Asbestos

By D. O. Kennedy [1] and James M. Foley [2]

THE UNITED STATES consumed 33 percent of the world output of asbestos in 1959 but produced only 6 percent of its requirements. Although the Nation ranked seventh among world producers, its output was only 2 percent of world production. Canada, with its extensive asbestos deposits in Quebec, produced almost 50 percent of the world supply.

TABLE 1.—Salient statistics of the asbestos industry

	1950–54 (average)	1955	1956	1957	1958	1959
United States:						
Production (sales)---short tons	50,004	44,568	41,312	43,653	43,979	45,325
Value (thousands)	$4,221	$4,487	$4,742	$4,918	$5,127	$4,379
Imports (unmanufactured) short tons	709,487	740,423	689,910	682,732	644,331	713,047
Value (thousands)	$56,604	$60,958	$61,939	$60,104	$58,314	$65,006
Exports (unmanufactured)[1] short tons	10,622	2,787	2,950	2,893	3,026	4,461
Value (thousands)	$2,260	$268	$375	$350	$424	$793
Apparent consumption short tons	748,869	782,204	728,272	723,492	685,284	753,911
Exports of asbestos products[1] (thousands)	$11,522	$12,859	$14,181	$15,223	$13,233	$12,921
World: Production---short tons	[2] 1,580,000	1,950,000	1,980,000	2,070,000	[2] 2,060,000	2,270,000

[1] Includes material that has been imported and later exported without change.
[2] Revised figure.

Invitations for bids were sent to Arizona asbestos producers for 500 tons of domestic low-iron asbestos to be used for the national stockpile.

The Commodity Credit Corporation arranged a barter program for amosite and crocidolite asbestos. Producers of crocidolite in the Union of South Africa and Australia expressed interest in the program.

DOMESTIC PRODUCTION

Asbestos production in the United States increased nearly 3 percent compared with 1958. An estimated 1 million tons of rock was mined, from which 45,000 tons of fiber was recovered.

The Vermont Asbestos Mines Division of Ruberoid Co., at Belvedere Mountain near Hyde Park, Vt., was the one large asbestos producer in the United States. A modern mill recovered fibers carefully classified in strict accordance with Canadian grading standards. The small output of spinning fiber was used in electrolytic cells rather than in textiles.

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Jaquays Mining Corp. and Phillips Asbestos Mines were the only producers in Arizona; however, shipments were also made by two other firms, American Fiber Corp. and Metate Asbestos Corp. With the termination of purchases by the Government of crudes 1, 2, and 3 on December 31, 1958, sales of these grades in 1959 decreased to 1 ton of Crude 1, none of Crude 2, and 583 tons of Group 3. The new mills of Jaquays Mining Corp. and Metate Asbestos Corp. began operating and some rejected material from former operations was processed at the Metate mill.

Two firms, the Asbestos Bonding Co. and Ray Sylvester, operated in California. The former produced short chrysotile asbestos from the Phoenix claim, Napa County, and the latter tremolite from the Sylvester asbestos claim, Shasta County.

Amphibole asbestos was produced by the Powhatan Mining Co. from the Kilpatrick claim in North Carolina.

The Bureau of Mines issued a report describing asbestos deposits in northern California.[3] The Clute Corp. of Littleton, Colo., acquired Asbestos Bonding Corp., Napa, Calif., and announced plans to install a 1,000-ton-per-day mill to produce 7-R and fine asbestos.[4] The Jefferson Lake Sulphur Co. purchased the Copperopolis, Calif., property of American Asbestos Mining Corp. after a diamond-drilling program had outlined 15 million tons of ore. The firm announced plans to erect a mill to process 2,000 tons of ore per day. Union Carbide Nuclear Corp. explored an asbestos occurrence 35 miles northwest of Coalinga, Fresno County, and National Mill and Mining Co., Inc., began construction of a mill at Coalinga.

CONSUMPTION AND USES

Consumption of chrysotile asbestos increased from 643,000 tons in 1958 to 711,000 tons in 1959. A general rise in construction accounted for most of the increase; over 96 percent of the chrysotile consumed was short fiber, which is used principally in asbestos-cement and asbestos-asphalt building materials. Increased use of asbestos fibers in plastics,[5] in asbestos-phenolic linings for missiles,[6] and as a mineral filler[7] was indicated.

