Asbestos

By R. A. Clifton[1]

Shipments of asbestos (all chrysotile) in 1980 from mines in the United States decreased 14% from those in 1979. Imports in 1980 were 36% lower than those in 1979.

U.S. apparent consumption declined 36% in 1980. Canadian production in 1980 was 13% lower than that for 1979. Shipments from Canada to the United States dropped 36% during 1980. Imports from Canada were 96% of total U.S. imports in 1980, and those from the Republic of South Africa accounted for 3%.

Table 1.—Salient asbestos statistics

	1976	1977	1978	1979	1980
United States:					
Production (sales) metric tons	104,873	92,256	93,097	93,354	80,079
Value thousands	$23,693	$25,267	$27,987	$28,925	$30,599
Exports and reexports (unmanufactured) metric tons	42,564	34,896	45,380	45,850	51,366
Value thousands	$12,791	$12,075	$20,533	$24,165	$29,677
Exports and reexports of asbestos products (value) do	$60,572	$62,665	$119,915	$130,906	$133,043
Imports for consumption (unmanufactured) metric tons	596,737	550,693	570,020	513,084	327,296
Value thousands	$142,145	$145,146	$154,351	r$135,210	$91,809
Released from stockpile (unmanufactured) metric tons	501	188	--	r1	--
Consumption, apparent[1] do	658,847	609,157	618,706	r560,600	358,700
World: Production do	r4,767,071	r4,793,257	r4,692,994	r4,889,688	4,818,369

rRevised.
[1]Measured by quantity produced, plus imports, plus stockpile releases, minus exports.

Legislation and Government Programs.—No date was set by the Occupational Safety and Health Administration (OSHA) for the public hearings mandatory for the proposed revisions to its asbestos standard for manufacturing. The proposal for a permissible-exposure level of 0.5 fibers per cubic centimeter has been pending for 6 years, with no hearings scheduled.

Asbestos was among the 61 chemical substances named by the Environmental Protection Agency (EPA) in a proposed rule under section 8(d) of the Toxic Substances Control Act. According to the proposal published December 31, 1979, in the Federal Register, all manufacturers, processors, distributors, and others in possession of the substances would be required to submit health and safety studies extant that are pertinent to the substance.

On March 28, 1980, the Interagency Regulatory Liaison Group (IRLG) announced in the Federal Register that four of its member agencies would implement an inspection referral program. A standardized procedure was adopted by which the four—EPA, Consumer Product Safety Commission (CPSC), Food and Drug Administration, and the Food Safety and Quality Service of the Department of Agriculture—would report suspected violations to the responsible agency. OSHA, while an IRLG member, deferred joining the program.

In the Federal Register of May 23, 1980, OSHA finalized its rule (effective August 21) requiring employers to make available to employees, their designated representatives, and OSHA the employees' asbestos exposure and medical records.

On June 14, 1980, the President signed

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into law the Asbestos School Hazard Detection and Control Act of 1980. The bill provides funds for hazard detection grants and loans for detected hazard control.

On July 2, 1980, the U.S. Supreme Court upheld a lower court's findings invalidating OSHA's benzene standard. The lower court noted that OSHA, rather than demonstrating by substantial evidence that a reduction in the benzene permissible-exposure level would result in a significant reduction in the carcinogenic risk of exposure, relied on a series of assumptions and policy positions relative to the regulation of suspected carcinogens. OSHA's position that there is no safe level of exposure to a carcinogen, and that the burden was on industry to show that there is a safe level of exposure, was flatly rejected.

On November 5, 1979, under Section 7(a)(1) of the Strategic and Critical Materials Stock Piling Act, President Carter released 1,000 short tons of high-quality chrysotile asbestos to the Department of Defense. The shortage of these fibers was delaying the production of some weapons subsystems.

Stockpile goals for both chrysotile and amosite were revised in May of 1980. The new goals are shown in table 2.

