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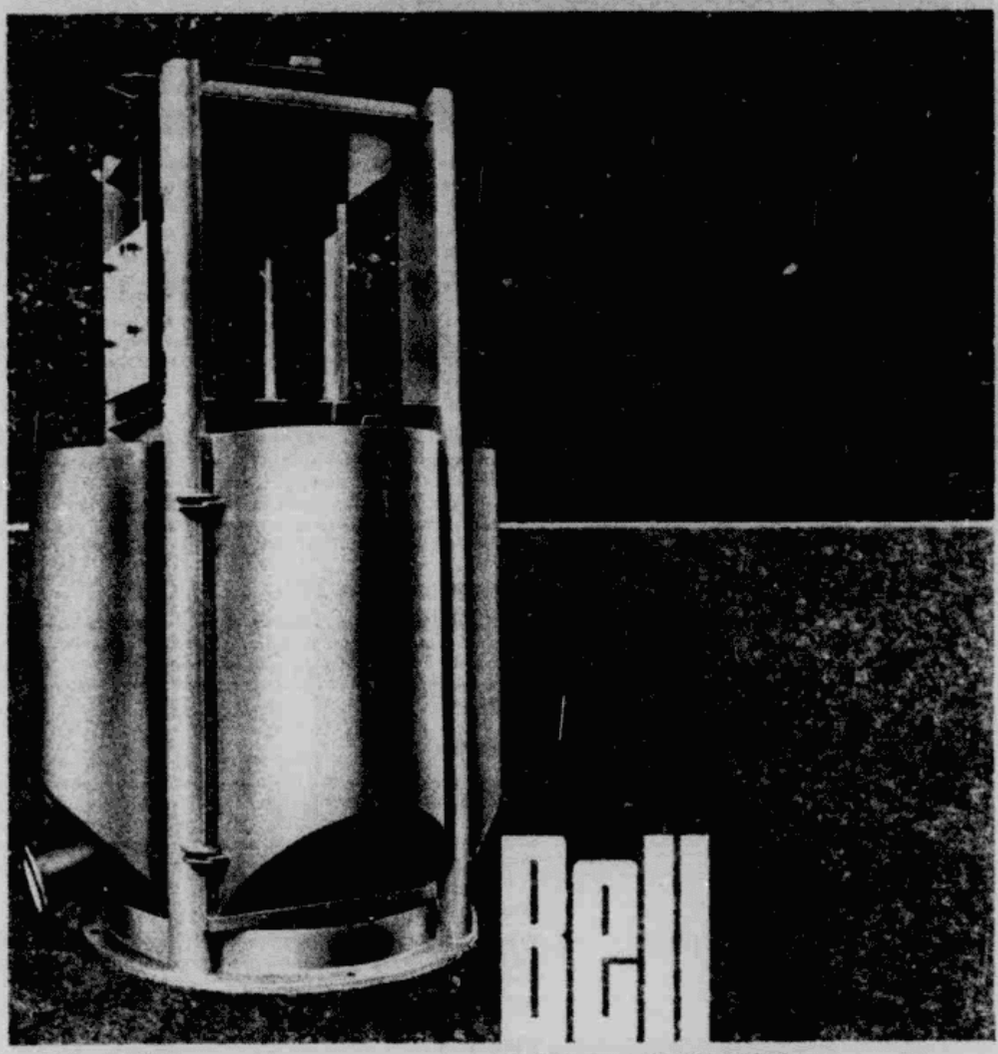


Yet the GA 73 is light enough for a single person to operate.

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Recommended Practices for Handling Asbestos Fiber

GENERAL PRECAUTIONS

In all stages of handling — packaging, transporting, unloading, storing, and in-plant moving — asbestos fiber bags should be handled carefully and in such a manner as to prevent damage of bags and the generation of dust.

Damaged bags should be immediately repaired, resealed or put into closed receptacles. Any spillage of asbestos fiber should be cleaned up immediately — either by vacuum equipment or, after thoroughly wetting, by sweeping — and should be deposited in suitable closed receptacles.

Consult and observe OSHA regulations governing asbestos in the workplace; EPA rules on discharge to the ambient air; and other local codes, rules or regulations controlling the handling and use of asbestos fiber.

UNLOADING

Unitized loads should be lifted intact to and from holds of ships, and off and on land transport by forklift trucks or other suitable handling equipment.

Care should be taken to avoid puncturing the asbestos fiber bags during unloading from ships, railroad cars, trucks or other modes of transportation. Hooks or other sharp instruments *should not* be used. Loose fiber accumulated during transit should be picked up by vacuum cleaner *before* unloading.

STORAGE

For storage, fiber bags should be stacked and moved with care to avoid breakage; protected from puncture by moving vehicles; and, if possible, should be isolated from traffic in the warehouse and covered to prevent dust generation. To prevent deterioration of stored bags, the principle of first-in, first-out should be followed.

HANDLING

Maximum possible enclosure and fully effective dust control systems should be provided at all stages of in-plant handling where dust is created, such as in bag opening, fiber dumping and bag disposal operations. Loose fiber should be cleaned from work areas by vacuum cleaner, or after thoroughly wetting, by sweeping, and then deposited in covered receptacles.

PROTECTIVE EQUIPMENT

Wearing of respiratory equipment approved for protection against asbestos dust should be required at all stages of asbestos fiber handling where quantities of dust are generated which cannot be kept within the Threshold Limit Value by dust control equipment or other methods.

TRANSPORT

Where the use of asbestos requires the transport of loose fiber in open carts or buggies, covers should be used to prevent spilling and dust generation.

WASTE MATERIALS

Waste materials, such as collected dust and empty fiber bags, should be placed in special closed receptacles and disposed of in such a manner as to prevent the release of dust. Safety practices outlined above in the *HANDLING* and *PROTECTIVE EQUIPMENT* sections should be followed during these operations.

All dust from exhaust systems should be collected and safely disposed of, being careful not to release dust into the outside air. Particular attention should be paid to the protection of employees whose job it is to dispose of collected dust from fabric filter dust collection and similar cleaning operations.

An employee pamphlet, "What You Should Know About Asbestos and Health," recommended work practices for various asbestos fabrication processes and a series of posters to serve as reminders for proper usage of asbestos in the workplace are among the materials available to the industry through a continuing education program

For additional information, write:

AIA NORTH AMERICA **ASBESTOS INFORMATION ASSOCIATION** 1835 K Street, N.W., Washington, D.C. 20006

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1976—THE YEAR IN REVIEW

GENERAL BUSINESS

The upturn in business which started in mid-1975 continued through the first half of 1976. The economy improved markedly during the first quarter with sales of consumer goods leading the way. Prices seemed to have stabilized and unemployment was moving downward, albeit rather slowly. New car sales were strong but housing, heavy construction and spending for capital goods in general were not keeping pace with consumer purchases.

As the year progressed, the rate of recovery moderated to what many observers felt was a more sustainable level. Interest rates edged higher as the Federal Reserve Board acted to slow the rapid growth of the money supply. Unemployment receded to a low of 7.3% and prices moved slightly higher. A certain hesitancy on the part of businessmen and consumers became evident, partially as a result of uncertainties regarding the upcoming Presidential election, and this was reflected in slowing sales of consumer durables and sluggish capital expenditures.

The third quarter witnessed declines in several key economic indicators and the unemployment rate moved up to 7.8%. These figures gave rise to fears that the recovery might abort. The FRB relaxed its tight rein on the money supply and interest rates trended lower with the prime rate at most banks dropping to 6½%, a low for the year.

Mr. Carter won the Presidency by a narrow margin. His first pronouncements on future policies did little to calm the fears of those who foresee an era of free spending, mounting government deficits and renewed strong inflationary pressures, not to mention the spectre of wage and price controls. The stock market reflected these concerns by dropping to a ten-month low.

Even considering the leveling-off toward year-end, 1976 was, in retrospect, a good year for the economy. Gross National Product grew at a healthy rate, corporate profits increased substantially and liquidity throughout the business and financial systems showed marked improvement.

As usual, we enter the new year faced with some serious problems. Economic recovery in a number of industrialized nations has slowed even more than in the United States and the question is whether this presages another worldwide recessionary period. Great Britain's politico-economic problems are

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ASBESTOS STOCK QUOTATIONS

Comparative Closing Prices	11/19/74	11/18/75	11/16/76
Abitibi Asbestos	C$1.30	C$1.00	C$.79
Advocate Mines	C$1.25	C$1.40	C$2.90
Armstrong Cork	17	25	29 5/8
Asarco	16 1/2	12 3/4	15 5/8
Asbestos Corporation	C$16.50	C$21.25	C$25.00
Bendix	20 1/4	43 3/8	39 5/8
Bendix (pfd 3)	34	66	80 1/2
Carlisle	12 1/4	10 5/8	13 7/8
Cassiar Asbestos	C$3.20	C$6.75	C$5.00
CertainTeed	7 1/2	13 3/4	18 5/8
Charter Conso. (pence)	108	174	132
Colt Industries	21 3/4	26	47 3/8
Colt Ind. (pfd 1.60)		17 1/2	25 3/4
Colt Ind. (pfd 4.25)	47 1/2	46 1/4	66 1/4
Conwest	C$2.52	C$3.30	C$3.00
Flintkote	11 1/4	15 1/4	21 3/4
F-kote (pfd-A 4.50)	43 1/2	53	64
F-kote (pfd-B 2.25)	21	24 3/4	30 1/4
GAF Corporation	7 3/4	10 7/8	11 1/2
GAF (pfd 1.20)	13 5/8	16 1/8	17 3/8
Gulf & Western	22 1/4	21 3/4	16 1/8
G&W (warrants)	3 7/8	4 1/4	3 1/8
G&W (pfd 5.75)	58 1/2	66 1/2	72 1/4
IC Industries	12 5/8	16 5/8	18 3/4
IC Ind. (pfd 6)	65	75	85
IC Ind. (pfd 3.50)	30	34 3/4	40 3/8
Jim Walter Corporation	19 1/4	34 7/8	38 5/8
Jim Walter (pfd 1.60)	22 3/4	38 1/4	42
Johns-Manville	16 5/8	21 5/8	33
Kennecott Copper	35 1/2	27 3/8	26 1/2
Maremont	8 7/8	18 1/2	16 1/4
McAdam Mining	C$.30	C$.29	C$.40
National Gypsum	9 3/8	11 7/8	17 3/8
Pathfinder	C$.15	C$.23	C$.32
Raybestos-Manhattan	17 5/8	24 3/4	27 1/2
Rio Algom	C$20.00	C$30.50	C$27.00
Royal Industries	3 1/2	5	10
Supradur (O.T.C)	Bid 4 3/8 Asked 4 7/8	Bid 4 1/2 Asked 5	Bid 4 1/8 Asked 4 5/8
Union Carbide	39 1/2	57 1/2	56 7/8
United Asbestos Inc.	2 9/16	4 1/4	3 5/8
Woodsreef Minerals	C$.10	C$.40	C$.75

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more serious than ever and pose a threat to the economic stability of the entire free world. The U.S. has failed to come to grips with its energy problem and the predicted rise in the price of OPEC oil will have a dampening effect on the economy as well as a direct inflationary effect on the general price level. The effects on the economies of some other countries could be even more severe. Unemployment remains a serious problem whose permanent solution is heavily dependent on increased capital formation with its attendant growth in spending for additional productive capacity.

On the brighter side, there is hope that the change in administration may serve as a tonic for the spirits of the people and, in a psychological way, give us renewed vigor with which to tackle and solve our most pressing problems.

HOUSING & CONSTRUCTION

Living up to expectations, residential building in 1976 totaled about $43-billion, an increase of some 35% over the 1975 total. While this compared rather unfavorably with the boom years of the early 1970's it did, nevertheless, contribute materially to the general economic recovery. Unfortunately, nonresidential building and nonbuilding construction together fell about $7-billion short of their projected total. The total construction figure of $102-billion represented a gain of $7.4-billion or about 8% over the 1975 total against a projected gain of $14.2-billion or about 15%. It became obvious during the year that contracts for commercial and manufacturing buildings and for utilities, highway and sewer projects were falling short of projections and that governmental stimulus was applied too late to have any appreciable effect on the 1976 figures.

Remodeling continued to comprise a substantial portion of work for many builders and was responsible for a goodly percentage of sales and earnings of many building materials manufacturers.

Construction contracts for 1977 are expected to total $114-billion, some 12% more than the 1976 total, according to George A. Christie, Vice President and Chief Economist for McGraw-Hill Information Systems Company. Addressing the annual Building Products Executives Conference, Mr. Christie predicted that all three major construction markets would show gains in the coming year. In the housing field, apartment building is expected to pick up strongly while single-family building levels off. Resi-

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dential contracts are expected to amount to $49-billion, a 14% gain over 1976.

Also predicted was $33-billion in nonresidential building in 1977, marking a 10% increase over the disappointing 1976 figure. Achievement of this goal, however, depends on "vigorously expanding business activity" which, in large part, must stem from improved confidence on the part of businessmen. Continuation of the present uncertain economic environment could negate the prediction.

Mr. Christie said that nonbuilding construction was poised for a new advance following the consolidation which took place in 1976 and contracts for 1977 should total $32-billion, an increase of 14% over the current year's figure. Utilities are the area of greatest uncertainty and activity in that area will probably determine whether the gain in nonbuilding construction for 1977 will be nominal or sizeable.

MOTOR VEHICLE SALES

Overcoming a disappointing 1975 performance, automobile sales played a leading role in the 1976 economic recovery. Sales for the first half were 1.9-million units greater than those of 1975, a gain of 46%. A strike at Ford Motor Company resulted in a sizeable loss of production in the third quarter but production at other companies continued at a strong pace. The slowdown in the general economy made itself felt during the latter part of the year and new car sales contracted appreciably. The public's preference for larger size cars was still evident and, near year end, General Motors instituted a rebate program to encourage purchases of the smaller economy cars. Some observers are revising downward estimates of sales for 1977.

The Motor Vehicle Manufacturers' Association of the United States, Inc., reported sales of vehicles from U.S. and Canadian plants for the last three 12-month periods to September as follows:

MOTOR VEHICLE FACTORY SALES FROM PLANTS IN UNITED STATES & CANADA

	Passenger Cars; U.S.	Trucks & Buses; U.S.	Total United States	Total Canada
Year to 9/76	8,238,922	2,910,471	11,149,393	1,622,734
Year to 9/75	6,609,369	2,296,347	8,905,716	1,424,717
Year to 9/74	7,887,123	2,804,057	10,691,180	1,561,012

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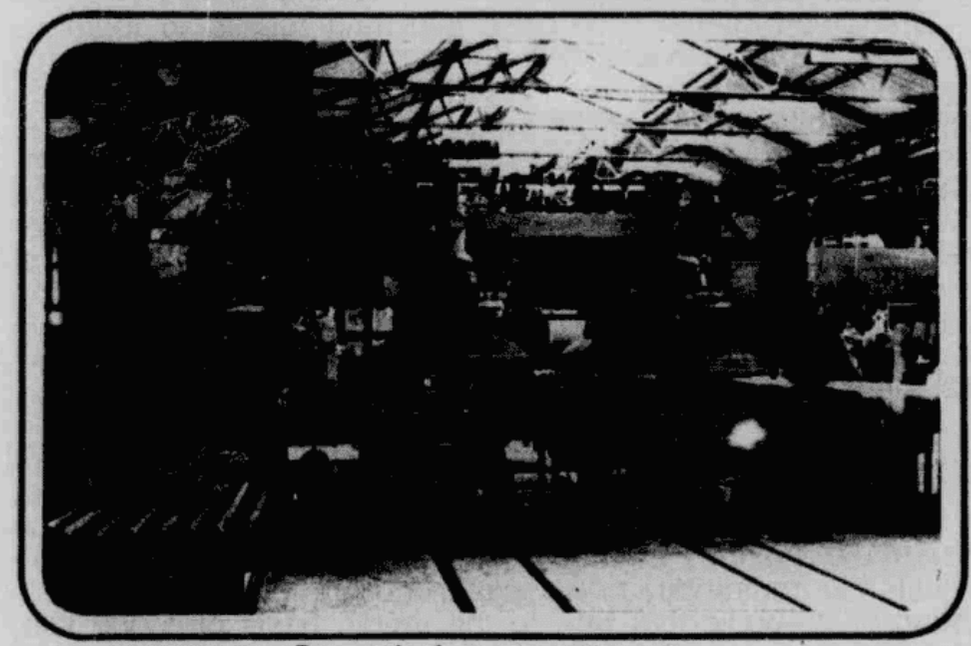
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METRICATION

On December 23, 1975, President Ford signed the *Metric Conversion Act of 1975* (Public Law 94-168), which provides for the establishment of a 17-member Board to coordinate the voluntary conversion of the U.S. to the metric system. A spokesman for the National Bureau of Standards stated that by establishing a policy of voluntary metric conversion, the U.S. industrial and commercial communities will be encouraged to export products made to metric dimensions, thus meeting the needs of foreign purchasers. Mr. J. Skinner, President of SKF Industries, Inc., warns that conversion to the metric system is only a first step toward successful competition in international markets. More emphasis should also be placed on adopting policies of international standardization of U.S. products which are marketed overseas. International standardization means that competing companies manufacture a product with the same basic characteristics regardless of country of origin. A caveat was issued by the U.S. Department of Justice that conversion to the metric system can lead to violations of the Sherman Act which forbids a firm from entering into a contract, combination or conspiracy in restraint of trade. Assistant Attorney General T. Kauper noted that such actions as exchanges of data, standardization, simplification and certification programs could be knowingly imposed so as to hurt the ability of smaller firms to compete.

