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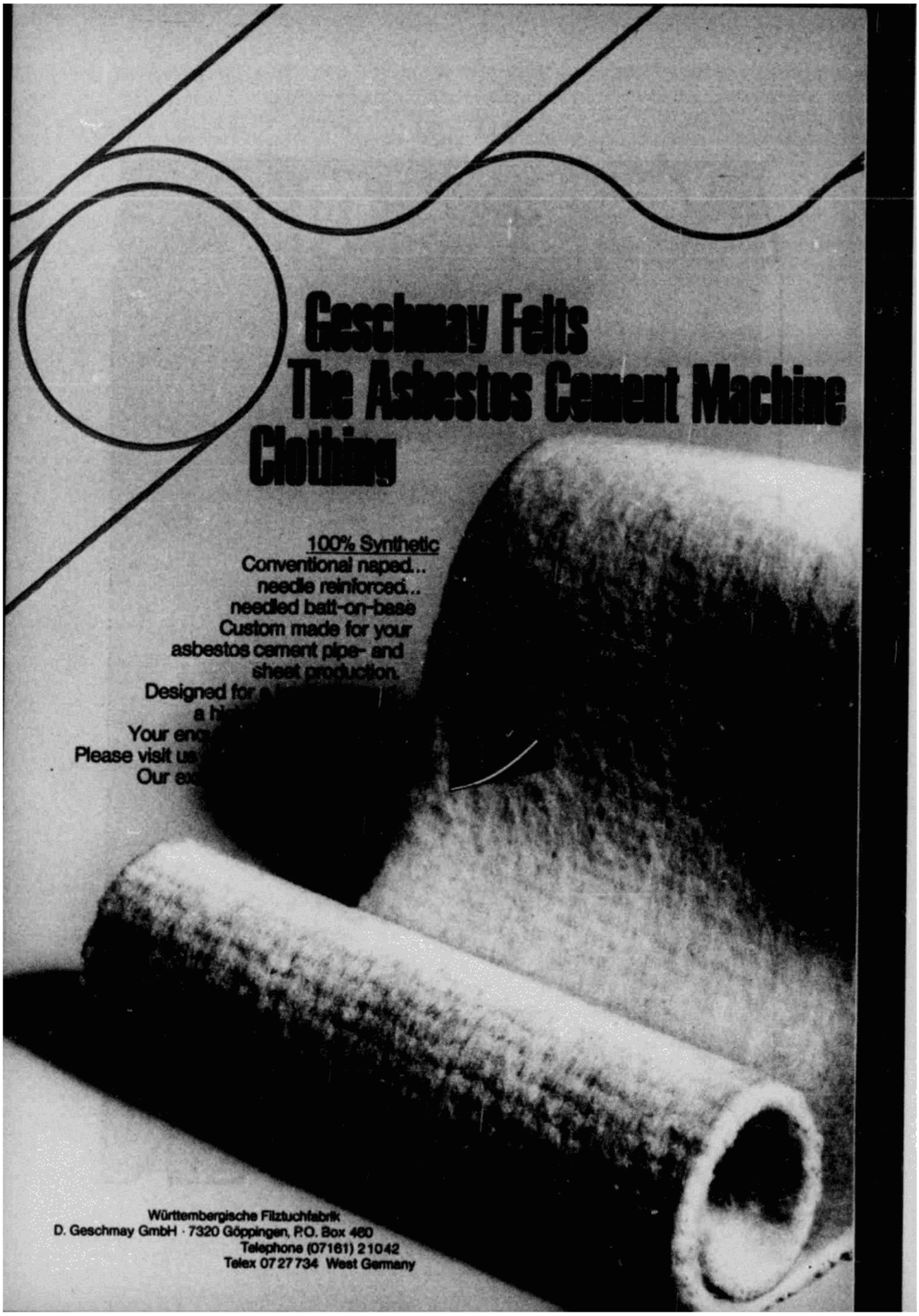
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GEFCO/BLUE ASBESTOS PRODUCER

(Based on material submitted by Mr. Peter Holz, free-lance journalist, and updated by Mr. C. H. Walters, General Manager, Base Minerals Division, General Mining and Finance Corporation Ltd., Johannesburg, Republic of South Africa)

Griqualand Exploration and Finance Co. Ltd. (Gefco) produces over 30% and markets nearly half of the total world output of Blue (Crocidolite) asbestos. In the Kuruman area of the Northwestern Cape Province the company operates ten mines, six sorting plants and four main milling complexes. Gefco is a public company managed by the Federale Mynbou/General Mining Group and employs approximately 4,300 people.

The Cape Crocidolite fiber occurs generally in smallish deposits located along a line which stretches practically uninterrupted from the Orange River in the Northern Cape Province to Botswana some 400 km to the north. The Gefco mines currently being exploited are situated in a central area of some 120 km in this belt. Most of the deposits lie under varying thicknesses of sand and those currently being worked are fairly close to the outcrops or areas that were originally easily identified from surface features.

In the interest of economy, prospecting work has been concentrated reasonably close to the earlier finds where the extraction plants have been erected. Fortunately it has been possible over the years to continue finding additional ore-bodies within fairly short distances of the existing plants and thus minimize transportation costs. Ample evidence exists of more remote deposits and, should increased reserves become necessary as required by demand, an intensified program of drilling should suffice to ensure adequate ore supplies. The general policy is to work on a "ten to twelve year ore reserve in sight." This is purely an arbitrary level based on demand patterns.

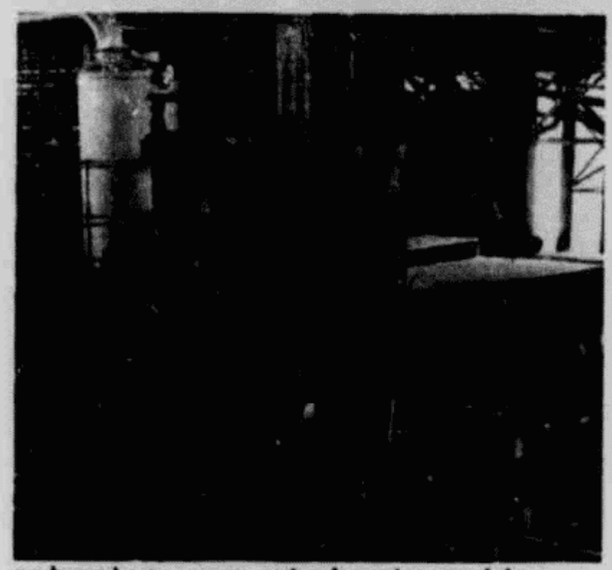
Gefco has concentrated in recent years on increasing production by improving rates of recovery from the raw ore. This results in production of additional shorter and more highly fiberized grades but it makes economic sense and singular success has been achieved in limiting fiber degradation. Thus, in addition to

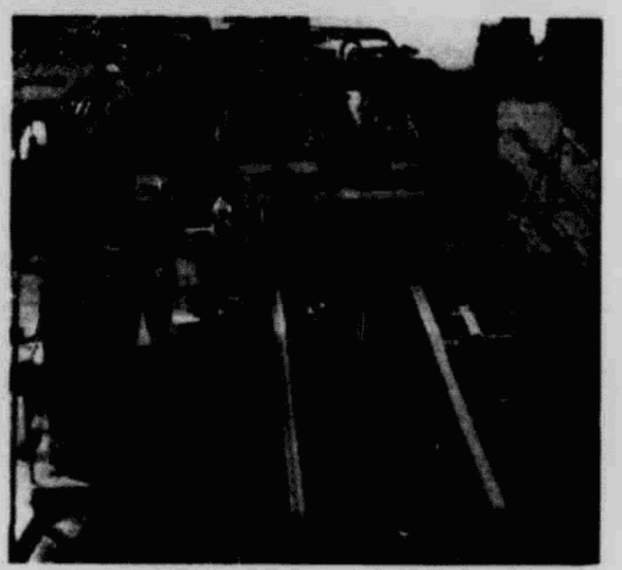
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ample reserves, the lives of current workings have been extended significantly.

HISTORY

The history of Gefco can be traced through the gradual development of a high level of exploration, marketing, mineral extraction and mining expertise over a period of more than 80 years which demanded perseverance in the face of, from time to time, very heavy odds.

The company, which was incorporated in 1895 in England under the name of African Salpetre Company, was formed to mine sodium nitrate in the northwest region of the Cape Province of South Africa. The venture almost aborted when the original report, which led to the formation of the company, was found to be based on "salted samples."

Fortunately the Chairman of the company, Mr. F. P. T. Struben, who was one of the gold pioneers of the Rand, paid a visit to the area in 1897 and saw several outcrops of Blue asbestos and tiger's eye in the area. On the strength of the mineralization he had seen, Mr. Struben persuaded the Board to retain an area of more than 200 square kilometers for investigation and a number of boreholes were drilled around 1908. Almost 20 years then passed, during which small operators produced very limited quantities of asbestos from tribute mining of the outcrops.

Following Major Sir E. H. M. Leggett's election to the Board in 1923 it was decided that the company itself should exploit the asbestos deposits. The necessary capital was obtained by selling most of the land and retaining only the two most promising farms.

The company was reorganized in 1927, when the name was changed to the more appropriate Griqualand Exploration and Finance Company and a production of 300 tons of asbestos was attained during 1928.

By 1936 production had grown to about 800 tons per annum and the then Mine Manager, Mr. Pascoe, persuaded the Board to purchase a third farm. By 1946, due to the increased demand for all types of asbestos, Mr. Pascoe was authorized to secure prospecting leases on several other farms. All product sales had, in the

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[illegible]

meantime, been channeled through the Central Asbestos Co., of London, England.

By the early 1960's Gefco had become firmly established worldwide as one of the leading producers of Blue asbestos, operating six mines and three mills. In 1962 the Federale Mynbou Group took over the controlling interest in Gefco and in 1970 the company became domiciled in South Africa. An additional two producing mines and one mill were added to the Gefco holdings in 1965 with the acquisition of the controlling interest in the Hans Merensky Trust Co.'s asbestos rights.

Gefco currently operates ten mines and five mills and has prospecting rights over a 145-thousand hectare area in the Northern Cape.

MINING PRACTICE AT GEFCO

Previous mention has been made of the fact that Gefco exploits the economical orebodies that occur in the middle 120 km of the ore belt. These deposits vary in size from 20,000 tons to 250,000 tons of fiber. At present ore is being mined at depths to 600 feet and plans are being formulated to exploit future deposits to depths of about 1,400 feet. The Crocidolite fiber occurs in up to four zones of local riebeckite enrichment in the sedimentary layered banded ironstones of the Griqualand Series of the Transvaal System. These fiber zones, which vary in thickness from stope widths of four feet up to fifty feet, dip westward at approximately 7°.

The usual method of winning the ore is by normal bord-and-pillar mining, using only roof-bolts and pillars to secure the hangingwall which, in the banded ironstone, is usually quite sufficient. Eight-foot-square pillars are spaced at thirty-foot centers. No timber is ever used underground in the Gefco mines. Depending on the thickness of the ore, either front-end loader haul dump units and scraper units or scraper units only are used to handle the broken ore into the ore-pass systems which are spaced on a 270-foot horizontal grid. These ore-passes feed down to the footwall drives and haulages, ten to fifty feet vertically below the fiber zone, from which the ore is transported by truck and locomotive to the inclined or vertical shaft system where it is hoisted to the surface in bottom-discharge skips.

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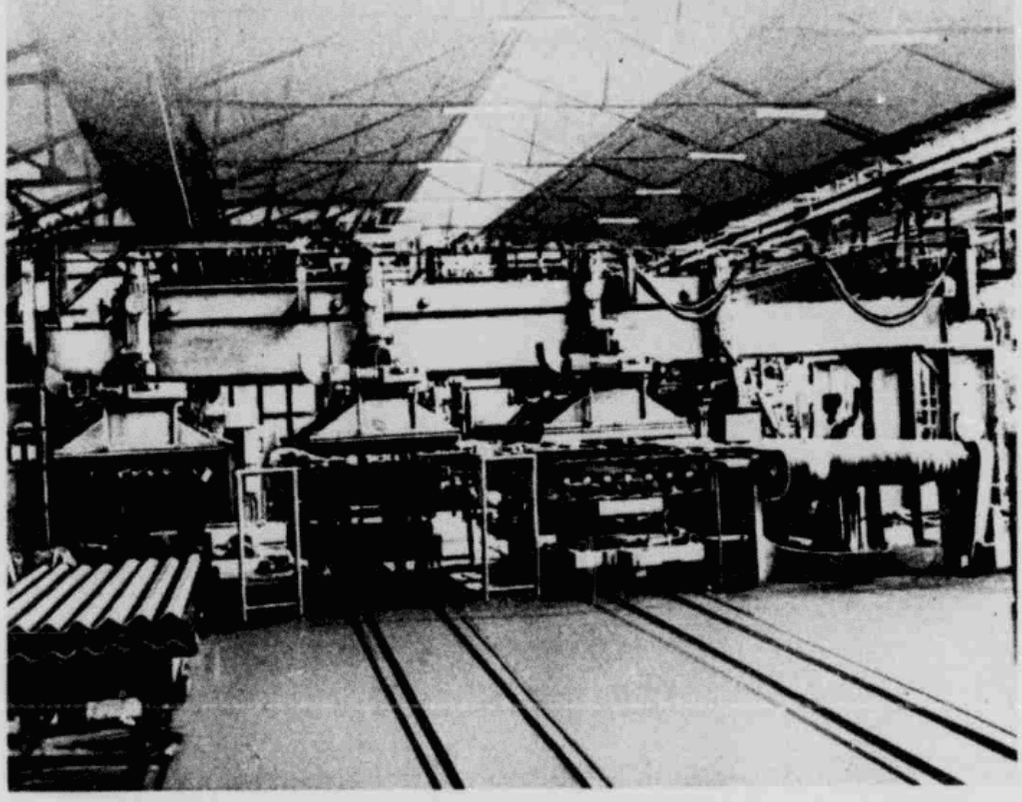
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Once on the surface the ore is first screened in a sorting plant. All the −1″ fraction is sent directly to the mill while the +1″ fraction is washed and reef-picked by hand. This reef-picked fraction is crushed down to 1½″ size and then waste-picked. All the ore thus upgraded is sent to the mill for further beneficiation while all barren ore is discarded.

