Talc, Soapstone, and Pyrophyllite

By Donald R. Irving [1] and Betty Ann Brett [2]

ALTHOUGH mine production of talc, soapstone,[3] and pyrophyllite in 1958 approached the record high of 1956, sales of these commodities were only slightly greater than in 1957. Imports increased during the year, and exports reached an alltime high.

TABLE 1.—Salient statistics of the talc, soapstone, and pyrophyllite industries

(In thousand short tons and thousand dollars)

	1949–53 (average)	1954	1955	1956	1957	1958
United States:						
Mine production:						
Quantity	590	619	726	739	684	737
Value [1]	[2] $3,524	$3,493	$4,517	$4,859	$4,796	$4,818
Sold by producers:						
Quantity	584	600	719	735	692	694
Value	$10,439	$12,634	$15,225	$15,026	$14,411	$14,206
Imports for consumption:						
Quantity	21	22	29	23	20	23
Value	$681	$678	$986	$749	$701	$785
Exports: [3]						
Quantity	21	24	35	42	40	59
Value	$638	$855	$961	$1,083	$1,265	$1,451
World: Production (estimated): Quantity	1,550	1,620	1,790	1,930	2,030	2,000

[1] Partly estimated.
[2] 1953 only.
[3] Excludes powders—talcum (in package), face, and compact.

DOMESTIC PRODUCTION

New York, California, and North Carolina ranked first, second, and third, respectively, in the quantity of talc, soapstone, and pyrophyllite produced, an order maintained since 1951. North Carolina continued as the major pyrophyllite-producing State, followed by Pennsylvania (sericite schist) and California.

Talc operations in Hudspeth County, Tex., were described.[4] Talc production in Texas has increased steadily since its beginning in 1952. About 95 percent of the output was used in wall-tile bodies; about 30 percent was exported to Mexico.

Pennsylvania became a soapstone-producing State.

[1] Assistant chief, Branch of Ceramic and Fertilizer Materials.
[2] Statistical clerk.
[3] Excludes soapstone sold in slabs and blocks, which is part of the stone industry.
[4] Flawn, P. T., Texas Miners Boast Talc Output: Eng. Min. Jour., vol. 159, No. 1, January 1958, pp. 104–105.

TABLE 2.—Talc, soapstone, and pyrophyllite sold by producers in the United States, by classes

Year	Crude			Sawed and manufactured		
	Short tons	Value at shipping point		Short tons	Value at shipping point	
		Total	Average		Total	Average
1949–53 (average)	18,431	$191,370	$10.38	890	$321,148	$360.84
1954	19,052	190,685	10.01	1,012	290,697	287.25
1955	47,032	340,243	7.23	1,311	397,476	303.19
1956	42,085	265,631	6.31	1,052	441,848	420.01
1957	57,382	330,131	5.75	1,212	519,664	428.77
1958	61,287	349,471	5.70	801	400,453	499.94

Year	Ground [1]			Total		
	Short tons	Value at shipping point		Short tons	Value at shipping point	
		Total	Average		Total	Average
1949–53 (average)	564,826	$9,926,418	$17.57	584,147	$10,438,936	$17.87
1954	579,934	12,152,651	20.96	599,998	12,634,033	21.06
1955	671,043	14,487,640	21.59	719,386	15,225,359	21.16
1956	691,661	14,318,414	20.70	734,798	15,025,893	20.45
1957	633,330	13,561,497	21.41	691,924	14,411,292	20.83
1958	631,804	13,455,650	21.30	693,892	14,205,574	20.47

[1] Includes some crushed material.

TABLE 3.—Pyrophyllite [1] produced and sold by producers in the United States

Year	Production (short tons)	Sales					
		Crude		Ground		Total	
		Short tons	Value	Short tons	Value	Short tons	Value
1949–53 (average)	115,341	4,653	$26,146	109,655	$1,478,067	114,308	$1,504,213
1954	126,702	3,015	18,552	114,998	1,644,337	118,013	1,662,889
1955	158,460	19,830	124,904	[2] 135,506	2,005,069	155,336	2,129,973
1956	167,756	20,847	121,497	141,143	1,808,502	161,990	1,929,999
1957	160,538	26,414	127,865	135,368	1,925,973	161,782	2,053,838
1958	174,644	20,732	135,790	122,419	1,886,531	143,151	2,022,321

[1] Includes sericite schist, 1953–58.
[2] Includes a small quantity of sawed material.