PRICES

Prices of Canadian chrysotile asbestos were reduced twice during 1959 as follows:

Grade:	Price per ton		
	Jan. 1	*Oct. 10*	*Nov. 10*
Crude No. 1	$1,520–$1,900	$1,475–$1,850	$1,410–$1,475
Crude No. 2—and sundry	810– 1,230	790– 1,200	610– 875
No. 3—Spinning fiber	380– 670	370– 650	350– 650
No. 4—Shingle fiber	185– 250	180– 245	180– 245
No. 5—Paper fiber	125– 155	120– 150	120– 150
No. 6—Plaster fiber	89	86	86
No. 7—Shorts	40– 80	40– 80	40– 80

[3] Wiebelt, F. J., and Smith, M. Clair, A Reconnaissance of Asbestos Deposits in the Serpentine Belt of Northern California: Bureau of Mines Inf. Circ. 7860, 1959, 52 pp.
[4] Engineering and Mining Journal, Chrysotile Asbestos Plant Will Be Expanded: Vol. 160, No. 12, December 1959, p. 128.
[5] Electronic News, Asbestosized Plastics Held Growing in Parts: Vol. 4, No. 128, Feb. 9, 1959, p. 17.
[6] Missiles and Rockets, Asbestos Availability: Vol. 6, No. 3, Jan. 18, 1960, p. 40.
[7] Dietrich, W. F., Market Trends for Mineral Fillers in Western States: Min. Eng., vol. 11, No. 8, August 1959, pp. 813–817.

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British Columbia chrysotile asbestos prices as quoted in E&MJ Metal and Mineral Markets were unchanged as follows: Per short ton f.o.b. Vancouver, British Columbia (Canadian currency effective Oct. 1, 1957), crude No. 1 $1,568, AAA $811, AA $703, A $509, AC $335, and AK $227. The AAA fiber corresponds to Rhodesian C&G 1, AA to C&G 2, A to Canadian 3K, AC to Rhodesian C&G 3, and AK to Canadian 4K.

Prices of Vermont asbestos per short ton, f.o.b. Hyde Park or Morrisville, changed in November as follows:

	Jan. 1, 1959	*Nov. 10, 1959*
Group 3 (spinning and filtering)	$370–$428	$353–$440
Group 4 (shingle)	181– 200	181– 218
Group 5 (paper)	120– 152	120– 142
Group 6 (plaster)	86	86
Group 7 (shorts)	41– 75	41– 75

Prices of Arizona asbestos, published in Asbestos magazine, were based upon monthly figures furnished by Arizona producers. The method of classifying Arizona price quotations of crudes 1, 2, and 3, soft and semisoft, and filter fiber, was changed as follows:

	Per short ton, f.o.b Globe	
Grade:	*May 10, 1959*	*Dec. 10, 1959*
No. 1 crude	$1,475–$1,850	$1,475–$1,850
No. 2 crude	830– 1,260	830– 1,260
Group 3	375– 675	350– 450
Group 4	190– 250	190– 250
Group 5	125– 177	125– 177
Group 7	60	60– 100

Market quotations are not available for African or Australian asbestos, because purchases and sales are negotiated individually. U.S. Department of Commerce reports show the following average values per short ton for imports:

Imports:	*1958*	*1959*
Amosite	$150.44	$153.10
Crocidolite:		
Bolivia	70.00	-------
Australia	213.57	205.99
Union of South Africa	192.45	199.13

FOREIGN TRADE [8]

Imports of crocidolite increased 3 percent, imports of amosite decreased 2 percent, and imports of chrysotile increased 11 percent compared with 1958, resulting in a net increase of 11 percent in total imports of asbestos in 1959.

Nearly 97 percent of the chrysotile imported was short fiber of less than spinning length. Imports of low-iron chrysotile of spinning length from British Columbia increased from 4,779 tons in 1958 to 5,988 tons in 1959.

