate the South African asbestos industry. . . . *Msauli Asbes* owns the entire issued share capital of *African Chrysotile Asbestos Ltd.*, which sells Chrysotile fiber produced at its mine in the Ka Ngwane homeland, formerly known as the Barberton District in the Transvaal, on the Swaziland border. Although fiber production improved nearly 20% in 1979 (84,980 tons against 70,967 tons in 1978), unit costs per ton of fiber escalated in spite of expected economies of scale. An improved level of sales (90,574 tons in 1979 against 80,707 tons in 1978) continued throughout the year. Steadily improving geographical distribution of Msauli fiber is expected, especially in light of the growing supply shortage of certain Chrysotile shorter grades. Drilling from underground to

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delineate and evaluate the bottom of the present orebody is continuing. Msauli, the largest producer of white Chrysotile in South Africa, was originally an open-cast mine until 1975 when the orebody was followed underground. . . . *Gefco* produces some 30% and markets almost half the total world output of Crocidolite (Gefco Blue) asbestos from the Kuruman area of the Northwestern Cape Province. Fiber production was reduced 21.5% in 1979 to 50,485 metric tonnes and by early 1980 the company had announced further reductions plus layoffs of employees. Operations were concentrated at the higher grade mines in an effort to maintain a reasonable balance between revenue and costs. Gefco purchases its Crocidolite fiber from the nearby *Wandrag Mine of Duiker Exploration, part of the Lornho Group.* The fiber is then blended with Gefco's own material. Wandrag sold 9654 tonnes of fiber to Gefco during the year to September 30, 1979, compared with 11,651 tonnes in 1978.

Transvaal Consolidated Land & Exploration Co. Ltd. (TCL), a member of the *Barlow Rand Group* of South Africa, wholly owns *Cape Blue Mines (Pty) Ltd.* and *Egnep (Pty) Ltd.*, following the purchase on June 29, 1979, of the Mining Division of *Cape Industries Ltd.*, London, England. Cape Blue Mines produces Crocidolite at Pomfret in the Northern Cape Province and Egnep mines Amosite at Penge in the Northeastern Transvaal. Annual production capacity stands at 160,000 tonnes—90,000 tonnes at Penge and 70,000 tonnes at Pomfret.

Asbestos Investments (Pty) Ltd., a member of the *Eternit Group of Companies,* is the third largest asbestos producer in South Africa. Via two subsidiaries in the Northern Cape Province *(Kuruman Cape Blue Asbestos (Pty) Ltd.* and *Danielskuil Cape Blue Asbestos (Pty) Ltd.),* Asbestos Investments has the capacity to annually produce some 60,000 tons of Crocidolite.

Everite Ltd., Cape Province, cut production 10% to avoid excessive stock accumulations. The company states that market conditions for asbestos continue to deteriorate and a drop in profits and dividends from *Asbesco* is expected.

ZIMBABWE (FORMERLY RHODESIA)

From statistics we have available, it appears that Zimbabwe continues to hold fourth place in the world of asbestos producers, although it is running very close to taking over the third position from South Africa. . . . *Production*—Following the lifting of Zimbabwe sanctions, we have now received official production and exports figures from The Chamber of Mines, Salisbury. As will be noted on the statistical table below, Zimbabwe produced an estimated 248,040 metric tonnes of asbestos in 1980, valued at Z$69,379,200. The output is down 4.5% below 1979, almost matches 1978 and is the lowest since the year 1972. Since we have not been in position to report production for the past several years, we list on page 31 the output and value of Zimbabwe asbestos for the years 1964 through 1980.

Exports—Official statistics from The Chamber of Mines indicate that 198,587 tonnes of asbestos, valued at Z$57,893,000, were exported during the period January-September 1980. This averages out to 22,065 tonnes per month or a possible 264,783 tonnes valued at $77,190,666 (US$82-million) for the entire year 1980. Export information for the past

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several years has not been made available as yet but as soon as it is received, the data will be published in ASBESTOS.

ZIMBABWE ASBESTOS PRODUCTION (METRIC TONNES)

SOURCE: THE CHAMBER OF MINES OF ZIMBABWE

YEAR	PRODUCTION	VALUE	COST PER TONNE
1980	248,040	Z$69,379,200	Z$279.71
1979	259,600	65,864,000	253.71
1978	248,900	67,077,000	269.21
1977	273,200	67,032,000	245.36
1976	281,400	61,077,000	217.05
1975	261,500	41,701,000	159.47
1974	261,400	32,375,000	123.85
1973	261,900	26,044,000	99.44
1972	205,900	20,765,000	100.34
1971	205,600	21,657,000	105.34
1970	187,700	17,913,000	95.43
1969	178,900	17,062,000	95.37
1968	167,700	15,860,000	94.57
1967	154,100	14,020,000	90.98
1966	162,900	17,170,000	105.40
1965	159,800	17,052,000	106.71
1964	139,200	13,698,000	98.41