Many companies have already taken steps to convert their operations to metric. In the meantime, representatives of all ten Federal Departments have been exploring means to increase interagency metric coordination. Also, 41 state governors have appointed representatives to an interstate metric committee being established by the National Governors' Conference.

As a means to educate the public, the Office of Education, U.S. Department of Health, Education and Welfare, will be awarding approximately $2.1-million in grants and contracts for metric instruction projects throughout the nation. This is the first year for Metric Education Program awards, authorized under the Education Amendments of 1974 (Public Law 93-380). The main purpose of the law is to teach school children and adults to use the International System of Units.

The Far East Conference and the Pacific Westbound Conference, ocean carrier associations which establish freight rates for commodities with the approval of the Federal Maritime Commission, each announced a new tariff that will quote rates based on the metric system. Effective January 1, 1977, the new tariff adjusts the commodity rate application from the present 2,000-pound or 40-cubic-foot rate to the metric basis of 1,000 kilograms or one cubic meter.

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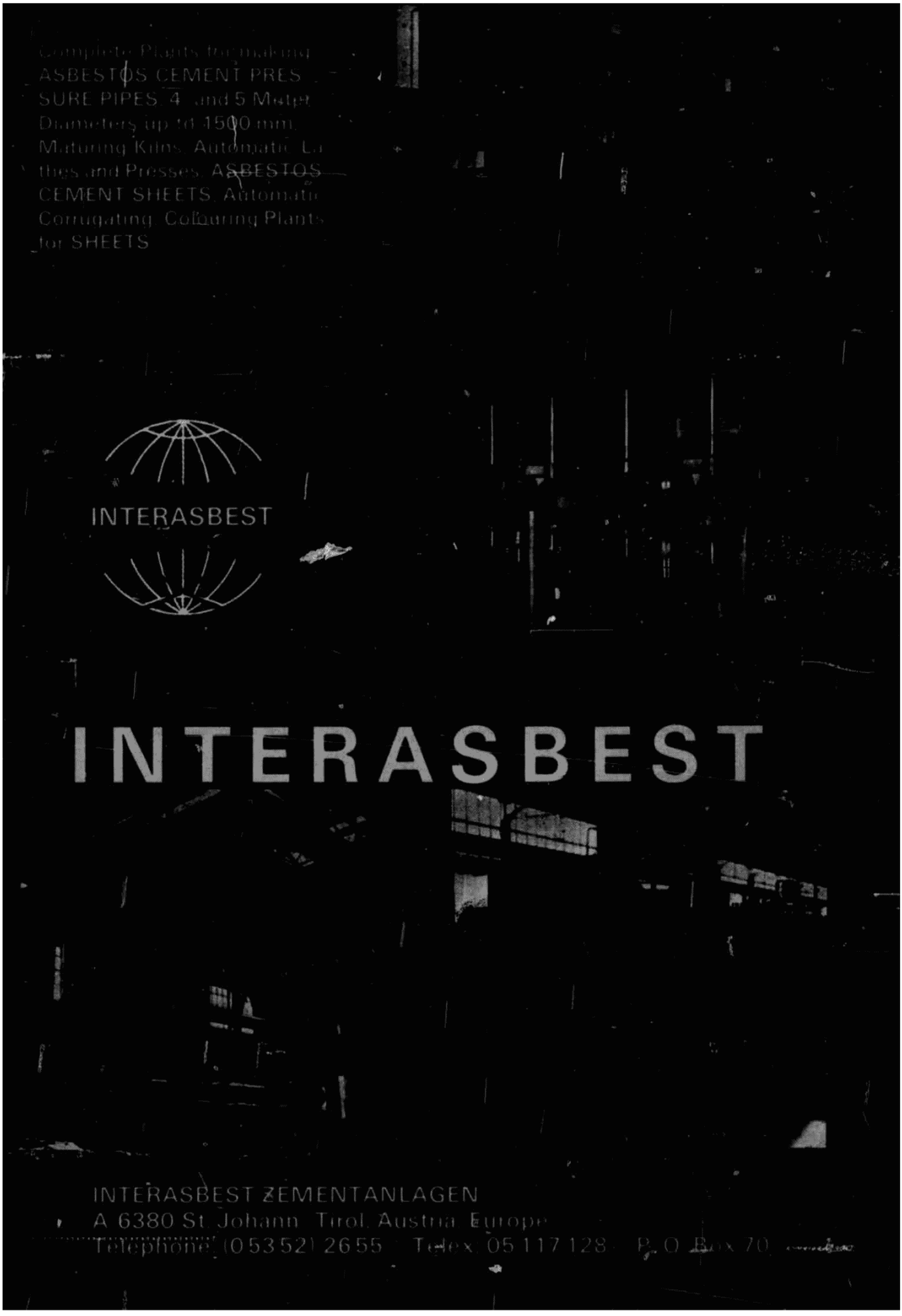
On August 14, 1976, the *Energy Conservation and Production Act* (Public Law 94-385) became law. A comprehensive analysis of the Act is available from the *National Insulation Contractors Association*. NICA summarizes the content of the Act as follows. Energy efficiency standards are to be established and enforced for new homes and buildings through a national performance building code. Loan guarantees are to be offered as incentives for improvements in energy conservation. Public education programs are to be scheduled toward encouraging energy efficiency improvements.

At a public hearing in July, J. L. Koach, Executive Vice President of NICA, expressed the Association's views regarding the *State Energy Conservation Program of the Federal Energy Administration*. Mr. Koach testified that the industry will not make any great strides in energy conservation until the introduction of tax incentives and that education is necessary prior to the establishment of guidelines.

In January the *U.S. Bureau of Mines* forecast that by the end of the 20th century, the nation will use over twice as much energy annually as in 1974 and nearly half of that will be for generating electricity. U.S. turn-of-the-century use of heat, light and power in all forms is projected to require energy equivalent to 163,430-trillion British thermal units and per capita energy consumption will rise at an average annual growth rate of 2.5% to 619-million Btu by 2000 A.D. The Bureau based its forecast on a number of assumptions about the U.S. population and economy as well as about energy policy and technology. . . . In contrast, four months later the Bureau issued preliminary figures which showed a decrease in U.S. energy usage in 1974 and 1975, mainly because of a substantial drop in energy use by industry brought about by higher fuel prices, energy conservation efforts, reduced economic activity and a relatively mild winter. Assistant Secretary of the Interior, W. L. Fisher, noted: "This is the first two-year downturn in overall energy use since 1945-46 and we hope Americans will continue efforts toward more effective, less wasteful energy use. Even so, we must do more to reduce our dependence on fuel imports and shift a larger share of our energy needs to domestic resources."

In its Open-File Report 75-583, the *U.S. Geological Survey* estimated that a minimum of 147,000 metric tons of asbestos will be needed for the production of U.S. energy during the period 1975-1980. The largest users will be geothermal and nuclear fission power plants and refineries, port facilities and pipelines.

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THE MINING SCENE

INTERNATIONAL OVERVIEW

Demand continues strong for all grades of asbestos fiber. According to figures issued by Statistics Canada, Canadian producers' shipments of asbestos for the First Ten Months of 1976 totaled 1,390,394 short tons, 60% higher than in the same period a year earlier. In analyzing these figures, one must bear in mind that production of asbestos in Quebec in 1975 was greatly curtailed due to a variety of factors such as the 7-month-long strike of mine workers at Thetford Mines, the landslide at the Jeffrey Mine of Canadian Johns-Manville Co. Ltd. at Asbestos, and the fire at the King-Beaver Mill of Asbestos Corporation Ltd. at Thetford.

Demand for all fiber grades is still exceeding supply and this situation is expected to continue into 1977. It appears the U.S. economy is on the threshold of a well-balanced upswing which should result in further improvement in all U.S. markets for asbestos fiber. Shipments to overseas countries, where large quantities of asbestos-cement grades are consumed, remain strong as companies continue to restock inventories.

In view of the expected continued demand for asbestos, a number of deposits around the world are being investigated or reassessed for viability. Finding new ways to secure capital and ensure markets will serve as the basis for effective mineral development in the 1980's.

There has been some contraction of uses for asbestos but as Sir Ralph Bateman, retired Chairman of Turner & Newall Ltd., points out: "The world's reserves of fiber are finite and we should be beginning to regard them as a precious resource, to be used with care and discernment, largely for applications in which there is no obvious economic alternative."

The construction industry is the biggest consumer of asbestos with almost 70% of the world's production going into the manufacture of a/c pipes, sheets, roofing, siding, shingles and floor tile. Asbestos fiber is also a vital factor in fire protection materials and in thermal and electrical insulation and is used in friction materials, paper, paints, coatings, adhesives, sealants, textiles, plastics, packings, gaskets and engineering components.

An overall growth in demand over the next ten years is estimated at 4-4.5% with an increase in use of the mineral in a/c products exceeding all others. It is anticipated that during the coming five-year period, demand will exceed supply especially for the shorter grades. However, there are indications of some softening in the textile grades, possibly due to the substitution of other fibers for asbestos. According to R. A. Clifton, Asbestos Specialist with the U.S. Bureau of Mines, asbestos reserves could well be in danger of depletion by the year 2000 at the forecast rate of consumption if the "find" rate of new sources does not increase.

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Exploration and mine development is being pursued on an international basis. Based on projected mine closures, new mines entering production and expansion programs for existing mines, Mr. Clifton forecasts that total world asbestos production capacity will increase 660,000 tons during the period 1975-1980 for a total capacity of 5,485,000 tons. Assuming a growth rate of 4-4.5% per year, it is estimated that demand will reach 6-million tons, resulting in a net shortage of 515,000 tons.

Another authoritative leader in the Industry has calculated that world asbestos production (all types and grades) reached 4,105,274 short tons in 1974, 5,025,500 tons in 1975 and an estimated 5,708,000 tons in 1977. A breakdown of the latter two years is as follows.

WORLD ASBESTOS PRODUCTION (SHORT TONS)
(All Types and Grades)

	1975	1976
USSR	*2,452,000	*2,528,000
CANADA	1,164,500	1,690,000
SOUTH AFRICA	694,000	720,000
EUROPE	320,000	320,000
CHINA, P.R.	145,000	145,000
UNITED STATES	100,000	135,000
SOUTH AMERICA	70,000	75,000
AUSTRALIA	55,000	70,000
OTHER COUNTRIES	25,000	25,000
	5,025,500	5,708,000

* Available for Export: 550,000 tons in 1975; 550,000 tons in 1976.

ASBESTOS PRICE RANGES

Prices for asbestos had remained rather static for several years, but since 1974 they have been steadily on the increase. *Quebec* asbestos fiber prices were raised an average of 37% in 1974, 23% in 1975 and as of January 1, 1977 (see opposite page) Groups 1 and 2 will be increased 14.5% and Groups 3-7 will cost 8% more. . . . *Cassiar* prices were increased an average of 53% in 1974, 8% in 1975 and as of December 1, 1976, are 15% higher. . . . *Vermont* asbestos prices were raised about 16% in 1974, 45% in 1975, 13% as of January 1, 1976, and 14% as of January 1, 1977. . . . *Arizona* prices went up 9% in 1974, 16% on January 1, 1975, and 15% on April 17, 1975. The producers advise that their price range as listed on the opposite page is sufficient to cover at least a firm 10% price rise and that, in fact, their customers have been notified that as of the first of 1977 there will be a minimum 10% increase in the cost of filter grades. . . . *California*—As of January 1, 1977, the

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CURRENT ASBESTOS PRICES

ARIZONA *Per Ton of 2000 Lbs., F.O.B. Globe, Arizona*
As of July 1, 1976 *U.S. Dollars*

No. 1 Crude (Soft)	$ — $3000.00
No. 2 Crude (Soft)	— 1800.00
AAA	— 1300.00
Group No. 3—Nonferrous Filtering—Plastic	750.00— 840.00
Group No. 4—Nonferrous Filtering—Plastic	750.00— 840.00
Group No. 7—White Shorts	100.00— 200.00

QUEBEC *Per Ton of 2000 Lbs., F.O.B. Mine*
As of January 1, 1977 *Canadian Dollars*

No. 1—Crude	$3300.00—$4000.00
No. 2—Crude	1800.00— 2175.00
No. 3—Spinning Fiber	850.00— 1700.00
No. 4—Asbestos Cement Fiber	465.00— 950.00
No. 5—Paper Fiber	315.00— 435.00
No. 6—Paper and Shingle Fiber	230.00— 275.00
No. 7—Shorts	85.00— 200.00

CASSIAR *Per ton of 2000 Lbs., F.O.B. North Vancouver, B.C.*
As of December 1, 1976 *Canadian Dollars*

Cassiar Mine

C-1 —No. 1 Crude	$3621.00
AAA —Nonferrous Spinning Fiber/Canadian Group 3	2093.00
AA —Nonferrous Spinning Fiber/Canadian Group 3	1664.00
A —Nonferrous Spinning Fiber/Canadian Group 3	1267.00
AC —Nonferrous Spinning Fiber/Canadian Group 3	913.00
AK —Asbestos Cement Fiber/Canadian Group 4	651.00
AS —Asbestos Cement Fiber/Canadian Group 4	563.00
AX —Asbestos Cement Fiber/Canadian Group 5	516.00
AY —Asbestos Cement Fiber/Canadian Group 5	362.00
AZ —Asbestos Cement Fiber/Canadian Group 6	268.00

Clinton Mine

CP —Asbestos Cement Fiber/Canadian Group 4	611.00
CT —Asbestos Cement Fiber/Canadian Group 4	553.00
CY —Asbestos Cement Fiber/Canadian Group 5	362.00
CZ —Asbestos Cement Fiber/Canadian Group 6	268.00

VERMONT *Per Ton of 2000 Lbs., F.O.B. Morrisville, Vermont*
As of January 1, 1977 *U.S. Dollars*

Grade 4T—Fiber	$ —$ 477.00
Grades 5D thru 5R—Fiber	314.00— 369.00
Grade 6D—Waste	— 228.00
Grades 7D thru 7T—Shorts	95.00— 182.00
Grade 7TF—Floats (Shorts)	— 82.00
Grade 8S—Shorts	— 62.00
Hooker No. 1—in 50-lb. woven polypropylene bags	1110.00
Hooker No. 2—in 100-lb. woven polypropylene bags	555.00

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prices for Calaveras Asbestos will be increased an average of 14%, as follows: Grade 4T—$551.00; Grade 5R—$383.00; Grade 6D—$264.00; Grade 7D—$186.00; Grade 7M—$120.00; and Grade 7R—$110.00. The quoted prices are per 2000 pounds, FOB truck, Mill, Copperopolis, California. . . . *Australia*—Comparing Australian domestic prices for asbestos as of January 1 1974, with the first of 1975, the costs were increased as follows: Grade 4—from $254.00 to $453.00; Grade 5—from $201.00 to $377.00; Grade 6—from $152.00 to $268.00; and Grade 7—from $105.00 to $188.00. Woodsreef Mines Ltd. announced an average 24% price increase as of January 1977. The rise includes a 9% increase as a result of a general upturn in world asbestos prices and a 15% increase due to devaluation. . . . *Brazil*—The FOB prices per ton for Chrysotile asbestos-cement grades from the Cana Brava Mine, Uruacu County, Goias State, owned by S.A. Mineracao de Amianto, as of June 1976 are as follows: Grade 4K—Cr$5791.00; Grade 4T—Cr$5146.00; Grade 4Z—Cr$4584.00; Grade 5K—Cr$3860.00; Grade 5R—Cr$2820.00; Grade 6D—Cr$2062.00; and Grade 7TF—Cr$815.00. . . . *Republic of South Africa*—Based on data compiled by the U.S. Bureau of the Census, in 1976 the United States is paying $438.00 per short ton for Amosite from South Africa compared with $395.00 in 1975, $238.00 in 1974, $188.00 in 1973 and $187.00 in 1972. The price being paid for U.S. imports of South African Crocidolite is $491.00 per ton against $427.00 in 1975, $257.00 in 1974, $213.00 in 1973 and $218.00 in 1972.