[8] Figures on imports and exports compiled by Mae B. Price and Elsie D. Jackson, Division of Foreign Activities, Bureau of Mines, from records of the U.S. Department of Commerce, Bureau of the Census.

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Imports from Australia consisted solely of crocidolite. The Union of South Africa supplied crocidolite and chrysotile and was the only source of amosite. Only chrysotile was imported from other countries.

Exports of unmanufactured asbestos increased slightly. Compared with imports they were insignificant.

TABLE 2.—Asbestos (unmanufactured) imported for consumption in the United States, by countries and classes

[Bureau of the Census]

Country	Crude (including blue fiber)		Mill fibers		Short fibers		Total	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1958								
North America: Canada	707	$277,934	134,190	$24,452,416	450,527	$23,643,514	585,424	$48,373,864
South America:								
Bolivia	11	770					11	770
Venezuela	6	824	17	2,160	25	3,870	48	6,854
Europe:								
Finland	7	313			55	1,500	62	1,813
Italy			2	2,940			2	2,940
Portugal	4	560			14	1,455	18	2,015
Yugoslavia	4,090	196,251					4,090	196,251
Asia: Japan					6	1,653	6	1,653
Africa:								
British East Africa			9	706	50	6,266	59	6,972
Rhodesia and Nyasaland Federation of [1,2]	7,178	1,221,092	660	132,035	294	42,470	8,132	1,395,597
Union of South Africa[3]	38,837	6,760,670	491	86,630	1,074	180,572	40,402	7,027,872
Oceania: Australia	6,077	1,297,860					6,077	1,297,860
Total	56,917	9,756,274	135,369	24,676,887	452,045	23,881,300	644,331	58,314,461
1959								
North America: Canada	339	109,269	149,341	28,184,066	504,845	26,681,457	654,525	54,974,792
South America: Venezuela			90	11,800	26	2,200	116	14,000
Europe:								
Finland	102	3,630			123	3,000	225	6,630
Italy			8	9,525			8	9,525
Portugal	14	1,680					14	1,680
U.S.S.R.	3	643					3	643
Yugoslavia	5,646	212,869					5,646	212,869
Africa:								
British East Africa					49	6,450	49	6,450
Rhodesia and Nyasaland, Federation of [1]	4,347	897,760	729	143,317	111	24,542	5,187	1,065,619
Union of South Africa[3]	36,446	6,485,909	1,511	322,986	760	141,860	38,717	6,950,755
Oceania: Australia	8,557	1,762,690					8,557	1,762,690
Total	55,454	9,474,450	151,679	28,671,694	505,914	26,859,509	713,047	65,005,653

[1] All believed to be from Southern Rhodesia.

[2] Includes 2 tons ($787) crysotile crudes, credited by the Bureau of the Census to the United Kingdom, and 4 tons ($589) credited to Mozambique, also 206 tons ($47,167) mill fibers, credited by the Bureau of the Census to the United Kingdom.

[3] Includes 1958: 51 tons ($10,800) blue crocidolite and 39 tons ($5,312) amosite crude credited by the Bureau of the Census to Mozambique; 1 ton ($405) amosite crude credited by the Bureau of the Census to West Germany; 880 tons ($125,723) blue crocidolite and 314 tons ($46,365) amosite crude credited by the Bureau of the Census to the Federation of Rhodesia and Nyasaland; 259 tons ($55,950) short fibers credited by the Bureau of the Census to the United Kingdom; and 42 tons short fibers ($5,475) credited to Mozambique. 1959: 75 tons ($9,066) other chrysotile crude, 2 tons ($787) blue crocidolite, 818 tons ($179,364) spinning fibers, and 446 tons ($92,517) short fibers credited by the Bureau of the Census to the United Kingdom; 8 tons ($6,580) amosite crude credited by the Bureau of the Census to Italy; 294 tons ($53,308) other chrysotile crude, 287 tons ($52,197) blue crocidolite, 73 tons ($10,303) short fibers credited by the Bureau of the Census to Mozambique; and 459 tons ($74,879) blue crocidolite, and 129 tons ($18,002) amosite crude credited by the Bureau of the Census to the Federation of Rhodesia and Nyasaland.