Zimbabwe Asbestos Mines

About 90% of Zimbabwe's asbestos production comes from Turner & Newall's subsidiary, *African Associates Mines*, which controls the Shabanie Mine at Shabanie and the Gaths, King and Temeraire Mines at Mashaba. A Z$100-million mill at Shabanie, opened in July 1980, will increase the milling rate by one-third to 200,000 tonnes per month. Gaths and King, where a new mill was opened in 1973, are crushing 180,000 tonnes a month from underground and old dumps. A further 40,000 tonnes per month of old dump and reclamation ore is treated at the Temeraire Mill. A massive investment program in recent years has resulted in the mines being among the most efficient on the continent, and a further Z$30-million capital expansion program is planned in 1981. . . . Early in 1980, *Turner & Newall* issued a resume of its initial assessment of the financial posture of its wholly-owned subsidiaries *(The RH Group)* operating in Zimbabwe. The principal subsidiaries are *Shabanie & Mashaba Mines (Pvt) Ltd. (formerly Rhodesian & General Asbestos Corporation)*, operator of three asbestos mines, and *Turnall Holdings (Pvt) Ltd.*, maker of construction and industrial materials. Aggregate figures based on management accounts for the 14 years to December 12, 1979, show that the RH Group had a corresponding net asset value of Z$138-million. Since 1965, retained profits of Z$91-million have been capitalized into additional equity capital of the RH Group. The RH Group expects to earn a profit before taxation of about Z$18-million for the year 1980. . . . Another major producer, the Swiss-controlled *Asbestos Investments*, operates the Pangani, Boss and Vanguard Mines and owns the now-dormant Rex Mine. . . . The DSO Mine, wholly-owned by the *Industrial Development Corporation*, produces about 6000 tonnes a year of Grades 4 and 5. . . . It has also been reported that a

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major new plant was installed at the *Kudu Asbestos Mine* in Bulawayo, increasing annual production capacity to some 200,000 tonnes. . . . Sources in the asbestos industry in Zimbabwe say there is no indication of slackening demand for their high quality product in spite of the recessionary trends in industrialized countries, especially due to the worldwide scarcity of spinning-grade fibers. In addition, South East Asian textile markets have become a major destination for Zimbabwe fiber and demand from that area is expected to continue on the upswing. [Some of our information on Zimbabwe was excerpted from Mining in Zimbabwe 1980]

AUSTRALIA

Exports—Traditionally a net importer, Australia's exports of asbestos exceeded imports for the second consecutive year, by 58.5% in 1980 and 15.7% in 1979. Total exports of all varieties of the mineral for the year ended June 1980 totaled 56,540 metric tonnes, valued at A$18,174,941, up 66.1% in quantity and 38.1% in value over the like 1979 period. For comparing, exports in prior years were: 1979—34,036 tonnes, valued at $13,164,459; 1978—32,145 tonnes, $20,004,922; 1977—28,011 tonnes, $10,384,430; 1976—38,138 tonnes, $11,793,186; 1975—15,940 tonnes, $3,693,186. . . . *Imports* of asbestos into Australia totaled 23,490 tonnes for the year to June 1980, valued at A$11,874,281, down 20.2% in quantity and 8.9% in value. The import breakdown, by variety of fiber, for the latest year, with percentage changes from the prior year, are as follows: Chrysotile—17,414 tonnes valued at $8,824,997, down 12.7% in quantity and 1.2% in value; Amosite—5862 tonnes valued at $3,009,341, down 32.6% in tonnage and 19.2% in value; Other—214 tonnes valued at $39,943, down 73.3% in tonnes and 89.5% in value. Total imports for past years amounted to 29,442 tonnes in 1979, valued at $13,037,911; 55,265 tonnes in 1978, valued at $25,978,419; 70,342 tonnes in 1977, valued at $29,414,733; 56,246 tonnes in 1976, valued at $17,852,927; and 50,879 tonnes in 1975, valued at $11,195,399.

Woodsreef Mines Ltd.—Asbestos *production at Woodsreef Mine* at Barraba, New South Wales, operated by Woodsreef Mines' subsidiary, *Chrysotile Corporation of Australia Pty. Ltd.*, totaled 83,427 metric tonnes in 1980, a 12.8% increase over the year 1979. Output for the entire life of the mining/milling complex, February 1972 to December 1980, amounts to 507,770.5 tonnes. *Sales* for the quarter to September 30, 1980, increased 19% in tonnage over the same quarter in 1979 and there was a 48% increase in revenue from sales. The high revenue increase was due to larger than normal shipments of longer fiber grades. It is anticipated that *fiber stocks* would be reduced to about 12,000 tonnes at the end of 1980, showing a reduction of 45% from the stock level at the beginning of the year. Installation of additional dust control equipment was completed and all items are now fully effective and operational. The federal government of Australia announced it would support the Barraba Mine with an interest-bearing repayable grant of up to $1-million. The grant will be fully secured using stocks of asbestos fiber as collateral and is conditional on restructuring being concluded. The parent company in Toronto, Ontario, *Transpacific Asbestos Inc. (formerly Woodsreef Minerals Ltd.)*, in December 1980, completed a private placement of C$2,050,000 of 11% convertible debentures to permit restructuring to proceed in Australia as well as the long-planned wet milling process prototype mill.

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OTHER ASBESTOS MINING NATIONS

Brazil—An open-pit Chrysotile mine is in operation by *S. A. Mineracao de Amiante* at Cana Brava, Goias State, 160 miles northwest of Brasilia. SAMA, which accounts for some 95% of total Brazilian asbestos output, is controlled by *S.A. Tubos Brasilit* which, in turn, is owned by *Saint-Gobain-Pont-A-Mousson* and the *Eternit Group.* Reserves are estimated at 3.5-million tonnes. Annual planned capacity, all for domestic use, is 140,000 tonnes per year, with 125,000 tonnes to have been reached by 1980.