UNITED STATES

Mines Bureau Study—Published statistics on asbestos demand are considered inadequate by researchers at The Pennsylvania State University. The research work is part of a larger study of data availability for about 20 critical minerals being done for the U.S. Bureau of Mines to modify mineral survey forms so as to gather data on shipments to end use industries. Such modifications would be made after consultation and agreement with marketing specialists at asbestos companies. The plan is to use SIC coding of end use industries. The ultimate data improvements should permit greater accuracy in forecasting future demand for asbestos and other critical minerals according to Mr. T. M. Majcher and Dr. G. Schenck, the researchers at the University's Department of Mineral Economics.

Resources & Minerals Policy—The United States is wasting its key mineral and energy resources on a massive scale and must take steps now to lessen dependence on foreign sources, warned Dr. V. E. McKelvey, Director of the U.S. Geological Survey. Speaking at the Fourth Materials Research Conference, Dr. McKelvey expressed deep concern about recent rates of growth in consumption which continue to outstrip development of new sources of supply. In addressing the same conferees, Dr. T. V. Falkie, Mines Bureau Director, expressed the desire that the Government use the forces of the marketplace, wherever

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possible, to achieve its goals in materials policy. He feels that in some quarters there seems to be a pervasive belief that the one best answer to every problem is to turn the whole thing over to the Government. "We apparently are unable, or unwilling, to remember that we have a dynamic private sector with intelligence, energy and talent, and that it has a capability for dealing effectively with a wide range of problems." In a summation of the recent American Mining Congress, the "Engineering and Mining Journal" wrote: "Increasingly restrictive regulation of land use is inhibiting exploration for minerals on large blocks of public land in the U.S. If this trend continues, the U.S. mining industry will eventually find it difficult to supply sufficient minerals to sustain a healthy U.S. economy."

Mineral Trends & Forecasts—The Mines Bureau has issued the following information on asbestos which reflects apparent changes in worldwide mineral supply-demand relationships—

Average annual growth in demand: −0.3% from 1950 to 1960; 0.3% from 1960 to 1970; 3.6% from 1970 to 1974; 0.5% from 1974 to 1985 and 1.1% from 1974 to 2000;

U.S. primary production from domestic sources: 113,000 short tons in 1974; 160,000 tons in 1985 and 200,000 tons in 2000;

U.S. primary demand: 846,000 tons in 1974; 895,000 tons in 1985; and 1,114,000 tons in 2000;

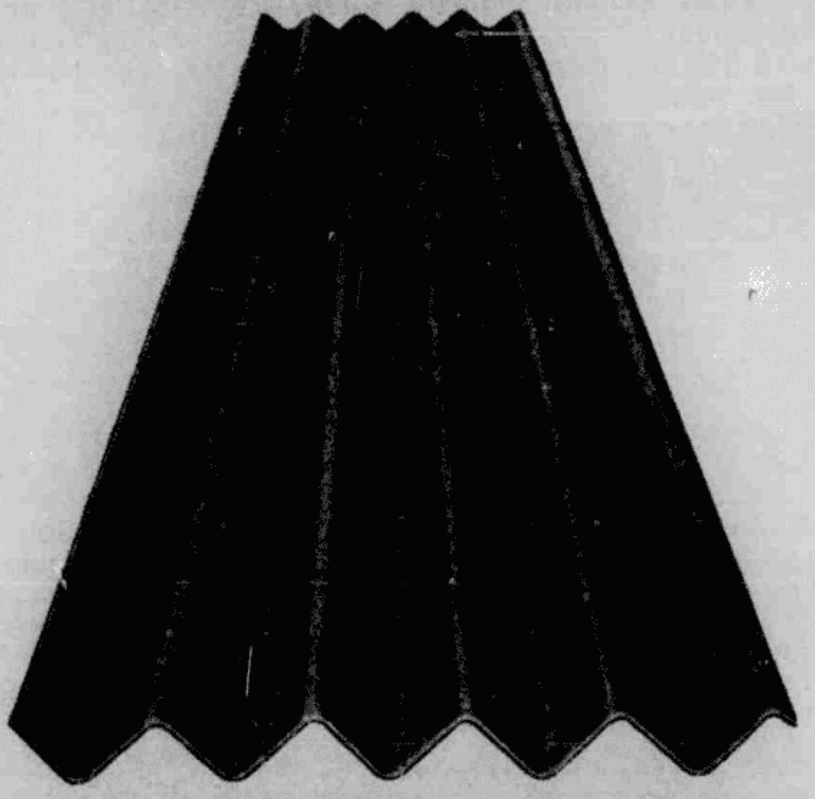
World primary demand: 4,535,000 tons in 1974; 6,524,000 tons in 1985; and 10,544,000 tons in 2000.

The Bureau further calculates that world cumulative demand for asbestos from 1974 to 2000 will be 188-million tons. Based on mineral reserves in 1974 of 160-million tons, the ratio of recoverable reserves to cumulative demand will be 0.3 for the U.S. and 0.9 for the rest of the world. Based on identified mineral resources in 1974 of 275-million tons, the ratio to cumulative demand will be 0.8 for the U.S. and 1.6 for the rest of the world.

New Stockpile Guidelines—As a result of a study undertaken by the Federal Preparedness Agency, General Services Administration, to assure sufficiency of strategic and critical materials to fulfill national requirements in an emergency, a new stockpile policy was approved in October by President Ford. Included are new procedures for calculating stockpile inventory requirements. An important policy change is that future stockpiling planning will be based on the first three years of an emergency of indefinite duration versus one year under the former criteria. The specific amounts of materials to be acquired and disposed of will be developed through an Annual Materials Plan. As of October 1, 1976, the stockpile goal set by the FPA was 26,291 short tons of Amosite and zero for Chrysotile and Crocidolite. Total inventory as of

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November 1, 1976, was 10,955 tons of Chrysotile, 42,623 tons of Amosite and 2,474 tons of Crocidolite. Also as of November 1, there remains for sale during this fiscal year 16,332 tons of Amosite and 2,474 tons of Crocidolite.

U.S. Production & Apparent Consumption—According to the U.S. Bureau of Mines' Mineral Industry Survey for "Asbestos in 1975," production (sales) of Chrysotile asbestos in the United States during 1975 was 12.3% less than in 1974 and was, in fact, less than in any of the past five years:

1975– 98,654 short tons, valued at $14,220,000;
1974–112,533 short tons, valued at $13,759,000;
1973–150,116 short tons, valued at $16,288,000;
1972–131,663 short tons, valued at $13,409,000;
1971–130,882 short tons, valued at $12,174,000.

Apparent consumption was also down, i.e., 605,191 tons in 1975, 845,825 tons in 1974, 882,908 tons in 1973, 821,728 tons in 1971 and 768,781 tons in 1971. Canada continues to be the major supplier of Chrysotile consumed in the United States. The Republic of South Africa ranks second and supplies all of the U.S. demand for Crocidolite and Amosite. Based on calculations issued by the Mines Bureau on asbestos distribution by end use in 1974, 26% was used in the manufacture of asbestos-cement pipes, 18% in flooring products, 11% in a/c sheets, 9.5% in friction materials, 8% in roofing products, 7.5% in paper and the remaining 20% in other products.

U.S. Fiber Imports—Based on monthly and cumulative figures published in this Magazine, U.S. imports of unmanufactured asbestos rose 7¾% in quantity and 13% in value for the year ended August 1976 compared with the prior 12-month period. As will be noted in the following table, imports of Chrysotile were up 6%, Crocidolite was down 20% and Amosite had decreased 68%. Comparing the latest year with the year ended August 1974, imports decreased 19% in quantity but rose 17% in value.

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

Year To	Chrysotile	Crocidolite	Amosite	Other	Total Quantity	Total Value
8/76	591,667	9,174	1,809	33,308	635,958	$132,375,509
8/75	558,630	11,483	5,616	14,472	590,201	117,254,264
8/74	739,231	12,436	7,644	28,362	787,673	113,294,848
8/73	726,274	10,775	7,282	6,264	750,595	91,318,202
8/72	710,526	5,594	8,332	8,912	733,364	87,712,683



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For the latest year under review, all the Amosite and Crocidolite imported into the U.S. was directly from the Republic of South Africa, except for 20 tons of Amosite by way of Canada and 217 tons of Crocidolite from Mozambique and Australia. . . . The sources of Chrysotile Crudes were 2104 tons from Rhodesia, 1063 tons from South Africa, 628 tons from the USSR, 564 tons from the United Kingdom, 405 tons from Canada, 234 tons from Mexico and 22 tons from Belgium. Except for 238 tons from Rhodesia and South Africa, the bulk of the Chrysotile spinning fiber came from Canada (5996 tons). The origins for the Chrysotile classified as "Other" were 578,670 tons from Canada, 1086 tons from West Germany, 428 tons from South Africa, and the remainder from the USSR, the United Kingdom, Italy and Mexico. In the "Other Crudes & Fibers" category, the U.S. imported 14,870 tons from Canada, 13,303 tons from the USSR, 4078 tons from South Africa, 823 tons from West Germany and the rest from Italy, Mexico, Belgium, Finland and Hong Kong.

U.S. Fiber Exports—Both the quantity and value of U.S. exports of unmanufactured asbestos increased from last year (up 36% and 37%, respectively), but comparing the figures with the year ended August 1974 the tonnage of exports continued to show a downward trend. A statistical picture of the past five years is as follows:

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

Year To	Fibers	Waste & Refuse	Total Quantity	Total Value
8/76	21,736	24,160	45,896	$12,752,021
8/75	14,953	18,832	33,785	9,308,660
8/74	36,503	35,281	71,784	9,752,917
8/73	23,461	37,415	60,876	7,923,575
8/72	27,516	28,700	56,216	8,084,003

U. S. Asbestos Mines

Alaska—Tanana Asbestos Corporation, a newly-formed subsidiary of Doyon Ltd., Fairbanks, was created as a result of a lease/partnership agreement between Doyon and Asarco Inc., of New York City. The pact involves the possible mining of asbestos at a deposit located about 50 miles southwest of the Alaskan native village of Eagle, 60 miles due west of the now-producing Clinton Mine of Cassiar Asbestos Corporation Ltd. located in the Yukon Territory of Canada. An exposed outcrop of asbestos-bearing serpentine rock shows good quality fiber at the surface and a drilling program is in progress on the property.

Arizona—Jaquays Asbestos Corporation operates the El Dorado Mine in the Tonto National Forest, about 32 miles north of the Globe-Miami District, Gila County, and annually recovers about 3000 tons of low-iron Chrysotile fiber at the mill at Globe.

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California—Atlas Asbestos Company, wholly-owned by Wheeler Properties, Inc., Reno, Nevada, produces some 25,000 tons of Chrysotile from its mine and mill in Fresno County, 32 miles northwest of Coalinga, California. The entire output is consumed in the vinyl-asbestos floor tile industry. . . . Calaveras Asbestos Ltd. is producing Chrysotile Grades 4-7 at its mining/milling operation at Copperopolis, California. Most of the material is used in the manufacture of asbestos-cement pipes and sheets. . . . Union Carbide Corporation, through its Metals Division, produces Calidria products made from short-fibered Chrysotile. The mine is located in San Benito County and the plant at King City. . . . An unimproved asbestos-bearing property said to hold 4.5 million to 9-million tons of recoverable asbestos in Grades 4-7 is still available for sale or lease. It is located near Chaparral Hill in Tuolumme County, Sonora.

North Carolina—Powhatan Mining Corporation has an Anthophyllite mine at Newdale, North Carolina, and operates a 700-ton-per-year mill at Baltimore, Maryland. We are not aware of any mine production during the past two years.

Texas—According to a preliminary geological study, the Diablo Asbestos Deposit of Lewter Oil Company, located northwest of Van Horn, contains fiber of sufficient quality and quantity to warrant development for strip mining. The material contained in the deposit is the amphibole variety called Richterite. The fibers are said to be long and to have good tensile strength.

Vermont—May 1976 marked the first anniversary and mortgage-burning ceremony of Vermont Asbestos Group, Inc. Readers will recall that the former workers, now turned owners, purchased from GAF Corporation the 2300-acre asbestos quarry and mill at Belvidere Mountain, Lowell, Vermont. Annual output is about 40,000 tons of finished fiber. VAG is proceeding with expansion plans to extend the life of the mine.

CANADA

Canada continues to be beset by a variety of economic and political problems. Mining is the most heavily taxed of all Canadian industries. Both the provincial and federal governments are competing for tax money and until this dispute is settled, the mining industry will be in a state of insecurity. As "The Northern Miner" reports: "Ottawa refuses to credit the mines for funds that they have already paid out to the provincial governments and the industry continues to be penalized by a form of double taxation." Another problem seen by the newspaper is one of nationalization. "Saskatchewan is the big offender with its program for taking over potash mines, but Newfoundland has also had a try at this game and Quebec may not be far behind."

Canadian Production—Canada is still the world's leading supplier of asbestos, exporting approximately 95% of total production each year. Primary producers' shipments of asbestos (including tonnage for own use) for the year ended September 1976 was 1,633,314 tons, 33% over the prior 12-month period but 12% less than in the year ended Septem-

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ber 1974. A breakdown by Quebec grades for the latest period, with percentage differences from the prior year, is as follows: Crudes 1 and 2 and Group 3—18,762 tons, up 21%; Group 4—310,939 tons, up 36.5%; *Group 5—137,366 tons, up 39%*; Group 6—237,813 tons, up 32%; Group 7—629,522 tons, up 50.6%; and Group 9—90 tons, down 40%. Production of asbestos in Canada for the past five years was as follows:

CANADIAN ASBESTOS SHIPMENTS (SHORT TONS)

Year To	Quebec	Other*	Total
9/76	1,334,492	298,822	1,633,314
9/75	940,284	285,610	1,225,894
9/74	1,574,499	287,281	1,861,780
9/73	1,498,189	327,251	1,825,440
9/72	1,370,099	325,907	1,696,006

*Newfoundland, Ontario, British Columbia and the Yukon.