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TABLE 3.—Asbestos imported for consumption in the United States, from specified countries, by grades, in short tons

[Bureau of the Census]

Grade	1958			1959		
	Canada	Southern Rhodesia [1]	Union of South Africa	Canada	Southern Rhodesia [1]	Union of South Africa
Chrysotile:						
Crude:						
No. 1	56	[2] 418	20	41	35	
No. 2	190	65		30	20	
Other	461	[2] 6,695	2,133	268	4,292	[3] 1,826
Spinning or textile	18,915	460	466	20,488	527	[3] 1,173
Shingle	68,890	200	25	72,679	202	300
Paper	46,385			56,174		38
Short fiber	450,527	294	[3] 1,074	504,845	111	[3] 760
Crocidolite (blue)			[3] 19,690			[3] 18,006
Amosite			[3] 16,994			[3] 16,614
Total	585,424	8,132	40,402	654,525	5,187	38,717

[1] Reported by the Bureau of the Census as Federation of Rhodesia and Nyasaland. Believed to be from Southern Rhodesia.
[2] Includes countries adjusted by Bureau of Mines. See table 2, footnote 2, for explanation.
[3] Includes countries adjusted by Bureau of Mines. See table 2, footnote 3, for explanation.

TABLE 4.—Exports (domestic [1] and foreign [2]) of asbestos and asbestos products from the United States, by kinds

[Bureau of the Census]

Products	1958		1959	
	Quantity	Value	Quantity	Value
Domestic:				
Unmanufactured:				
Crude and spinning fibers—short tons	278	$85,979	1,216	$295,549
Nonspinning fibers—do	514	88,907	802	200,003
Waste and refuse—do	2,145	232,143	2,299	267,736
Total unmanufactured—do	2,937	407,029	4,317	763,288
Products:				
Brake lining and blocks—Molded, semimolded and woven	[3]	4,612,458	[3]	4,673,987
Clutch facing and lining—number	1,340,622	1,091,636	1,427,059	1,139,154
Construction materials, n.e.c.—short tons	13,961	2,758,785	11,031	2,423,793
Pipe covering and cement—do	3,054	1,032,879	2,414	1,081,061
Textiles, yarn, and packing—do	1,166	2,965,097	1,164	2,812,663
Manufactures, n.e.c	[4]	764,740	[4]	771,660
Total products		13,225,595		12,902,318
Foreign:				
Unmanufactured:				
Crude and spinning fibers—short tons			53	12,570
Nonspinning fibers—do	30	6,252	19	3,600
Waste and refuse—do	59	11,045	72	13,780
Total unmanufactured—do	89	17,297	144	29,950
Products:				
Brake lining and blocks—Molded, semimolded and woven	[3]	740	[3]	18,519
Construction materials, n.e.c.—short tons	56	7,101		
Total products		7,841		18,519

[1] Material of domestic origin, or foreign material that has been milled, blended, or otherwise processed in the United States.
[2] Material that has been imported and later exported without change.
[3] Values have been summarized; quantities not shown.
[4] Quantity not recorded.

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WORLD REVIEW

NORTH AMERICA

Canada.—Production from 14 mills—12 in Quebec and 1 each in Ontario and British Columbia—increased about 14 percent. During the year 23.1 million tons of rock was mined and 1.1 million tons of fiber recovered from 14 million tons of ore milled. More than 7,000 men were employed in the Quebec mines.

Expansion of the asbestos producing industry resulted in overproduction, accumulation of large inventories at warehouses, and seasonal shutdowns at mines of Asbestos Corp., Ltd., and Johnson's Co., Ltd.[9]

Programs were started by the Canadian Johns-Manville Co., Ltd., to give more emphasis to open-pit than underground mining at the Jeffery mine[10] in Quebec and to convert from open-pit to underground mining at the Munro mine in Ontario.