TABLE 4.—Crude talc, soapstone, and pyrophyllite produced in the United States

State	1957		1958	
	Short tons	Value [1] (thousands)	Short tons	Value [1] (thousands)
Alabama	1,600	$3	(2)	(2)
California	133,915	1,526	148,806	$1,439
Georgia	49,372	106	(2)	(2)
Maryland and Virginia	24,690	100	26,674	115
Nevada	7,467	57	5,391	41
North Carolina	120,905	558	126,158	614
Texas	47,780	199	60,827	168
Washington	4,065	25	4,000	21
Other States [3]	294,659	2,222	365,477	2,420
Total	684,453	4,796	737,333	4,818

[1] Partly estimated.
[2] Included with "Other States."
[3] Includes States indicated by footnote 2 and Arkansas, Montana, New York, Pennsylvania, and Vermont.

CONSUMPTION AND USES

Ceramics, paints, insecticides, roofing, rubber, asphalt filler, and paper consumed 80 percent of the talc and soapstone sold by producers, compared with 83 percent in 1957. Percentage increases were reported for ceramics and roofing; decreases were reported for paint, insecticides, rubber, and asphalt filler. Insecticides and ceramics consumed 55 percent of the pyrophyllite sold by producers, compared with 47 percent in 1957.

TABLE 5.—Talc, soapstone, and pyrophyllite sold or used by producers in the United States, by uses

Use	Talc and soapstone		Pyrophyllite	
	1957	1958	1957	1958
	Short tons	Short tons	Short tons	Short tons
Asphalt filler	19,073	18,493	(1)	(1)
Ceramics	170,326	187,668	33,722	36,273
Crayons	712	701		
Foundry facings	7,352	4,823		
Insecticides	45,184	37,888	42,166	42,285
Paint	119,848	102,058	6,223	5,480
Paper	15,980	18,302		
Plaster products			4,766	4,399
Rice polishing	1,785	2,666		
Roofing	39,124	53,044		64
Rubber	28,532	24,431	(1)	12,458
Textile	7,393	8,556		
Toilet preparations	10,390	9,541		
Other	[2] 64,443	[2] 82,570	[3] 74,905	[3] 42,192
Total	530,142	550,741	161,782	143,151

[1] Included with "Other" to avoid disclosing individual company confidential data.
[2] Includes adhesive, cement admixtures, composition floor and wall tile, export, fertilizer, instrument wire and cable, joint cement, plaster, plastics, refractories, stucco, and vault manufacturing.
[3] Includes uses indicated by footnote 1 and exports, heavy clay products, joint cement, refractories, stucco, and related products.

PRICES

The price quotations in trade journals for talc remained unchanged during the year. These quotations merely indicate the range of prices; actual prices are negotiated between buyer and seller, based on a wide range of specifications.

TABLE 6.—Prices quoted on ground talc, in bags, carlots, 1958, per short ton

[Oil, Paint and Drug Reporter]

Grade	1958
Domestic, f.o.b. works:	
Ordinary:	
California	$33.00–$39.50
Vermont	19.40
Fibrous (New York):	
Offcolor	28.00
325-mesh:	
99.5 percent	31.00
99.95 percent, micronized	38.00
Imported (Canadian), f.o.b. mines	20.00– 35.00

TABLE 7.—Prices quoted on talc, carlots, 1958, per short ton, f.o.b. works

[E&MJ Metal and Mineral Markets]

Grade [1]	1958
Georgia: 98 percent minus-200-mesh:	
Gray, packed in paper bags	$10.50–$11.00
White, packed in paper bags	12.50– 15.00
New Jersey: Mineral pulp, ground, bags extra	10.50– 12.50
New York: Double air-floated, short fiber, 325-mesh	18.00– 20.00
Vermont:	
100 percent through 200-mesh, extra white, bulk basis [2]	12.50
99½ percent through 200-mesh, medium white, bulk basis [2]	11.50– 12.50
Virginia:	
200-mesh	10.00– 12.00
325-mesh	12.00– 14.00
Crude	5.50

[1] Containers included, unless otherwise specified.
[2] Packed in paper bags, $1.75 per ton extra.