Canadian Exports—Exports of asbestos from Canada totaled 1,481,349 short tons, valued at $415,064,000, for the twelve months to August 1976, up 7% in quantity and 29.5% in value over the prior like period. Compared with the year ended August 1974, the tonnage showed a decrease of 16.8% although the value rose 36.6%. For the past five years ended in August, the cost per ton of asbestos exported, based on data issued by Statistics Canada, is calculated as $280.26 in 1976, $231.30 in 1975, $170.68 in 1974, $143.01 in 1973 and $142.64 in 1972. For the latest year under review, the United States consumed 40% of Canadian asbestos exports, Western Europe 32% and Asia 13%, leaving 15% for the rest of the world. Canadian exports by fiber grade for the past five years were as follows:

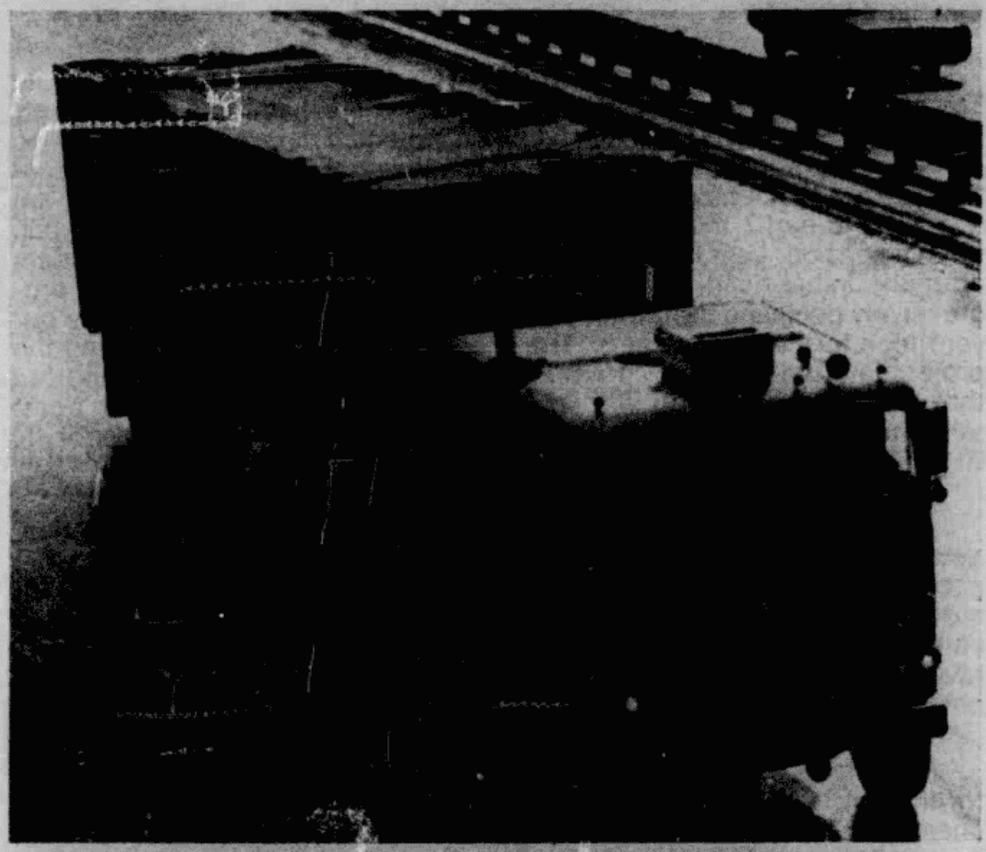
CANADIAN ASBESTOS EXPORTS (SHORT TONS)

Year To	Crude	Milled 3	Milled 4&5	Shorts 6-9
8/76	194	22,338	698,612	760,205
8/75	303	26,458	706,876	652,405
8/74	16	32,708	854,491	892,897
8/73	46	31,039	829,874	962,657
8/72	62	29,546	683,533	800,353

Total quantities and values for the five years are:

1976–1,481,349 short tons; $415,064,000;
1975–1,386,043 short tons; $320,588,000;
1974–1,780,112 short tons; $303,806,000;
1973–1,823,616 short tons, $260,856,000;
1972–1,513,494 short tons, $215,816,000.

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Canadian Asbestos Mines:

Abitibi Asbestos Mining Co. Ltd.—The Abitibi property in Maizarets Township, near Amos, in Northwestern Quebec, has been under study by *Brinco Ltd.* since 1972. A production schedule developed for planning purposes calls for the processing of a minimum of 103-million tons of fiber-bearing rock having an average gross value of about $10.00 per ton at a fixed rate of 7-million tons per year. This would yield about 220,000 tons of fiber per year in the 4T-7D Chrysotile grade range for seven years after the initial build-up year, with the annual production of fiber progressively declining thereafter at an approximate rate of 10,000 tons per year for a further seven years. The latest estimate of the cost to bring the project into production by 1978 is $292-million. It was recently reported that Brinco and *Asarco Inc.* have been discussing a possible commercial arrangement which could lead to development of the deposit. Brinco holds a 55% interest in Abitibi.

Advocate Mines Ltd.—QAMA grades 4-6 are produced from Advocate's Chrysotile mine at Baie Verte, Newfoundland. Ore reserves are about 50-million short tons. For the nine months to September 30, 1976, production reached 66,054 tons, 31% ahead of the same period a year earlier. The company operates under a 1958 financing agreement between *Canadian Johns-Manville Co. Ltd.* (Mine Manager), *Amet Corporation, Inc.*, and *Compagnie Financiere Eternit S.A.*

Asbestos Corporation Ltd., 54% owned by *General Dynamics Corporation*, St. Louis, Missouri, produces over 300,000 short tons of Chrysotile, Grades 1-8, at the King-Beaver, Normandie, British Canadian and Asbestos Hill Mines in Quebec. Tonnages of ungraded fiber from Asbestos Hill are shipped to the finishing mill at Nordenham, West Germany. Proven ore reserves at the end of 1975 were 152-million tons. An underground exploration program is underway at Asbestos Hill to determine the extent of ore reserves existing at depth and to provide the necessary data for possible future development of underground mining operations. Surface diamond drilling is continuing at Thetford Mines which may result in the transfer of proable ore to the proven category. Due to depleted resources, Corporation announced it will discontinue mining operations at the Normandie Mine in September 1977. A processing plant will remain in operation to handle raw material from the King-Beaver Mine which is to be reactivated.

Aylmer Mines Ltd. currently owns asbestos deposits at Coleraine Township, Megantic County, Quebec. Plans are in the offing to construct a portable plant at the site.

Bell Asbestos Mines Ltd., operator of the Bell Mine at Thetford Mines, Quebec, is a wholly-owned subsidiary of *Turner & Newall Ltd.* It also serves as Sales Representative for *Cassiar Asbestos Corporation Ltd.* Bell's mill is capable of producing some 60,000 short tons per year of QAMA Grades 1-7 Chrysotile. A program is underway toward improving the haulage of mill tailings, extending the mill and meeting environmental standards.

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Canadian Johns-Manville Co. Ltd. operates the largest asbestos mine in the free world at Asbestos, Quebec. The mill at the Jeffrey Mine has the capacity to produce 720,000 short tons per year of Chrysotile asbestos, QAMA Grades 3-8. Jeffrey also mills asbestos ore which is concentrated at the Bolduc Mine, near Val d'or, Quebec. The Board of Directors of Johns-Manville Corporation, the parent company, approved $77-million in capital expenditures to be used over a five-year period to assure continuation of a high level supply of Chrysotile fiber from Jeffrey.

Carey-Canadian Mines, Ltd., a wholly-owned subsidiary of *Jim Walter Corporation*, runs a Chrysotile mine and mill at East Broughton, Quebec. Annual mill capacity is about 200,000 short tons of QAMA Grades 3-8. The firm is looking toward more processing of medium grade fibers which are expected to continue in strong demand for at least the next five years.

Campbell Chibougamau Mines Ltd. is holder of 96 claims at McKenzie Bay, Roy Township, near Chibougamau, Quebec, known as the Q project. An agreement has been entered into with *McAdam Mining Corporation Ltd.* whereby McAdam can earn a 50% interest in the project. The initial exploration hole put down by McAdam encountered a wide section of asbestos mineralization. The core shows good cross fiber seams of asbestos from $\frac{1}{2}$" to $\frac{1}{16}$". Substantial new financing and a major winter drilling program are under consideration. The property is located just five miles west of McAdam's main asbestos project at Roberge Lake.

Cassiar Asbestos Corporation Ltd. produces asbestos from the Cassiar Mine at McDame Mountain, Cassiar, British Columbia, and the Clinton Mine at Clinton Creek, Yukon Territory. The operation at Cassiar yields fibers equal to Chrysotile QAMA Grades 1-6. Clinton offers products equivalent to Grades 4-6. At Cassiar a new waste phase with wider operating benches has been started and the company is proceeding with flattening the overall slope of the footwall. The firm intends to search for a replacement for the Clinton Mine which will be phased out of production in 1978 when ore reserves will have been depleted. The first target for exploration will be the deposit at Kutcho Creek.

Citlec Minerals Ltd., Vancouver, British Columbia, is seeking the participation of a major company in its asbestos prospect at St. Cyr, Richmond County, Quebec. Citlec estimates the property contains about 50-million tons of ore-grade Chrysotile.

Consolidated Midvale Explorations Ltd. holds five unpatented mining claims at Seigneurie St. Joseph Paroisse St. Frederic, in Beauce Township, Quebec. Further drill exploration of the zones to a greater depth is being considered since an earlier engineering report had indicated the asbestos fiber content in each of the zones tends to increase with depth.

Great Northern Pulp & Paper Group Ltd. has assessed the economic viability of the Daffodil asbestos property, formerly known as the Nakhodas property, located in the central part of Deloro Township, Cochrane District, Ontario. In a preliminary economic assessment, it

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hydraulic pipe testing presses

hydraulic pipe bursting presses

12.000 tons short-cycle press and 315 to stamping press for the production of asbestos-cement sheets
size of finished sheets: 1600 x 3600 mm
cycle time: 12 seconds

kamp

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was determined there is a potential of 50-100 million tons of asbestos-bearing rock amenable to open-pit mining (fiber Grades 4-7). Great Northern is seeking a major partner to provide funds to complete exploration and development of the property.

Hedman Mines Ltd., owned by *Gulf & Western Industries, Inc.*, handles about 112 tons of Chrysotile ore per day at its open-pit mine at Matheson, Ontario. The ore is then hauled 25 miles by truck to the mill for the production of approximately 7000 short tons per year of a predominantly non-fibrous, industrial, serpentine filler.

Hollinger Mines Ltd. is undertaking a diamond drilling program on an asbestos discovery on the Newton Township property of its Rundle Gold Mines, located in the Horwood Lake-Rush Lake area, 65 miles southwest of Timmins. Results of rock sample tests show the fiber to have good, acceptable physical qualities.

Lake Asbestos of Quebec Ltd., wholly-owned subsidiary of *Asarco, Inc.*, produces QAMA Grades 3-7 at two Chrysotile mines in Quebec. Mill capacity at the Black Lake Division is 161,000 short tons per year. Capacity at the National Mines Division, Thetford Mines, is 80,000 tons. An Asarco-patented process is employed at Black Lake based on magnetic separation for the preconcentration of asbestos ore fed to the mill. This has produced such significant economies that a similar process has been put in operation at Thetford.

Lynx-Canada Explorations Ltd. continues to hold asbestos claims at Deloro Township, Cochrane District, Northern Ontario. President M. I. Watson advises that several inquiries have been received from interested companies and some activity is expected in 1977.

McAdam Mining Corporation Ltd. owns a Chrysotile property at Roberge Lake, McCorkill Township, near Chibougamau, Quebec. Under an option agreement, *Rio Tinto Canadian Explorations Ltd.* has completed a drilling program and samples are now undergoing milling analyses at the pilot plant of the Quebec Department of Natural Resources. Envisioned is a complex capable of producing 100,000 tons of fiber per year.

Pathfinder Resources Ltd. is to recalculate indicated ore reserves at its Lili asbestos property in Cleveland Township, Quebec. Three years ago, three large separate zones of Chrysotile fiber-bearing material were outlined as having 49-million tons of drill-indicated ore.

Talisman Mines Ltd. and *The Shield Development Co. Ltd.* have entered into a 50-50 venture for the exploration and development of an asbestos-bearing property discovered by Hollinger Mines Ltd. in the Rush Lake-Horwood Lake Region, Northern Ontario. The property straddles the boundary between Hollinger's Rundle Gold Mines ground and a large acreage held by the Algoma-Talisman Minerals subsidiary. Shield is now drilling eight holes to probe a length of just over 2000 feet. Earlier the company had announced surface showings of asbestos fiber along a strike length of 5400 feet. A magnetometer survey traced the favorable formation for about 7500 feet and it is still open to the west. Long fibers, ½" or better, have been found in four separate trenches in the first 2700 feet extending west from the Hollinger-Rundle boundary.

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United Asbestos Inc. began trial production in August 1975 at its new wholly-owned asbestos mine at Matachewan, Midlothian Township, near Timmins, Ontario. The mill has an annual start-up production capacity of 100,000 tons of fiber. Indicated ore reserves are 150-million tons down to the 1000-foot level and the mine is said to have an initial estimated life span of over 20 years. At its present rated output, the facility is expected to eventually yield double the income derived from the joint venture with Lake Asbestos of Quebec Ltd. at Black Lake, Quebec. . . . A series of start-up problems plus the fact United was trying out a new environmental control system contributed to a situation which left the plant open to attack on the issue of interior working conditions and the outside environment. The Ontario Government halted milling operations on April 12, 1976, and ordered a general clean-up. This was accomplished in two weeks and operations were resumed but at a slower pace. The mining, crushing and drying facilities are running at 67% capacity and the milling at 30%. Management is aiming at a full capacity operation by the fiscal year end of March 31, 1977.

UNION OF SOVIET SOCIALIST REPUBLIC

Although unofficial figures from a variety of sources disagree on actual annual production rates, they all seem to indicate that the USSR has the edge on Canada as the world's leading producer of asbestos. Estimates of Russian production for the year 1976 are over 2-million tons vs. Canadian output of about 1.7-million tons. The picture was similar in 1975 which means that 1974 was the latest year in which Canada was the largest worldwide producer of asbestos. The impact of this situation may be minimal, at least in the near term, since the USSR utilizes about 75% of her output internally whereas Canada exports about 95% of her production. The Soviet Union has projected 1980 output at 2.6-million metric tons.

In the Tenth 5-Year Plan for the years 1976-1980, the aims are to increase national income 26% and gross national production 36% and to put greater emphasis on quality. In the past, quality had often been sacrificed for quantity objectives. Also, the plan calls for a 30-35% increase in foreign trade. Coincidentally, the *Comecon countries are continuing to coordinate their national economic plans and are setting economic targets covering the same five-year period as Russia's new plan. The only mention of asbestos in the 1980 plan is as a component of asbestos cement. Mass production of this construction material will receive heavy Soviet emphasis in coming years to help reduce the use of metal in home building. The program, coupled with Soviet consumer complaints that they cannot get asbestos sheets for home use, leads ob-

*Comecon countries include Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania, the USSR, Cuba and Mongolia.

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servers to believe that internal demand for asbestos is strong in the USSR making it a priority item for extraction and for further geological searching.

The USSR produces six grades of Chrysotile asbestos and is in the process of expanding production capacity at all locations. The largest mining-milling complex is the Uralasbest Combine at Asbest, near Sverdiovsk in the Ural Mountains. Output in 1975 was reported at 1,250,000 metric tons. The Dzhetygara Combine at Dzhetygara, Kazakhstan, is the second largest producer with an annual capacity of 400,000 tons. Its output of asbestos in 1975 was some 360,000 tons. A production capacity of 205,000 tons is reported at the Tuvaasbest Combine located in Ak-Dovurak near Krasnoyarsk in South Central Siberia. Construction of another complex is underway at Kiembay, on the eastern slopes of the southern Urals. This facility is to have the capability of producing 250,000 tons of asbestos per year by 1979 and 500,000 tons by 1982.

REPUBLIC OF SOUTH AFRICA

The Republic of South Africa ranks third in the world as a Producer of asbestos and is the main supplier of the Crocidolite (Blue) and Amosite varieties. Both Chrysotile and the amphiboles are mined in the Transvaal, in the northern parts of the country. As will be seen in the following five-year table, production of Cape Blue fibers in 1976 was about the same as in 1975 but had increased 8% over 1974; Chrysotile output rose 15% over 1975 and 40% over 1974; Amosite showed a decrease of 9% from 1975 and 17% from 1974; and Tremolite more than doubled over 1975 and nearly tripled over 1974.