Environmental Impact.—A trade journal article described the asbestos-related disease liability insurance in its headline as "...Becoming Problem of Monstrous Proportions."[2] Citing the Johns-Manville Corp.'s problems, the article said that the company was named a defendant in more than 5,000 suits by more than 9,300 people and that case costs have risen from $13,000 per claim in 1979 to $23,000 in 1980. In calling the problem "monstrous," William N. Edwards of American Re-Insurance Corp. said that by toting up plaintiffs and defendants, he surmised that loss and loss adjustment expense for claims filed in 1981 will approximate $1.35 billion.

The cancer policy published by OSHA in the Federal Register (January 22, 1980) to become effective April 21, 1980, would impact greatly on the asbestos industry if it were not probably contravened by the Supreme Court benzene decision. Under the rule, asbestos would undoubtedly be classified as Category I—substances that have been found to cause cancer in humans. The policy provides for lowering exposure to Category I agents to the lowest feasible levels and where suitable substitutes exist for certain uses, *no* occupational exposure will be permitted for those uses.

An article in a business magazine reported that neither labor nor industry likes the policy; among the things industry did not like was that OSHA has effectively barred the inclusion of human and animal studies that show no evidence of cancer after exposure to a suspected carcinogen.[3] Industry maintains that knowledge of vital scientific value may be excluded. (The National Institute of Environmental Health Science' (NIEHS) animal feeding study on the carcinogenicity of ingested asbestos could not be included in any deliberations of OSHA if the results continue as reported, and the cancer policy remains as written.) Concessions to industry such as omission of a provision to trigger temporary emergency standards for Category I substances have cut off much of labor's support.

Table 2.—Stockpile goals and Government inventories as of December 31

(Metric tons)

	Stockpile goals[r]	Total inventories			Sales of excesses, 1980
		1978	1979	1980	
Amosite	15,422	38,587	38,587	38,587	--
Chrysotile	2,722	9,940	[r]9,034	9,034	--
Crocidolite	--	2,163	2,163	2,163	--
Total	18,144	50,690	[r]49,784	49,784	--

[r]Revised.

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DOMESTIC PRODUCTION

Mines in the United States shipped about 14% less asbestos in 1980 than in 1979, but the value increased 6%. Three States produced asbestos: California was the leader, followed by Vermont and Arizona. Total output was 80,079 tons valued at $30.6 million.

Calaveras Asbestos Corp. was California's and the Nation's leading producer from its Copperopolis Mine. One other mine was also active in California on the Joaquin Ridge near Coalinga. Atlas Asbestos Corp. apparently closed its Santa Cruz Mine (Fresno County), and Union Carbide Corp. operated its Santa Rita Mine (San Benito County), both on the ridge.

The Vermont Asbestos Group's Lowell Mine (Orleans County, Vt.), is second in the country in production.

Arizona production in 1980 was below the 1979 level. The Jaquays Mining Corp. in Gila County had the only active asbestos mine in the State.

Powhatan Mining Co. has gone out of business. No anthophyllite is now mined in the United States.

The Alaska Asbestos Co., jointly owned by International Paper Co., McIntyre Mines, Ltd., and Tanana Asbestos Corp., is maintaining an active program of drilling and engineering feasibility tests at the Eagle property owned by Doyon, Ltd. The work is being done by WGM, Inc., for a 5% interest. U.S. asbestos producers and mine sites follow:

State and company	County	Mine	Type of asbestos
Arizona: Jaquays Mining Corp	Gila	Chrysotile	Chrysotile.
California:			
Calaveras Asbestos Corp	Calaveras	Copperopolis	Do.
Union Carbide Corp	San Benito	Santa Rita	Do.
Vermont: Vermont Asbestos Group	Orleans	Lowell	Do.

Employment in U.S. asbestos mines and mills averaged about 480 persons during 1980.

CONSUMPTION AND USES

Total U.S. asbestos consumption decreased 36% from 1979 to 1980. Chrysotile was 93% of that consumed, crocidolite 7%, a little amosite was used, and no anthophyllite was reported used for the first time in many years. The demand was lower for every end use, but the degree of drop varied from 25% for flooring products to 67% for textiles.