FOREIGN TRADE [5]

A 26-percent increase in imports of ground talc from Italy more than offset declining imports from other major suppliers. The value of imports of manufactures, n.s.p.f. (not specifically provided for), except toilet preparations was $19,141, distributed as follows: West Germany, $13,688; Mexico, $3,921; and Canada, $1,532.

Shipments to Mexico and Canada comprised more than 70 percent of talc, soapstone, and pyrophyllite exports. Shipments to Mexico doubled, furnishing the rise in exports to a new high.

[5] 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.

TABLE 8.—Talc, steatite or soapstone, and French chalk imported for consumption in the United States, by classes and by countries

[Bureau of the Census]

Country	Crude and unground		Ground, washed, powdered, or pulverized, except toilet preparations		Cut and sawed		Total unmanufactured	
	Short tons	Value	Short tons	Value	Short tons	Value	Short tons	Value
1949–53 (average)	163	$25,765	20,908	$619,463	119	$36,054	21,190	$681,282
1954	36	6,230	22,076	[1] 653,850	45	18,149	22,157	[1] 678,229
1955	125	20,300	28,882	[1] 936,312	72	29,363	29,079	[1] 985,975
1956	117	17,555	23,128	[1] 684,954	106	46,761	23,351	[1] 749,270
1957								
Canada			2,119	27,322			2,119	27,322
France			3,325	74,618	2	615	3,327	75,233
India	277	42,265	755	20,732			1,032	62,997
Italy			13,572	495,078	3	828	13,575	495,906
Japan					73	33,486	73	33,486
Mexico			261	4,722			261	4,722
Other countries					8	1,687	8	1,687
Total	277	42,265	20,032	[1] 622,472	86	36,616	20,395	[1] 701,353
1958								
Canada			1,556	23,465			1,556	23,465
France			3,008	65,370	1	401	3,009	65,771
India	29	5,935	929	25,333			958	31,268
Italy	2	105	17,069	619,516	9	2,715	17,080	622,336
Japan					89	37,998	89	37,998
Mexico			198	3,900			198	3,900
Total	31	6,040	22,760	737,584	99	41,114	22,890	784,738

[1] Data known to be not comparable with other years.

TABLE 9.—Talc, pyrophyllite, and talcum powders exported from the United States

[Bureau of the Census]

Year	Talc, steatite, soapstone, and pyrophyllite				Powders—talcum (in packages), face, and compact (value, thousands)
	Crude and ground		Manufactures, n.e.c.		
	Short tons	Value (thousands)	Short tons	Value (thousands)	
1949–53 (average)	21,073	$573	116	$65	$1,375
1954	23,348	745	259	110	1,076
1955	35,230	859	135	102	1,246
1956	42,333	1,009	69	74	1,371
1957	39,985	1,127	291	138	1,322
1958	58,647	1,358	212	93	1,341

WORLD REVIEW

Estimated world production of talc, soapstone, and pyrophyllite reached 2 million tons for the second successive year; quantity increases, principally in the United States and Italy, offset the decrease in Japan.

TABLE 10.—World production of talc, soapstone, and pyrophyllite, by countries,[1] in short tons[2]