Continuous depletion of the ore reserves requires continuous prospecting to find new orebodies. As the old mines near the end of their lives, new shafts are continually being sunk and brought into production.

MILLING

Milling operations are carried out at four major milling complexes strategically situated to serve the various mines. Milling is performed in the time-honored method of crushing the ore and aspiration of the fiber. After separately bagging the various basic grades, the fiber is transported to the main blending plant where grades are blended to standard specifications, packed to customer's requirements and then sent by truck to Hotazel, 35 kilometers away, for rail transportation to the coast.

Needless to say, operating ten mines and four milling complexes in a mining field stretching over an area of 120 kilometers involves transport and communication problems which are not only difficult, but extremely expensive to solve.

PERSONNEL

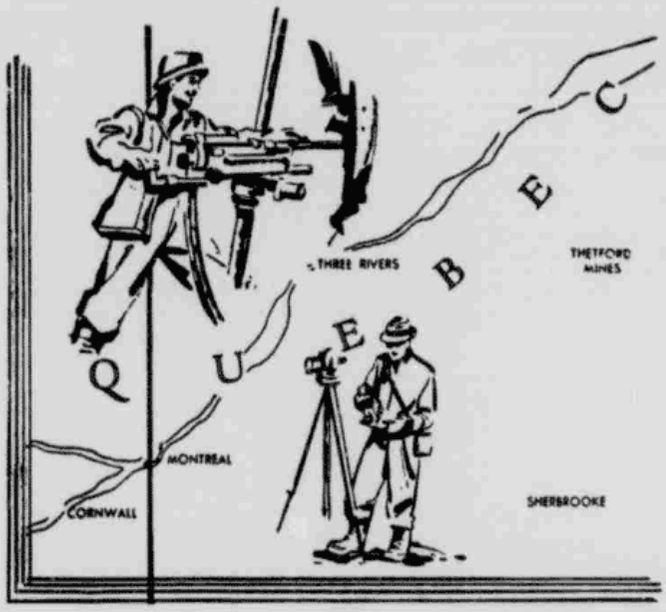
To man the above mines and mills, most operating personnel are housed at the milling complexes while the supervisory staff is housed in Kuruman. The company runs staff bus services to the various places of work. This requires keeping some 80 kilometers of unpaved road in good condition. The company's administrative and senior management staff coordinate all these operations from modern offices situated in Kuruman.

USES OF BLUE ASBESTOS

The asbestos cement industry, particularly the a/c pipe industry, is by far the largest consumer of Blue asbestos. The

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superior length and high tensile strength of Blue fiber make it ideally suited to the manufacture of high-pressure pipes, imparting both wet and dry strength to the product. In addition, its surface properties induce a highly desirable uniform dispersion in aqueous suspensions of cement and fiber, giving the excellent drainage characteristics for which Blue asbestos is known and consequently enabling higher production rates to be maintained in a/c plants.

Other properties of Blue asbestos such as its superior acid and alkali resistance and low absorption of water give rise to a multitude of applications in the chemical and related industries. It is used with various resins in the manufacture of battery boxes, heavy-duty clutch plates and special duty piping.

Extensive use is also made of Blue abestos in the manufacture of special packings, jointings and sealing compounds where the chemical resistance, heat resistance and degree of resilience of the mixes allows the formation of perfect seals under pressure.

In combination with cement, waterproof resins and other additives, it is used to produce caulking compounds. Long fiber Crocidolite with Chrysotile in the form of papers impregnated with special resins result in a tough product which is being used in missile and aircraft construction, fuel tanks and automobile bodies.

Despite the health problems associated with asbestos and increasing efforts to utilize substitute materials, there are many applications where the unique properties of Blue asbestos are essential to optimum product performance and where no acceptable substitute has been found. So long as this situation prevails there will be a continuing demand for Blue asbestos—and Gefco is prepared to meet this demand for many years to come.

THE COVER—Photographs of two facilities of the GEFCO Group: part of the Fiber Laboratory at the Riries Asbestos Mine (left); the Mill Control Panel at the Elcor Asbestos Mine (right).

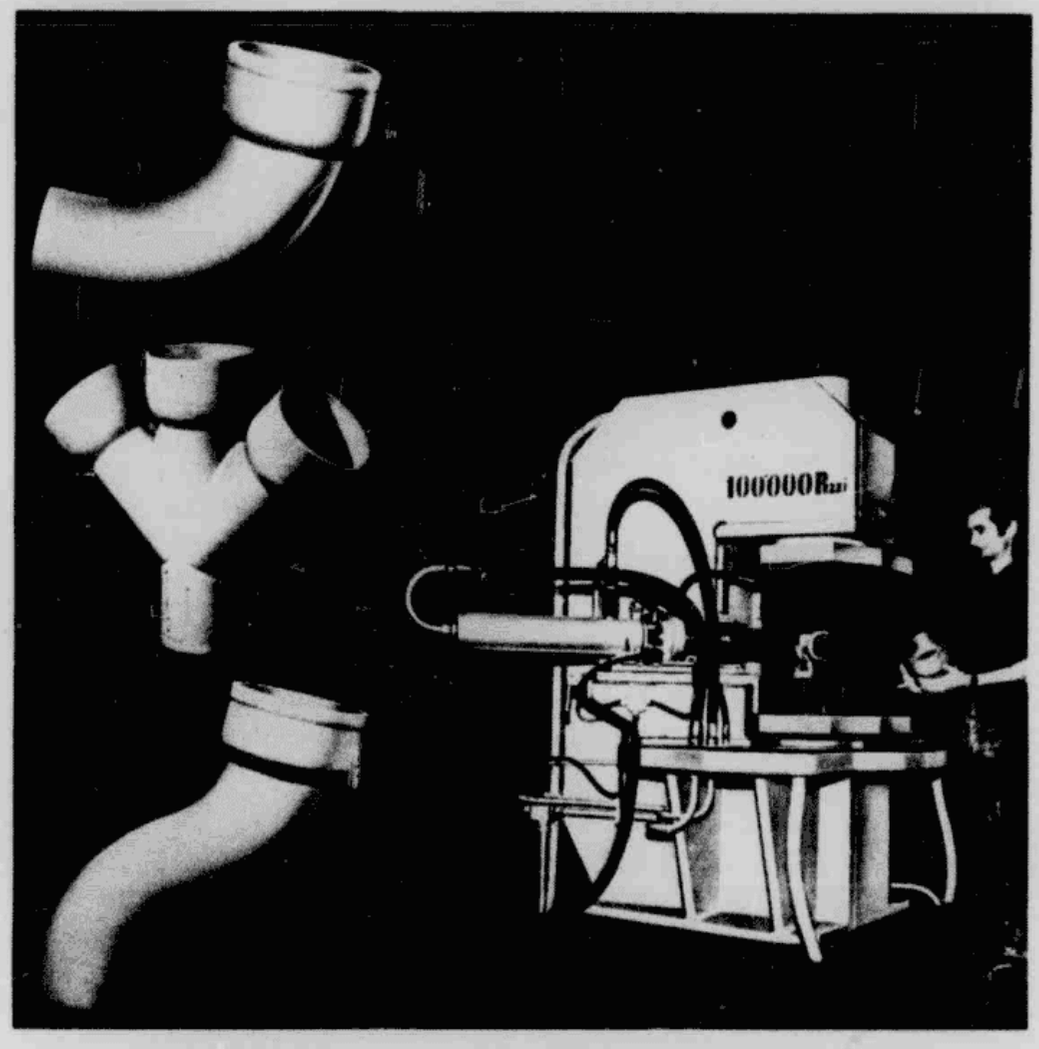
—WELCOME TO NEW ADVERTISER—

PENTAGON PLASTICS USA LTD., page 15

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CANADA, ENVIRONMENTALLY SPEAKING

TWO-FIBER FEDERAL LIMIT SET

Effective December 31, 1978, the Canadian Federal Government, under the Clean Air Act, has established new asbestos emission regulations which will permit no more than two fibers per cubic centimeter of air to be emitted to the surrounding air from crushing, drying and milling operations and from dry rock storage areas. The 2f/cc limitation conforms with regulations adopted last year by the Ontario Government and with those proposed for introduction next year in the Province of Quebec. It also matches the occupational limitation now in effect in the United States. The new Canadian regulations stipulate that monitoring operations in individual plants begin immediately in order to allow enforcement agencies to identify problem areas. Emission measurements are to be submitted semi-annually in the case of milling operations and yearly for crushing, drying and dry rock storage facilities.

QAMA PICKS BEST MONITORS

Following six months of trials and testing conducted by technicians of the five member companies of the Quebec Asbestos Mining Association, two continuous monitoring and internal checking time-weight measurement instruments have been proven to be highly superior in performance over other industrial units. . . . The APM Ambient Pollution Monitor, manufactured by GCA Corporation, is considered as the best available instrument for continuous monitoring. Designed to automatically measure the concentration of dust in a specific environment, its high sensitivity, prolonged autonomous operation and attenuating radiation operating principle allow it to perform most favorably. Other major features are ease of installation, distinct modular units and adaptability to underground mining. . . . Among the internal checking instruments studied, QAMA selected the Respirable Dust Monitor designated the RDM 101-4, also made by GCA, to become its standard internal checking instrument. The equipment operates according to a dust accumulation principle by impact on a polyester disc on which vaseline has been evenly spread. It is compact, light in weight and shock resistant. . . . The Tyndallometer, an instrument which measures respirable dust, was also recommended for certain applications at the mills. Its greatest advantage is that it can quickly produce results in such a way that it is possible to obtain particularly interesting data about the variations in dust levels, notwithstanding the absolute value.

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DECADEX FIRECHECK IS HELPING A LOT OF PEOPLE BREATHE MORE EASILY

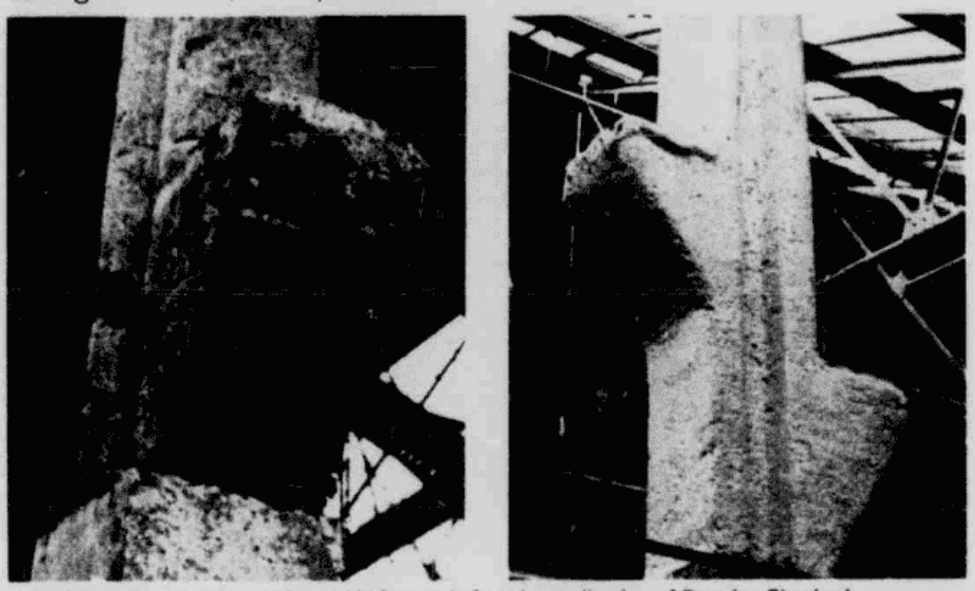
Decadex Firecheck has proved to be the most effective solution to the health hazard of asbestos. Firecheck, applied by brush or spray, cures to an impervious, flexible envelope, sealing in all loose fibres. The alternative–stripping–generates a high level of fibres, some of which will remain airborne indefinitely; causes major dislocation of operations; and incurs additional cost in replacement with an acceptable insulant which usually requires sealing with a suitable membrane.

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An asbestos insulated beam pictured before and after the application of Decadex Firecheck.