Asbestos-cement pipe increased its share of the asbestos used from 38% in 1979 to 40% in 1980. Chrysotile was 83% of that used in asbestos-cement pipe, and crocidolite practically all of the rest. Flooring products with 25%, friction products with 12%, and roofing products with 7% were the other major uses.

Ninety-nine percent of the chrysotile used was either grade 4, 5, 6, or 7, with the grade 7's the most used at 40%, grade 5's next at 27%, grade 4's at 26%, and grade 6's at 6%.

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Table 3.—U.S. asbestos consumption by end use, grade, and type

(Metric tons)

	Chrysotile											
	Grades 1 and 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Total chrysotile	Crocidolite	Amosite	Anthophyllite	Total asbestos
1979	100	8,800	162,100	105,300	52,800	193,900	--	523,000	35,700	1,500	300	560,600
1980:												
Asbestos-cement pipe	--	--	81,700	29,800	4,300	3,900	--	119,700	24,100	200	--	144,000
Asbestos-cement sheet	--	--	--	100	4,300	3,500	--	7,900	--	--	--	7,900
Flooring products	--	100	--	35,900	200	53,800	--	90,000	--	200	--	90,200
Roofing products	--	100	300	100	3,900	22,100	--	26,500	--	--	--	26,500
Packing and gaskets	--	800	2,300	6,200	100	2,800	--	12,200	100	--	--	12,300
Insulation:												
Thermal	--	--	100	--	700	5,200	--	6,000	--	--	--	6,000
Electrical	--	200	--	100	--	2,600	--	2,900	--	--	--	2,900
Friction products	--	400	2,100	14,200	4,700	22,300	--	43,700	--	--	--	43,700
Coatings and compounds	--	--	100	--	100	10,700	--	10,900	--	--	--	10,900
Plastics	200	--	--	400	--	800	--	1,400	100	--	--	1,500
Textiles	200	1,700	--	--	--	--	--	1,900	--	--	--	1,900
Paper	--	100	--	200	100	--	--	400	100	--	--	500
Other	--	200	300	2,500	1,500	4,600	--	9,100	--	1,300	--	10,400
Total	400	3,600	86,900	89,500	19,900	132,300	--	332,600	24,400	1,700	--	358,700

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PRICES

Published data from company price lists will be used from now on to reflect asbestos prices. The price list of the Asbestos Corp., as Quebec's largest independent producer, will probably be representative. There was no increase in its prices during 1980. Prices for British Columbia Cassiar chrysolite asbestos rose more than 20% for cement grades and 10% for other grades to start 1980.

Prices for Vermont chrysotile asbestos rose on July 1, 1980. For some grades (cement) the raise was 12%, shorts were 8%, and Hooker 17% and 20%. Arizona prices did not increase during 1980. The latest prices are still those that went into effect on July 1, 1976, and quotations, f.o.b. Globe, are shown below:

Grade	Description	Value per metric ton
Group 1	Crude	$3,307
Group 2	do	1,984
AAA		1,433
Group 3	Nonferrous filtering and spinning	$827- 926
Group 4	Nonferrous plastic and filtering	827- 926
Group 7	White shorts	110- 220

As of July 1, 1980, Vermont chrysotile asbestos, f.o.b. Morrisville, was priced as follows:

Grade	Description	Value per metric ton
4T	Fiber	$729
5K	do	564
5R	do	478
6D	Waste	351
7D	Shorts	226
7M	do	129
7R	do	119
Hooker No. 1		1,609
Hooker No. 2		926

Quotations for Asbestos Corp. (Quebec) chrysotile, f.o.b. mine, as of January 1, 1980, follow:

Grade	Description	Value per metric ton
Group 3Z to 3F	Spinning fiber	Can$1,240-$1,929
Group 4T to 4A	Asbestos-cement fiber	933-1,215
Group 5R to 5D	Paper fiber	584- 690
Group 6D	Paper and shingle fiber	419
Group 7TS to 7D	Shorts	134- 257