Peoples Republic of China—Based on figures published by the U.S. Bureau of Mines, Mainland China continues to be fifth among the world asbestos producers, primarily of the Chrysotile variety. Production has increased considerably during the last decade, roughly doubling to the general level of 250,000 tonnes per year. Internal demand has risen steadily and many kinds of asbestos products are made to meet industrial requirements. In recent years the Chinese have had small surpluses of asbestos and asbestos products for export. . . . The principal asbestos operation in China is the Shihmien (meaning asbestos) Mine in Szechuan Province. Reserves are estimated at 28-million tonnes of better than 2% ore with top quality Chrysotile fibers 2 centimeters or longer constituting more than half of total production. The Penghsien Mine is considered the second major asbestos deposit in the Province. Outside Szechuan, the most productive deposits are situated in Laiyuan County, Hopeh, where the Chrysotile is reportedly 2-5 centimeters in length and high in tensile strength. The asbestos produced in Liaoning is said to be medium long and strong, suitable for use in asbestos-cement products. Asbestos has also been discovered in Yuankiang County, Yunnan Province.

Colombia—L. A. Serna, President of *Minera Las Brisas S.A.*, Bogota, reports that start-up of production at the Chrysotile processing plant at Antioquia, near Campamentos, is now scheduled for the third quarter of 1981. Initial output is to be some 6000 metric tonnes per annum, with an eventual annual production of 16,000 tonnes. Total output will be absorbed by Colombian markets. The project involves investors from Switzerland and South Africa, with participation by *Eternit Colombiana.*

Cyprus—The sole asbestos producer on the Island is *Cyprus Asbestos Mines Ltd.* One mill is in operation which *produced* 35,472 tonnes of fiber in 1979—19,374 tonnes of long and 16,098 tonnes of short. Prior production was 34,342 tonnes in 1978, 36,684 tonnes in 1977 and 34,518 tonnes in 1976. *Exports* reached 38,990 tonnes in 1979 valued at C£5,003,797. By order of importance, countries of destination were Denmark, Greece, Belgium, Ireland, Italy, Thailand, the United Kingdom, Japan, Spain and Czechoslovakia. Exports in prior years were 29,539 tonnes valued at £3.8-million in 1978, 35,342 tonnes valued at £4.4-million in 1977 and 32,836 tonnes valued at £3.3-million in 1976.

Greece—As advised by Professor L. S. Moussoulos, Chairman of the Board and Managing Director of *Asbestos Mines of Northern Greece S.A.*, in October 1980 the *Zidani Asbestos Mine* reached the contemplated capacity of handling 4-million tonnes of ore per year. With ore reserves calculated at 100-million tonnes, a life span of 25 years is indicated. The deposit offers 2.63% of Chrysotile Grades 4-7. Production capacity will be 100,000-110,000 tonnes of asbestos per annum, with 65,000 tonnes anticipated for 1981, the first full year of operation. Total investment for the complex is an estimated $85-million. Greece will currently utilize 20% of annual output, with the remainder to be exported, primarily to Mediterranean, Far Eastern and European countries.

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Italy—Most of the asbestos produced in Italy is from the *Balangero Mine* at San Vittore, owned by *Amiantifera de Balangero SpA*, Milano. A method of mining on a narrow grid with a 400-horsepower excavator was tried and adopted for extraction of ore from the benches.

Mexico—A $44-million asbestos project at Concepcion Papalo, in Oaxaca State, is expected to soon come on stream, with an initial capacity of 60,000 tonnes per annum. It is an operation of *Cia. Minera Pegaso S.A.*, a joint subsidiary of *Industrias Penoles S.A. de C.V.* (60%) and *Johns-Manville Corporation* (40%). Output will mostly be Chrysotile cross fiber in Groups 4 and 6 and will be used mainly by Mexican markets.

Mozambique—Minas Gerais de Mozambique Lda., Maputo, reports it is pilot testing and expects to soon be producing Anthophyllite from the Mavita Mines. The property has been closed since mid-1975.

Sudan—Johns-Manville Corporation was awarded two asbestos exploration concessions. Only one, in Qala-el-Nahl near the Ethiopian border, is believed to have commercial possibilities, according to the U.S. Bureau of Mines. Other partners in the venture are the *Sudan Textile Industry* and the *Gulf International Group* of Kuwait.

Swaziland—Asbestos continues to be Swaziland's chief revenue earner so far as mining is concerned, contributing some 76% of the total 1979 earnings from ex-mine sales. At the *Havelock Asbestos Mine*, a partnership between the *Swazi nation* and *Turner & Newall*, there was a decrease in tonnage sold and in average product value. The mining of lower grade ore resulted in a lower production of asbestos fiber and sales were augmented by drawing on stocks. In the treatment plant at the mine, work continued on the dust suppression program. Annual mine production totaled 34,294 tonnes in 1979 vs. 36,951 tonnes a year earlier.

Taiwan produced an estimated 2404 metric tonnes of asbestos in 1980, mostly the Tremolite and Actinolite varieties, compared with 2957 tonnes in 1979. Imports totaled an estimated 20,004 tonnes in 1980 vs. 29,325 tonnes in 1979.

Turkey—Adana Atermit and *Amyant Sanayii A.S.* operate the two largest of six asbestos mines in Turkey. Reportedly the latter operates an asbestos processing plant capable of producing 10,000 tons of fiber per year. An estimate made in 1979 established Turkey's asbestos reserves at nearly 5-million tons.