SOUTH AFRICAN ASBESTOS PRODUCTION (METRIC TONS)

Variety	4/75-3/76	4/74-3/75	4/73-3/74	4/72-3/73	4/71-3/72
Cape Blue	161,139	160,854	149,521	157,499	153,568
Chrysotile	101,241	87,697	72,087	62,735	58,897
Amosite	85,017	93,829	102,419	102,854	101,433
Tremolite	1,855	769	640	25	..
Transvaal Blue	..	..	1,597	3,733	6,384
	349,252	343,149	326,264	326,846	320,282

Exports of asbestos from South Africa have been steadily on the rise. During the past five years ending in March, the values were: R88,589,641 in 1976; R58,068,842 in 1975; R51,474,972 in 1974; R44,641,131 in 1973; and R35,153,095 in 1972.

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South African Asbestos Mines

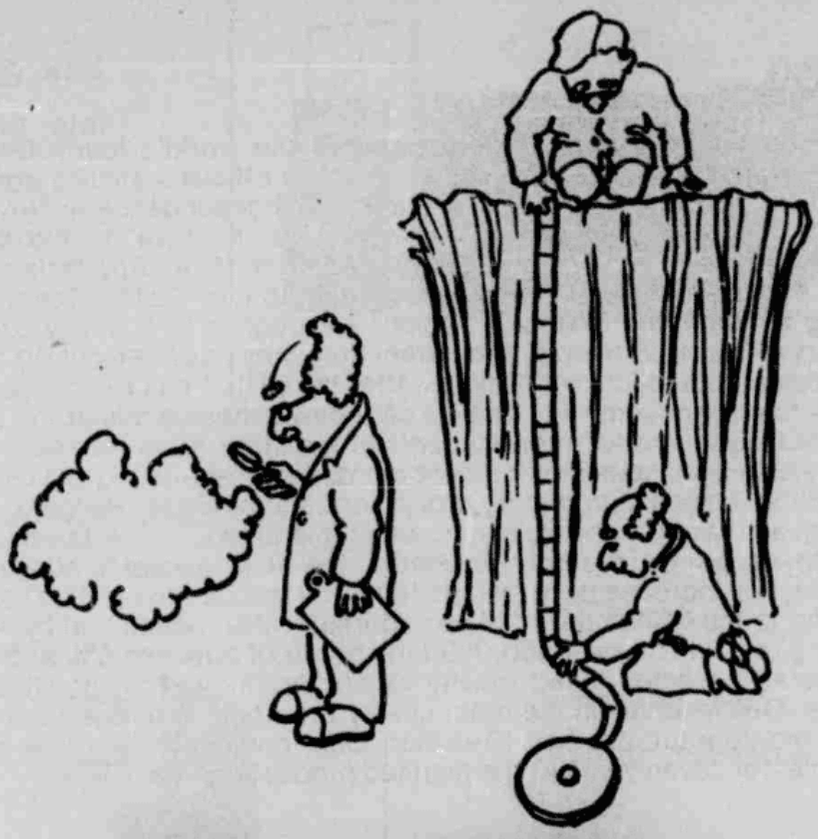
Cape Industries Ltd.—The *Penge Amosite Mine* in the Transvaal, with an annual production capacity of 100,000 tons, is undergoing expansion and improvements. Steps were taken to increase mechanization underground and to improve productivity. A drilling program to indicate further reserves has been started and initial results have been favorable. Selective mining on a reduced scale is being done at the *Kromellenboog Amosite Mine.* Annual Corcidolite production of about 55,000 tons is reported for the *Pomfret and Koegas Mines* in the Northern Cape Province. An option to purchase an existing minor Blue producer in the Postmasburg area was secured and a substantial investigation is being undertaken to establish the potential of the lease areas held by the present producer.

General Mining and Finance Corporation Ltd.—The General Mining/Federale Mynbou Group is on its way to becoming the second largest mining house in South Africa, the leader being the Anglo American Group. General Mining has about a 30% interest in *Msauli Asbes Ltd.* which is a Chrysotile producer in the Barberton District of the Eastern Transvaal. Output in 1976 is estimated at 100,000 tons of Grades 4-7, 22% over the previous year. Over R1-million was to be spent this year on new pressure packing equipment, an additional milling plant, shaft deepening and development work to continue mining at lower levels. . . . *Griqualand Exploration and Finance Co. Ltd.* (Gefco) mines Crocidolite at small operations in the Kuruman District, Northern Cape Province. Total production for the year 1976 is projected at 62,000 tons. Sales are handled by the wholly-owned subsidiary, *Central Asbestos Co. Ltd.*, London. . . . *Wandrag Asbestos (Pty) Ltd.* runs two Crocidolite mines and a mill at Kuruman and a third mine near Danielskuil. The three grades of fibers produced from the three facilities are blended with those of its sales agents, Gefco.

Eternit—Asbestos Investment (Pty) Ltd. produces about 60,000 tons per year of Crocidolite in the Northern Cape Province, via two subsidiaries. *Kuruman Cape Blue Asbestos (Pty) Ltd.* operates two mills at Whitebank and a mine and mill at Klipfontein. The final product is bagged and shipped to *Danielskuil Cape Blue Asbestos (Pty) Ltd.*, at Ouplaas.

Other South African Asbestos Mines—Dublin Consolidated Asbestos Mines (Pty) Ltd., a subsidiary of *Turner & Newall Ltd.*, conducts small-scale Crocidolite mining in the Vryburg District, Cape Province, and an Amosite facility near Pietersburg, in the Transvaal. Two of its small mines were sold in 1975. . . . *Valley Asbestos Mines (Pty) Ltd.* sells about 10,000 metric tons a year of Crocidolite from the combined operations, in the Postmasburg District, Cape Province, of *Groenwater Asbestos Mining Co. (Pty) Ltd., Postmasburg Cape Blue Asbestos (Pty) Ltd.* and *Rooipoort Blue Asbestos (Pty) Ltd.* . . . *Consolidated African Mines Ltd.* is capable of producing some 8000 tons of Grades 4-7 at its mine and mill in the Barberton District of the Transvaal. Its principal sales agent is *Commonwealth & Overseas Asbestos Corporation (Pty) Ltd.*

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RHODESIA

It is still assumed that Rhodesia remains the world's fourth largest asbestos producer, mostly Chrysotile, although official statistics are unobtainable since the Unilateral Declaration of Independence in November 1965. However, production estimates we do have on file show 264,000 short tons in 1975 and 297,000 tons in 1974. *Rhodesian and General Asbestos Corporation* operates the Shabanie, Gaths, Temeraire and King Mines in the Shabanie region. Although it is a wholly-owned subsidiary of *Turner & Newall*, the parent company has been cut off from the Rhodesian operation since shortly after the UDI. It has been reported that RGA has spent some £11-million on a new asbestos mill at the King Mine in Mashaba and for improvements at the other three facilities. The company also owns asbestos-cement plants in Salisbury and Bulawayo. . . . *Another sizeable producing group* controls the Boss, Pangani, Rex and Vanguard Mines in the Bulawayo-Shabanie area. . . . A tower drier plus other equipment, recently installed at the *Kudu Asbestos Mine* near Essexvale, will increase daily millage from 200 metric tons to 1000 tons. According to the "Chamber of Mines Journal," this means that by 1978 the milling rate will be over 360,000 tons of ore of between 6% and 7% short-fibered asbestos, used mainly in a/c products and for filtration purposes. Ore reserves in the main quarry are about 5-million tons and beneath the floor are another 15-million tons, enough to keep the mine operational for seven years at the planned production rate.

AUSTRALIA

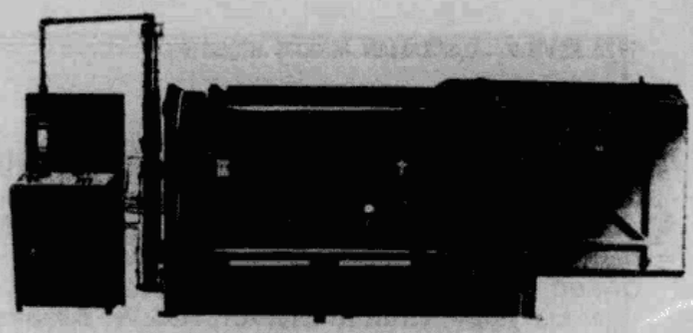
According to the Bureau of Mineral Resources, Geology and Geophysics, Canberra, production of asbestos in Australia amounted to 30,863 metric tons in 1974, 43,529 tons in 1973, 16,844 tons in 1972 and 756 tons in 1971. To permit comparison, we give below production from the Wood's Reef asbestos mine and mill at Barraba, New South Wales, as supplied by the *Chrysotile Corporation of Australia (Pty.) Ltd.*:

Year To	Wood's Reef Production
6/72	3,338
6/73	31,826
6/74	41,242
6/75	41,699
6/76	61,151
	179,256 metric tons produced since the mine began operating in February 1972.

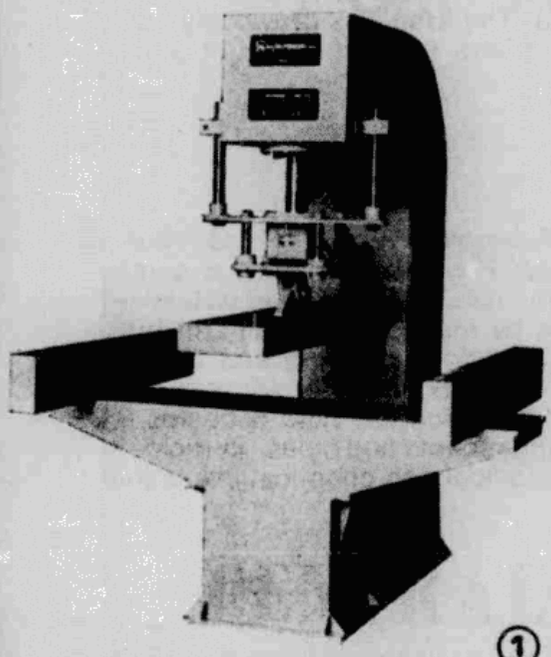
Woodsreef Mines Ltd. is continuing to prove viable its Chrysotile mining-milling complex at Barraba, New South Wales. As can be seen in the above table, production is steadily increasing and annual production may exceed 75,000 metric tons by the end of this year. Virtually all of its

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① Bending and crushing test press for sheet and pipes



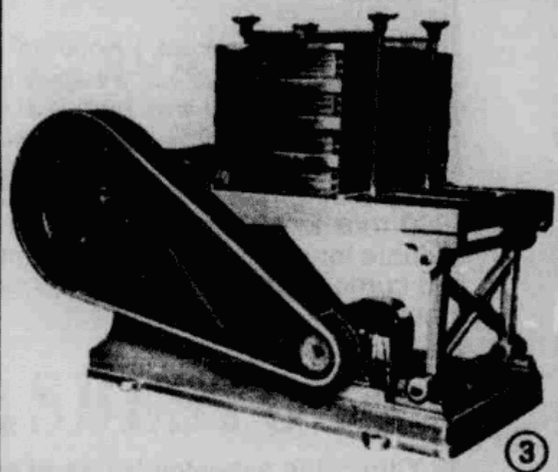
②



①

② Bursting test press for pipes

③ Classifier for testing asbestos fibres



③

Asbestos-cement testing machines designed and manufactured by:

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scheduled production for 1977 has been sold. The mill began operating exclusively on ore from the North Pit in May 1975 and improvements in milling techniques are permitting the production of a consistently higher grade of fiber. . . . Three drill rigs are operating as part of the current diamond drilling program being carried out by Woodsreef's wholly-owned subsidiary, *Yulgilbar Exploration Ltd.*, on asbestos properties near Baryulgil, Grafton District, N.S.W. Assays performed to date confirm the average grade of fiber is likely to be in the Group 4 range, which is in short supply on a worldwide basis. Spinning length fibers are also present. Data compiled from previous exploration have outlined an area of Chrysotile fiber development that has a strike length of about 1300 meters and an average width of some 70 meters. . . . In late 1976 Woodsreef acquired all of the issued shares of *Asbestos Mines Pty. Ltd.* from *James Hardie Asbestos Ltd.* The former Hardie subsidiary operates a small asbestos mine and mill at Baryulgil and holds a number of mining leases in the region. Current mine production is about 400 metric tons of fiber per year. Economic viability will determine if the operation will continue after mid-1977. . . . Woodsreef also acquired a 95% interest in ten mineral claims in Western Australia. The area was previously held by Antelope Exploration Pty. Ltd. and offers potential for Chrysotile asbestos development.

BOLIVIA

From an article on "Bolivian Blue Asbestos," by Dr. H. G. Klos, General Manager of *Bolivian Minag Ltda.*, we learned that a semi-mechanized project was begun at Cochabamba in 1975 toward obtaining a concentrate of 90% to 98% asbestos by manual selection and that work has been started on standardization and classifying and toward guaranteeing quantity, quality and delivery. Production projections are 2000 tons in 1976 and 10,000 tons by 1978. Bolivian Blue asbestos is suitable for use in asbestos-cement roofing, sheets and pipes, in molded and compressed tiles and in thermal, acoustical and chemical insulation materials.

BRAZIL

Chrysotile asbestos is mined at Cana Brava, 160 miles northwest of Brasilia. Operated by *S.A. Mineracao de Amianto*, it accounts for some 95% of Brazil's total asbestos output. SAMA is controlled by *S.A. Tubos Brasilit* which, in turn, is owned by *Saint-Gobain-Pont-A-Mousson* and the *Eternit Group.* Operations began in 1967 with an output of 1000 metric tons of fiber. Annual production has increased significantly to 43,000 tons in 1973, 60,000 tons in 1974 and 72,000 tons in 1975. Projections are 110,000 tons for 1976 and 115,000 tons by 1979. Reserves are estimated at 50-million tons of rock containing some 7% fiber (3.5-million tons of fiber).

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CHILE

A 400-hectare asbestos-containing property is for sale and the owner, *Sr. Carlos A. Baldeig*, invites anyone interested to investigate its possible potential. The property is situated about 700 kilometers south of Santiago, of equal distance to the loading ports of Talcahuano and Valdivia.

PEOPLES REPUBLIC OF CHINA

China ranks 5th in the world as an asbestos producer with annual production running 145,000 tons or more, mostly Chrysotile. The principal operation is at Shihmien (which means asbestos), in Szechwan Province. Reserves are calculated at 28-million metric tons and the product is said to qualify as a first-grade textile fiber. Other deposits are located at Penghsien, Leiyan, Chinhsien, Yuank'ang, Chian, Nanyang, Penli, Yang-shan, Shapatsu, Liuchouwan and Shaopuhai.

COLOMBIA

Minera Las Brisas S.A., Bogota, reports that engineering plans for the processing plant are being completed at the Chrysotile property at Las Brisas, near Campamento in Antioquia Province. Feasibility studies indicated the presence of 8.4-million metric tons of asbestos, capable of producing about 390,000 tons of fiber. Fiber production at 20,000 tons per annum is scheduled to begin in 1979. The project is now valued at $24-million.