The first year of operations at National Asbestos Mines, Ltd., Thetford Mines, Quebec, was reportedly very successful.[11] Underground mining methods were described at five asbestos mines in Quebec.[12]

Operations of Cassiar Asbestos Corp., Ltd., in British Columbia were expanded; sales commitments in 1958 and 1959 necessitated the installation of mill equipment to increase daily capacity from 1,000 to 1,500 tons of ore.[13]

A test mill at Advocate Mines, Ltd., property in Newfoundland produced more than 200 tons of fiber, which was shipped to plants in the United States and Europe for further testing. Feed for the test mill was provided by underground exploration and development work. It was reported that diamond drilling at the Atomic Mining Corp. property in Quebec outlined 9 million tons of 5.1-percent asbestos ore. Exploration on the Chibougamau asbestos property in northwestern Quebec revealed three asbestos-bearing zones. A pilot mill was placed in operation by Golden Age Mines at its property near Beauceville in Quebec. The Murray Mining Corp. began drilling a large asbestos-bearing belt near Deception Bay in the Ungava region of northern Quebec. Encouraging results were reported.[14] The first plant for manufacturing asbestos-cement pipe in Quebec opened in May at Montreal East.

SOUTH AMERICA

Argentina.—Exploration was begun in Jaque, La Rioja Province, of deposits reportedly containing chrysotile, some anthophyllite, and crocidolite.

[9] Northern Miner (Toronto), Asbestos Industry Hits Seasonal Lag Improvement in 1959: Vol. 45, No. 44, Jan. 21, 1960, p. 3.
[10] Asbestos, Change in Jeffery Mine Program: Vol. 41, No. 2, August 1959, pp. 10, 12, 14.
[11] Meschter, Elwood, National Gypsum Co. Jumps into Asbestos Production: Rock Products, vol. 62, No. 7, July 1959, pp. 94–96, 98, 100.
[12] Sinclair, W. E., Underground Mining in Canadian Asbestos Mines: Asbestos, vol. 41, No. 1, July 1959, pp. 2, 4, 6, 8, 10.
[13] Northern Miner (Toronto), Cassiar Asbestos Shows Higher Net Mill Being Enlarged: Vol. 45, No. 41, Dec. 31, 1959, pp. 1, 8.
[14] Northern Miner (Toronto), Mine Chances Good for Murray Mining in Asbestos Field: Vol. 45, No. 24, Sept. 3, 1959, pp. 1, 7.

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TABLE 5:—World production of asbestos by countries,[1] in short tons[2]

[Compiled by Helen L. Hunt and Berenice B. Mitchell]

Country [1]	1950–54 (average)	1955	1956	1957	1958	1959
North America:						
Canada (sales) [3]	922,645	1,063,802	1,014,249	1,046,086	925,331	1,050,429
United States (sold or used by producers)	50,004	44,568	41,312	43,653	43,979	45,325
Total	972,649	1,108,370	1,055,561	1,089,739	969,310	1,095,754
South America:						
Argentina	212	1,380	238	319	285	[4] 275
Bolivia (exports)	377		62	121		168
Brazil	1,599	3,124	3,739	2,654	3,816	[4] 3,300
Chile	170					
Venezuela	371	1,757	5,041	8,390	9,152	5,095
Total	2,729	6,261	9,080	11,484	13,253	[4] 8,800
Europe:						
Bulgaria	685	1,323	1,100	1,100	1,100	[4] 1,100
Finland [5]	11,299	18,674	8,282	10,031	7,977	9,420
France	10,048	14,459	9,370	15,731	20,503	26,455
Greece	20	3	6	9		
Italy	25,161	35,385	39,446	37,797	39,627	49,594
Portugal	193	56	35	64	98	[4] 110
Spain	60					
U.S.S.R.[4]	300,000	450,000	500,000	500,000	550,000	600,000
Yugoslavia	2,646	4,305	4,165	5,025	5,960	4,748
Total [4]	350,000	525,000	560,000	570,000	625,000	690,000
Asia:						
China [4]	8,000	23,000	26,000	33,000	66,000	88,000
Cyprus	16,980	15,306	15,375	15,028	16,494	[6] 15,943
India	604	1,564	1,378	1,910	1,190	1,464
Iran [7]	12	110	[4] 165	[4] 165	[4] 165	[4] 165
Japan	5,501	6,932	9,914	13,192	11,179	13,669
Korea, Republic of	46	66	54	96	22	88
Taiwan	93	403	118	268	47	150
Turkey	82	259	634	99	839	[4] 40
Total [4]	31,000	48,000	54,000	64,000	96,000	120,000
Africa:						
Bechuanaland	425	1,426	1,356	1,582	1,734	1,410
Eritrea	[8] 55			55	28	[4] 30
Egypt	389			22	485	[4] 400
Kenya	290	152	170	109	120	45
Morocco: Southern zone	612	631	379	132		
Mozambique	40	301	202	152	284	74
Rhodesia and Nyasaland, Federation of: Southern Rhodesia	80,345	105,261	118,973	132,124	127,115	119,699
Swaziland	32,529	32,613	29,875	30,727	25,261	24,807
Uganda	1	2	2		5,600	6,418
Union of South Africa	106,518	119,699	136,520	157,474	175,644	182,405
Total	221,204	260,085	287,477	322,377	336,271	335,288
Oceania:						
Australia	4,014	5,993	9,709	14,670	15,570	[4] 20,000
New Zealand	344	172	368	230	454	[4] 450
Total	4,358	6,165	10,077	14,900	16,024	[4] 20,450
World total (estimate) [1] [2]	1,580,000	1,950,000	1,980,000	2,070,000	2,060,000	2,270,000