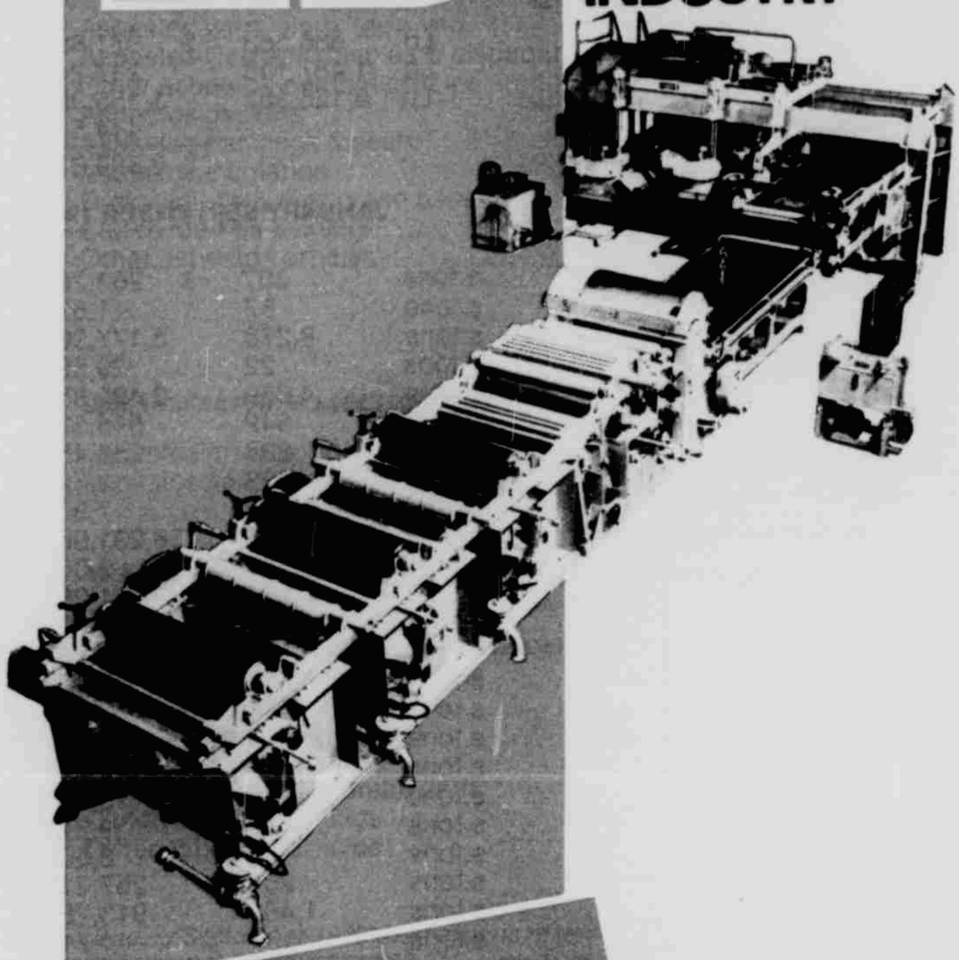
Yugoslavia—The Mining Journal reports that *Invest Import*, Belgrade, has awarded *KHD Humboldt Wedag AG*, Cologne, a contract to supply equipment for an asbestos ore preparation plant in the Yugoslav Stragari. . . . Plans are progressing to increase fiber output at the Bogutovo Selo open-pit mine at Ugljevik. Yugoslavian asbestos ore reserves are estimated at 21-million tonnes.

ASBESTOS Magazine has changed ownership. The undersigned, who has been Editor since July 1968, is now, effective January 1, 1981, also the publisher of ASBESTOS and President of the publishing company, D & B Enterprises, Inc. My sincere appreciation is expressed to Carrell J. Stover, son of the Founder of this Magazine, for his fine leadership and dedication as Publisher for the past 12 years. ASBESTOS will continue in its endeavors to serve the International Asbestos Industry and keep it informed. We hope you will continue to support this effort via subscriptions and advertising and with news contributions on a worldwide basis.

Doris M. Fagan

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Imports Into the United States

From: U.S. Bureau of the Census

			SEPTEMBER 1980	
UNMANUFACTURED ASBESTOS:				
Chrysotile Spinning Fibers, Canada	s.tons		464	$ 367,401
Chrysotile, Other, Brazil	s.tons		19	5,514
Canada	s.tons		25,117	5,104,276
Other Crudes & Fibers, Canada	s.tons		1,723	449,183
Zimbabwe	s.tons		20	22,542
			27,343	$ 5,949,006
MANUFACTURED ASBESTOS PRODUCTS:				
Asbestos yarn, cloth, tape, etc.	Lb		586,583	$ 971,895
A-C pipes, tubes & fittings	Lb		1,487,146	237,244
Other asbestos-cement articles	Lb		6,125,382	1,155,994
Other asbestos articles			..	444,537
				$ 2,809,670
			JANUARY-SEPTEMBER 1980	
UNMANUFACTURED ASBESTOS:				
Amosite, South Africa	s.tons		307	$ 263,262
Crocidolite, Canada	s.tons		57	11,672
South Africa	s.tons		8,278	5,177,960
Chrysotile Crudes, Zimbabwe	s.tons		22	29,592
Chrysotile Spinning Fibers, Canada	s.tons		4,669	3,499,851
Zimbabwe	s.tons		542	515,325
South Africa	s.tons		298	253,455
Sweden	s.tons		23	2,520
Chrysotile, Other, Brazil	s.tons		42	7,935
Canada	s.tons		245,509	56,291,962
Germany, Fed. Rep.	s.tons		21	2,368
Mexico	s.tons		30	1,285
Zimbabwe	s.tons		20	20,703
South Africa	s.tons		758	432,262
Sweden	s.tons		46	5,040
Yemen	s.tons		46	12,454
Other Crudes & Fibers, Canada	s.tons		9,494	2,554,821
Germany, Fed. Rep.	s.tons		22	28,607
India	s.tons		46	13,890
Japan	s.tons		29	9,212
Mexico	s.tons		2	3,500
Zimbabwe	s.tons		251	257,212
South Africa	s.tons		1,452	913,265
United Kingdom	s.tons		1	712
			271,965	$70,308,865
MANUFACTURED ASBESTOS PRODUCTS:				
Asbestos yarn, cloth, tape, etc.	Lb		5,650,139	$ 9,420,194
A-C pipes, tubes & fittings	Lb		7,150,037	1,061,699
Other asbestos-cement articles	Lb		49,449,655	9,130,914
Other asbestos articles			..	4,609,885
				$24,222,692