CYPRUS

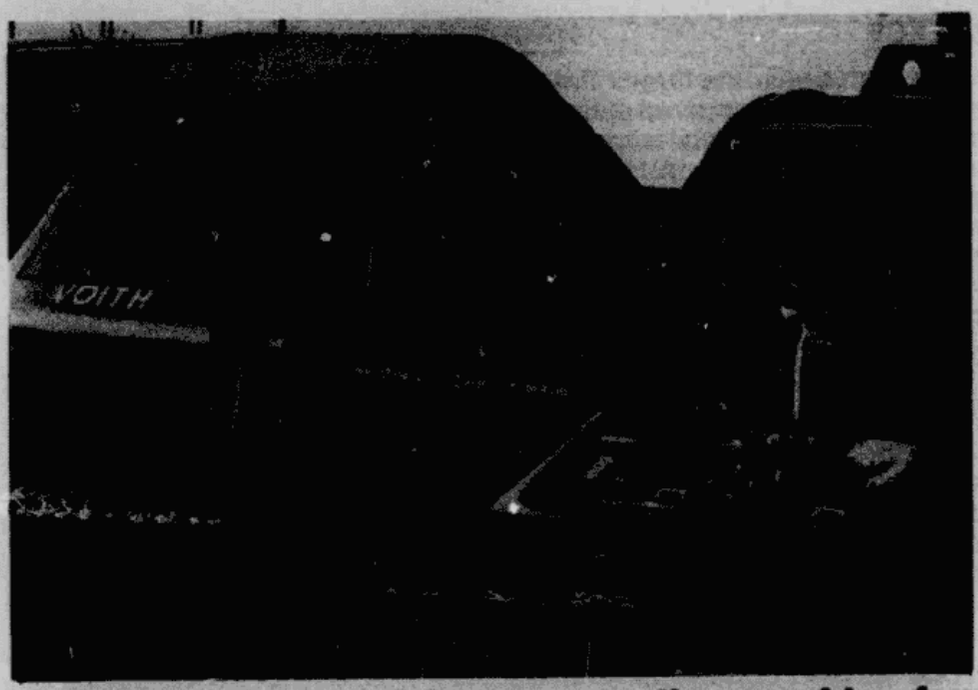
Production of asbestos in Cyprus continues stable as shown in the following tabulation:

CYPRUS ASBESTOS PRODUCTION

Year To	Short Tons	Value
6/76	31,744	£ 2,679,465
6/75	33,582	2,360,880
6/74	30,275	1,849,900
6/73	29,402	1,725,120
6/72	30,988	1,871,500

Cyprus Asbestos Mines Ltd. remains the sole asbestos producer on the Island. The company again received the Safety Shield for the best safety record in 1975.

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The photo shows a laboratory testing machine for carrying out bursting tests on asbestos cement pipes with more than 1200 tons pressing force for diameters of up to 1600 mm.

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GREECE

Early this year the Greek Parliament passed rulings that revised the mining code and improved public and private research. The bills provide for closer governmental supervision of minerals research and development, the creation of an Institute of Geological and Mineral Research, empowering the State to oblige mine operators to supply ore to local metallurgical industries, a time limit on concession rights or leases of state mines, exclusion of foreign individuals or companies from acquiring mining exploration permits, the requirement for Council of Ministers' approval of foreign applications for mining concessions, regulation of reserve or idle mines to prevent hoarding and to promote maximum production, and environmental protection and pollution requirements.

A Chrysotile facility is in operation on a pilot plant scale at Zidani, near Kozani, in Western Macedonia. Latest information is that a 50,000-tons-per-year plant is in the offing, with an ultimate annual capacity of 100,000 tons by 1980. *Cerro Corporation* no longer holds its 51% interest in MABEM (the Asbestos Mining Company of Northern Greece).

INDIA

So far as we know, *Andhra Pradesh Mining Corporation* is still processing asbestos at Pulivendia, in the area of Cuddapah. The new processing facility was to have come on stream early this year.

ITALY

Production of Chrysotile totaled 146,980 metric tons in 1975 vs. 148,099 tons in 1974, 150,256 tons in 1973, 131,272 tons in 1972 and 119,568 tons in 1971. Prime Producer is *Amiantifera Di Balangero S.p.A.*, Milano, operator of the Balangero Mine.

MEXICO

Beginning in 1978, approximately 60,000 short tons of fiber per year (Grades 4-6) are to be produced by *Concepcion Papalo* at the Chrysotile mine and mill in the Quicatlan District, 100 kilometers northwest of Oaxaca. . . . *Sr. J. A. Rogue* again holds the mining rights to the cross fiber, Chrysotile property at Canon del Novillo, near Ciudad Victoria in the State of Tamaulipas.

MOZAMBIQUE

Minas Gerais de Mocambique, Lda., Lourenco Marques, was scheduled to begin producing Anthophyllite (Grades 3-7) this year at Mavita. Prior information indicated reserves of 250,000 tons of proven ore, 1-million tons of probable ore and 20-million tons of ore classified as possible.

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DEMOCRATIC REPUBLIC OF SUDAN

Johns-Manville Corporation, the *Gulf International Group* of Kuwait and the *Sudanese Government* have signed an agreement for the exploration and possible development of asbestos deposits in the Sudan. Under the pact, J-M and Gulf are granted licenses to explore for asbestos on 3861 square miles in the Blue Nile and Kassala Provinces for an 18-month to 3-year period. If successful, the three parties will form a joint venture for the mining and marketing of asbestos fiber.

SWAZILAND

Asbestos and iron ore comprise 95% of the total of Swaziland's mine value of mineral sales. The figure for asbestos was 41.219 metric tons in 1975 against 32,421 tons in 1974 and 35,000 tons in 1973. Improved production and profitability continue at *Havelock Asbestos Mines (Swaziland) Ltd.*, owned 60% by *Turner & Newall* and 40% by the Swaziland Government. Discussions were held between Havelock and *Lonrho Ltd.* concerning the best approach toward optimizing reserves in the lower part of the orebody. Lonrho holds the adjacent mineral rights.

TAIWAN

Seven small asbestos mines operate in Taiwan and primarily produce the Actinolite variety. All output is used internally, mostly in heat insulation materials. Production was 1737 metric tons in 1975, compared with 2957 tons in 1974, 5308 tons in 1973 and 2687 tons in 1972. The estimate for the year 1976 is 2317 tons.

TANZANIA

A geological survey team recently undertook a general reconnaissance project in the Mara Region, near the Kenya border just east of Lake Victoria. Past data define the variety as Tremolite. Also, there is talk of the possible establishment of an asbestos cement factory in Tanzania sometime in the future.

TURKEY

One of the largest of six asbestos deposits being worked in Turkey is *Adana Atermit*, located near the Syrian border. The company uses Chrysotile fiber with small amounts of Crocidolite to produce flat and corrugated a/c sheets. Further, a study is being made by *Amyant Sanayii A.S.* of a deposit at Tatarcik, near Mihaliccik. Tentative plans were to build a 10,000-tons-per-annum mill, perhaps by 1977, with expansion capabilities to 30,000 tons per year.

YUGOSLAVIA

Although asbestos properties have not been sufficiently investigated, reserves are indicated to amount to more than 21-million metric tons of ore.

THE NEXT ISSUE WILL CONCLUDE THIS REVIEW OF THE YEAR 1977. IT WILL COVER THE ASBESTOS PRODUCTS MANUFACTURING INDUSTRY AND INDUSTRIAL HEALTH AND SAFETY ISSUES.

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DEATHS

Walter C. Atkinson—September 25, 1976; retired from Johns-Manville Corporation in 1968.

Edgard Medard Bollaert—November 9, 1975; during his career he had been associated with Van Packer Corporation, Pabco Products Corporation, U.S. Gypsum Company and The Philip Carey Manufacturing Company; he was co-founder of Pacific-Asbestos Cement Products Corporation and the holder of the 6th casting of the Asbestos Story Ring; age 68.

Adin A. Brown—April 4, 1976; retired Vice President and a Director, Asarco Inc.; age 78.

Sir Val Duncan—December 1975; Chairman and Chief Executive Officer, Rio Tinto-Zinc Corporation; age 62.

Sir William Fenton—January 24, 1976; Honorary President, BBA Group Ltd.

Jesse Thomas Griffis—October 22, 1976; retired in 1969 as Sales Representative for Southern Asbestos Company; prior positions had been Manager of the Charlotte and Davidson Works and Manager-Marketing Development-Textiles; age 70.

Lawrence E. Moody—March 8, 1976; Engineering Manager, Southern Asbestos Company; previous titles include Assistant Works Manager, Works Manager and General Manager; age 51.

Edgar L. Newhouse, Jr.—November 4, 1975; retired Vice President and a Director, Asarco Inc.

Frank G. Ruggles—February 13, 1976; Owner and President, Frank G. Ruggles Company, Inc.

Willard A. Speakman, Jr.—October 1976; Chairman of the Board, Speakman Company; age 75.

Robert W. Winson—January 11, 1976; Mine Project Manager, Asbestos Fibre Division, Canadian Johns-Manville Co. Ltd.; age 58.

RETIREMENTS

Sir Ralph Bateman—Chairman and a Director, Turner & Newall Ltd.; July 31, 1976.

Colon Brown—Chairman and Chief Executive Officer, National Gypsum Company; February 29, 1976.

John Despard Christian—Chairman and a Director, Cassiar Asbestos Corporation Ltd.; April 22, 1976.

John J. Collins—Vice President of Exploration, Asarco Inc.; December 1975.

Charles R. Elliott—Secretary of Cassiar Asbestos Corporation Ltd., Chairman and a Director of Conwest Exploration Company Ltd. and an Officer and a Director of Conwest's associated companies; he remains active as a Director of Cassiar.

H. Leonard Falle—Vice President, Atlas Asbestos Company, Montreal; October 1976.

Albert H. Fay—Vice President-Marketing, Gold Bond Building Products Division, National Gypsum Company; August 31, 1976.

George Goffin—General Manager Technical, Humes Ltd.; December 1975.

Walter Hill—Pensions Consultant and former Controller-Group Pensions and Executive Services, Turner & Newall Ltd., June 30, 1976.

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Michael F. Howe—Managing Director of Turners Asbestos Fibres Ltd., a former Director of TBA Industrial Products Ltd. and Deputy Chairman of the U.K. Asbestos Information Committee; June 30, 1976.

E. G. Kedge—Advertising Manager, Scapa Group Ltd., June 1976.

Ronald D. Lord—Vice President-Research & Development, Rio Algom Ltd.; December 31, 1975.

Paul O. Nicodemus—Senior Insulations Applications Chemist and Laboratory Supervisor, General Electric Wire & Cable Department; July 1, 1976.

L. D. Norton, a Director, TAC Construction Materials Ltd., October 1, 1976.

William W. Oughtred—President and Chief Executive Officer, Asbestos Corporation Ltd.; November 17, 1976.

A. Proctor—a Director of Turner & Newall Ltd. and Chairman of Newalls Insulation Co. Ltd.; November 30, 1975.

William J. W. Smith—Director and Vice President, Bell Asbestos Mines Ltd.; April 1, 1976.

F. Perry Wilson—Chairman and Chief Executive Officer, Union Carbide Corporation; December 31, 1976.

FRONT COVER ILLUSTRATIONS—1976

MARCH—Composite of Photographs from *EMV Associates, Inc.*, concerning microanalysis of asbestos, i.e.: typical bundle of Chrysotile magnified 3000X; spectrum of energy dispersive X-ray analysis; Chrysotile Fibers in a wallboard material magnified 1500X; and a scanning electron microscope.

APRIL—Nilfisk Model GA 73 vacuum cleaner in use at an asbestos textile manufacturing facility; photograph supplied through the courtesy of *Nilfisk of America, Inc.*

MAY—Picture contributed by *G. Siempelkamp & Co.* of a plant for the manufacture of pressed asbestos-cement sheets.

JUNE—The new asbestos textile mill at Sherbrooke, Quebec, a joint venture between *Garlock of Canada Ltd.* and the Quebec Government.

JULY—Glasal asbestos-cement panels, manufactured by *Eternit*, Belgium, and marketed in the Republic of South Africa by *Everite Ltd.*, face all sides of the National Employer's House, Johannesburg, as decorative, shell-colored bands.

AUGUST—"Before and after" photographs from *Aeropulse, Inc.*, demonstrate how the Hi-V exhaust system dramatically reduces airborne dust generated by a 6,000 rpm, 7", 24-grit disc grinder.

SEPTEMBER—Cross sections of Chrysotile fibers from the Transvaal, South Africa, taken at 100 kv X 1,050,000 and of Chrysotile fibers from Coalinga, California, taken at 100 kv X 1,200,000; photographs contributed by *Professor Keiji Yada*, Research Institute for Scientific Measurements, Tohoku University, Sendai, Japan.

NOVEMBER—Partially completed Hurricane Pulverizer-Classifiers under inspection prior to installation of motors and drives at the new plant in Brantford, Ontario, of *C-E Bauer (Canada), a part of the Process Equipment Group of Combustion Engineering, Inc.*; units are used in the Asbestos Industry for fiberizing, removal of magnetite and rock and recovery of fibers from previously discarded tailings.

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— Machinery for asbestos-cement since 1912, therefore take advantage of our experience.

— Complete plants with high capacity for corrugated and flat sheets, flat pressed and coloured sheets.

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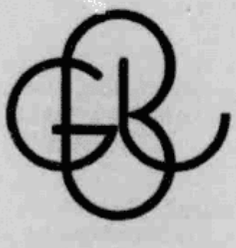
— Auxiliary machines for special sheet profiles.

— Complete plants with high production for pressure and sewage pipes.

— Special plants for preparation of wet and dry Asbestos.

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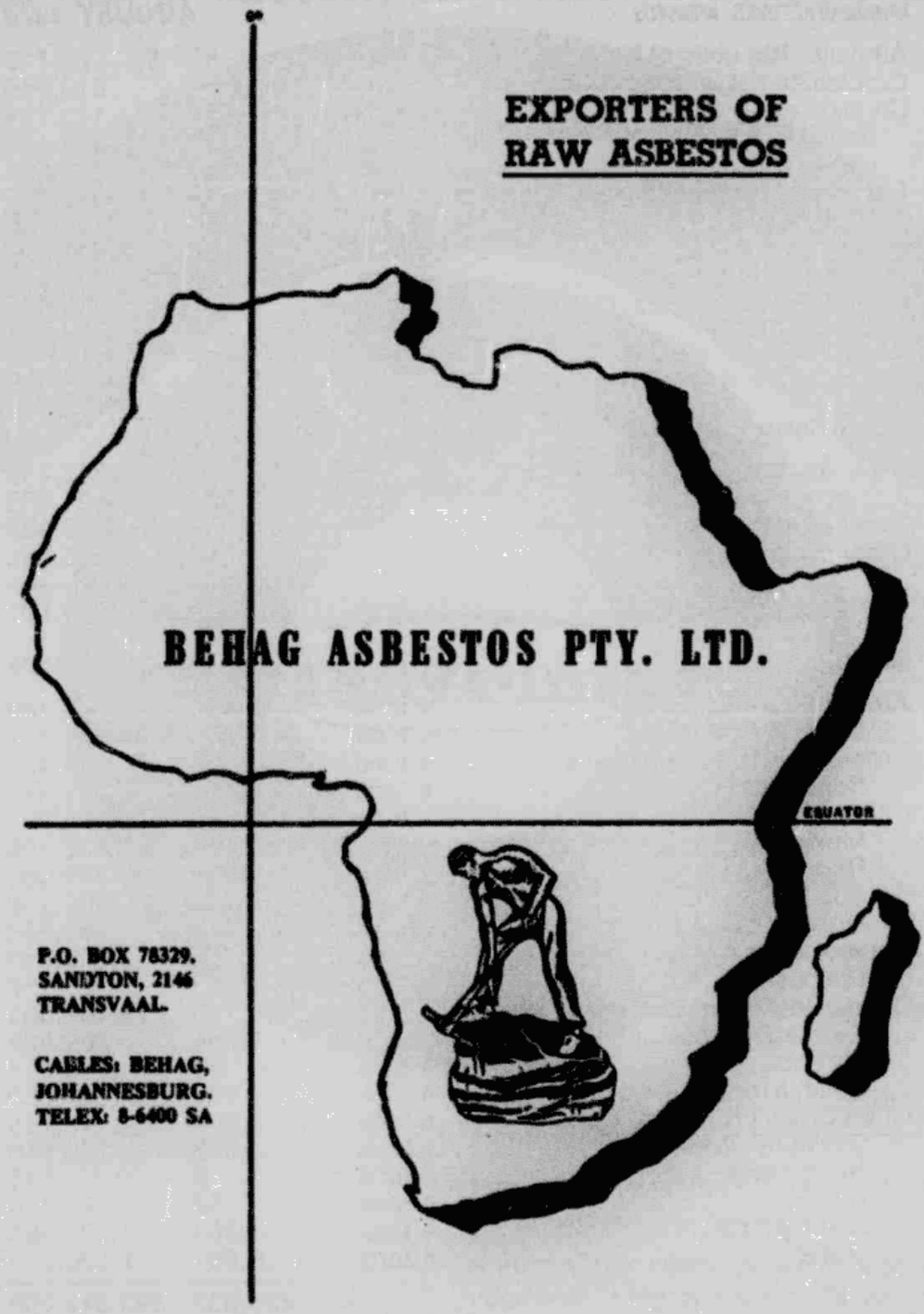
Thyssen Umformtechnik