[1] Asbestos also is produced in Czechoslovakia, North Korea, and Rumania. No estimates for these countries are included in the total, as production is believed to be negligible.

[2] This table incorporates some revisions. Data do not add to totals shown because of rounding where estimated figures are included in the detail.

[3] Exclusive of sand, gravel, and stone (waste rock only), production of which is reported as follows: 1950–54 (average) 33,796 tons; 1955, 28,582 tons; 1956, 45,427 tons; 1957, 13,652 tons; 1958, 18,450 tons; 1959, 29,532 tons.

[4] Estimate.

[5] Includes asbestos flour.

[6] Exports.

[7] Year ended March 20 of year following that stated.

[8] Average for 1 year only, as 1954 was first year of commercial production.

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TABLE 6.—Sales of asbestos in Canada by grades

[Dominion Bureau of Statistics]

Grades	1958			1959		
	Short tons	Value		Short tons	Value	
		Total (thousands)	Average per ton		Total (thousands)	Average per ton
Crude No. 1, 2, and other	605	$617	$1,020	432	$491	$1,137
Milled group:						
3	24,900	10,852	436	30,375	13,338	439
4	215,670	40,717	189	238,185	44,210	186
5	101,992	13,025	128	135,459	17,409	129
6	138,747	11,325	82	166,346	13,838	83
7	427,665	18,208	43	465,052	20,256	44
8	15,752	324	21	14,580	303	21
Total, all grades	925,331	95,068	103	1,050,429	109,845	105
Waste rock	18,450	24	1	29,532	29	1

EUROPE

Finland.—The use of anthophyllite asbestos in Finland was described.[15] Anthophyllite has been used in acid-resistant cement, compounds, and plastics in which acid-resistant fibers of moderate strength can be used. Small quantities of short fiber (approximate value $30 per ton) were exported to the United States in 1958 and 1959.

Greece.—Exploration of the Macedonian asbestos deposit by Kennecott Copper Corp. outlined a large body of fiber suitable for use in the asbestos-cement industry. Plans to develop the property were underway.

Rumania.—New asbestos deposits were reported at Socet, Urdele, and Mutinu in the Paring, Poiana Rusca, and Sebes Mountains.

Yugoslavia.—Most of the asbestos produced in Yugoslavia was very short fiber, and the bulk (approximate value $50 per ton) was exported to the United States. Requirements for longer crude material were met by imports, mainly from U.S.S.R.