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ASBESTOS-BASED PRODUCTS

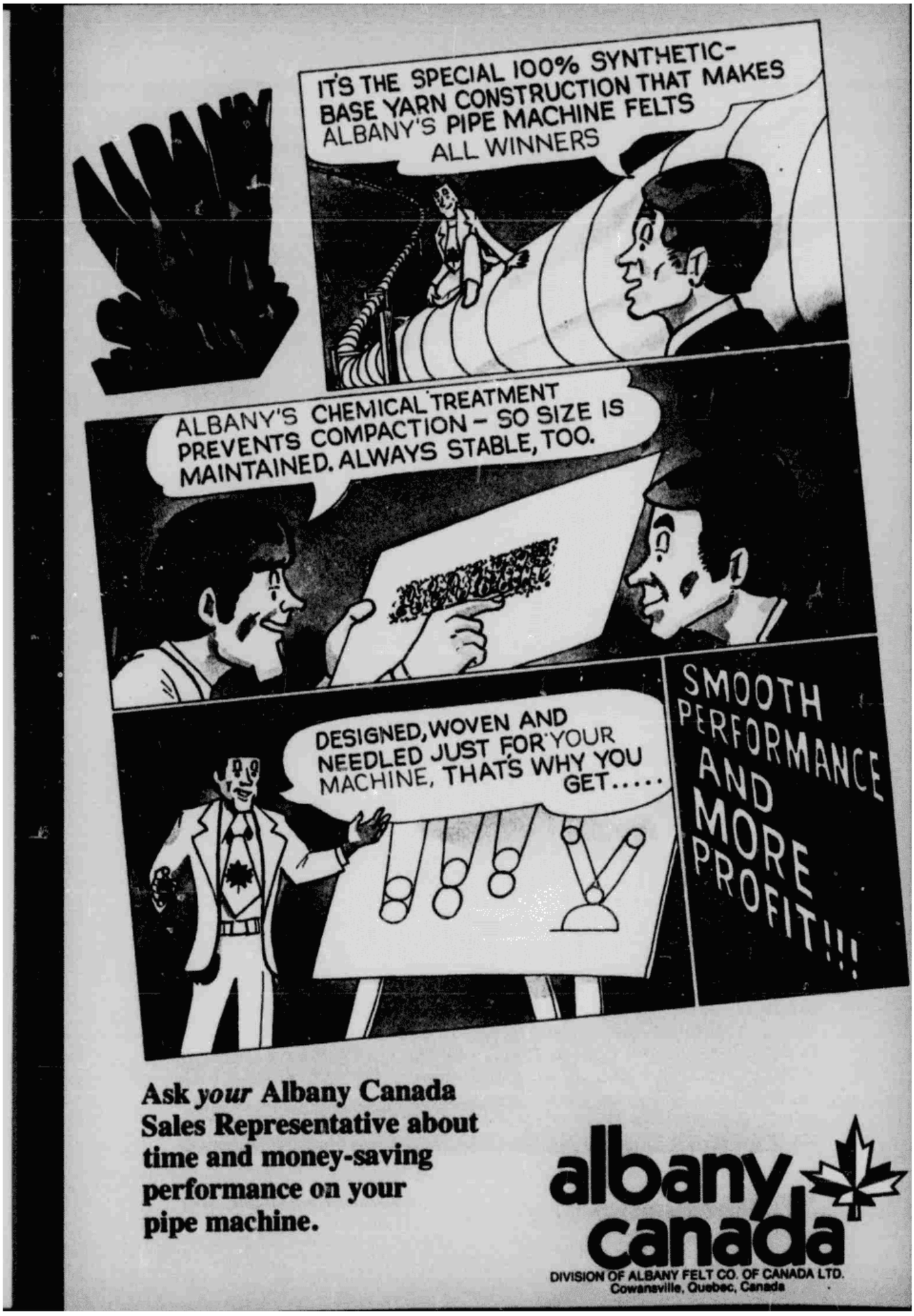
QUEBEC MANUFACTURING STUDY

In February 1977, the Quebec Asbestos Mining Association retained Sores, Inc., a consulting firm in Quebec, to study the economic feasibility of enlarging the asbestos products manufacturing industry in the Province of Quebec. Sores, in turn, retained Arthur D. Little, Inc., Cambridge, Massachusetts, to collaborate in the study. The project was prompted by the threat of the Quebec Government to nationalize all or part of the industry unless it increases its local upgrading of asbestos fiber from the current 3% to about 20%. The Provincial Government is currently doing its own study of the industry and is expected to make its policy known in the next few months.

The $225,000 QAMA study is divided into two phases. Phase I, now completed, basically consisted of a market and economic evaluation, with production and transportation cost analysis, for 14 pre-selected asbestos products in six selected world regions. Among the 14 products, the five selected as the most likely to present economic opportunities for further processing in Quebec and which, therefore, warrant further study, are molded friction materials, asbestos-cement pipes, asbestos-cement finished sheets, flooring felts and asbestos paper. The six areas included in the evaluation were Quebec, the rest of Canada, the United States, Western Europe, the Middle East and the Far East, especially Japan.

There are seven main producing countries of asbestos fiber, five of which belong to the western world. Canada is still considered the primary supplier of asbestos-cement, paper and short fibers, in the average to superior quality range. The USSR and countries in Eastern Europe represent the main consuming countries for asbestos, having consumed close to 2.2-million tons in 1974, the reference year of the study. Western Europe is the second largest market in the world, having consumed between 1.1-million and 1.2-million tons annually from 1970 to 1974. The United States is the main consuming nation in the world, with the possible exception of the Soviet Union. In 1974 the U.S. used about 845,000 tons of asbestos, the majority of which was imported from Canada. Japan is equally an important consumer and importer of asbestos fibers. Its consumption is usually slightly lower than half that of the U.S. In Canada, domestic consumption of asbestos fibers constitutes a small portion of the country's annual production. In 1974, out of a total Canadian production of 1.8-million tons of fibers, over 1.7-million tons were sold on the

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international market. It is expected that a number of countries in the Middle East and South America will increase their consumption of asbestos as local industries are developed. Consequently, these countries could become important importers of asbestos fibers in the future.

Phase II of the study should be submitted by the end of this year. Its objective is to analyze plans for the manufacture of asbestos products in Quebec which could be feasible and to determine the conditions of their economic viability.

SUPRADUR CORNERS MARKET

According to "Roofing Siding Insulation," mineral fiber roofing shingles are coming out of semi-retirement and are making a vigorous comeback across the country. In increasing numbers the owners and/or architects of residences, schools, churches, public buildings, restaurants, etc., are specifying mineral fiber roofings as an alternative to such materials as clay, wood, slate, tile and top-of-the-line asphalt shingles. The resurgence in popularity is being felt across the United States—in Southern California, New Orleans, Houston and the Northeast. Mineral fiber roofing is already on some 3,000 McDonald Restaurants and one of the largest shopping centers in Atlanta, Georgia, is specifying 750 squares of mineral fiber shingles. The Court House at Rage County, Tennessee, site of the famous Scopes Monkey trial, is being re-roofed with mineral fiber.

At present Supradur Manufacturing Company is the sole maker of mineral fiber roofing, manufacturing the product at its plant in Wind Gap, Pennsylvania. The real appeal of mineral fiber, says Kurt Schwarz, Sales Manager for Supradur, is durability, appearance and fire rating—virtually all mineral fiber roofings carry a Class "A" Underwriters Laboratories label.

In a press release issued recently by the company, Supradur commented that the destruction by raging fire of beautiful homes and lifetime possessions, and the upheaval in the lives of hundreds of displaced families, caused by the Santa Barbara, California, brush fire last summer, could have been contained or reduced. Many of the houses had cedar shake roofs, and dried-out shingles make the houses easy prey to showering cinders. It was reported in "The New York Times" that most of the houses with wood roofs were destroyed whereas many with clay or asbestos roofing survived the fire.

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MARKET CONDITIONS

GENERAL BUSINESS

Reports on the state of general business took a turn for the better in late September. The index of leading economic indicators showed an increase of 0.8% for August and the July drop of 0.2% was changed to an increase of 0.2% on the basis of revised data. Particularly encouraging was a strong increase in the total of business orders for new plants and equipment. While there are still no signs of a boom in the rate of capital expenditures, a definite upward trend seems to be developing which augurs well for continued economic growth over the near term.

Retail sales improved in August, contrary to many predictions. Auto production dropped due to model changeovers but sales of cars and other consumer durables have been strong. It appears that increasing numbers of consumers are becoming convinced that, with no end of inflation in sight, they will buy now to avoid almost certain future price increases. While this makes for good business now, there is a question as to how many of today's sales are being made at the expense of sales six months or a year hence.

Disquieting news comes from the steel industry where some major producers have announced the closing of certain facilities and permanent layoffs of substantial numbers of both mill and white collar workers. The cause is cited as "foreign competition" and some charges of "dumping" have been made against Japanese producers in particular.

The President's energy program has encountered rough sailing in the Senate. The main bones of contention are the pricing of natural gas and the proposed well-head tax on domestic crude oil, both of which are key components of the program. At this point there is no telling what the outcome will be. However, should the Senate eviscerate the President's program, a bitter House-Senate fight is sure to ensue and this will involve further delay in making a start toward the common goal–a solution to our energy problem. Regardless of the merits of the President's proposals, many of which remain highly questionable, he has made no real drive, since his first pronouncements on the subject, to convince the public of the severity of the problem or of the rightness of his positions. Under these conditions, it would not be surprising to see the Legislative bodies wind up in a hopeless impasse on this highly

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critical matter. It would cetainly be a travesty to adopt a national energy bill consisting of a tax credit to individuals for insulating their homes, laudable though such action may be.

Possibly the second most publicized program under consideration by the Administration is that of tax revision for business and individuals. We hesitate to use the words "reform" or "simplification" because neither of these has been achieved by previous "sweeping changes" in the tax code, most of which have served only to further complicate matters for the taxpayer. Preliminary indications are that some overall tax reductions are contemplated, including an end to the double taxation of dividends. Other proposals would lower tax rates on lower and middle incomes and reduce the maximum rate on very high incomes. The price of all this may well be further complications in details of the tax code.

ASBESTOS FIBER DEMAND

Demand has softened for all grades of asbestos fiber. Cassiar Asbestos Corporation Ltd. has reduced its production from a six-day week to a five-day week and several Quebec producers are studying the possibility of going to a five-day work week to reduce inventory build-up.

Group 7 sales to the resilient flooring industry are showing some improvement over the first two quarters of 1977.

Unofficial figures show Canadian shipments of asbestos through June 1977 to be 805,111 short tons vs. 824,770 tons for the same period in 1976.

Shipments are not anticipated to pick up until the world economies improve and customers begin to work down their inventories accumulated in 1976.

"ASBESTOS BULLETIN"

Keeps you abreast of all developments. Each issue contains about 100 abstracts relating to the manufacture of asbestos-based products. Special chapters on asbestos mining, asbestos-cement, friction and asbestos-reinforced plastics. Annual subscription US $39.00; back copies half price. Order from:

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PRODUCTION—IMPORTS—EXPORTS

ASBESTOS IN 1977—A PROFILE

United States—The U.S. may no longer be the world's largest consumer of asbestos since the USSR probably consumes as much or more of the mineral. The domestic construction industry presently uses the majority of asbestos fibers in products such as asbestos-cement pipes and sheets, roofing products, flooring materials, paints and caulking. This segment of the industry should remain the largest U.S. user of asbestos. The eleven major U.S. uses for asbestos in 1976 were: roofing products, 34%; asbestos-cement pipes, 19%; flooring materials, 15%; friction products, 8%; paper, 4%; asbestos-cement sheets, 3%; plastics, 2%; packings and gaskets, 2%; coatings and compounds, 2%; insulation, 1%; textiles, 1%. U.S. mines produced 17% of the nation's consumption needs in 1976. Canada is the leading supplier of U.S. asbestos imports (about 95%) with the Republic of South Africa ranking second. South Africa supplies all of the U.S. demand for Crocidolite and Amosite.

Leading Supplier—In spite of the rise of production in the USSR, Canada could remain the world's leading producer of asbestos as activity in exploration, evaluation and development of asbestos deposits remains high. Most Soviet asbestos is used domestically or in other countries which have centrally controlled economies. If one were to remove from consideration the asbestos produced in the People's Republic of China (nearly all is used domestically) and that produced in the USSR, a truer picture of Canadian prominence emerges. In the rest of the world Canada had 67% of the market in 1973; the Republic of South Africa, 12%; Italy, 6%; and the United States, 5%.

World Production—Total world production in 1975 was an estimated 4.5-million tons of all grades and varieties. Canada's share, because of a prolonged strike, was just 25%; the USSR produced an estimated 46%; the Republic of South Africa, 9%; the People's Republic of China, 4%; Italy, 4%; and the United States, 2%. Recent published data on world production do not credit Russian production with the lower grades that are not used as fibers.

Search for Deposits—Exploration and development are apparently increasing throughout the world because of the growing demand for asbestos fiber and the lack of production capacity to meet that demand. At least one major company is still actively exploring possible sites in the contiguous 48 States. Recently announced asbestos showings in the Eagle Quadrangle in Alaska seem to be subeconomic. Exploration in Canada remains quite active.

Alternative Materials—Substitution is possible in many end uses, particularly in asbestos-cement products where a variety of alternative ceramic and new plastic materials are available and in paints and caulking where asbestos has a wide range of substitutes. There are several synthetic inorganic fibers available commercially and more are becoming available each year. Most efforts seem to be aimed at thermal insulation,

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which constitutes only a small portion of the asbestos market. The most desirable characteristic of asbestos, its tensile strength, compares very favorably with such other fibers as glass, aluminum and steel. Accelerated research is necessary to find substitute fibers which will have at least some of the attractive asbestos characteristics of strength, chemical inertness, heat resistance and economy.