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

Country[1]	1949–53 (average)	1954	1955	1956	1957	1958
North America:						
Canada (shipments)	27,362	28,143	27,160	29,326	34,725	33,494
United States	589,785	618,994	725,708	739,039	684,453	737,333
Total	617,147	647,137	752,868	768,365	719,178	770,827
South America:						
Argentina	19,741	50,376	25,211	24,920	26,239	[3] 26,500
Brazil	18,184	21,967	27,190	30,684	23,023	[3] 22,000
Chile	61					
Paraguay	[4] 99	132	[3] 110	[3] 110	[3] 110	[3] 110
Peru	[5] 96	131	3,708	4,031	2,689	[3] 2,750
Uruguay	853	1,167	1,249	1,580	1,566	1,990
Total	39,034	73,773	57,468	61,325	53,627	[3] 53,350
Europe:						
Austria	63,839	68,310	77,905	72,813	80,915	78,074
Finland	3,305	8,197	5,265	8,146	9,259	7,330
France	112,404	132,154	132,683	126,840	156,528	155,205
Germany, West (marketable)	30,375	36,170	38,889	39,463	[3] 33,000	[3] 33,000
Greece	1,769	1,275	2,315	2,205	2,205	[3] 2,200
Italy	81,398	94,440	110,292	105,005	102,065	120,101
Norway	70,660	80,771	88,598	82,154	72,752	63,383
Portugal	7	6	11	95		
Spain	20,816	22,896	25,168	30,405	32,064	32,131
Sweden	12,239	14,689	13,695	14,492	13,918	15,242
United Kingdom	2,980	4,447	5,641	4,270	4,256	[3] 4,400
Yugoslavia			2,922			
Total [1 3]	420,000	485,000	525,000	510,000	530,000	535,000
Asia:						
Afghanistan	560	1,200	700	899	[3] 770	[3] 770
India	29,173	47,405	47,476	52,478	49,253	51,520
Japan	351,325	246,197	251,479	345,846	469,109	381,378
Korea, Republic of	11,363	20,965	12,092	15,719	12,434	17,581
Taiwan	1,265	7,791	5,807	6,758	5,938	3,677
Total [1 3]	450,000	390,000	430,000	565,000	705,000	620,000
Africa:						
Egypt	4,395	2,822	6,878	7,706	6,031	[3] 6,000
Kenya	365	111				
Union of South Africa	6,820	7,974	1,581	1,968	2,314	765
Total	11,580	10,907	8,459	9,674	8,345	[3] 6,765
Oceania: Australia	10,968	14,699	14,075	14,979	16,484	14,018
World total (estimate) [1 2]	1,550,000	1,620,000	1,790,000	1,930,000	2,030,000	2,000,000

[1] In addition to countries listed, talc or pyrophyllite was reported in China, Rumania, and U.S.S.R., but data were not available; estimates for these countries are included in total.
[2] This table incorporates a number of revisions of data published in previous Talc, Soapstone, and Pyrophyllite chapters. Data do not add exactly to totals shown because of rounding where estimated figures are included in the detail.
[3] Estimate.
[4] Average for 1 year only as 1953 was first year of commercial production.
[5] Average for 1951–53.

Canada.—Canada Talc Industries, Ltd., furnished the following prices of ground talc per short ton, f.o.b. Madoc, Ontario: Roofing grade, $10 to $13.75; Filler grade, $11.50 to $15; Ceramic grade, $17.50 to $26; and Cosmetic grade, $26 to 50.[6]

[6] Reeves, J. E., Talc and Soapstone; Pyrophyllite, Canada, 1957: Review 58, Canada Dept. Mines and Tech. Surveys, Ottawa, June 1958, p. 6.

Newfoundland Minerals, Ltd., subsidiary of American Encaustic Tile Co., Lansdale, Pa., planned to build a 100-ton-per-day grinding plant at its pyrophyllite deposit at Manuels, Newfoundland.

The Canadian talc and soapstone industry in 1957 was described as follows:[7]

During 1957 the Canadian producers of talc, soapstone, pyrophyllite and steatite shipped 34,725 short tons valued at $427,673 compared with 29,326 tons valued at $365,226 in the preceding year. Production of pyrophyllite in Newfoundland was on a fairly regular basis during the latter half of the year. Quebec mines produced ground talc and steatite, also soapstone blocks and crayons. Talc of various particle sizes was shipped from the Madoc, Ontario, area. There has been no production of talc or pyrophyllite from British Columbian properties in recent years.

The average number of persons employed in the industry was 77 to whom $222,287 were paid as salaries. Fuel cost $7,692 and 1,380,150 kwh. of electricity were purchased for $27,735. Containers and process supplies cost $107.298.

Imports of talc and soapstone in 1957 amounted to 14,949 tons valued at $536,189. Exported were 2,353 tons worth $29,848.