The latest prices for chrysotile asbestos from Cassiar Resources in British Columbia, Canada, effective January 1, 1980, f.o.b. Vancouver, follow:

Grade	Description	Value per metric ton
AAA	Nonferrous spinning fiber	Can$2,205
AA	do	1,764
A	do	1,268
AC	do	1,157
AK	Asbestos-cement fiber	1,075
AS	do	992
AX	do	909
AY	do	634
AZ	do	413

African asbestos producers privately negotiate sales, thereby ruling out market quotations. The following tabulation shows the average value per metric ton of South African imports, regardless of grade, calculated from 1980 U.S. Department of Commerce data:

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Type	1976	1977	1978	1979	1980
Amosite	$508	$589	$569	$577	$902
Crocidolite	571	582	624	686	689
Chrysotile	259	485	451	679	692

FOREIGN TRADE

There was an increase in the value of asbestos and asbestos products exported from the United States in 1980 over that in 1979. Most of the gain was accounted for by a 26% increase in the value of unmanufactured asbestos, which had a 14% rise in tonnage. There was an increase in the value, in U.S. dollars, per metric ton from $521 to $576 in 1980. The fiber share of the export dollar declined from 16% in 1979 to 13% in 1980.

In 1980, the United States recovered 177% of the cost of imported asbestos by exporting and reexporting fibers and products.

Canada remained the largest user of U.S. asbestos and products. Thirty-eight percent of the value realized from these products in 1980 came from Canada, Saudi Arabia and Mexico tied for second in receiving U.S. asbestos and products and each provided 8% of the U.S. export dollars in 1980.

Other major buyers of U.S. asbestos and products were the Federal Republic of Germany, Japan, Venezuela, the United Kingdom, Australia, Colombia, and the Netherlands.

Canada provided 96% of the asbestos fiber imported into the United States in 1980, and the Republic of South Africa provided 3%. Several countries provided the remainder. Chrysotile again dominated the imported types, with 98% of the total. The dollar value of imported fiber in 1980 was just 68% of that for 1979.

Table 4.—Countries importing U.S. asbestos fibers and products, by type and country

(Thousand dollars)

	1979			1980		
	Unmanufactured fibers	Manufactured products	Total	Unmanufactured fibers	Manufactured products	Total
Australia	429	2,778	3,207	936	2,363	3,299
Canada	2,508	53,761	56,269	1,936	59,197	61,133
Colombia	364	3,324	3,688	249	1,557	1,806
Germany, Federal Republic of	924	4,009	4,933	1,309	3,455	4,764
Japan	4,686	2,950	7,636	4,551	3,522	8,073
Mexico	4,931	6,430	11,361	6,442	6,948	13,390
Netherlands	126	2,712	2,838	421	2,867	3,288
Saudi Arabia	596	11,448	12,044	678	12,751	13,429
United Kingdom	387	3,217	3,604	742	3,888	4,630
Venezuela	193	4,078	4,271	483	2,958	3,441
Other	8,250	r33,456	41,606	11,600	33,183	44,783
Total	23,394	r128,163	151,457	29,346	132,689	162,036

Table 5.—U.S. exports and reexports of asbestos and asbestos products

Products	1978		1979		1980	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
EXPORTS						
Unmanufactured:						
Crudes, fibers, and stucco (metric tons)	22,153	$8,371	31,635	$12,968	36,426	$17,044
Sand and refuse (do.)	18,666	4,719	10,501	3,642	11,793	3,693
Asbestos fibers (do.)	3,597	7,137	2,559	6,784	2,695	8,610
Total (do.)	44,416	20,227	44,695	r23,394	50,914	29,347

See footnotes at end of table.