The Future—The rate of growth in the use of asbestos continues higher in the developing countries. Asbestos reserves could well be in danger of depletion by the year 2000, at the forecast rates of consumption, if the "find" rate of new sources does not increase. A total of 1.15-million tons per year of new capacity is expected to become available in world markets during 1973-80. This includes 300,000 tons of Soviet exports and production from mines in Australia, Colombia, Greece, New Zealand, Mexico and Brazil. . . . Domestic demand for asbestos is expected to increase slowly to between 1,026,000 and 2-million short tons in the year 2000. The low of the range indicates an average annual growth rate of 1.0%; the high indicates 3.8%. About two-thirds of the asbestos demand in the U.S. during 1975 was consumed by the construction industry and this ratio is expected to persist throughout the forecast period. The U.S. probable demand for asbestos in 2000 is expected to be about 1.3 times that of the 20-year trend point for 1975. The rest-of-the-world demand should show a greater growth since the developing countries have a much greater new construction potential. Demand is likely to be limited by capacity to produce. This growth rate is estimated at 4.5%. If problems prevent an increase in general living standards in the rest of the world, the consumption of asbestos would represent an annual average growth rate estimated at 3.4%. The low of the range would be 8.6-million tons under these conditions. Demand for asbestos for use in the construction industry was projected to the year 2000 at an average annual growth rate of 0.3 to 0.5% on the basis of total new construction modified by the 20-year trend. [U.S. Bureau of Mines, Mineral Commodity Profile, MCP-6, Asbestos—1977, by Robert A. Clifton]

AUSTRALIAN IMPORTS & EXPORTS

For the *Year Ended June 1977*, Australia *imported* 70,342 metric tons of asbestos valued at A$29,414,733, ahead 25% in tonnage and 65% in value over the prior year and up 38% in quantity and 163% in value over the year ended June 1975. The breakdown by variety of asbestos for the latest year is (comparative year-earlier figures are enclosed in parentheses): Chrysotile, 38,867 tons (up 7,522 tons), $16,596,622; Amosite, 15,567 tons (down 110 tons), $6,775,678; Other, 15,908 tons (up 6,684 tons), $6,042,433. . . . *Exports* of all types of asbestos for the Year to June 1977 totaled 28,011 metric tons valued at $10,384,430, a decrease from the prior year of 27% in quantity and 12% in value but an increase over the year to June 1975 of 76% in tonnage and 178.5% in value. [Commonwealth Bureau of Census and Statistics, Canberra]

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CANADIAN FIBER SHIPMENTS

Primary Canadian Producers' shipments of asbestos (including tonnage for own use) amounted to 128,624 short tons in *July 1977* compared with 116,083 tons for the seventh month of 1976. The cumulative total for *January-July 1977* was 934,730 tons: 751,765 tons from Quebec plants and 182,965 tons from plants in Newfoundland, Ontario, British Columbia and the Yukon. The total for *January-July 1976* was 944,243 tons: 768,090 tons from plants in Quebec and 176,153 tons from plants in the other four Provinces. [Statistics Canada, Ottawa]

JAPANESE ASBESTOS PRODUCTION

Production of Chrysotile asbestos in Japan for the *Year 1975* amounted to 4,612 metric tons compared with 5,130 tons in 1974, 8,255 tons in 1973, 9,639 tons in 1972, 8,830 tons in 1971 and 8,130 tons in 1970. Amosite has not been produced in Japan since 1972 when an output of 4,788 tons was recorded against 266 tons in 1971 and 5,014 tons in 1970. [Industrial Minerals]

JAPAN'S ASBESTOS PRODUCTS OUTPUT

According to statistical data received on the asbestos products manufacturing industry in Japan, 74,465 metric tons of asbestos-containing materials were *produced in the Year 1975* compared with 95,719 tons in 1973, 83,517 tons in 1972, 83,733 tons in 1971 and 83,940 tons in 1970. The products by order of importance, were specialty brake linings, sheets and millboard, textiles, asbestos-cement products, woven brake linings and rubber and graphite compounds. . . . *Exports* reached 3,097 metric tons in 1975 against 3,247 tons in 1974, 3,477 tons in 1973, 3,663 tons in 1972, 3,471 tons in 1971 and 3,358 tons in 1970. [Nippon Asbestos Co. Ltd., Tokyo]

SOUTH AFRICAN OUTPUT & EXPORTS

Production of asbestos for the *First Quarter of 1977* totaled 93,618 metric tons, 16% over the first quarter of 1976 and 9% ahead of the first three months of 1975. The breakdown for the latest period is: 47,238 tons of Cape Blue (up 10,830 tons from the matching quarter a year earlier), 28,161 tons of Chrysotile (up 2,809 tons), 17,669 tons of Amosite (down 654 tons), 550 tons of Anthophyllite (up 220 tons). . . . *Exports* for the 1977 first quarter were valued at R31,032,563, up 63% from the same period in 1976 and 79% from the matching 1975 quarter. By variety of asbestos, the values for the latest quarterly period are: R19,322,362 for Cape Blue (up R8.3-million), R5,921,003 for Chrysotile (up R2.7-million), R5,765,104 for Amosite (up R1-million), R24,094 for Anthophyllite (down R16,156). [Department of Mines, Braamfontein]

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IMPORTS INTO THE UNITED STATES

From: U.S. Bureau of the Census

JUNE 1977

UNMANUFACTURED ASBESTOS:			
Amosite, South Africa	s.tons	40	$ 21,180
Crocidolite (Blue), South Africa	s.tons	825	485,670
Chrysotile Crudes, South Africa	s.tons	231	132,797
Chrysotile, Spinning Fibers, Canada	s.tons	439	445,611
South Africa	s.tons	57	38,194
USSR	s.tons	1,105	222,263
Chrysotile, Other, Canada	s.tons	55,423	12,117,817
Other Crudes & Fibers, Canada	s.tons	1,302	167,330
Mexico	s.tons	220	133,000
South Africa	s.tons	60	7,125
		59,702	$13,770,987
MANUFACTURED ASBESTOS PRODUCTS:			
Asbestos yarn, cloth, tape, etc.	Lb	1,204,621	$ 1,792,868
A-C pipes, tubes & fittings	Lb	1,517,760	153,471
Other asbestos-cement articles	Lb	1,454,827	301,343
Other asbestos articles		..	362,877
			$ 2,610,559

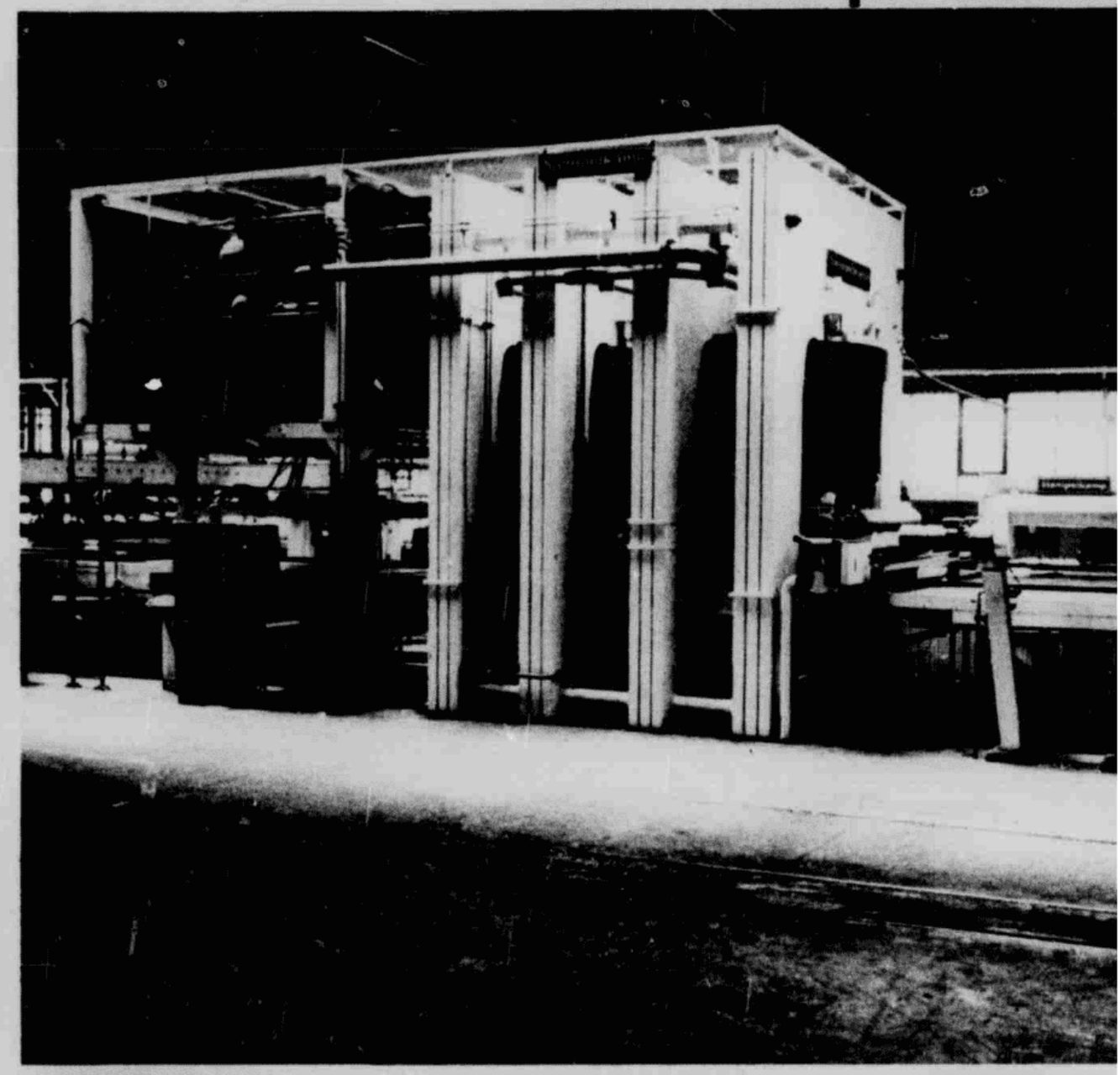
JANUARY-JUNE 1977

UNMANUFACTURED ASBESTOS:			
Amosite, South Africa	s.tons	172	$ 88,274
Crocidolite (Blue), South Africa	s.tons	6,985	2,768,744
Chrysotile Crudes, Canada	s.tons	85	56,324
Rhodesia	s.tons	2,451	2,368,050
South Africa	s.tons	1,926	1,114,476
Chrysotile, Spinning Fibers, Canada	s.tons	3,191	3,051,827
South Africa	s.tons	57	38,194
USSR	s.tons	1,105	222,263
Chrysotile, Other, Canada	s.tons	276,659	62,737,208
Mexico	s.tons	12	2,702
South Africa	s.tons	20	13,885
USSR	s.tons	117	34,828
Other Crudes & Fibers, Canada	s.tons	5,947	1,057,036
Mexico	s.tons	220	133,000
South Africa	s.tons	1,606	777,943
Sweden	s.tons	1	495
USSR	s.tons	3,738	650,633
		304,292	$75,115,882
MANUFACTURED ASBESTOS PRODUCTS:			
Asbestos yarn, cloth, tape, etc.	Lb	5,598,091	$ 7,866,167
A-C pipes, tubes & fittings	Lb	7,797,922	793,052
Other asbestos-cement articles	Lb	18,274,038	3,345,429
Other asbestos articles		..	3,167,686
			$15,172,334

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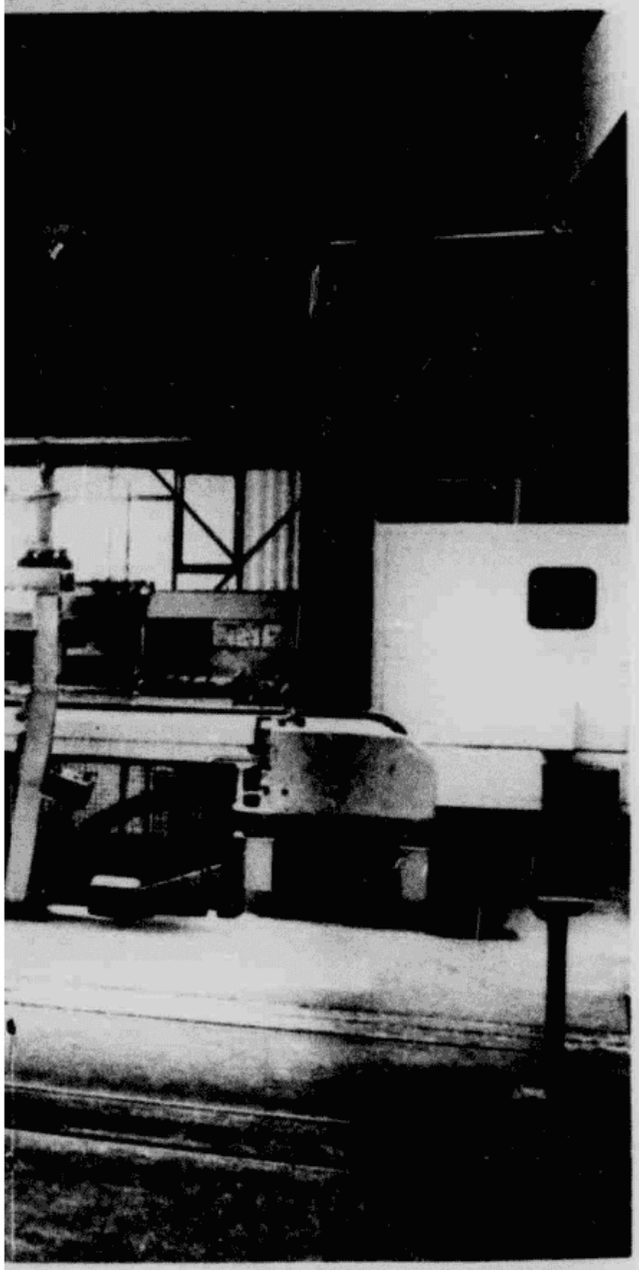
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ic production plants for the of:

flat and corrugated asbestos-cement sheets
asbestos-cement pipes

ic press lines ction of:



highly compressed asbestos-cement sheets

Fully automatic press lines for: laminating of flat asbestos-cement sheets

Fully automatic press lines for the production of building elements

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hydraulic pipe testing presses

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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
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EXPORTS FROM THE UNITED STATES