TABLE 11.—Talc and soapstone exported from selected countries, by countries of destination, in short tons[1 2]

[Compiled by Corra A. Barry]

Country of destination	Exporting countries					
	Austria		France		Italy	
	1957	1958	1956	1957	1957	1958
Algeria			2,006	1,953		
Austria					632	(3)
Belgium-Luxembourg	2,419	2,339	3,607	3,831	285	(3)
Canada					1,670	(3)
Denmark	76	131				
France	957	1,366			3,917	4,061
Germany:						
East	1,431	1,424				
West	17,576	17,326	4,942	5,528	6,813	6,744
Hungary	2,003	1,980				
Italy	2,241	1,498				
Morocco: Southern Zone			867	582		
Netherlands	1,048	878	1,099	918	411	(3)
Philippines	109					
Poland	25,082	26,124				
Portugal					220	(3)
Saar	89	123				
Sweden	50	88		633		
Switzerland	2,716	2,797	7,016	9,081	1,231	(3)
Union of South Africa					708	(3)
United Kingdom	563	634	5,718	6,449	9,802	10,107
United States			4,160	3,121	14,071	18,016
Yugoslavia	28	116				
Other countries	3	40	3,125	3,520	4,947	10,687
Total	56,391	56,864	32,540	35,616	44,707	49,615

[1] Computed from customs returns of exporting countries.
[2] This table incorporates a number of revisions of data published in the preceding Talc, Soapstone, and Pyrophyllite chapter.
[3] Data not separately recorded.

[7] Canada, Department of Trade and Commerce, Dominion Bureau of Statistics, The Talc and Soapstone Industry, 1957: Ind. Merchandising Div., Mineral Statistics Section, Ottawa, 1957, 5 pp.

Japan.—Suspension of trade relations between Japan and Communist China eliminated the major source of talc used by Japanese manufacturers of toilet preparations and porcelain products.[8] Some talc for these uses was imported from the Republic of Korea. Local production of talc, suitable principally for use in insecticides, was enough to meet Japan's needs for lower grade material.

For manufacturing porcelain products, consumers required talc containing 60 to 63 percent SiO_2, 30 to 33 percent MgO, not more than 0.7 percent Al_2O_3, 0.5 percent Fe_2O_3, and 0.5 percent CaO. For toilet preparations, consumers required 59 to 63 percent SiO_2, 30 to 34 percent MgO, and not more than 0.9 percent Al_2O_3, 0.7 percent Fe_2O_3, and 0.7 percent CaO.

Principal producers of ground talc were Asada Seifun, K.K., 1 Honmachi-dori 2-chome, Nakano-ku, Tokyo; Kunimine Koka Kogyo, K.K., 7 Shinkawa 1-chome, Chuo-ku, Tokyo; Nihon Talc, K.K., 1 Okajima-cho, Taisho-ku, Osaka; and Shin Nihon Kasei Kogyo, K.K., 59 Shikanjima Motomiya-cho, Konohana-ku, Osaka.

Korea, Republic of.—Pyrophyllite production in 1957 was 5,159 short tons; talc production was 7,275 short tons.[9]

Principal pyrophyllite deposits are the Okmaison and Sungsan mines, Kasa Island, Cholla Namdo; and the Milyang mine, Kyongsang Namdo. A typical analysis of the pyrophyllite shows 38.7 percent Al_2O_3, 39.2 percent SiO_2, 1.1 percent Fe_2O_3, and 14.0 percent ignition loss. Principal talc deposits are the Tongyang Talc and Chosun Talc mines, Chungchong Pukdo; and the Sinbo Talc mine, Cholla Pukdo. The material ranges from 30 to 33 percent MgO, 61 to 62 percent SiO_2, and up to 0.42 percent Fe_2O_3.

Pyrophyllite resources exceed 1 million tons; talc resources exceed 600,000 tons.

Peru.—Pyrophyllite production in 1957 was 2,554 short tons; talc production was 134 short tons.[10]

TECHNOLOGY

Insulators made from phosphate-bonded steatite talc were determined to be equal to insulators made from natural block steatite talc in evaluation tests completed in 1958 by two power-tube manufacturers. Phosphate-bonded talc was somewhat more difficult to fabricate, and manufacturing losses were 2 or 3 percent greater, but its use required no changes in tube-manufacturing procedures. The tests were conducted under the sponsorship of the U.S. Army Signal Supply Agency. Successful conclusion of the tests eliminated strategic dependency of the United States on foreign sources of block steatite talc.