Valley Asbestos (Pty) Ltd.
Verlag Karl Kramer & Co.
Peter Villforth
J. M. Voith AG

Gebr. Wehrhahn
Wurttembergische Filztuchfabrik
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EXPORTERS OF
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IMPORTS INTO THE UNITED STATES

From: U.S. Bureau of the Census

UNMANUFACTURED ASBESTOS:		AUGUST 1976	
Amosite, Republic of South Africa	s.tons	53	$ 23,710
Crocidolite (Blue), South Africa	s.tons	637	313,246
Chrysotile Crudes, Rhodesia	s.tons	159	143,824
South Africa	s.tons	119	126,432
United Kingdom	s.tons	269	135,991
Chrysotile Spinning Fibers, Canada	s.tons	689	224,562
Rhodesia	s.tons	123	105,152
Chrysotile, Other, Canada	s.tons	43,806	8,910,407
Mexico	s.tons	2	416
Other Crudes & Fibers, Canada	s.tons	2,021	350,032
South Africa	s.tons	1,411	324,094
USSR	s.tons	1,102	137,377
		50,391	$10,795,243
MANUFACTURED ASBESTOS PRODUCTS:			
Asbestos yarn, cloth, tape, etc.	Lb	631,300	$ 882,450
A-C pipes, tubes & fittings	Lb	892,801	94,658
Other asbestos-cement articles	Lb	1,423,859	235,988
Other asbestos articles		..	606,595
			$ 1,819,691
UNMANUFACTURED ASBESTOS:		**JANUARY-AUGUST 1976**	
Amosite, Canada	s.tons	20	$ 469
South Africa	s.tons	1,204	527,373
Crocidolite (Blue), Australia	s.tons	99	46,498
South Africa	s.tons	6,254	3,073,418
Chrysotile Crudes, Canada	s.tons	385	175,399
Mexico	s.tons	234	125,486
Rhodesia	s.tons	1,619	1,300,083
South Africa	s.tons	748	460,156
United Kingdom	s.tons	564	282,238
Chrysotile Spinning Fibers, Canada	s.tons	3,757	2,909,740
Rhodesia	s.tons	123	105,152
Chrysotile, Other, Canada	s.tons	393,743	79,101,334
Germany, West	s.tons	1,086	202,826
Mexico	s.tons	24	5,611
South Africa	s.tons	396	217,440
Other Crudes & Fibers, Canada	s.tons	12,804	2,113,168
Germany, West	s.tons	823	179,840
Hong Kong	s.tons	2	345
Mexico	s.tons	52	21,624
South Africa	s.tons	3,364	1,222 983
USSR	s.tons	8,631	1,570,915
		435,932	$93,642,098
MANUFACTURED ASBESTOS PRODUCTS:			
Asbestos yarn, cloth, tape, etc.	Lb	4,699,365	$ 6,652,171
A-C pipes, tubes & fittings	Lb	7,615,818	745,748
Other asbestos-cement articles	Lb	12,171,913	2,033,949
Other asbestos articles		..	4,076,459
			$13,508,327

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Plants for the manufacture of pressure and sewer pipes, variable lengths: 3-4-5-6 m.

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EXPORTS FROM THE UNITED STATES

From: U.S. Bureau of the Census

UNMANUFACTURED ASBESTOS: — **AUGUST 1976**

Fibers not further processed than beaten, washed or graded to length	s.tons	1,948	$ 704,457
Waste and refuse	s.tons	1,964	532,699
		3,912	$ 1,237,156

MANUFACTURED ASBESTOS PRODUCTS:

A-C shingles & clapboard	Lb	1,078,373	$ 190,758
Other a-c fiber-cement articles	Lb	2,791,769	426,803
Gaskets	Lb	31,543	193,338
Packing	Lb	381,175	668,964
Heat or sound insulation		..	227,040
Textiles & yarns	Lb	1,643,790	723,752
Protective clothing		..	118,159
Mfrs. other than friction materials		..	795,589
Clutch facings & linings for auto. use	No	59,628	91,234
Other clutch facings & linings	No	19,916	34,696
Brake linings for automotive use	Lb	648,961	558,931
Other brake linings	Lb	156,686	182,604
			$ 4,211,868

UNMANUFACTURED ASBESTOS: — **JANUARY-AUGUST 1976**

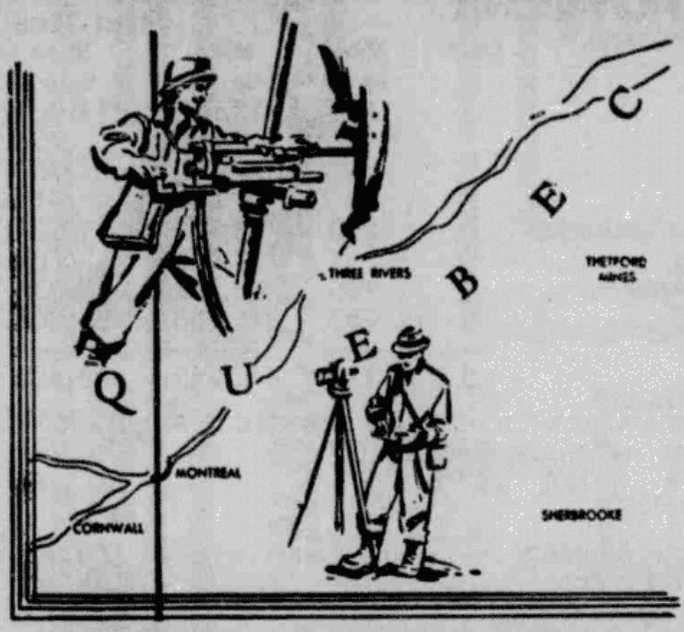
Fibers not further processed than beaten, washed or graded to length	s.tons	15,762	$ 5,063,939
Waste and refuse	s.tons	18,851	4,265,771
		34,613	$ 9,329,710

MANUFACTURED ASBESTOS PRODUCTS:

A-C shingles & clapboard	Lb	18,082,063	$ 3,039,132
Other a-c fiber-cement articles	Lb	17,854,130	3,485,417
Gaskets	Lb	425,073	1,151,595
Packing	Lb	2,793,296	5,553,326
Heat or sound insulation		..	2,811,326
Textiles & yarns	Lb	11,369,190	4,949,225
Protective clothing		..	610,558
Mfrs. other than friction materials		..	8,218,937
Clutch facings & linings for auto. use	No	448,113	781,060
Other clutch facings & linings	No	173,597	174,524
Brake linings for automotive use	Lb	6,560,512	5,486,002
Other brake linings	Lb	1,582,964	1,769,647
			$38,030,749

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EXPORTS FROM CANADA

From: Statistics Canada

AUGUST 1976

Short Tons

UNMANUFACTURED ASBESTOS:	Crude	Milled Gp 3	Milled Gp 4&5	Shorts Gp 6-9
Western Europe	..	521	13,955	14,551
Eastern Europe	..	..	1,499	738
Middle East	..	..	502	197
Africa	..	..	835	415
Asia	3	210	6,716	11,528
Oceania	..	1	7,040	707
So. & Cen. America & Antilles	..	186	6,332	2,236
United States	5	253	11,263	36,260
	8	1,171	48,142	66,632

The total amount of unmanufactured asbestos exported in *August 1976* was 115,953 short tons, valued at $32,081,000.

MANUFACTURED ASBESTOS PRODUCTS:

Asbestos cloth, dryer felts & sheets	$ 150,000
Asbestos brake linings & facings	158,000
Asbestos-Cement building materials	725,000
Other basic asbestos products	128,000
	$1,161,000

JANUARY-AUGUST 1976

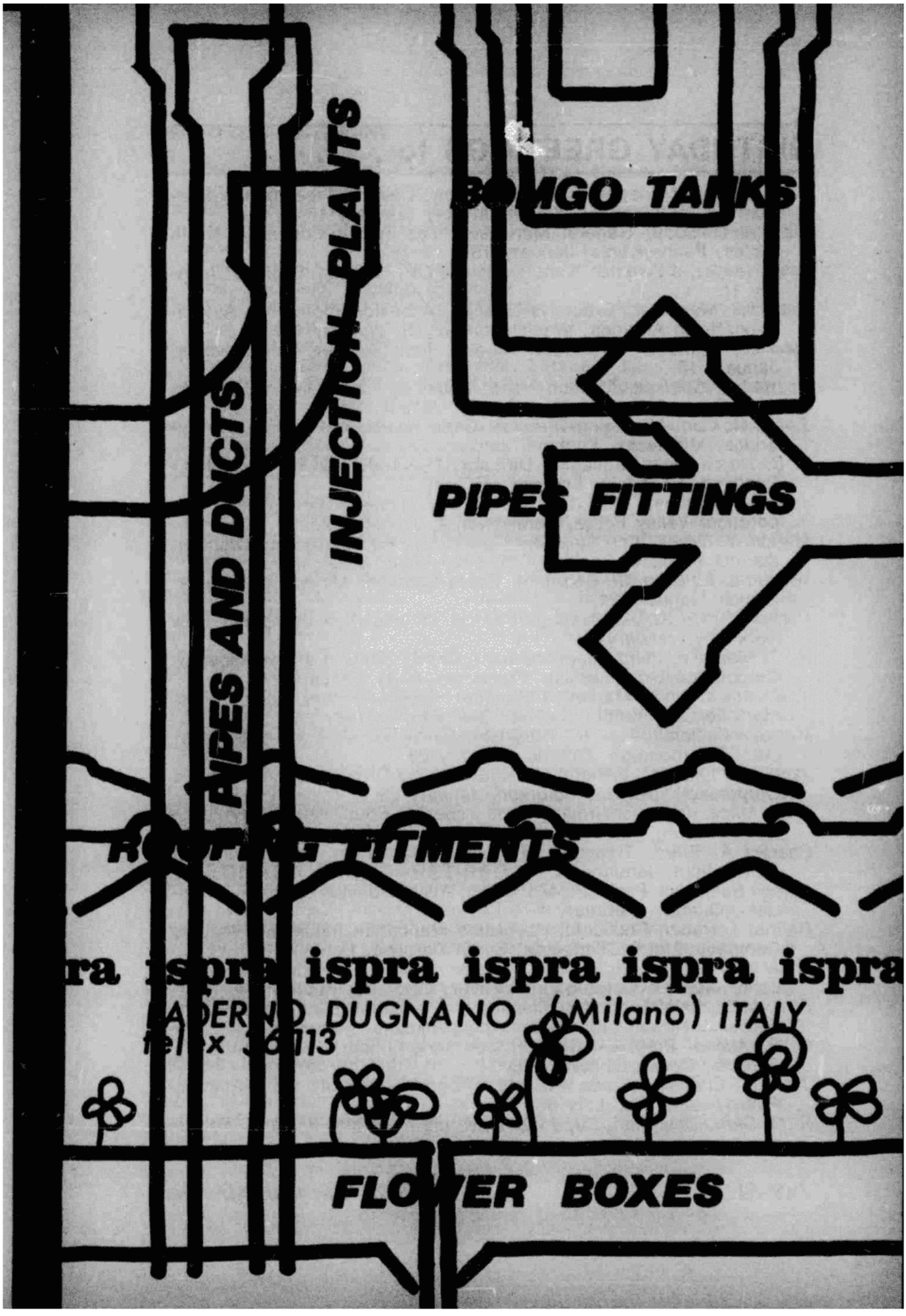
UNMANUFACTURED ASBESTOS:	Crude	Milled Gp 3	Milled Gp 4&5	Shorts Gp 6-9
Western Europe	64	7,471	172,869	113,943
Eastern Europe	..	572	9,703	2,317
Middle East	..	215	9,987	4,743
Africa	..	..	6,776	4,079
Asia	3	1,325	62,414	94,925
Oceania	..	6	33,426	4,916
So. & Cen. America & Antilles	..	1,335	53,490	21,300
United States	25	5,140	95,825	308,588
	92	16,064	444,490	554,811

The total amount of unmanufactured asbestos exported in *January-August 1976* was 1,015,457 short tons, valued at $289,732,000.

MANUFACTURED ASBESTOS PRODUCTS:

Asbestos cloth, dryer felts & sheets	$1,498,000
Asbestos brake linings & facings	1,109,000
Asbestos-Cement building materials	5,641,000
Other basic asbestos products	1,615,000
	$9,863,000

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BIRTHDAY GREETINGS to . . .

E. K. English, Manager, Territorial Supply, Cassiar Asbestos Corporation Ltd., Whitehorse, Yukon Territory, January 15.

Michael L. Scott, General Manager, Atlas Textile Company, North Wales, Pennsylvania, January 15.

A. E. Hepper, a Director, Cape Industries Ltd., London, England, January 16.

Robert H. Mereness, Executive Director, Asbestos Information Association/North America, Washington, D. C., January 18.

John K. Whittaker, President, Nicolet, Inc., Ambler, Pennsylvania, January 18.

Charles E. Stiefken, Section Head, Asbestos Fiber Division, Asarco Inc., South Plainfield, New Jersey, January 20.

T. M. McKain, Managing Director, Cape Boards & Panels Ltd., Uxbridge, Middlesex, England, January 21.

J. B. Heron, Joint Managing Director, TBA Industrial Products Ltd., Spotland, Rochdale, England, January 22.

John A. Malone, Asbestos Research Engineer, CertainTeed Corporation, Valley Forge, Pennsylvania, January 22.

Marion W. Oliver, Vice President-Operations, Raybestos Manhattan Industrial Products Company, N. Charleston, S. C., January 23.

William L. Stribling, III, Chairman, Carey-Canadian Mines Ltd., Tampa. Florida, January 24.

Herbert S. Hirschfeld, Manager, Standard Insulation Company, New York City, January 27.

H. C. Metcalfe, Plant Superintendent, Cassiar Mine, Cassiar Asbestos Corporation Ltd., Cassiar, British Columbia, January 27.

J. Eugene Connor, Marketing Manager, Asbestos Fibre Sales, Johns-Manville Corporation, Denver, Colorado, January 28.

Malcolm E. Schumann, Jr., President, Raybestos-Manhattan (Canada) Ltd., Peterborough, Ontario, January 28.

James M. Fletcher, General Manager, Mining Division, Johns-Manville Corporation, Denver, Colorado, January 29.

J. G. Mackeurtan, Chairman, Cape Asbestos South Africa (Pty) Ltd., Johannesburg, Republic of South Africa, January 29.

Charles A. Fried, Treasurer, Raybestos-Manhattan, Inc., Trumbull, Connecticut, January 31.

Nelson Bain, Vice President-Marketing, Atlas Asbestos Company, Montreal, Quebec, February 1.

Gabriel Ferrucci, President, Raybestos Manhattan Industrial Products Company, North Charleston, South Carolina, February 1.

W. H. Bartlett, Product Group Manager, Industrial Products Division, Johns-Manville Corporation, Denver, Colorado, February 4.

F. E. Mills, Chief Executive, Plastics and Industrial Materials Division, Turner & Newall Ltd., Manchester, England, February 4.

G. R. Albino, President & Chief Operating Officer, Rio Algom Ltd., Toronto, Ontario, February 5.

John P. Cumiskey, Vice President-Finance, Nicolet, Inc., Ambler, Pennsylvania, February 5.

R. H. Dent, Chairman, Cape Industries Ltd., London, England, February 9.

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C. Fred Workman, Vice President-Marketing, Nicolet, Inc., Ambler, Pennsylvania, February 9.

Ronald R. Moalli, President, R/M International, and Corporate Vice President, Raybestos-Manhattan, Inc., Trumbull, Connecticut, February 10.

R. A. Wells, Joint Manager Director, TBA Industrial Products Ltd., Spotland, Rochdale, England, February 11.

S. Gibbs, Deputy Chairman, Turner & Newall Ltd., Manchester, Lancashire, England, February 12.

James D. Moran, Chairman & Chief Executive Officer, The Flintkote Company, White Plains, New York, February 12.