From: U.S. Bureau of the Census

JUNE 1977

UNMANUFACTURED ASBESTOS:			
Fibers not further processed than beaten, washed or graded to length	s.tons	1,616	$ 706,153
Waste and refuse	s.tons	1,539	360,314
		3,155	1,066,467
MANUFACTURED ASBESTOS PRODUCTS:			
A-C shingles & clapboard	Lb	789,676	$ 125,847
Other a-c fiber-cement articles	Lb	1,174,990	204,123
Gaskets	Lb	35,267	181,848
Packing	Lb	463,496	1,106,846
Heat or sound insulation		..	646,456
Textiles & yarns	Lb	867,794	672,694
Protective clothing		..	66,291
Mfrs. other than friction materials		..	1,864,209
Clutch facings & linings for auto. use	No	66,783	179,272
Other clutch facings & linings	No	17,805	7,022
Brake linings for automotive use	Lb	695,870	692,783
Other brake linings	Lb	201,348	250,556
			$ 5,997,947

JANUARY-JUNE 1977

UNMANUFACTURED ASBESTOS:			
Fibers not further processed than beaten, washed or graded to length	s.tons	8,310	$ 3,639,460
Waste and refuse	s.tons	10,455	2,252,335
		18,765	$ 5,891,795
MANUFACTURED ASBESTOS PRODUCTS:			
A-C shingles & clapboard	Lb	4,142,470	$ 698,044
Other a-c fiber-cement articles	Lb	23,830,371	5,717,871
Gaskets	Lb	549,024	1,141,700
Packing	Lb	2,711,544	6,206,537
Heat or sound insulation		..	2,201,926
Textiles & yarns	Lb	11,420,634	6,399,088
Protective clothing		..	693,607
Mfrs. other than friction materials		..	9,099,575
Clutch facings & linings for auto. use	No	243,306	553,957
Other clutch facings & linings	No	191,563	202,752
Brake linings for automotive use	Lb	5,629,537	5,196,354
Other brake linings	Lb	1,035,693	1,419,168
			$39,530,579

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EXPORTS FROM CANADA

From: Statistics Canada

JUNE 1977
Short Tons

UNMANUFACTURED ASBESTOS:	Crude	Milled Gp 3	Milled Gp 4&5	Shorts Gp 6-9
Western Europe	..	698	25,857	13,121
Eastern Europe	..	130	3,335	865
Middle East	..	..	4,138	486
Africa	..	..	1,700	350
Asia	..	152	6,284	9,301
Oceania	..	..	3,135	504
So. & Cen. America & Antilles	..	33	9,971	3,048
United States	..	782	10,179	40,268
	..	1,795	64,599	67,943

The total amount of unmanufactured asbestos exported in *June 1977* was 134,337 short tons, valued at $47,249,000.

MANUFACTURED ASBESTOS PRODUCTS:

Asbestos cloth, dryer felts & sheets	$ 114,000
Asbestos brake linings & facings	369,000
Asbestos-Cement building materials	1,654,000
Other basic asbestos products	473,000
	$ 2,610,000

JANUARY-JUNE 1977

UNMANUFACTURED ASBESTOS:	Crude	Milled Gp 3	Milled Gp 4&5	Shorts Gp-6-9
Western Europe	..	5,948	147,872	91,021
Eastern Europe	..	1,327	17,737	2,882
Middle East	..	198	13,670	1,845
Africa	..	..	7,676	3,450
Asia	..	1,454	53,172	73,549
Oceania	..	5	31,614	5,171
So. & Cen. America & Antilles	..	610	48,397	17,170
United States	..	4,180	66,673	214,020
	..	13,722	386,811	409,108

The total amount of unmanufactured asbestos exported in *January-June 1977* was 809,641 short tons, valued at $277,197,000.

MANUFACTURED ASBESTOS PRODUCTS:

Asbestos cloth, dryer felts & sheets	$ 577,000
Asbestos brake linings & facings	1,510,000
Asbestos-Cement building materials	6,166,000
Other basic asbestos products	2,521,000
	$10,774,000

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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 July 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	530.00— 700.00
No. 5—Paper Fiber	315.00— 400.00
No. 6—Paper and Shingle Fiber	245.00— 275.00
No. 7—Shorts	90.00— 200.00

CASSIAR — *Per ton of 2000 Lbs., F.O.B. North Vancouver, B.C.*
As of July 1, 1977 — *Canadian Dollars*

Cassiar Mine	
C-1 —No. 1 Crude	$3621.00
AAA —Nonferrous Spinning Fiber/Canadian Group 3	2000.00
AA —Nonferrous Spinning Fiber/Canadian Group 3	1600.00
A —Nonferrous Spinning Fiber/Canadian Group 3	1050.00
AC —Nonferrous Spinning Fiber/Canadian Group 3	913.00
AK —Asbestos Cement Fiber/Canadian Group 4	770.00
AS —Asbestos Cement Fiber/Canadian Group 4	670.00
AX —Asbestos Cement Fiber/Canadian Group 4	580.00
AY —Asbestos Cement Fiber/Canadian Group 5	420.00
AZ —Asbestos Cement Fiber/Canadian Group 6	320.00
Clinton Mine	
CP —Asbestos Cement Fiber/Canadian Group 4	730.00
CT —Asbestos Cement Fiber/Canadian Group 4	650.00
CY —Asbestos Cement Fiber/Canadian Group 5	420.00
CZ —Asbestos Cement Fiber/Canadian Group 6	320.00

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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INTERNATIONAL MINING SCENE

WOODSREEF SALES UP

Woodsreef Mines Ltd., Barraba, New South Wales, reported sales revenue of $14.2-million for the nine months to July 31, 1977, against $13.4-million for the like period a year earlier. Net trading profit was $778,000 compared with $1-million. At July 31 the company had unsold fiber stocks on hand with a book value of $376,467. As a contingency the fiber is being carried at $122,000 less than the commercial value of the fiber. A build-up in stocks of unsold fiber is anticipated in the remainder of 1977. Any unsold fiber will be offered together with the forecast production for 1978 during the traditional marketing period in October and November 1977. . . . The second stage diamond drilling program at Baryulgil was completed in March. Total meterage drilled was 5,038 meters in 17 holes from which were selected 83 samples representing 1,337 meters of Chrysotile-fiber-bearing serpentinite. The result of 72 assays from Stages 1 and 2 were reported previously by Woodsreef. Results from the remaining samples show a fiber content ranging from .30% to 6.94% with an average of 2.10%. The dollar value per ton of rock runs from A$1.05 to $35.44, averaging out to $8.06. A new exploration program at Baryulgil consisting of percussion drilling and surface trenching was to commence in September.

PALLETIZER AT LAKE ASBESTOS

Following automation of its bagging section, begun in 1973, Lake Asbestos of Quebec Ltd., Black Lake, is now installing a new automatic bag palletizing system which will reduce exposure to dust and physical effort of employees and will considerably increase palletizing efficiency. The $600,000 project includes the installation of ten bag accumulation and recirculation conveyor circuits, eight bag depressors and 66 pieces of related equipment. Following implementation of the new system, maximum capacity will increase from 750 to 900 tons per day. Stacking patterns will be selected by an operator at the palletizing central control room and will be programmed on a computer for each conveyor. Quality control will be done visually and damaged bags will be mechanically rejected. Lake Asbestos is a wholly-owned subsidiary of Asarco Inc. [QAMA Bulletin]

BELL ASBESTOS INNOVATES

Automation of waste disposal and transportation at Bell Asbestos Mines Ltd., Thetford Mines, Quebec, has led to a substantial decrease in dust emission at loading and dumping points. Previously transported to the tailings by rail car, the waste is now hauled by huge 35-ton tractor trailers over a new $1-million road. The trucks operate around-the-clock, carrying 3,000 tons of waste each day. The truck cabs are equipped with air-

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conditioning, pressurization and filtration systems. Loading and dumping operations are controlled by radio and are entirely automated, allowing drivers to complete their work without having to leave their cabs. [QAMA Bulletin]

GRECIAN INVESTMENT

The public sector of Greece is expected to invest about $600-million in projects which may be started next year, including the exploitation of asbestos reserves and development of processing facilities at Kozani. The Hellenic Industrial Development Bank is to establish a joint stock company to handle the project. A 100,000-metric-tons-per-year production capacity is envisaged which could earn for Greece an annual estimated $30-million in foreign exchange over a 20-year period. A $60-million investment in the asbestos undertaking has been allocated. It was emphasized that State investment was only being made to encourage more public interest and it was hoped to relinquish shares to local investors in due course. [Mining Journal]

VERMONT RESERVES

Vermont Asbestos Group, Inc., has proven reserves of 3.9-million tons of open-pit ore and an additional probable reserve of 13.9-million tons of open-pit ore and 34-million tons available by underground mining, according to geological reports submitted at the company's third annual stockholders meeting. However, VAG will face up to $3-million in costs for dust control modifications when the U.S. Mining Enforcement and Safety Administration tightens its asbestos fiber air standards from five to two fibers per cubic centimeter of air. A spokesman for VAG advised MESA that a 2f/cc limitation is not immediately achievable for a variety of reasons.

HIGHER OUTPUT FROM CYPRUS

The Cyprus Asbestos Mines Ltd. has estimated its asbestos fiber production will reach 43,000 tons in 1977 compared with 38,050 tons in 1976 and 34,835 tons in 1975. Expansion and modernization of the mill is still underway as is the company's program of improving environmental conditions via installation of additional filters, enclosed conveyors, etc. An x-ray monitoring of all employees is also being carried out on a regular basis.

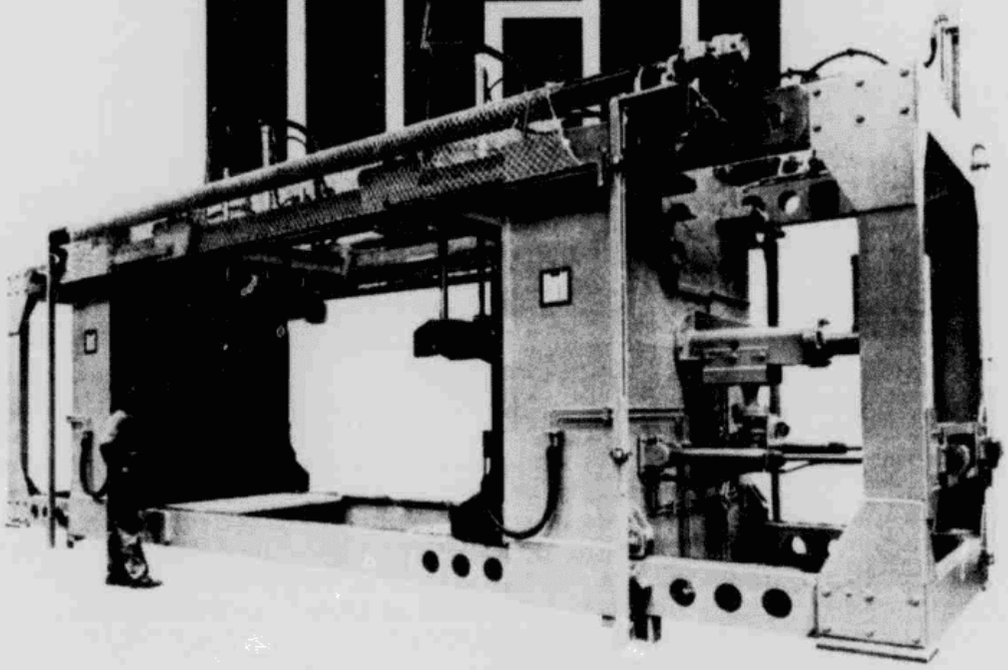
SUDANESE STUDY

The Government of Sudan, Southern Region, has retained a team of four British geologists to undertake mineral surveys at a 30,000-square-kilometer-area in Southern Sudan. Under the £370,000 contract, the group will search for a variety of metallic and industrial minerals including asbestos, limestone, clay and talc. The results of the study may form the basis for local industrial development. [Industrial Minerals]

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Asbestos Cement Machines

BELL



▲ Press for water pressure test,
Pipe inside diameter
150 to 1300 mm

Bell Engineering Works Ltd., a member of the Sulzer Group, designs, manufactures, assembles and puts into operation complete asbestos cement sheet and pipe production lines as well as individual machines, such as:

Slurry preparation equipment
Sheet machines
Stamping machines for cutting slates
Presses for high density sheets
Stackers and Corrugators
Stack transport systems
Pipe machines
Pipe curing and rounding systems
Pipe finishing machines
Watering vacuum pumps
Asbestos board machines

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ANNUAL REPORTS—1977

JAMES HARDIE ASBESTOS LTD.

The year 1977 marks the *60th Anniversary* of James Hardie Asbestos Ltd.'s first production of asbestos-cement sheets. Group sales for the year ended March 31, 1977, increased 16% to $166.4-million and operating profit after tax but before extraordinary items rose 12.1% to $16.5-million. . . . Australia is undergoing major structural changes, especially in its secondary industries. High labor costs and under-use of capacity are pricing Australian products above those of comparable imported items. Nevertheless there are encouraging signs, says Hardie Asbestos . . . . on June 29, 1977, the Australian Trade Practices Commission approved the acquisition by James Hardie & Coy. Pty. Ltd. of the asbestos-cement interests of Wunderlich Ltd., a wholly-owned subsidiary of CSR Ltd. The $19-million transaction covers plant, equipment, stock and some land. Last year Wunderlich contributed $629,000 to the CSR Group's net profit.

James Hardie & Coy. Pty. Ltd. reported another good year. Municipal construction for the most part was limited to the completion of projects commenced in earlier years. In housing the year was largely one of growth in renovations and handyman activity. There has been good growth in corrugated a/c for fencing, in addition to the traditional roofing market, and a/c shingles are increasing in popularity. Compressed a/c is gaining acceptance for decking and for bathroom and laundry flooring. In the non-dwelling market there has been a significant upsurge in the use of Hardie's products in educational and public buildings. The reduction in Government expenditure on water supply schemes continued although there were some major and worthwhile projects supplied by Hardie. In the private, Government and mining sectors new projects are coming out for tender and Hardie looks forward to a period of greater activity. . . . *Exports* have been constrained by the world's economic difficulties and a lack of export incentives. Nevertheless the market in Japan continues to provide an outlet for the company's decorated boards which are used principally in road tunnel linings. In Hong Kong plain compressed sheets are specified for the same use. Pipe contracts in Pakistan and elsewhere have been won and in Idonesia the major part of the Forty-Two Cities water supply project has been secured despite worldwide competition.