ASIA

India.—Asbestos was mined in opencut mines in five States and in an underground mine at Cuddapah, Andhra State. Domestic production supplied less than one-tenth of the demand of the growing asbestos-cement industry. Nearly two-thirds of the imported asbestos in 1958 came from Southern Rhodesia.[16]

Japan.—The Hokkaido deposits of the Yamabe district supplied almost all of the output of chrysotile asbestos. Imported asbestos, primarily from Canada and Union of South Africa, was more than 40,000 tons.[17]

Malaya, Federation of.—The Malayan Nozawa Asbestos Co., Ltd., announced plans to build an asbestos-sheet manufacturing plant.

[15] Kosonen, E., Over 50 Years of Asbestos Mining in Finland: Asbestos, vol. 40, No. 12, June 1959, pp. 24, 26. 28.
[16] Gilbert, H. A., India Still Needs Asbestos: Foreign Trade (Ottawa), vol. 112, No. 6, Sept. 12, 1959, pp. 15–16.
[17] Bureau of Mines, Mineral Trade Notes: Vol. 50, No. 3, March 1960, pp. 4–5.

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Pakistan.—The first asbestos-cement sheet plant in Pakistan opened in August 1959. Domestic cement and imported asbestos were used as raw materials. Imports of asbestos sheets were banned by the Government to encourage and assist the new enterprise.

AFRICA

Nigeria.—An Italo-Anglo-Nigerian company was formed to construct a plant for manufacturing asbestos-cement products in Nigeria. Two English groups agreed to furnish the capital and to use Italian technicians and machinery in the project.

Rhodesia and Nyasaland, Federation of.—The Rhodesian and General Asbestos Corp., Ltd. (Turner and Newall), acquired Rhodesian Asbestos Co., Ltd. (Johns-Manville), and mined asbestos at the Temeraire mine, Meshaba area, Southern Rhodesia. Production of top-grade spinning fibers, corresponding to Canadian groups 1, 2, and 3, was more than 14 percent of the total production of asbestos in Southern Rhodesia, compared with 2.5 percent in Canada. Mines controlled by the Turner and Newall group produced over 75 percent of the total output of Southern Rhodesia.[18]

TABLE 7.—Asbestos produced in Southern Rhodesia

Year	Short tons	Value (thousands)	Year	Short tons	Value (thousands)
1955	105, 261	$19, 684	1958	127, 115	$24, 147
1956	118, 973	23, 832	1959	119, 699	20, 753
1957	132, 124	25, 185			

TABLE 8.—Asbestos produced in the Union of South Africa, by varieties and sources, in short tons

Variety and source	1955	1956	1957	1958	1959
Amosite (Transvaal)	50, 137	50, 097	56, 798	69, 773	71, 720
Chrysotile (Transvaal)	20, 535	24, 336	25, 646	27, 403	29, 326
Blue (Transvaal)	13, 964	14, 399	15, 303	16, 670	13, 113
Blue (Cape)	34, 878	47, 688	59, 549	61, 520	68, 024
Anthophyllite (Transvaal)	185	----------	----------	----------	----------
Tremolite (Transvaal)	----------	----------	178	278	222
Total	119, 699	136, 520	157, 474	175, 644	182, 405

TABLE 9.—Asbestos produced in and exported from the Union of South Africa

Year	Production (short tons)			Exports	
	Transvaal	Cape Province	Total	Short tons	Value (thousands)
1955	84, 821	34, 878	119, 699	114, 056	$18, 625
1956	88, 832	47, 688	136, 520	122, 867	20, 432
1957	97, 925	59, 549	157, 474	142, 799	25, 278
1958	114, 124	61, 520	175, 644	145, 796	25, 420
1959	114, 381	68, 024	182, 405	151, 515	25, 971

[18] Mining Journal (London), Asbestos in Southern Rhodesia: Vol. 252, No. 6451, Apr. 10, 1959, pp. 392–393; vol. 254, No. 6495, Feb. 12, 1960, pp. 178–179.

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Union of South Africa.—All operations at the chrysotile mine of Stoltzburg Asbestos Holding, Ltd., were suspended pending a special investigation of ore reserves, mining methods, and a possible increase in milling facilities.[19]

OCEANIA

Australia.—Australian Blue Asbestos, Ltd., reported recovery of 13,313 tons of fiber from 214,505 tons of ore milled. Eighty-six percent of the total Australian asbestos production was crocidolite.