A. B. Marchant, Senior Vice President-Labor Relations, Johns-Manville Corporation, Denver, Colorado, February 13.

W. W. OUGHTRED—RETIRED

William W. Oughtred retired as President and Chief Executive Officer of Asbestos Corporation Ltd., effective November 17, 1976.

He was born at Ainsworth, British Columbia, served as a pilot in the Royal Canadian Air Force and graduated from McGill University as a Mining Engineer with a degree of B.Eng. He joined Asbestos Corporation in 1946, spent three years on exploration in Newfoundland, became Exploration Manager in 1949 and later served also as Cost Control Manager. He was appointed Assistant General Manager in 1954, Vice President and General Manager in 1964 and Executive Vice President in 1965. Mr. Oughtred was elected a Director and appointed to the Executive Committee in 1966 and became President and Chief Executive Officer in 1967. On the formation of Asbestos Corporation (Explorations) Ltd. in 1951, he was appointed Manager and in 1961 became Vice President.

Mr. Oughtred served as a Director of Baffinland Iron Mines Ltd., Chairman and a Director of Minorex Ltd. and President and a Director of Asbestos Corporation Services Ltd., Hudson Strait Asbestos Ltd., and General Minerals Beneficiation Ltd.

H. LEONARD FALLE—RETIRED

H. Leonard Falle, Vice President of Atlas Asbestos Company, Montreal, Canada, retired after 37 years service with the company.

Well respected in the asbestos and construction industries in Canada, Mr. Falle began his career with project work for Atlas Asbestos at Baie Comeau, Quebec. After a stint in the Canadian Army during World War II, he worked in Atlas' Montreal Office until 1951 when he was appointed Ontario Branch Manager. He remained in Toronto until 1957 when he returned to Montreal as General Merchandising Manager. In 1959 Mr. Falle was appointed Marketing Manager for Cement-Asbestos Pipe, a position he held until 1968 when he was promoted to Vice President-Marketing. He served on the Executive Board of Atlas Asbestos and as a Director of Bell Asbestos Mines Ltd., Thetford Mines, Quebec.

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CALENDAR OF EVENTS

ASTM COMMITTEE MEETINGS—G-3 on Deterioration of Nonmetallic Materials, Sheraton Hotel, Dallas, Texas, *January 11-12;* D-9 on Electrical Insulating Materials, Sheraton Hotel, Dallas, Texas, *January 12-14;* C-24 on Building Joint Sealants, Sun Rise Inn, Ft. Lauderdale, Florida, *January 17-19;* and E-7 on Nondestructive Testing, Galt Ocean Mile Hotel, Ft. Lauderdale, Florida, *January 24-27.*

COLORADO MINING ASSOCIATION—80th National Western Mining Conference, Denver, Colorado, *February 2-4.*

NATIONAL HOME IMPROVEMENT COUNCIL—1976 Annual Convention, Fairmont Hotel, San Francisco, California, *February 3-5.*

UNIVERSITY OF WISCONSIN—Extension Courses in *February* include: Hazardous Waste Management (*3-4*); Sanitary Landfill Site Selection, Design & Operation (*7-9*); A Systematic Approach to Building Material Evaluation and Selection (*7-12*); Film Wraps and Palletization (*10-11*); Energy Conservation Methods in Heating and Air Conditioning Systems (*10-11*); How to Develop Standard Data Suitable for Computer and Manual Applications (*14-15*); and On-Site Liquid Waste Disposal II (*14-16*).

AMERICAN SOCIETY FOR QUALITY CONTROL—Short Course on Quality Engineering, Holiday Inn-Midtown, Milwaukee, Wisconsin, *February 7-11.*

MINERAL MANAGEMENT AND ECONOMICS—Seminars at McGill University, Montreal, Quebec: The Development of Supervisory Personnel for the Mineral Industry, *February 7-9;* Mineral Investment Decision Techniques, *February 14-25;* and Strategic Planning in the Mining Company, *February 28-March 4.*

INDUSTRIAL VENTILATION CONFERENCE—Kellogg Center Continuing Education Service, Michigan State University, East Lansing, Michigan, *February 13-18.*

NATIONAL BUREAU OF STANDARDS—Symposium on Flow Measurements, NBS Headquarters, Gaithersburg, Maryland, *February 23-24.*

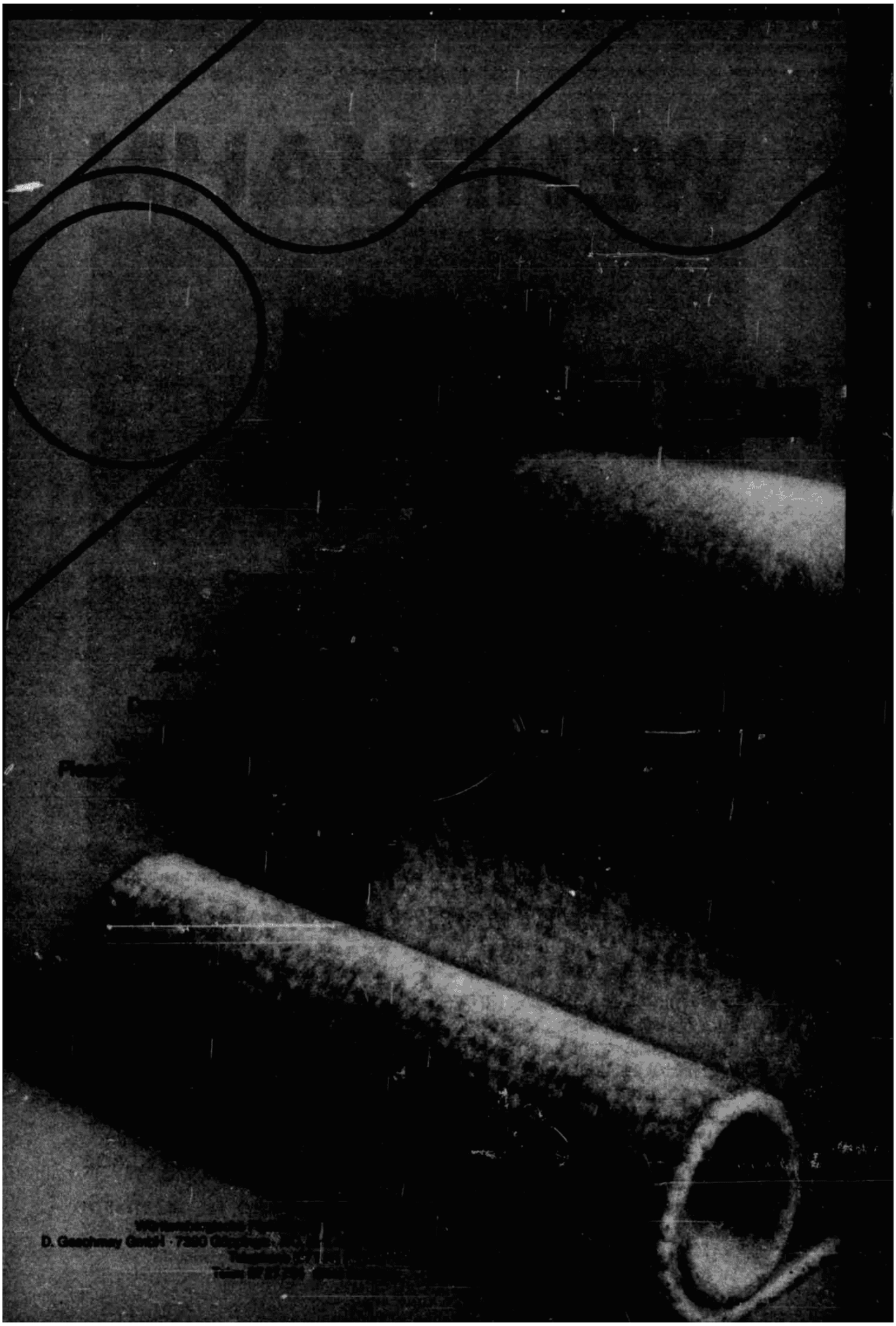
SOCIETY OF EXPLOSIVES ENGINEERS—Third Conference on Explosives and Blasting Technique, Pittsburgh, Pennsylvania, February 23-25.

INTERNATIONAL ATOMIC ENERGY AGENCY—Symposium on Nuclear Techniques in Exploration, Extraction and Processing of Mineral Resources, Vienna, Austria, *March 7-11.*

18TH BAUMA—International Construction Machinery Fair, Fairgrounds, Munich, Germany, *March 10-16.*

NEXT ISSUE—GREETINGS FROM INDUSTRY LEADERS

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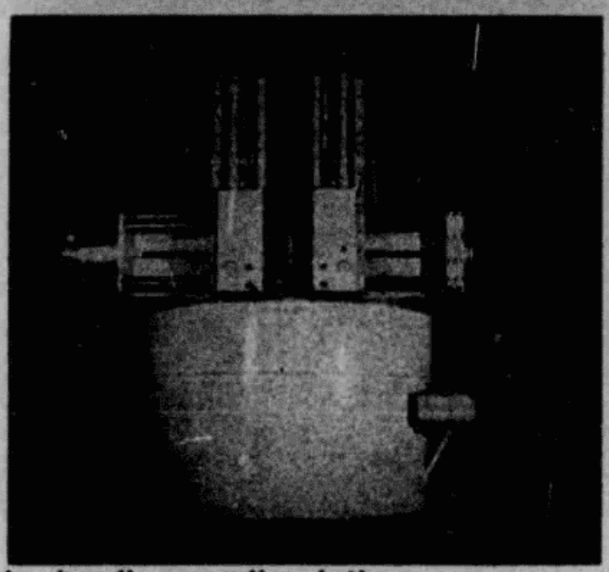


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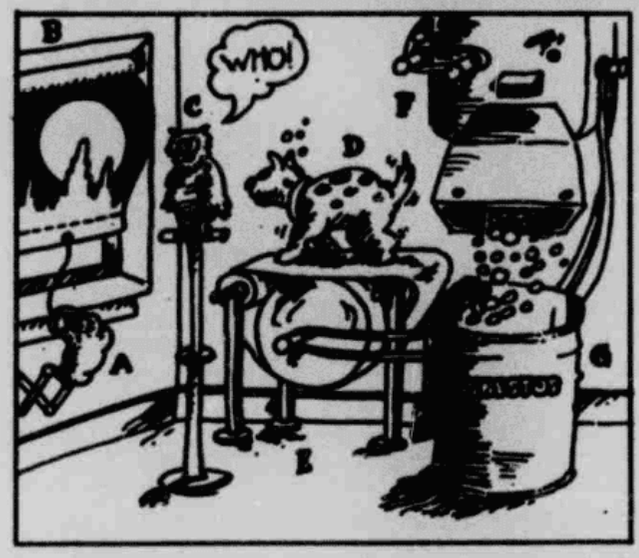
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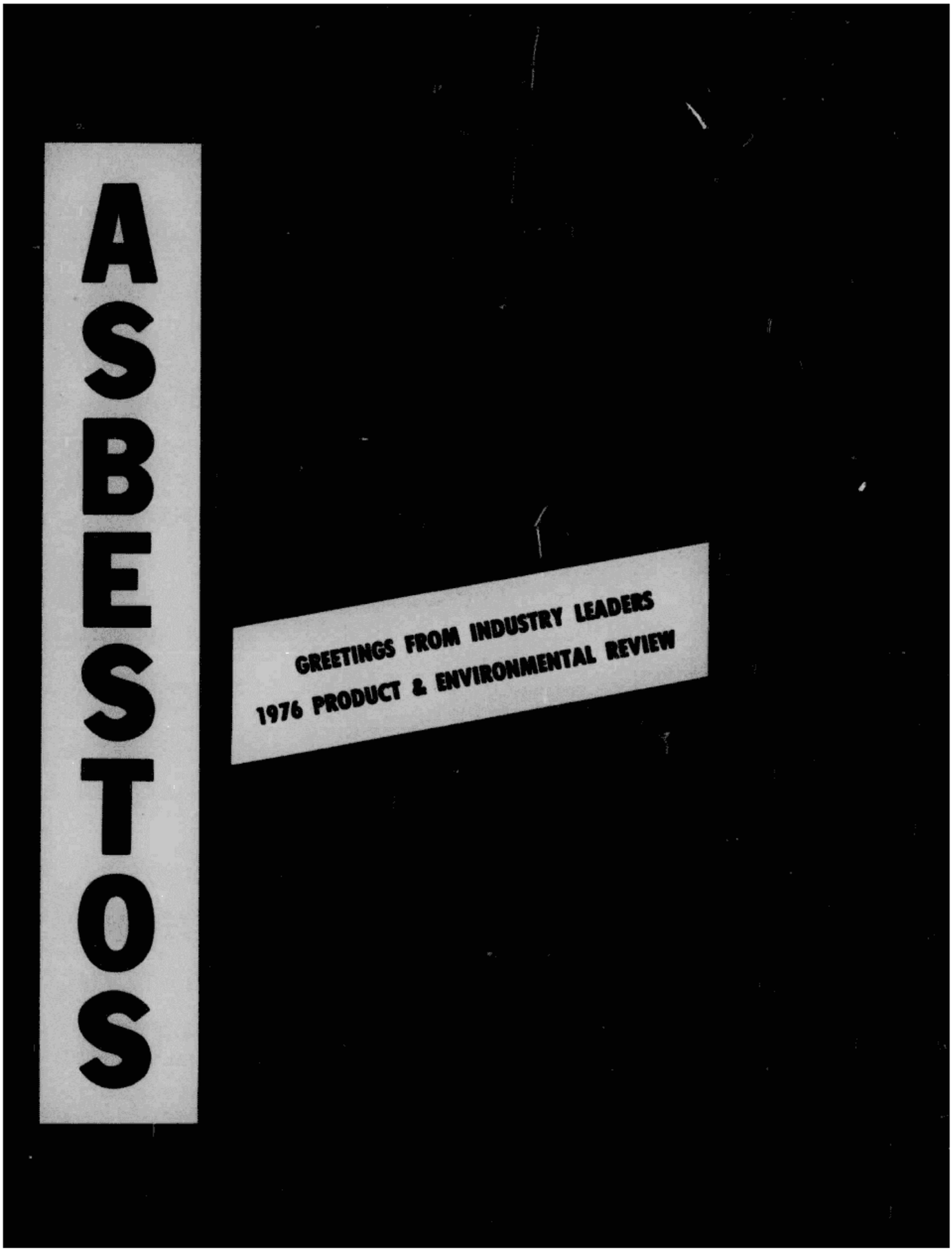
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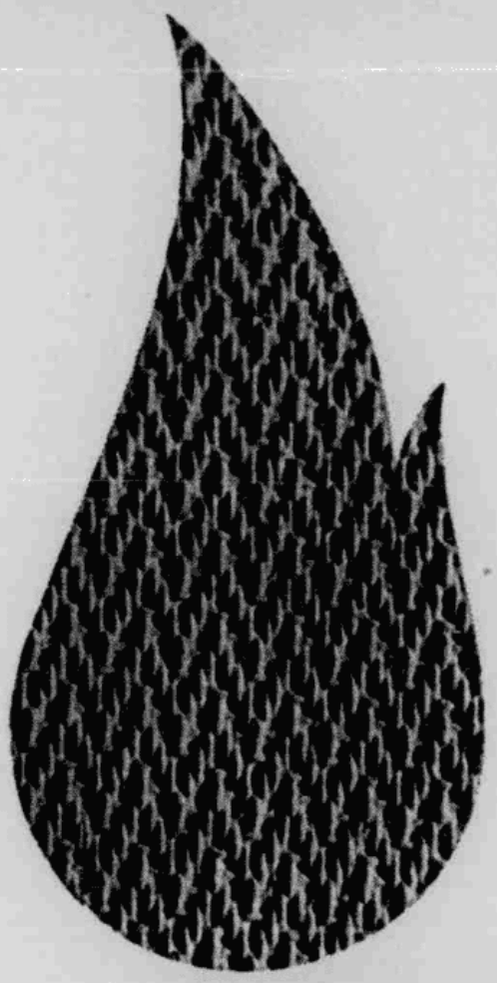
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