A great deal of fundamental and applied research and design has occupied the *Research and Engineering Division* this year in connection with the US$22-million project at Tangerang, Indonesia, a second pipe machine at Ipoh, Malaysia, and the construction at Moss Vale (formerly Berrima Junction) for the making of a/c pipe.

Hardie-Ferodo (Pty) Ltd. reported that increased sales of friction materials to vehicle manufacturers for original equipment more than offset the downturn in the replacement parts market. Slow but steady progress is being made in the export market for railway brake blocks to several countries.

System Built Pty. Ltd. and its subsidiaries, situated in Perth, Western Australia, was acquired during the year under review. It is a maker of prefabricated panels and components for use in buildings in remote areas where ease of construction is important.

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ASBESTOS STOCK QUOTATIONS

September 20, 1977

Abitibi Asbestos	C$.57	G&W (pfd 2.50)	31⅝
Advocate Mines	C$3.40	G&W (pfd 3.87)	59
Armstrong Cork	18¼	IC Industries	23¼
Armst. Cork (pfd 3.75)	50¾	IC Ind (pfd 6)	107½
Asarco	15⅞	IC Ind (pfd 3.50)	44½
Asbestos Corporation	C$23.00	Jim Walter Corporation	26⅞
Bendix	36¼	Jim Walter (pfd 1)	11¾
Bendix (pfd 3)	75¾	Jim Walter (pfd 1.60)	29
Carlisle	23	Johns-Manville	38⅞
Cassiar Asbestos	C$8.875	Kennecott Copper	23
CertainTeed	25⅝	Lear Siegler	15⅛
Charter Conso.	pence 143	Lear Siegler (pfd 2.25)	38½
Colt Industries	42⅝	Maremont	16⅞
Colt Ind. (pfd 1.60)	24	McAdam Mining	C$.26
Colt Ind. (pfd 4.25)	61½	National Gypsum	15⅝
Conwest	C$3.90	Pathfinder	C$.29
Flintkote	18	Porter (pfd 5.50)	77½
F-kote (pfd-B 2.25)	30⅜	Raybestos-Manhattan	29½
GAF Corporation	10¼	Rio Algom	C$24.25
GAF (pfd 1.20)	16	Supradur	Bid 5⅞; Asked 6⅜
Gulf & Western	11½	Union Carbide	43⅛
G&W (warrants)	⅛	Woodsreef Minerals	C$.74



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MEN ON THE MOVE

CERTAINTEED CORPORATION

Roger Martin, Chairman and General Manager of Saint-Gobain-Pont-a-Mousson, was elected a Director of CertainTeed. SGPM is one of the leading industrial groups in Europe and holds a majority interest in CertainTeed.

GAF CORPORATION

Philip B. Dalton was elected President and Chief Operating Officer of GAF Corporation. He joined the company in 1954 as a Market Development Engineer, has been a Director since 1966 and served as Executive Vice President since 1967.

Dr. Jesse Werner, President since 1962, continues as Chairman and Chief Executive Officer of GAF.

GARLOCK OF CANADA LTD.

William H. Price was promoted to the position of President of Garlock of Canada Ltd., it was announced by *George W. Townsend*, Group Vice President of Garlock Inc. Mr. Price has been with the Canadian company for over 15 years and has held positions in sales and marketing. He was Vice President of Sales since 1972.

JIM WALTER CORPORATION

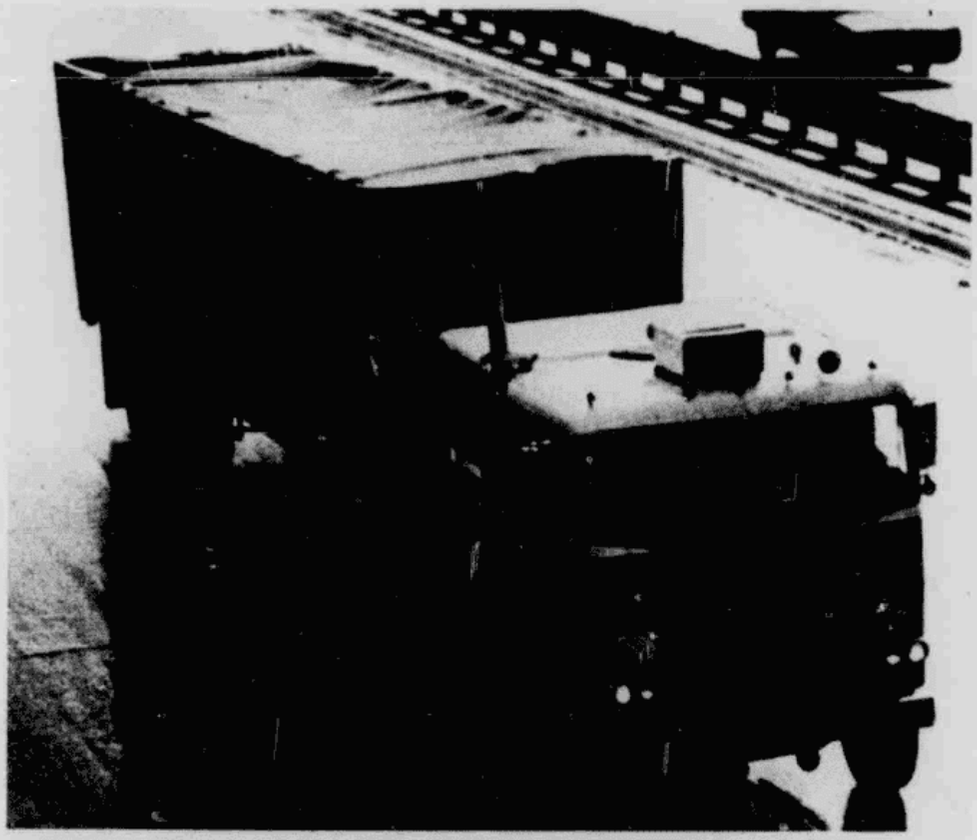
Thomas L. Hires was named to the Board of Directors of Jim Walter Corporation. He joined the Homes Division as a Branch Manager in 1955, has been a Vice President of the company since 1958 and President of the homebuilding operation since 1973.

The Celotex Building Materials Division has been restructured into three individual profit centers, each with its own production and marketing responsibilities. Reporting to *William D. Herbert*, President of Celotex and Senior Vice President of Jim Walter, are: *E. A. DiSalvo*—President of the Roofing Products Division; *Frank S. Burgen*—President of the Building Products Division; and *Sam E. Brasher*—President of the Industrial Products Division. Each gentleman previously held major positions with Celotex.

UNION CARBIDE CORPORATION

Russell E. Train, former Administrator of the U.S. Environmental Protection Agency and currently Senior Associate of The Conservation Foundation, was elected a Director of Union Carbide. Mr. Train is well known for his broad experience in public and governmental affairs and for a unique understanding of the complex field of environmental regulation.

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Stop 'em in their tracks.

Heavy duty brake linings must deliver on demand, usually hundreds of times a day. There's no room for failure.

Lake Asbestos long fibres give the required ruggedness to brake linings used in trucks, buses, railway and subway cars. The unique characteristics of these fibres also help assure the proper coefficient of friction. They also provide the necessary resistance to heat, wear and weathering.

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LAKE ASBESTOS

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BIRTHDAY GREETINGS to . . .

Miguel C. Leman, Sales Representative (Latin America), Asbestos Fiber Division, Johns-Manville, Denver, Colorado, November 16.

J. J. Mangan, President and Managing Director, Hedman Mines Ltd., Timmins, Ontario, November 16.

Gorden E. MacDonald, Vice Chairman, Asbestos Corporation Ltd., Groton, Connecticut, November 19.

Louis J. Melillo, Corporate Vice President of Research and a Director, Nicolet, Inc., Ambler, Pennsylvania, November 19.

Stanislaw Stachelski, Chairman, Valley Asbestos (Pty) Ltd., Johannesburg, Republic of South Africa, November 19.

Dr. A. J. P. Sabberwal, Joint Managing Director, TAC Construction Materials Ltd., Manchester, England, November 25.

W. I. Stewart, a Director, Cape Asbestos Insulations (Pty) Ltd., Benoni South, Republic of South Africa, November 25.

David F. Cortright, Vice President of Marketing, Norristown Division, Nicolet, Inc., Ambler, Pennsylvania, November 27.

E. J. Heath, Managing Director, James Hardie Asbestos Ltd., Sydney, N.S.W., Australia, November 27.

B. B. Stevenson, Finance Director and a Director, Cape Industries Ltd., London, England, November 28.

N. J. Blake, Managing Director, Blake & Clements Asbestos & Engineering Pty. Ltd., Riverwood, N.S.W., Australia, November 29.

John G. Ordway, Jr., President, MacArthur Company, St. Paul, Minnesota, November 29.

Walter A. Cooper, Manager, Environmental Communications, Johns-Manville, Denver, Colorado, November 30.

Nicholas Gritzuk, Chairman of the Board, Cassiar Asbestos Corporation Ltd., Vancouver, British Columbia, December 1.

Jules LaPrairie, Manager, Atlas Asbestos Company, Coalinga, California, December 1.

Robert J. Collier, Vice President and Director of Divisional Advertising, Johns-Manville, Denver, Colorado, December 3.

K. Fred Netter, President, Supradur Manufacturing Corporation, New York City, December 3.

James F. Reis, Market Manager, Asbestos Fiber Division, Johns-Manville, Denver, Colorado, December 3.

Frank S. Williams, Product Manager, Southern Asbestos Company, Charlotte, North Carolina, December 3.

Bernd Simon, Plant Engineer, Cement Asbestos Products Company, Van Buren, Arkansas, December 7.

F. A. Page, Deputy Managing Director, James Hardie Asbestos Ltd., Sydney, N.S.W., Australia, December 8.

Peter Steen, President, Cassiar Asbestos Corporation Ltd., Vancouver, British Columbia, December 8.

George W. Townsend, Vice President, Mechanical Packings Group, Garlock Inc., Palmyra, New York, December 10.

C. W. Newton, a Managing Director, Turner & Newall Ltd., Manchester, England, December 11.

E. W. Shortridge, Asbestos Plant Manager, Union Carbide Corporation, Metals Division, Niagara Falls, New York, December 12.

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G. F. A. BRINK—RETIRES

Gaylord F. A. Brink, Vice President-Research and Environment for Asbestos Corporation, retired August 1, 1977 after a long and distinguished career with the company.

A native of Edmonton, Alberta, Mr. Brink joined Asbestos Corporation as Mining Engineer in 1936 following his earning an engineering degree in mining at the University of Alberta. He joined the Active Service Force of the Canadian Army in 1939 and served overseas with the First Batallion of the Royal Canadian Engineers. He was awarded an M.B.E. for his services and returned to civilian life in 1945. Shortly thereafter he was appointed Superintendent of the Vimy Ridge Mine of Asbestos Corporation. In 1950 he was transferred to Superintendent of the Beaver Mine and in 1954 he organized and managed the company's Quality Control Department. He was named Product Research and Development Manager in 1962 and Vice President-Research and Environment in 1973. Mr. Brink is well known throughout the world as an expert on the uses and applications of asbestos.

He was active in the affairs of the Quebec Asbestos Mining Association, represented the company at meetings of the Asbestos Textile Institute, Inc., and was involved with the American Society for Testing and Materials, particularly its work on asbestos-related standards. We extend to Mr. Brink our best wishes for a happy, healthy and long retirement.

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VALUABLE LITERATURE

PHOTOCOPIES OF MOST OF THE FOLLOWING ARE AVAILABLE FROM ASBESTOS @20¢ PER PAGE.

REVIEW AND EVALUATION OF ANALYTICAL METHODS FOR ENVIRONMENTAL STUDIES OF FIBROUS PARTICULATE EXPOSURES—A photocopy of document to be published as a technical report of the U.S. National Institute for Occupational Safety and Health; reviews sampling and analytical methods which may be used to identify and quantify fibrous particulates in environmental samples; describes in detail the electron microscopic methods used by NIOSH [71 pages].

ASBESTOS/THE CALIFORNIA AND CONNECTICUT STORIES—An assessment of recent coverage given by the news media to stories concerning occupational exposure to asbestos [Columbia Journalism Review; 8 pages].

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION—The following articles appeared in the June 1977 issue of the AIHA Journal: Of Acceptable Risk or Whither the Threshold? [2 pages]; Some Aspects of Experimental Infective Pneumoconiosis [7 pages]; Empirical Relationships Among Heat Stress Indices in 14 Hot Industries [11 pages]; The Prediction of WBGT (Wet Bulb-Globe Temperature) from the Botsball [8 pages].