January-September 1979: U.S. imports of unmanufactured asbestos totaled 439,353 short tons, valued at $106,217,792; imports of manufactured asbestos products were valued at $23,504,206.

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Exports From the United States

From: U.S. Bureau of the Census

			SEPTEMBER 1980	
UNMANUFACTURED ASBESTOS:				
Asbestos crudes, fibers & stucco	s.tons	3,841	$	1,479,569
Asbestos sand & refuse	s.tons	1,035		267,891
		4,876	$	1,747,460
MANUFACTURED ASBESTOS PRODUCTS:				
Asbestos yarn, cloth, tape, etc.	Lb	688,946	$	845,954
Asbestos-Cement shingles & clapboard	Lb	679,096		183,814
Other asbestos-cement articles	Lb	2,785,250		1,481,696
Asbestos gaskets	Lb	78,347		390,418
Asbestos packings & seals	Lb	356,939		1,086,746
Asbestos insulation		..		187,589
Brake linings & disc brake pads		..		4,728,264
Clutch facings & linings		..		617,358
Other asbestos articles		..		1,507,020
			$	11,028,859

			JANUARY-SEPTEMBER 1980	
UNMANUFACTURED ASBESTOS:				
Asbestos crudes, fibers & stucco	s.tons	29,305	$	12,560,246
Asbestos sand & refuse	s.tons	10,163		2,996,417
		39,468	$	15,556,663
MANUFACTURED ASBESTOS PRODUCTS:				
Asbestos yarn, cloth, tape, etc.	Lb	4,377,018	$	6,487,954
Asbestos-Cement shingles & clapboard	Lb	8,060,989		2,029,992
Other asbestos-cement articles	Lb	24,255,040		8,761,025
Asbestos gaskets	Lb	749,797		2,697,743
Asbestos packings & seals	Lb	3,506,163		11,591,053
Asbestos insulation		..		5,102,550
Brake linings & disc brake pads		..		39,228,295
Clutch facings & linings		..		7,880,956
Other asbestos articles		..		19,518,105
				$103,297,673

January-September 1979: U.S. exports of unmanufactured asbestos reached 32,689 short tons, valued at $11,507,015; exports of manufactured asbestos products were valued at $104,928,034.

—NEXT ISSUE—

FIAT-ALLIS TRACTOR HELPS INCREASE PRODUCTION AT CALAVERAS ASBESTOS LTD.

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Exports From Canada

From Statistics Canada

SEPTEMBER 1980

Short Tons

UNMANUFACTURED ASBESTOS:	***Crude***	***Milled Gp 3***	***Milled Gp 4&5***	***Shorts Gp 6-9***
Western Europe	..	824	28,944	7,814
Eastern Europe	..	..	516	99
Middle East	..	..	..	..
Africa	..	..	3,716	1,168
Asia	..	66	10,774	5,228
Oceania	..	..	100	77
So. & Cen. America & Antilles	..	..	4,958	4,071
United States	—	175	4,338	26,327
		1,065	53,346	44,784

The total amount of unmanufactured asbestos exported in *September 1980* was 99,105 short tons (89,988 metric tonnes), valued at C$47,386,000.

MANUFACTURED ASBESTOS PRODUCTS:

Asbestos cloth, dryer felts & sheets	C$ 561,000
Asbestos brake linings & facings	327,000
Asbestos-Cement building materials	1,005,000
Other basic asbestos products	1,165,000
	C$ 3,058,000

JANUARY-SEPTEMBER 1980

UNMANUFACTURED ASBESTOS:	***Crude***	***Milled Gp 3***	***Milled Gp 4&5***	***Shorts Gp 6-9***
Western Europe	..	4,061	181,799	105,666
Eastern Europe	..	1,626	11,058	1,496
Middle East	..	100	9,640	342
Africa	..	21	24,306	11,031
Asia	..	2,522	94,907	95,365
Oceania	..	7	14,722	909
So. & Cen. America & Antilles	..	968	61,765	38,170
United States	—	2,865	50,847	218,440
		12,170	449,044	471,419

The total amount of unmanufactured asbestos exported in *January-September 1980* was 932,633 short tons (846,070 metric tonnes), valued at C$422,068,000.

MANUFACTURED ASBESTOS PRODUCTS:

Asbestos cloth, dryer felts & sheets	C$ 3,431,000
Asbestos brake linings & facings	2,330,000
Asbestos-Cement building materials	14,355,000
Other basic asbestos products	9,713,000
	C$29,829,000

January-September 1979: Canadian exports of unmanufactured asbestos totaled 1,211,260 short tons (1,098,828 metric tonnes), valued at C$483,148,000; exports of manufactured asbestos products were valued at C$25,428,000.

