than in 1960. Producers at marble deposits in Inyo, San Bernardino, and Tuolumne Counties quarried and processed substantially larger quantities of stone for building exteriors, terrazzo, and roofing granules. The tonnage of natural and artificially colored roofing granules, prepared from crushed stone, gravel, slag, and volcanic cinder, increased from 404,000 tons in 1960 to 428,000 tons.

TABLE 13.—Stone sold or used by producers, by uses

Use		1960		1961	
		Quantity	Value	Quantity	Value
Dimension stone:					
Rough construction and rubble	short tons	45,270	$842,795	83,458	$729,930
Rough architectural	cubic feet	[1] 74,607	[1] 504,239	[1] 134,879	[1] 704,865
Approximate equivalent in	short tons	6,240		11,220	
Monuments and mausoleums	cubic feet	22,728	289,431	36,767	289,240
Approximate equivalent in	short tons	1,959		3,093	
Flagging	cubic feet	19,667	50,716	22,197	51,312
Approximate equivalent in	short tons	1,657		1,856	
Total dimension stone, approximate short tons		55,126	1,687,181	99,627	1,775,347
Crushed and broken stone:					
Riprap	short tons	4,942,054	6,611,511	5,108,014	7,446,743
Metallurgical	do	[2]	[2]	[2]	[2]
Concrete and roadstone	do	10,659,927	13,153,995	11,483,138	14,441,914
Railroad ballast	do	[2]	[2]	[2]	[2]
Agricultural	do	[2]	[2]	[2]	[2]
Chemical	do	[2]	[2]	25,955	249,148
Miscellaneous [3]	do	[4] 17,417,742	[4] 28,389,377	[5] 17,133,468	[5] 26,413,419
Total crushed and broken stone	do	33,019,723	48,154,883	33,750,575	48,551,224
Grand total, approximate short tons		33,074,849	49,842,064	33,850,202	50,326,571

[1] Includes dressed architectural, roofing slate, and millstock (1961).
[2] Included with "Miscellaneous" to avoid disclosing individual company confidential data.
[3] Includes whiting substitute, filler, mineral food, poultry grit, stucco, roofing granules, filter beds, terrazzo, metallurgical, railroad ballast, agricultural, chemical, and miscellaneous uses.
[4] Includes 11,878,047 short tons of limestone and oystershell used in cement valued at $14,670,521 and 726,876 tons of limestone used in lime valued at $1,974,004.
[5] Includes 12,035,463 short tons of limestone and oystershell used in cement valued at $13,305,490 and 742,458 tons of limestone used in lime valued at $2,006,600.

Sulfur.—Elemental sulfur was recovered as a byproduct of oil refining at four plants—two in Los Angeles County, and one each in Contra Costa and San Luis Obispo Counties. A chemical plant near Long Beach, Los Angeles County, received hydrogen sulfide gas from a refinery at Watson and recovered the contained sulfur. Recovery from all sources was virtually unchanged from 1960, but shipments declined 11 percent. The Long Beach chemical plant used the Simon-Carves process to extract sulfur from the gas; all other refineries employed the Modified Claus method. Output of hydrogen sulfide rose 12 percent, based on sulfur content. Recovery of liquid sulfur dioxide from stack gases at the American Smelting and Refining Co. Selby smelter, Contra Costa County, was essentially the same as in 1960.

Sulfur-ore production came principally from The Anaconda Company Leviathan mine, Alpine County. The crude ore was stockpiled for use at the company sulfuric acid plant in Nevada. Active during the year and producing sulfur used in soil treatment were Crater Sulphur mine, Inyo County, and the S Bar S and Sulphur Bank mines, Lake County. The quantity and value of sulfur ore shipments were slightly lower than in 1960.

of the FMC Corp. Mineral Products Division. The company used a gas-fired rotary kiln to produce lime from dolomite mined from a San Benito County quarry. The lime was used in extracting magnesia from the bitterns. Other plant products included synthetic gypsum and ethylene dibromide. FMC Corp., using phosphate rock and trona from company mines in Idaho and Wyoming, respectively, also operated a plant at this site to produce phosphoric acid and a variety of phosphate products. Fibreboard Paper Products Corp. purchased magnesium hydroxide and manufactured insulation in Emeryville. In Berkeley, Philadelphia Quartz Co. produced hydrous magnesium sulfate from purchased magnesite and brucite. Fibreboard also calcined crude gypsum from its Nevada mine for use in wallboard. Miscellaneous clay was dug from a deposit near Livermore by E. H. Metcalf Materials, from pits near Fremont by Interlocking Roof Tile Co. and Mission Clay Products Corp., and near Niles by Kraftile Co. These clays were sold or used for heavy clay products, floor and wall tile, stoneware, and terra cotta.

Open-hearth steel furnaces were operated by Judson Steel Corp. in Emeryville and by Pacific States Steel Corp. in Union City. The source for metal in both instances was iron and steel scrap. Installation of the proposed blast furnace for Pacific States Steel was delayed indefinitely. In Oakland, Chemical & Pigment Co. ground purchased metallic and nonmetallic minerals. C. K. Williams Co. produced natural and synthetic iron oxide pigments. Raw materials for the natural pigments were obtained from out-of-State sources.

Alpine.—Most of the sulfur ore mined in California during 1961 was obtained from the Leviathan mine near Markleeville. The Anaconda Company mined and trucked the crude mineral to its copper-leaching plant in Nevada where the ore was used in making sulfuric acid.

Government contractors produced the sand and gravel required to construct highways near Ebbetts Pass and Picketts. A portable preparation unit was operated by Nevada Lumber Co. on the west fork of the Carson River to produce aggregate for concrete. State road crews quarried decomposed granite used in road maintenance.

The only active metal mine was the Zaca near State Highway 89 southeast of Markleeville. Claude B. Lovestedt shipped silver ore from this property to the Selby smelter, Contra Costa County, where silver, gold, and lead were recovered. The ore also contained recoverable zinc.

Amador.—Silica sand from the Gladding, McBean & Co. clay-recovery plant near Ione was processed in the nearby sand plant of Owens-Illinois Glass Co. for glass manufacture and foundry use. Gladding, McBean began constructing a new and highly automated plant at Ione for processing additional tonnages of clay and sand. Fire clays recovered at the present plant, and those mined by Harbison-Walker Refractories Co. and Pacific Clay Products Co., were used in manufacturing heavy clay products and refractories. Pacific Clay Products Co. also produced miscellaneous clay. Also in the Ione area, Harley H. Kreth produced fill material for local use, and maintenance crews of the County road agency produced sand and gravel for their own use. South of Ione, Harbison-Walker Refractories Co. quarried quartzite from the Custer deposit for use in making