AMERICAN SOCIETY FOR TESTING AND MATERIALS—The ensuing books were published by ASTM in recent months; orders may be placed either with ASTM or through ASBESTOS Magazine; please add 3% shipping charges for delivery to the United States, Canada and Mexico and 5% for shipments to all other countries:

Fracture Analysis—Of interest to engineers and scientists concerned with the analysis of the fracture phenomenon as well as to designers who must integrate the information available into their plans [262 pages; STP 560; $22.75];

ASTM Standards on Magnetic Properties—a compilation of 32 standards related to magnetic properties, i.e., definitions, electrical steel, metallic and nonmetallic magnetic materials, etc. [240 pages; Publication *Code* #03-106076-06; $9.75];

Biological Monitoring of Water and Effluent Quality—evaluates present and future needs for biological monitoring toward solving watershed management problems; assesses the current state-of-the-art of biological monitoring; stimulates research in biological monitoring techniques [242 pages; STP 607; $24.25];

Compilation of ASTM Standard Definitions—contains over 13,000 definitions contained in ASTM Standards; the terms have been given standard definitions in the context of their technical use within the Society's Standards [732 pages; Publication Code #03-508076-42; $24.75];

Fire Standards and Safety—useful for those who are required to understand some of the complexities of fire safety problems and the appropriate application of fire standards [344 pages; STP 614; $27.75];

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SUPPLY SO MANY
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Composite Materials: Testing and Design/Fourth Conference—deals with subjects which may affect the application of advanced composites to industrial, military and consumer products; covers fracture, fatigue and impact phenomena, resin matrices for advanced composites and adhesives, processing for multi-directional fiber-reinforced composites, test methods, environmental effects and the design and analysis of advanced composite materials [535 pages; STP 617; $51.75];

Gaskets: A Symposium—includes papers titled Tightening Process Equipment Gasketed Joints Safely, The Relationship Between Bolt Load and Leak Rate in a Gasketed Joint, A Unique Concept in Gasket Technology for Reducing Vehicle Weight and Lowering Flange Design Costs, Performance Criteria of Gasket Materials, Testing Gasket Materials for Design Purposes, Sealability Characteristics of Gasket Materials, Formed-in-Place Gaskets: Concept vs. Reality, and The ASTM Classification System for Gasket Materials and Its Use [42 pages; STP 620, $15.00];

Nondestructive Testing Standards: A Review—addresses two questions, i.e., where are nondestructive standards satisfactory or lacking, and what suggestions can be made for improvement? [338 pages; STP 624; $33.75];

1977 ASTM Proceedings—contains the official reports of each ASTM Technical Committee; describes actions taken throughout the year, projects undertaken and other important details about standardization activities [580 pages; Publication Code #07-000770-00; $19.00].

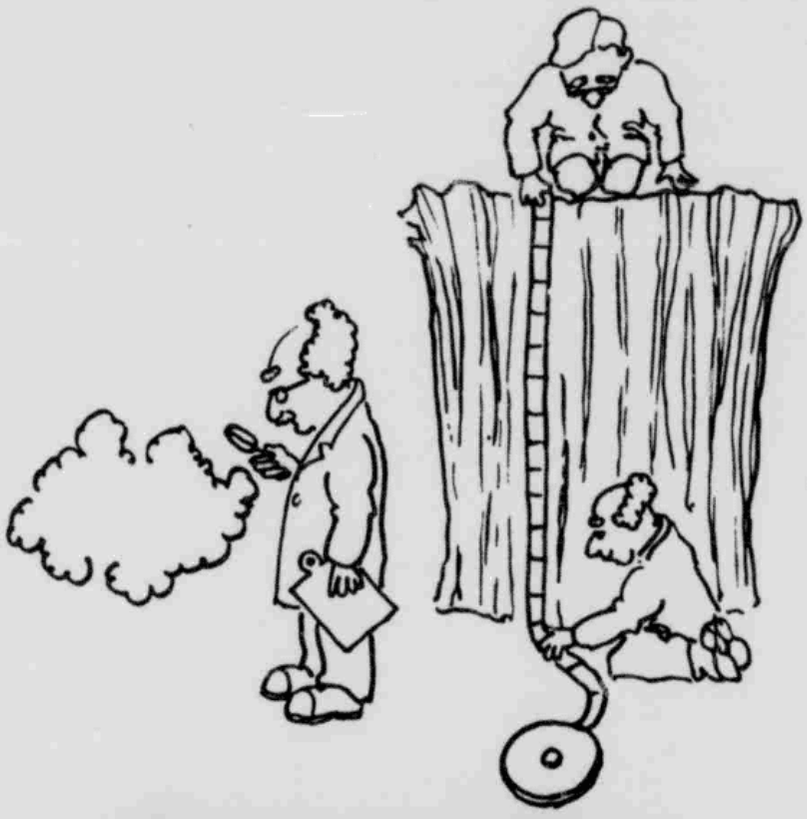
STILL AVAILABLE . . .

ASBESTOS/A REMARKABLE MINERAL FIBER—Reference book on asbestos by Marion S. Badollet; presents technical information on asbestos minerals and data on the chemical, physical and optical properties of Chrysotile, Riebeckite, Anthophyllite and Tremolite; contains electron micrographs, thermal analyses and X-ray diffraction patterns. [80 pages; $20.00 per copy; advance payment required; order from ASBESTOS Magazine]

CHRYSOTILE ASBESTOS TEST MANUAL, 3RD EDITION—Prepared jointly by the Asbestos Textile Institute, Inc., and the Quebec Asbestos Mining Association; provides 34 standard methods for testing the physical and chemical properties of Chrysotile asbestos fiber. [$18.95 to the U.S., Canada and Mexico; $21.95 to all other countries; place orders with ASBESTOS Magazine]

THE ASBESTOS FACTBOOK, 3RD EDITION—Compiled by the staff of ASBESTOS Magazine; written in layman's terms; offers useful information on the origin, locations and uses of asbestos; gives the chemical compositions of the various types of the mineral; contains data concerning testing methods and grades. [28 pages; $1.00 per paper-bound copy; order from ASBESTOS Magazine]

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Amosite from Cape

With its outstanding filtration characteristics, Amosite in asbestos cement products improves drainage, speeds production.
Its longer fibres add flexibility and strength and for insulation there is nothing better.
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150 N. Wacker Drive,
Chicago, Illinois 60606
Tel: (312) 726 8515

NEW ASBESTOS PATENTS

U.S. patents may be purchased from The Commissioner of Patents, Washington, D. C. 20231, for 50c each. Photoprints of non-U.S. patents may be purchased from the same source at a cost of 30c per page. Remittances should be in coin, currency or check and the number of the patent, name of the inventor and date of issue should be given.

British 1,472,944—In the opening of asbestos fibers to form a suspension for direct use in the manufacture of asbestos-cement products, raw asbestos is suspended in water, the suspension diluted and hydrocloned, the over-fibers separated in an aqueous phase, the dispersion of under-fibers impacted and the process repeated to obtain a uniform aqueous suspension containing about 5% by weight of fibers; assigned to ISPRA SpA, May 11, 1977, 9 pages.

British 1,473,963—Manufacture of a microporous membrane, for use as a diaphragm in electrolysis cells; a pre-mix of calcium carbonate and asbestos is blended with a fluorocarbon polymeric resin latex, water and a plasticizer, the blend rolled into sheets and the sheets sintered to remove the carbonate; P. Bouy, M. Juillard & J.-L. Bourgeois; assigned to Rhone-Poulenc Industries, May 18, 1977; 8 pages.

British 1,476,429—A friction dust for blending with asbestos, barite and a phenolic resin binder and forming into friction elements is made by curing and grinding a mixture of polybutadiene having at least 80% of its units in the 1,2-configuration; H. Williams & A. G. Stockwell; assigned to BP Chemicals International Ltd., June 16, 1977; 3 pages.

British 1,477,606—Improved friction elements are formed from a mixture of about 5% by weight each of butadiene-nitrile rubber and butadiene-styrene rubber, 15% of amine-phenolformaldehyde resin, 42% of asbestos, 11% of alumina, 10% of barite, 6% of brass chips, 3% of graphite, 1% of zinc oxide and a small amount of a composite vulcanizing material comprising sulfur mercaptothiazole, tetramethyl thiuram disulfide and sodium oleate; I. Shepeleva, et al.; assigned to Vsesjuzny Nauchno-Issledovatelsky i Konstruktorsko-Tekhnologichesky Institut Asbestovykh Technicheskikh Izdely, June 22, 1977; 7 pages.

British 1,478,042—Asbestos yarn is produced by extruding an aqueous dispersion of asbestos, coagulating the fibers to form strands, heating the strands in the presence of a solvent to remove residual chemicals and twisting the strands to form yarn; R. Huggett; assigned to TBA Industrial Products Ltd., June 29, 1977, 4 pages.

British 1,478,043—A vulcanizable compound for forming metal-cored asbestos-rubber gaskets comprises (1) butadiene-styrene rubber containing accelerators and curing agents, (2) asbestos, (3) toluene, (4) silane-coated hollow silica or glass microspheres, (5) sodium carbonate and (6) water; D. J. Adams, assigned to TBA Industrial Products Ltd., June 29, 1977; 2 pages.

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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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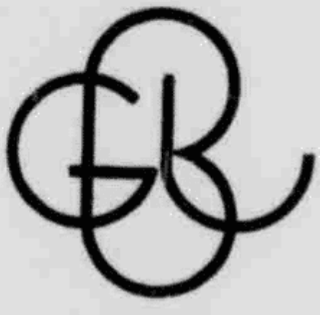
— Auxiliary machines for special sheet profiles.

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

— Special plants for preparation of wet and dry Asbestos.

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— Complete projects, know-how, technical assistance for sheet and pipe lines.



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CALENDAR OF EVENTS

AMERICAN SOCIETY FOR QUALITY CONTROL—Forthcoming short courses include: Managing for Quality, Holiday Inn—Golden Gateway, San Francisco, California, *October 31-November 4;* Quality Engineering, Downtowner Motor Inn, Milwaukee, Wisconsin, *November 14-18;* Quality Audit—Development and Administration, Downtowner Motor Inn, Milwaukee, Wisconsin, *November 30-December 2.*

BUILDING AND CONSTRUCTION EXPOSITION AND CONFERENCE—Sponsored by the Producers' Council; theme is concerned with new opportunities in 1978 and the energy challenge; McCormick Place, Chicago, Illinois, *November 1-3.*

1ST SOUTHERN PLANT ENGINEERING AND MAINTENANCE CONFERENCE—Produced by Clapp & Poliak, Inc.; World Congress Center, Atlanta, Georgia, *November 1-3.*

INTERNATIONAL POLLUTION ENGINEERING CONGRESS AND EXPOSITION—Integral, but separate, sections of the Southern Plant Engineering and Maintenance Conference; World Congress Center, Atlanta, Georgia, *November 1-3.*

MECHANICAL FAILURES PREVENTION CONFERENCE—Sponsored by the National Bureau of Standards and the Mechanical Failures Prevention Group; NBS Headquarters, Gaithersburg, Maryland, *November 1-3.*

UNIVERSITY OF WISCONSIN—Extension Courses at the Madison Campus: Products Liability for Claims Personnel, *November 1-2;* Noise Control in Industry, *November 7-8;* Noise Measurement and Control, *November 7-11;* Industrial Ventilation Design, *November 28-30;* Industrial Exhaust and Ventilation, *December 1-2;* Built-Up Roofing Design, *December 12-16;* Industrial Liquid Waste Monitoring and Disposal, *January 9-13;* Piping and Plant Engineers, *January 10-11.*

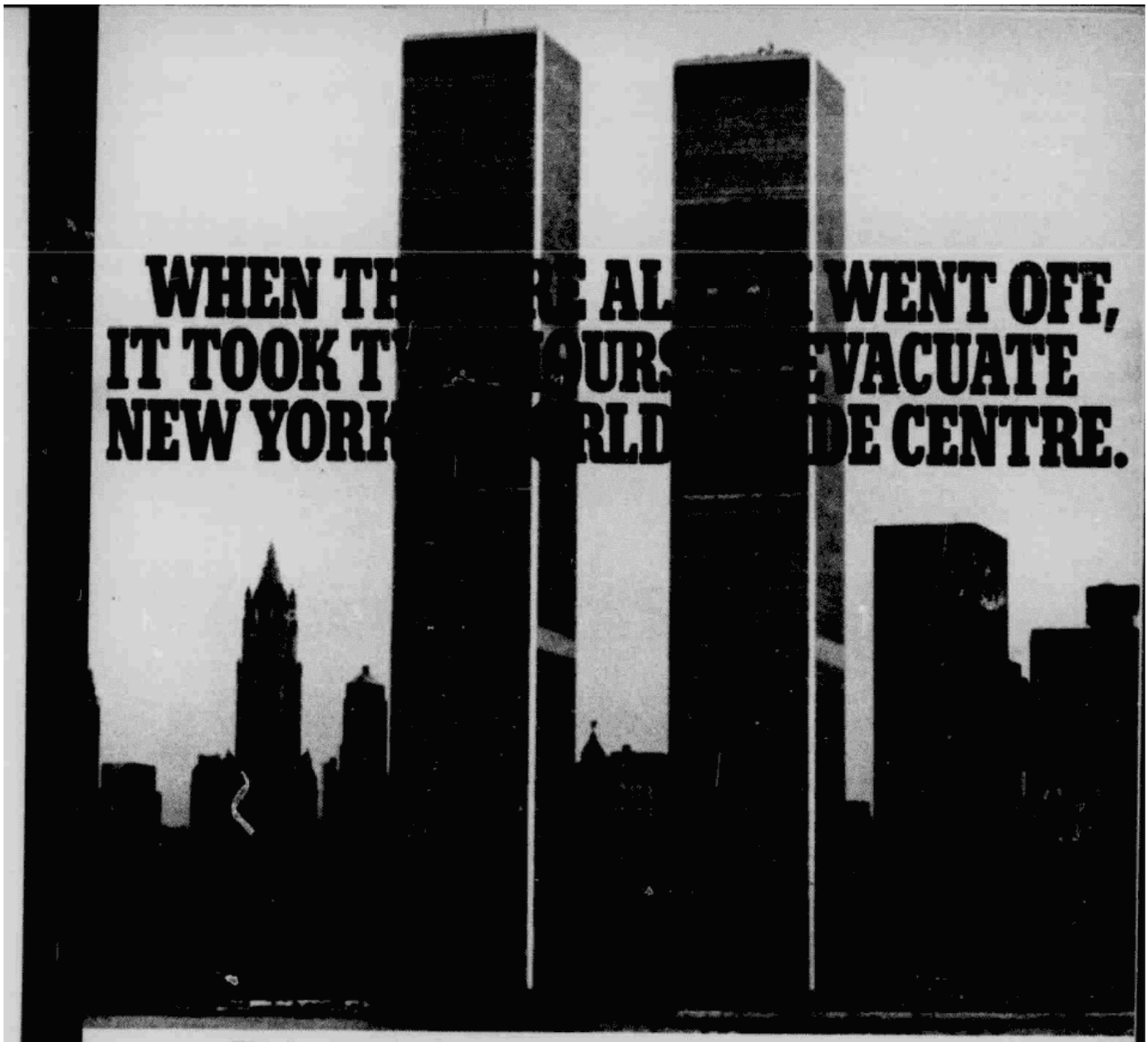
BUSINESS PLANNING CONFERENCE—Presentations will be concerned with the latest tools and methods for long-range business and managerial planning; Battelle Columbus Laboratories, Columbus, Ohio, *November 2-3.*

DOMESTIC AND INTERNATIONAL LICENSING COURSE—Presented by the Practising Law Institute; *November 3-4* in New York City; *November 10-11* in San Francisco, California.