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Latest Asbestos Stock Quotations

CLOSE: DECEMBER 16, 1980

Abitibi Asbestos	C$.88
Advocate Mines	C$1.65
Armstrong World Ind.	14¼
Armstrong (pfd 3.75)	29
Asarco	38¾
Asbestos Corporation	C$27.50
Bendix	52½
Bendix (pfd)	44
Carlisle	72⅝
Cassiar Resources	Asked C$15.00
CertainTeed	11¾
Charter Conso.	pence 221
Colt Industries	43¼
Colt Ind. (pfd 1.60)	36
Colt Ind. (pfd 4.25)	95¼
Conwest-A	C$8.75
Conwest-B	C$6.75
GAF Corporation	9⅞
GAF (pfd 1.20)	12½
General Mining	US$21.625
Genstar	31½
Gulf & Western	15⅜
G&W (pfd 2.50)	39
G&W (pfd 3.87)	92
G&W (pfd 5.75)	57½
IC Industries	30⅝
IC Ind. (pfd 3.50)	45⅞
Johns-Manville	21⅞
J-M (pfd 5.40)	41½
Kennecott	25½
Lear Siegler	36½
Lear Siegler (pfd 2.25)	86
McAdam Mining	C$.85
National Gypsum	22⅜
Pathfinder	C$.58
Porter, H. K. (pfd 5.50)	72
Raybestos-Manhattan	29¼
Rio Algom	C$35.75
Rio Algom (pfd 5.80)	C$56.00
Rio Algom (pfd 8.5%)	C$4.35
St. Gobain	French Francs 137.50
Supradur	Bid 5¼, Asked 5¾
Union Carbide	48
United Asbestos	C$7.00
Walter, Jim	28¼
Walter, Jim (pfd 1)	8
Walter, Jim (pfd 1.60)	29¼
Transpacific Asbestos	C$.59

Asbestos Health Education

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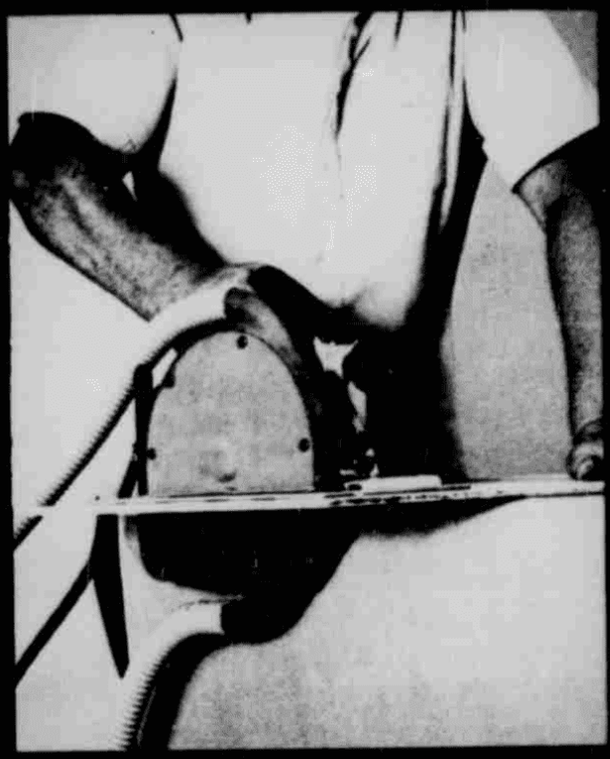
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Valuable Mining Literature

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THE CHANGING STRUCTURE OF THE CANADIAN MINERAL INDUSTRY—Proceedings of the 7th Policy Discussion Seminar held March 1980; includes a digest of the discussions and the following papers: The Canadian Mineral Industry in the 1980's, Changing Relations Between Host Governments of LDC's and International Mining and Petroleum Companies, The Federal-Provincial Backdrop in the Eighties, Changing Company Roles: A Trend to Concentration? and Integrated Oil Company Diversification into Mining. [$5.00; a working paper of the Centre for Resource Studies; order from Renouf Publishing Co. Ltd., 2182 St. Catherine Street West, Montreal, Quebec, Canada H3H 1M7]

AN ECONOMIC ANALYSIS OF THE CANADIAN TAXATION OF AN INTEGRATED MINING COMPANY—Describes and analyzes the economic impact of federal and provincial taxation on the decisions of integrated mining firms with respect to their use of the factors of production; the author concludes that the taxation systems are not neutral in their treatment of the factors of production. [112 pages; $5.00; a CRC working paper, order from Renouf Publishing Co. Ltd., address as above]

THE FUTURE OF SMALL-SCALE MINING—Defines the importance of small mineral deposits in the world's mineral economy; discusses problems and practical solutions re fostering development and expansion of small-scale mining; contains 79 presentations offered at the 1st International Conference on the Future of Small-Scale Mining held in 1978. [501 pages; $55.00; McGraw-Hill's Mining Informational Services; may be ordered through ASBESTOS]

MINING METHODS AND EQUIPMENT—An introductory book on mining, written in non-technical language by Professor K. S. Stout; presents a basic pictorial review of the mining process; covers the wide spectrum of steps involved in mine operation, i.e., finding and evaluating ore or coal, developing and mining the deposits and reclamation required after operations cease. [$16.50; McGraw-Hill's Mining Informational Services; may be ordered through ASBESTOS]