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Table 5.—U.S. exports and reexports of asbestos and asbestos products —Continued

Products	1978 Quantity	1978 Value (thousands)	1979 Quantity	1979 Value (thousands)	1980 Quantity	1980 Value (thousands)
EXPORTS —Continued						
Products:						
Shingles and clapboard metric tons	10,652	$5,256	7,323	$3,875	4,535	$2,560
Other articles of asbestos do.	14,340	11,700	17,758	13,301	16,646	14,236
Gaskets do.	3,911	4,510	4,203	4,556	438	3,542
Packing and seals do.	2,396	11,520	2,405	14,497	2,118	15,661
Insulation do.	NA	5,193	NA	4,524	NA	6,151
Other articles, n.s.p.f do.	NA	24,876	NA	22,806	NA	25,442
Brake linings and disc brake pads do.	NA	44,696	NA	55,270	NA	55,471
Clutch facings and linings number	NA	11,090	NA	9,334	NA	9,626
Total	XX	118,841	XX	128,163	XX	132,689
REEXPORTS						
Unmanufactured:						
Crudes and fibers metric tons	896	296	1,039	851	383	307
Sand and refuse do.	68	10	116	20	69	23
Total do.	964	306	1,155	871	452	330
Products:						
Shingles and clapboard do.	--	--	--	--	477	78
Gaskets do.	NA	37	--	--	--	--
Packing and seals do.	NA	20	4	109	1	5
Insulation do.	NA	1	--	--	NA	1
Other articles, n.s.p.f do.	NA	103	NA	68	NA	14
Brake linings and disc brake pads do.	NA	683	NA	2,492	NA	219
Clutch facings and linings number	NA	230	NA	52	NA	24
Other articles of asbestos metric tons	--	--	NA	22	3	13
Total	XX	1,074	XX	2,743	XX	354

NA Not available. XX Not applicable.

Table 6.—U.S. imports for consumption of asbestos fibers by type, origin, and value

Type	Canada Quantity (metric tons)	Canada Value (thousands)	Republic of South Africa Quantity (metric tons)	Republic of South Africa Value (thousands)	Other Quantity (metric tons)	Other Value (thousands)	Total Quantity (metric tons)	Total Value (thousands)
1978	543,233	$139,742	24,908	$14,165	1,879	$444	570,020	$154,351
1979:								
Chrysotile:								
Crude	138	28	378	269	16	4	532	301
Spinning fibers	8,070	7008	--	--	--	--	8,070	7,008
All other	487,499	116,577	2,235	1,504	460	148	490,194	118,229
Crocidolite (blue)	[1]134	54	[r]13,327	9,138	[1]366	250	13,827	9,442
Amosite	[1]73	6	[r]388	224	--	--	461	230
Total	[r]495,914	[r]123,673	[r]16,328	[r]11,135	842	402	513,084	[r]135,210
1980:								
Chrysotile:								
Crude	129	20	--	--	29	32	158	52
Spinning fibers	5,424	4,571	360	338	567	578	6,351	5,487
All other	309,886	78,371	2,041	1,379	899	721	312,826	80,471
Crocidolite (blue)	[1]52	12	7,545	5,201	--	--	7,597	5,213
Amosite	[1]49	302	315	284	--	--	364	586
Total	315,540	83,276	10,261	7,202	1,495	1,331	327,296	91,809

[r]Revised.
[1]Transshipment from the Republic of South Africa.

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WORLD REVIEW

The 1% reduction in world asbestos production in 1980 was attributable to the general recession and environmental factors, according to a Canadian trade journal.[4] The article noted the slowed construction activity in Western Europe and the United States and the environmental problems that seem to have caused a loss of market for the shorter asbestos fibers. The growing market in the less developed countries was described. New asbestos cement plants, either in operation or under construction, were mentioned in Tunisia, the Middle East, the Philippines, Nigeria, Malaysia, Sri Lanka, and elsewhere.

New asbestos discoveries in the Arab world were noted in a letter to the editor of a trade magazine.[5] A member of the geology department of the American University in Beirut said the unexploited deposits were in Saudi Arabia, Iraq, Syria, and Morocco.