4TH JOINT CONFERENCE ON SENSING OF ENVIRONMENTAL POLLUTANTS—Hosted by the American Chemical Society under the joint sponsorship of ACS and several other organizations and governmental agencies; Hilton Hotel, New Orleans, Louisiana, *November 6-11.*

AMERICAN NATIONAL METRIC COUNCIL—Metric Management Workshop, Town and Country Hotel, San Diego, California, *November 7-8;*

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The bigger the building, the more important fire-proofing becomes.

That's why today's buildings have asbestos-cement walls and even floors containing asbestos.

Asbestos contains fire, cannot burn and holds up after metal and glass have melted down, giving vital time for people to escape.

You'll also find asbestos sealing plumbing joints, insulating heating pipes, electric motors and emergency generators.

Asbestos. We couldn't live the way we do without it.

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Bookuk and Company Ltd., C.P.O. Box 1101, Seoul, **KOREA.**
Yah Sheng Chong Yung Kee Co. Ltd., 198 Nanking East Rd., Section 2, Taipei, **TAIWAN.**
Other representatives around the world.

Metric Trainers Seminar, Dutch Inn Hotel, Orlando, Florida, *December 5-6.*

NEW CONCEPTS OF OCCUPATIONAL MEDICINE UNDER OSHA—Accredited course for plant medical directors and physicians with part-time industrial affiliation; contact Industrial Health Foundation; Los Angeles, California, *November 7-10.*

NIOSH TRAINING COURSES—To be held at the National Institute for Occupational Safety and Health, Cincinnati, Ohio: Introduction to Occupational Safety, *November 7-11;* Heat Stress, *November 14-18;* Industrial Hygiene Respiratory Protection, *November 21-24* and *December 12-15;* Recognition, Evaluation and Control of Occupational Hazards, *December 5-9;* Industrial Noise, *December 13-15.*

COMMUNITY ENERGY SYSTEMS PLANNING—Executive briefings by energy experts from Battelle Memorial Institute: *November 9-10* in Chicago, Illinois; *December 6-7* in Los Angeles, California; *January 23-24* in Atlanta, Georgia; *March 6-7* in Boston, Massachusetts.

RAPID SOLIDIFICATION TECHNOLOGY WORKSHOP—Sponsored by the National Bureau of Standards and the Advance Research Projects Agency; Sheraton-Reston, Reston, Virginia, *November 13-17.*

NATIONAL FIRE PROTECTION ASSOCIATION—1977 Fall Meeting; Marriott Hotel, Atlanta, Georgia, *November 14-17.*

ASTM COMMITTEE MEETINGS—American Society for Testing and Materials; Sheraton Biltmore, Atlanta, Georgia: E-9 on Fatigue, *November 14-17;* C-3 on Chemical Resistant Non-Metallic Materials, *November 16-18.*

CURRENT BLASTING PRACTICE SEMINAR—Organized and instructed by Precision Blasting Services, a division of the Intercontinental Development Corporation; Birmingham, Alabama, *November 16-18.*

DIAGNOSTICA/THERAPEUTICA/TECHNICA—9th International Congress and Trade Fair for physicians; Fair Congress Centre, Dusseldorf, Germany, *November 16-20.*

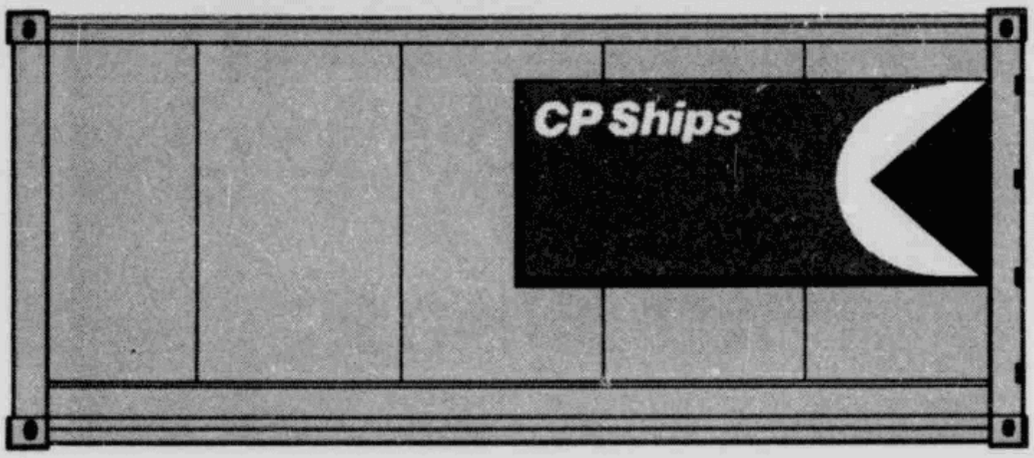
INTER-CAN EXPO 77—Canadian International Construction, Logging and Mining Exposition; International Centre of Commerce, Toronto, Ontario, *November 19-23.*

FUNDAMENTALS OF INDUSTRIAL TOXICOLOGY SEMINAR—Conducted by the American Industrial Hygiene Association; Holiday Inn, Airport Junction, Moline, Illinois, *November 29-30.*

SOVEXPO 77—Produced by Clapp & Poliak, Inc.; a new exhibition under U.S. auspices to market equipment, products and services needed for the industrial functions of plant engineering and maintenance, design engineering and pollution control; Sokolniki Park, Moscow, USSR, *December 7-15.*

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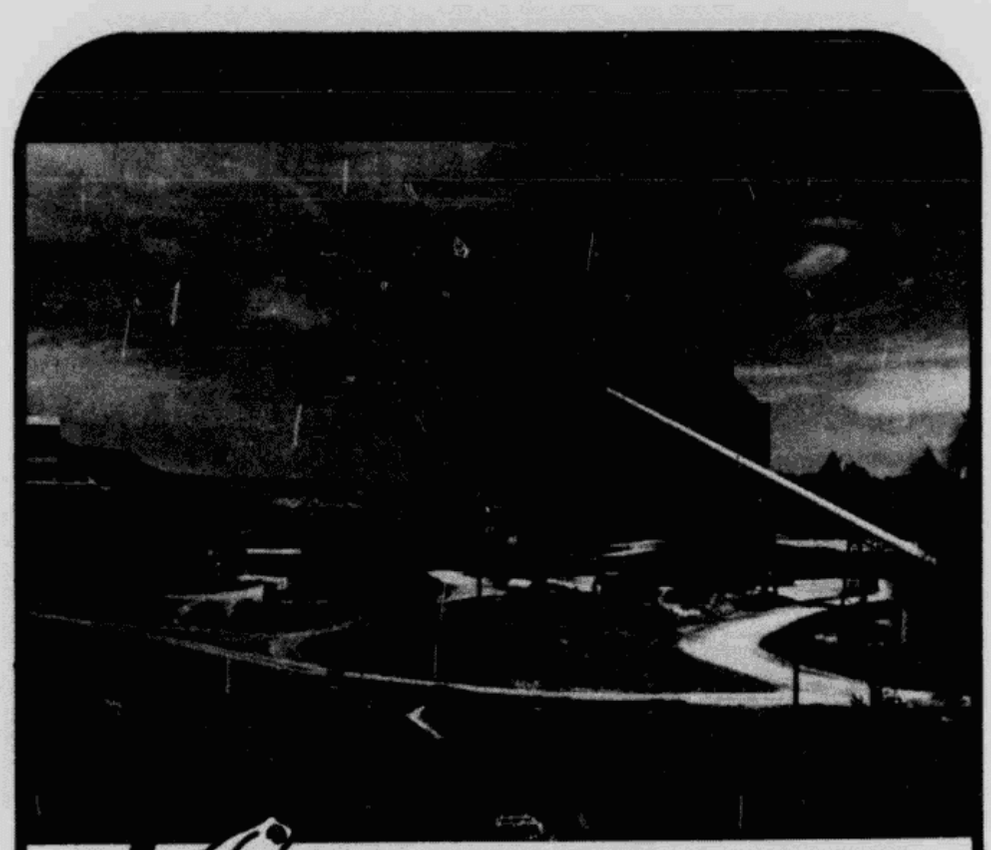
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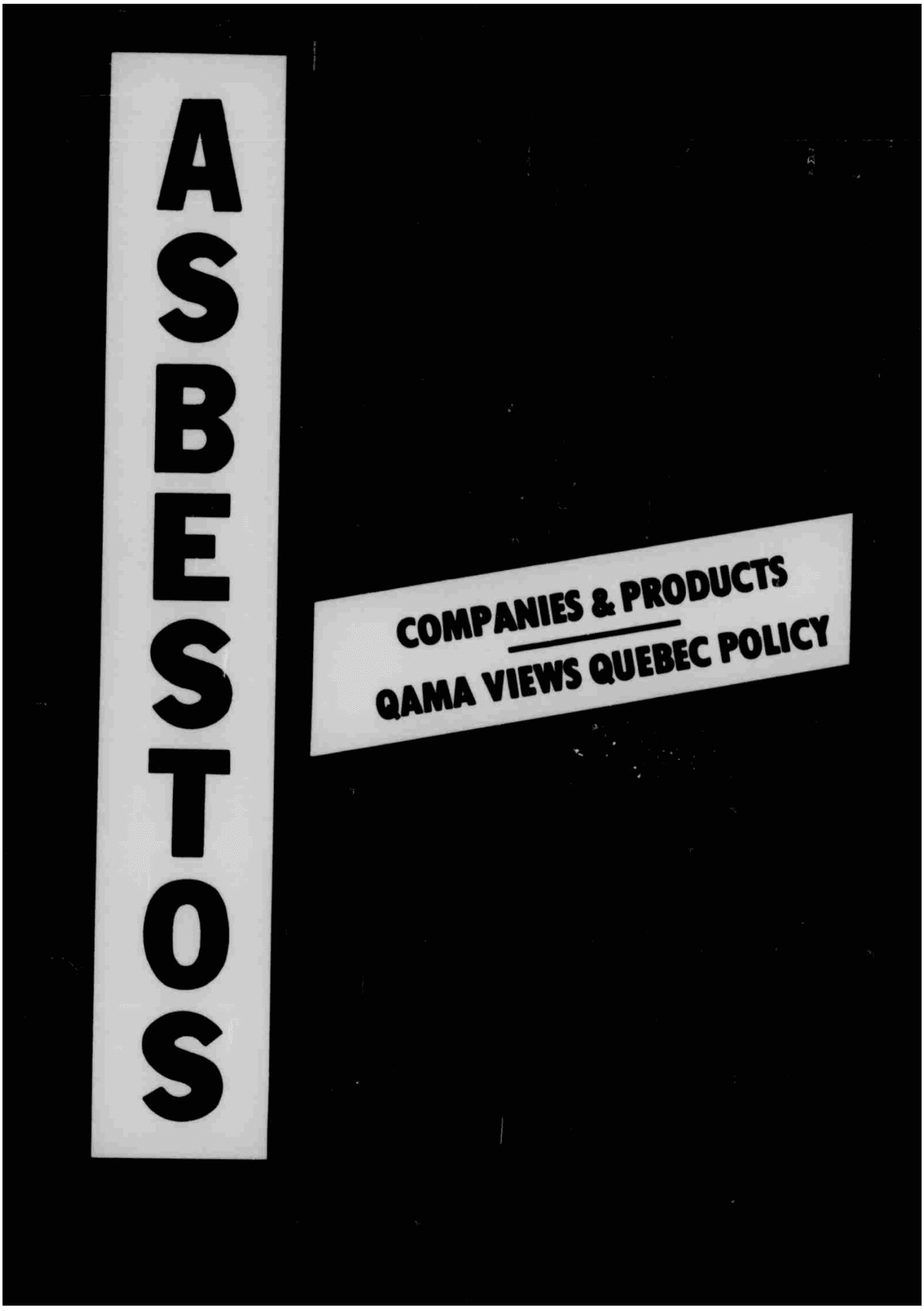
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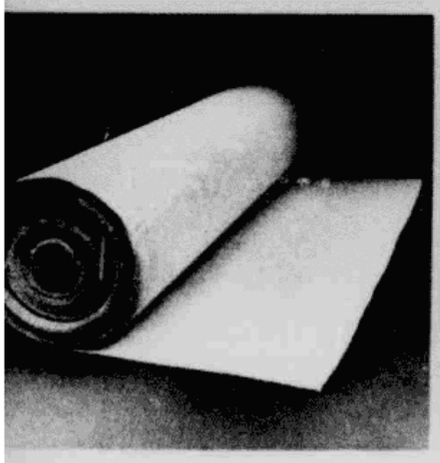
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