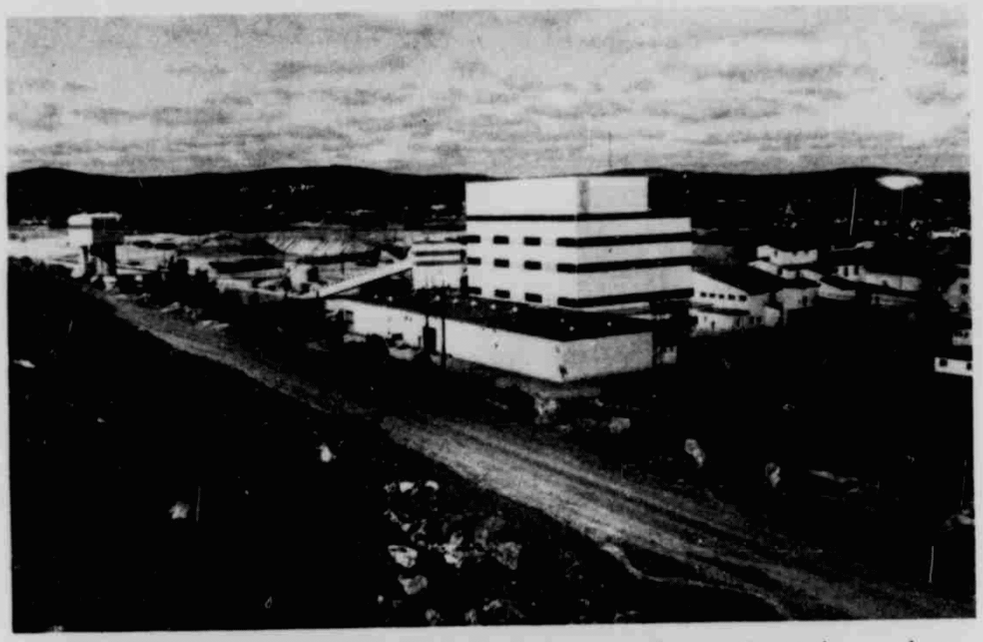
MINING IN CANADA/FACTS & FIGURES/1980—Published to define the significance of the Canadian mining industry which boasts of nearly 270 operating mines, producing over 60 different commodities; contains statistical summaries by mineral class and provincial data; discusses exploration, transportation, production, exports, employment, manpower, taxes, research, development, environmental control, Canadian mining communities and principal mining areas. [44 pages; 10 tables; free from The Mining Association of Canada, 36 Toronto Street, Suite 409, Toronto, Ontario, Canada M5C 2C2]

GEOPHYSICAL AND GEOCHEMICAL TECHNIQUES FOR EXPLORATION OF HYDROCARBONS AND MINERALS/1980—Based primarily on patent literature to help meet the world's needs for energy and minerals; covers geochemical and geobiological prospecting; geophysical exploration; magnetic, gravitational, electrical, nuclear and seismic geophysical prospecting; and exploratory well drilling. [300 pages; $40.00; Noyes Data Corporation; may be ordered through ASBESTOS]

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R. L. Schult, National Sales Manager, Union Carbide Corporation, Metals Division, Niagara Falls, New York, *February 17.*

Dan Wayne Grimmitt, Secretary-Treasurer, Southern Textile Corporation, Charlotte, North Carolina, *February 18.*

C. R. Pattison, Managing Director, Cape Insulation Services Ltd., Watford, Hertfordshire, England, *February 18.*

E. R. E. Carter, Chairman of the Board & President, Advocate Mines Ltd., Toronto, Ontario, *February 20.*

James K. Gilmore, Sales Manager, Vermont Asbestos Group, Inc., Hyde Park, Vermont, *February 20.*

Michael J. Messel, President, Lac d'Amiante du Quebec Ltee, Black Lake, Quebec, *February 22.*

Benno Raschkes, Overseas Sales Manager, Turners Asbestos Fibres Ltd., Manchester, England, *February 23.*

K. H. Davenport, a Director, James Hardie Industries Ltd., Sydney, New South Wales, Australia, *February 24.*

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John Fear, Plant Industrial Engineer, CAPCO Pipe Company, Inc., Van Buren, Arkansas, *March 12.*

Paul-A. Filteau, Executive Vice President, Quebec Asbestos Mining Association, Quebec City, Quebec, *March 12.*

Roger Mercier, Production Superintendent, Asbestos Plant, Johns-Manville Canada Inc., Asbestos, Quebec, *March 12.*

Michel Besson, Vice Chairman & Chief Executive Officer, CertainTeed Corporation, Valley Forge, Pennsylvania, *March 14.*

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To meet clean air standards you not only need a centralized dust collector, you also need a decentralized dust collector.