Canada.—The Canadian asbestos industry had, in 1980, one of the leanest years in recent history. Asbestos Corp., for example, had a 12-week strike from March 4 to May 26 and still had such large inventories of fibers that it had to announce a suspension of all operations for the first 26 days of 1981 and a reduction of the normal 6-day work week to 5 days for the following 6 months.

In Quebec, the Provincial Government had not relinquished its plans to expropriate the controlling shares of the Asbestos Corp., now owned by General Dynamics Corp. of the United States. The purchase of Bell Asbestos Mines Ltd. and its two affiliated manufacturers of asbestos products—Atlas Turner Co. and Turner Building Products Co.—in May did not alter the Province's stand. The May decision by the Quebec Superior Court upholding the constitutionality of the expropriation act has been appealed.

Brinco Ltd. acquired 98% of the outstanding shares of Cassiar Resources and plans to acquire the remainder. The mining and exploration activities of Cassiar will be combined with those of Brinex Ltd., and the whole entity will be renamed Brinco Mining Ltd.

Colombia.—Late 1980 was the scheduled startup time for the Minera Las Brisas, S. A. asbestos mine at Antioquia. Production is set for 20,000 metric tons per year of grades 4, 5, 6, and 7.

Cyprus.—While production of chrysotile on Cyprus varied little from the previous few years, Cyprus Asbestos Mines, Ltd., in 1979 exported 32% more than in 1978, a total 120% of production.

France.—French imports of asbestos rose 14% in 1979 over 1978, but the most interesting data concerned the changes in the supplying countries' shares of this market. Canada's share rose from 39% in 1978 to 47% in 1979, the U.S.S.R.'s share dropped from 34% to 20%, and the Republic of South Africa's share rose from 8% to 13%.

Germany, Federal Republic of.—The Bonn Government was preparing a program to support industrial stockpiling of five minerals which it characterizes as "sensitive basic commodities with high economic importance and high supply risk." It says of asbestos, the only nonmetallic on the list, that, "for the short term, substitution in sources of supply as well as in uses is not possible."

Greece.—Full-scale operation of the new Zidani chrysotile mine near Kozani was rescheduled for late 1980, with hopes that 100,000 tons can be produced in 1981. Grades 4, 5, 6, and 7 will be produced with grade 4's providing 15% of the total and grade 7's 10%. About 20% to 25% of the production will be used domestically.

Turkey.—Asbestos production is one of the few encouraging events in Turkey's mineral picture. The 1979 production was more than four times that of 1977 at 17,210 metric tons.

U.S.S.R.—Geologists of the Tuva A.S.S.R. have announced completion of a survey of a major new deposit at Sayan. Reportedly containing 7 million tons of chrysotile, experimental development and long-range planning have started. Output from the Kiyembay asbestos combine was threatened by transportation difficulties according to a trade journal item.[6] Citing a Pravda article, the item said that "rock delivery was held up because the locomotives assigned by the Building Materials Ministry were 10 to 15 years old and broke down frequently."

Yugoslavia.—The West German company KHD Humboldt Wedag AG has the contract to supply the equipment for improvements at the Stragari-Azbest asbestos mine of Kolubara, Serbia. The ore from the open pit mine will be milled in a wet process plant reportedly environmentally safe that will increase fiber yield by 6% to 7%.

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Downstream capacity for asbestos board and paper will be extended.

Zimbabwe.—With the removal of United Nations sanctions, data on the Zimbabwe asbestos industry are once again available, and it is apparent that it is a healthy and growing industry. Asbestos production increased by a 3.1% average annual growth rate during the first 10 years of the sanctions (1966-75) and a 2.65% overall growth rate from 1964 through 1979. Production peaked in 1976 at 281,400 metric tons and dropped off somewhat after that.

African Associated Mines (Pvt.) Ltd. (AAM), a subsidiary of Turner & Newell of the United Kingdom, is by far the largest asbestos producer in the country having 90% of the production. AAM operates a mine and brand new mill (July 1980) at Shabanie. Near Mashaba, the King Mine has a new (1973) mill, and the company operates another mine (Gaths Mine), and another mine and mill (Temeraire). They are presently remilling considerable old dump material for the now recoverable fibers.