A survey was made of alunite, pyrophyllite, and clay deposits in the Cerro La Tiza area, Puerto Rico.[11] A resource-use study of North

[8] Bureau of Mines, Mineral Trade Notes: Vol. 49, No. 1, July 1959, pp. 53–55.
[9] U.S. Embassy, Seoul, Korea, State Department Dispatch 70: Aug. 9, 1958, p. 2.
[10] U.S. Embassy, Lima, Peru, State Department Dispatch 766: Apr. 15, 1958, p. 6.
[11] Hildebrand, F. A., and Smith, R. J., Occurrences of Alunite, Pyrophyllite, and Clays in the Cerro La Tiza area, Puerto Rico: Geol. Survey Open File Rept., Nov. 10, 1958, 82 pp.

Carolina pyrophyllite was reported,[12] and the characteristics of California and Montana talcs were compared.[13]

Substantial reduction in thermal expansion and increased thermal shock resistance in pyrophyllite refractories were obtained in laboratory tests by adding talc to the pyrophyllite-clay mixture.[14] Studies were made of talc used in steatite ceramics,[15] the effect of pyrophyllite on the quality of saggers,[16] and the properties of ceramic talc used in the U.S.S.R.[17]

A booklet on steatite manufacturing standards was compiled.[18]

Patents were issued during 1958 for a water-dispersible talc pigment[19] and a flameproof mastic, using talc as an ingredient.[20] New processes were patented for grinding[21] and pelletizing[22] talc and other materials with similar grinding and agglomerating characteristics.

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[12] Stuckey, J. L., Resources and Utilization of North Carolina Pyrophyllite: Min. Eng., vol. 10, No. 1, January 1958, pp. 97–99.

[13] Stafford, Ray, and Felton, Ernest, A Comparative Study of California and Montana Talcs: Bull. Am. Ceram. Soc., vol. 37, No. 6, June 1958, pp. 274–279.

[14] Kenan, W. M., Control of Reversible Thermal Expansion of Pyrophyllite Refractories by Talc Additions: North Carolina State Coll., Bull. 68, April 1958, 19 pp.

[15] Santos, Persio de Souza, and Santini, Pedro [Characteristics of Talc for the Manufacture of Steatite Ceramics of Low Dielectric Loss]: Cerâmica (São Paulo), vol. 4, No. 14, 1958, pp. 2–14.

[16] Romankevich, I. P., and Gerasimova, N. A. [The Influence of Additions of Pyrophyllite on the Quality of Saggers]: Steklo i Keramika (Moscow), vol. 15, No. 6, June 1958, p. 40.

[17] Ajetikov, V. G., Belinskaia, G. V., and Zin'ko, E. I. [Properties of Tales Used in Ceramic Industry of U.S.S.R.]: Trudy Gosudarstvennyi Issledovtel'skii Elektrokeramicheskii Institut (Moscow), No. 2, 1957, pp. 15–22; Monthly Index of Russian Accessions vol. 11, No. 7, October 1958, p. 2253, The Library of Congress, Washington, 1958.

[18] Steatite Manufacturing Association, Standards of the Steatite Manufacturing Association, 1958: Bull. Am. Ceram. Soc., vol. 37, No. 5, May 1958, p. 253.

[19] Lamar, R. S. (assigned to Sierra Talc and Clay Co.), Water Dispersible Talc Pigment Composition: U.S. Patent 2,844,486, July 22, 1958.

[20] Ellis, W. P., Smith, L. I., and Steltz, I. J. (assigned to Benjamin Foster Co.), Flameproof Mastic Composition Containing Isobutylene Polymer: U.S. Patent 2,861,967, Nov. 25, 1958.

[21] Work, L. T. (assigned to Texaco Development Corp.), Fluid Energy Grinding: U.S. Patent 2,846,150, Aug. 5, 1958.

[22] Jordan, M. E. (assigned to Godfrey L. Cabot, Inc.), Process of Pelletizing Metal Silicates: U.S. Patent 2,844,444, July 22, 1958.