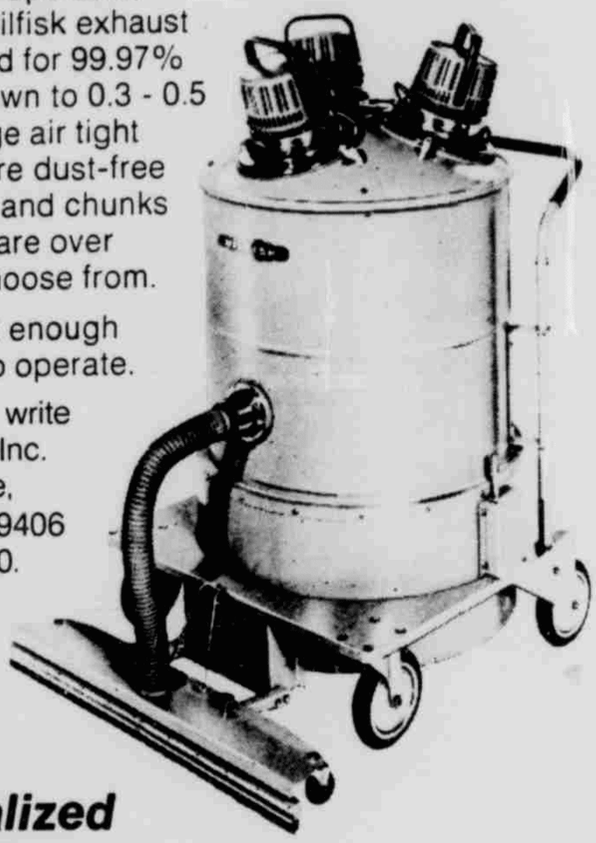
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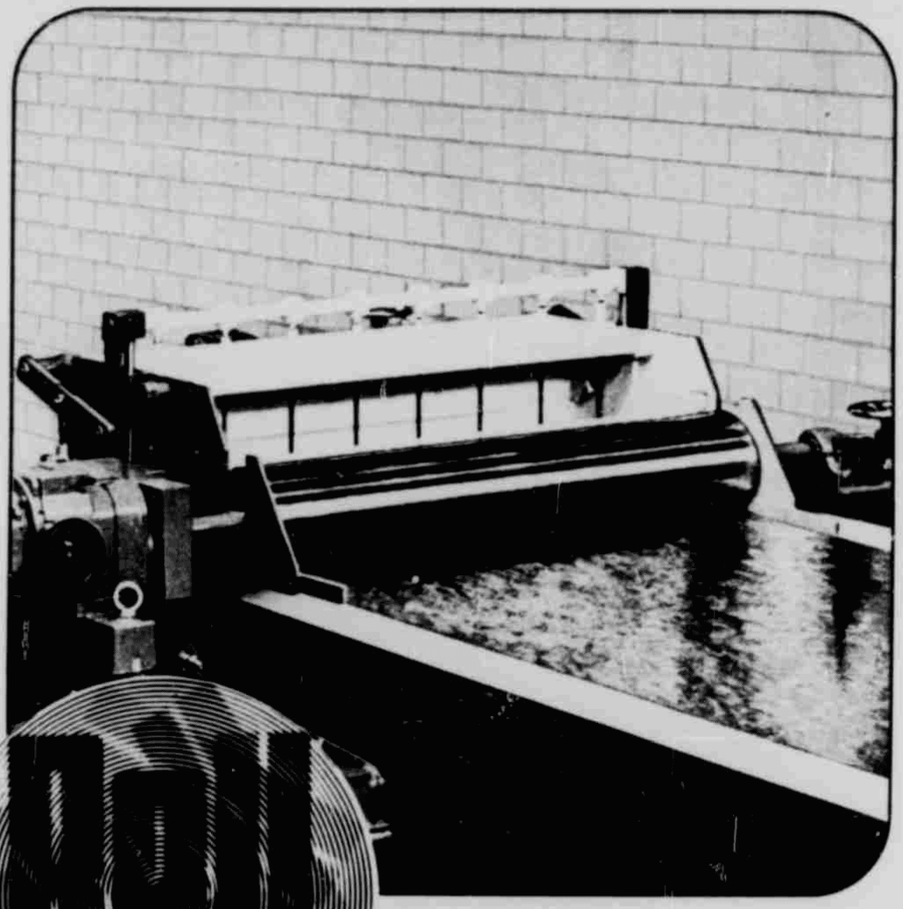
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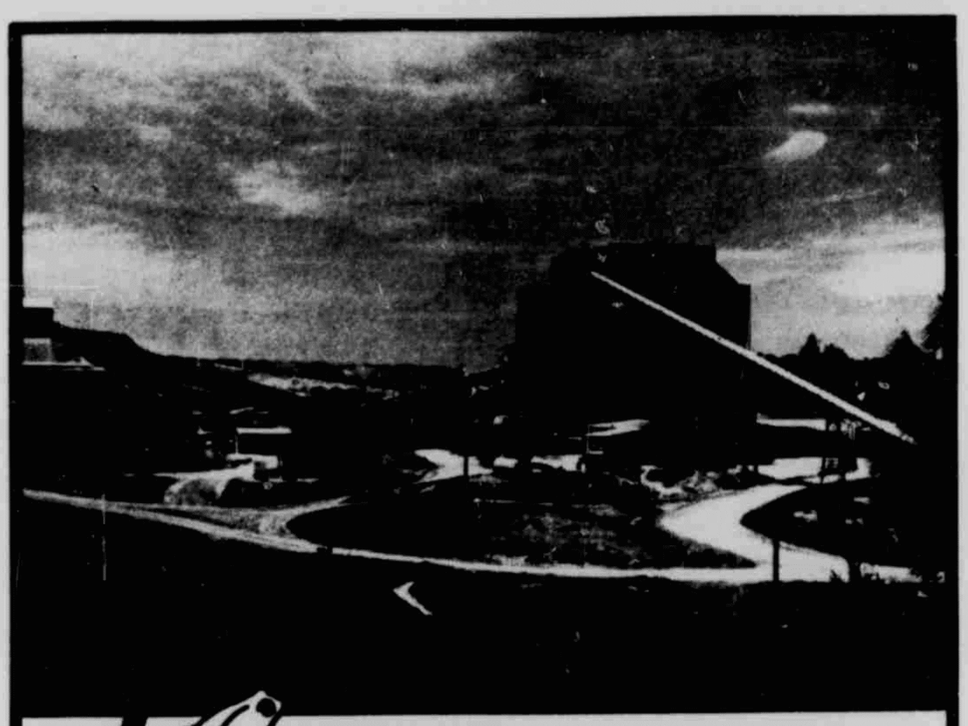
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