According to Industrial Minerals, AAM is not the only Zimbabwean asbestos producer to install a major new plant recently.[7] Both Asbestos Investments Ltd. and Kudu Asbestos Ltd. have also made plant investments. An interesting facet of this modernization of the country's asbestos industry is that, because of the sanctions, all the needed equipment was manufactured domestically.

Table 7.—Asbestos: World production, by country[1]

(Metric tons)

Country[2]	1976	1977	1978	1979[p]	1980[e]
North America:					
Canada (shipments)	1,536,091	1,517,360	1,421,808	1,492,719	[3]1,291,371
Mexico	1	--	--	--	--
United States (sold or used by producers)	104,873	92,256	93,097	93,354	[3]80,079
South America:					
Argentina	889	686	1,069	1,196	1,100
Brazil	92,703	92,773	122,815	138,457	140,000
Colombia	[e]5,000	--	--	--	--
Europe:					
Bulgaria[e]	300	500	[r]700	[r]600	700
Italy	164,788	149,327	135,402	143,931	145,000
U.S.S.R.[e]	[r]1,850,000	[r]1,900,000	1,945,000	2,020,000	2,150,000
Yugoslavia	12,830	[r]9,066	10,360	10,041	[3]12,106
Africa:					
Egypt	1,096	478	349	238	230
Mozambique				789	800
South Africa, Republic of	369,840	380,164	257,325	249,187	270,000
Swaziland[4]	41,847	38,046	36,951	34,294	35,000
Zimbabwe	281,000	273,000	249,000	260,000	[3]251,000
Asia:					
Afghanistan	13,260	[e]13,000	[e]13,000	[e]4,000	--
China:					
Mainland[e]	150,000	200,000	250,000	250,000	250,000
Taiwan	853	673	2,031	2,957	[3]683
Cyprus	34,518	36,684	34,342	35,472	35,000
India	24,119	22,177	24,263	37,816	38,000
Japan	7,703	[r]6,307	5,746	3,502	3,300
Korea, Republic of	4,762	6,180	13,616	14,804	14,000
Thailand	15	4	4		
Turkey	9,941	3,975	13,372	17,210	20,000
Oceania: Australia	60,642	50,601	62,744	79,121	80,000
Total	[r]4,767,071	[r]4,793,257	4,692,994	4,889,688	4,818,369

[e]Estimated. [p]Preliminary. [r]Revised.

[1]Table includes data available through Apr. 30, 1981.

[2]In addition to the countries listed, Czechoslovakia, North Korea, and Romania also produce asbestos, but output is not officially reported, and available general information is inadequate for the formulation of reliable estimates of output levels.

[3]Reported figure.

[4]Exports.

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TECHNOLOGY

Current research of most interest to asbestos producers and users is the series of animal feeding studies begun a few years ago by NIEHS. Now under the National Toxicology Program, the research aims to ascertain the carcinogenicity of ingested asbestos on hamsters and rats. Excerpts from the latest status report are given.[8]

Test Materials.—Two samples of chrysotile, and single samples of amosite and crocidolite asbestos plus a tremolite material are being tested. A repository of these materials was established and has also served as a source for other scientific studies on asbestos.

Hamster Studies.—Three asbestos materials are being studied at the Illinois Institute of Technology at Chicago. The lifetime exposure phase of these experiments has been completed. There was no indication of major differences in the mortality rate between the hamsters receiving the asbestos diet or the control diet. Histopathologic examination of tissues from female hamsters has been completed. The contractor has reported that a preliminary analysis of the hamster data indicates that no carcinogenic or cocarcinogenic effect was observed.

Rat Studies.—Five test materials are being studied in this species at the Hazleton Laboratories, Vienna, Va. In addition, a subset of two studies includes neonatal as well as lifetime oral exposure to asbestos. The lifetime exposure phase of the study has been completed. Although data have not yet been statistically analyzed, it appears that longevity was not affected by exposure to the various types of fibers, although the known carcinogen, dimethylhydrazine, did significantly shorten lifespan.