Advancing the industrial economy of Australia was the installation at Regents Park, New South Wales, of the first asbestos-gasket manufacturing plant in the Southern Hemisphere.[20]

TECHNOLOGY

Several noteworthy publications on asbestos were issued. A revision of "A Materials Survey, Asbestos," by the late Oliver Bowles, contained the fundamental data needed by defense personnel responsible for emergency planning.[21] A new edition of a textbook on asbestos included new chapters on primary production and manufacture of asbestos products in North America.[22] The structure of the Canadian industry was outlined, and production and demand trends were discussed.[23] Two books on asbestos and other inorganic fibers discussed the traditional applications of asbestos fibers, the development of new products, and their use in the missile industry.[24] Practically all specifications for asbestos materials for electrical insulation have requirements for maximum amounts of total iron and magnetic iron. The significance of these requirements was discussed in an article summarizing the work of a subcommittee of the American Society for Testing Materials.[25]

Industrial television was installed in the Jeffery mine at Asbestos, Quebec, to improve hoisting efficiency. The skip attendant on the 940 level was able to see the skips in either of two dumping positions.[26]

A new asbestos-milling machine, with an inclined conveyor belt in place of aspiration equipment, was described.[27] Five patents were issued by the U.S. Patent Office on methods of opening and recovering asbestos fibers. A mechanic at the British Canadian mine, Black Lake, Quebec, developed a new sealing ring, which prevented the escape of dust from a cone crusher. Overhaul of the crusher to clean

[19] Mining World, Union of South Africa: Vol. 21, No. 2, February 1959, p. 78.
[20] Industrial and Mining Standard (Melbourne), Asbestos in Industry: Vol. 114, No. 2879, May 7, 1959, p. 3.
[21] Bowles, Oliver, Asbestos, A Materials Survey: Bureau of Mines Inf. Circ. 7880, 1959, 94 pp.
[22] Sinclair, W. E., Asbestos, Its Origin, Production, and Utilization: Min. Pub., Ltd., London, 1959, 512 pp.
[23] Bonkoff, E. J., Canadian Asbestos Industry: General Research Associates, Toronto, 1958, 41 pp.
[24] Rosato, D. V., Asbestos, Its Industrial Applications: Reinhold Publishing Corp., 1959, 214 pp.
Carroll-Porczynski, C. Z., Inorganic Fibres: Academic Press, 1959, 350 pp.
[25] Nicodemus, P. O., The Significance of Iron in Asbestos Materials Used for Electrical Insulating Purposes: ASTM Bull. 237, April 1959, pp. 62–67.
[26] Mine and Quarrying Engineering (London), Mine Television: Vol. 25, No. 8, August 1959, p. 376.
[27] Smith, C. V., A New Process for the Separation of Asbestos Fibre from Crushed Rock: Asbestos, vol. 40, No. 9, March 1959, pp. 14–18.

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dust-fouled machine parts was reduced from once in 3 months to once in 15 months.

Technical service was reported to have an increasingly important role in the sale of asbestos fiber. Asbestos producers were advised to assist in developing and producing more efficient fiber and in developing new uses. Interpretation of consumer requirements into the most effective fiber production was said to be the primary role of technical service.[28]

The asbestos-cement products committee of the American Society for Testing Materials revised the specifications for asbestos-cement pipe, sheet, shingles, and siding. Four patents were issued for asbestos-cement products and for an apparatus that detaches pipe pneumatically from the mandrel on which it is found.

Numerous patents were issued covering the use of asbestos in special heat insulating applications, electrical insulators, vibration damping materials, filters, paint fillers, part of the porous material for filling acetylene containers, and drilling muds for use under conditions of high temperature.

A new motion picture on asbestos, produced in cooperation with the Johns-Manville Co., was added to the Bureau of Mines film library. The new film shows mining operations and describes the uses of asbestos fibers.

[28] Monroe, D. L., The Role of Technical Service in Today's Asbestos Fibre Market: AIME Preprint 59H308, September 1959, 7 pp.

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