Sherbrooke University in Quebec is the scene of much ongoing research regarding asbestos. As the site of the research laboratories of both the Association des Mines d'Amiante du Québec (AMAQ) and the la Société Nationale de l'Amiante (SNA) of the Quebec Government, this is only natural. One report originating there describes the process by which asbestos tailings will be the feed for a new magnesium metal plant.[9] Another report on a joint effort by AMAQ and SNA holds high interest.[10] Professor Jacques Dunnigan has, by a simple reaction of asbestos fibers with a phosphoric salt, produced a fiber which reportedly has all the useful properties of asbestos, but has substantially less harmful physiological effects. A third interesting report from Sherbrooke decribes how magnetic concentration of asbestos tailings gives a forsterite-type material that exceeds the refractory properties of olivine because of its very low iron content. The magnetic fraction, on the other hand, surpasses olivine in thermal conductivity and heat capacity because of its higher iron content.

Substitutes.—In July, EPA, CPSC, and IRLG held a 3-day National Workshop on Substitutes for Asbestos. The meeting was intended as a factfinding exercise to ensure that future laws on minerals and health would be fair and practical. The intention was not met according to one journal.[11] In the comment section of that magazine, the meeting program was characterized as designed to uphold the traditional EPA line to nail down and bury asbestos as a commercial product and to promote substitutes. If that had indeed been the design of the workshop, then it, too, failed. The manufacturers of products containing asbestos who had found, through research too costly for smaller concerns, substitutes in the products for asbestos, characterized the new products as (1) a great deal more costly than their former asbestos-containing products, (2) inferior to the former products, and (3) containing materials of unknown health effects.

Two new organic fibers have been announced as asbestos substitutes in some areas. A trade journal carried news of the first.[12] The heat and chemical resistant fiber is called PBI (polybenzimidazole) by Celanese Corp., its developer. Celanese claims it is nonflammable in air, emits little or no smoke or toxic offgases up to 500° C, and has excellent chemical resistance. The projected $30 per pound ($60,000 per short ton) price would not compete with asbestos.

The Dupont Co. announced a new product in 1980 even though it is not a new fiber. It is also described in a trade journal.[13] Through process changes, Dupont is now able to produce a pulp of short (2 to 4 millimeters) Kevlar (aramid) fibers that are highly fibrillated, fine (less than a micrometer in diameter), and with an aspect ratio often over 500. Even though the Kevlar costs at least seven times as much as

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asbestos, Dupont claims cost-effectiveness if amount needed and lifetime costs are evaluated.

[1]Physical scientist, Section of Nonmetallic Minerals.
[2]Journal of Commerce, Mar. 5, 1981, p. 7.
[3]Cahan, V., and C. Canape. A Cancer Policy Neither Industry Nor Labor Likes. Business Week, No. 2622, Feb. 4, 1980.
[4]Nolk, B. Asbestos—Under Pressure. The Northern Miner, Nov. 27, 1980, p. 1.
[5]Khawlie, M. Letter to the Editor. Industrial Minerals (London), No. 153, June 1980.
[6]Engineering and Mining Journal. V. 181, No. 8, August 1980, p. 105.
[7]Industrial Minerals (London). No. 148, January 1980, pp. 7, 15.
[8]Biological Effects of Ingested Asbestos. Status Report, Jan. 22, 1981. National Toxicology Program, P.O. Box 12233, Research Triangle Park, N. C. 27709.
[9]Mining Magazine. V. 141, No. 6, December 1979, p. 615.
[10]Industrial Minerals (London). Quebec Claims to Safer Asbestos. No. 154, July 1980, p. 9.
[11]——. No. 156, September 1980, p. 7.
[12]Chemical Week. Business Newsletter. V. 127, No. 14, Oct. 1, 1980, p. 13.
[13]Materials Engineering. V. 93, No. 1, January 1981, p. 22.

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