

Gem Stones

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GEM-STONE production in the United States in 1954 continued to depend upon the efforts of amateur collectors to provide cuttable material. A few small companies operated deposits, chiefly for turquoise, opal, tourmaline, and jade.

Because only a small percentage was mined on a commercial scale, complete statistics were not compiled on the value of the domestic output of gem stones. The value of the crude uncut stone was estimated at \$600,000 to \$700,000.

The many forms of quartz, such as agate, jasper, and petrified wood, composed the largest output, with kunzite second, jade third, and turquoise fourth. California, Texas, Oregon, Washington, and Wyoming were the chief producing States.

The gem-stone collecting and cutting hobby continued to increase in 1954, particularly in central and eastern United States. An increased number of amateur rock collectors was in the field in the Western States; however, many focused their attention on uranium prospecting instead of the collection of gem stones.

DOMESTIC PRODUCTION

The reported sources of gem materials in the United States in 1954 are listed in table 1. The principal gem-stone production, in areas where more detailed information was obtained, is given as follows:

Agate.—Production of agate in Montana increased in 1954. Of the reported \$20,000 production, about half was scenic and banded agate from the Yellowstone River. The remainder was moss agate and lower grade banded material.

The value of Oregon agate produced in 1954 approximated \$12,000. Plume thunder-egg agate from 20 miles north of Madras, Oreg., ranged in price from \$0.50 to \$10 per square inch of slab material.

Agate production valued at \$5,000 was reported from the Alpine area of Brewster County, Tex., in 1954. The total agate production in the State was considered to be greater in 1954 than in any previous year.

Gravels in Imperial County, Calif., produced several varieties of agate. The value of this material, combined with that from the Hauser geode beds in the northern part of the county, was about \$5,000 in 1954. Riverside County production was reported to be approximately 1 ton of rough agate valued at \$400.

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TABLE 1.—Localities in the United States where gem materials were reported to have been found in 1954

State	County	Locality	Gem material
Alaska	1st Judicial division	Baranof (southeast Alaska)	Petrified wood and agate.
Do.	4th Judicial division	Circle	Jade.
Do.	2d Judicial division	Kobuk River on the north	Do.
Do.	do	Noatak River	Jasper.
Arizona	Apache		Petrified wood.
Do.	do	Fort Defiance	Pyrope garnet.
Do.	Gila		Obsidian.
Do.	do	Globe (Salt River Canyon)	Serpentine.
Do.	do	Globe-Miami area	Chalcedony, turquoise, garnet, amethyst, agate, and apache tears (volcanic glass).
Do.	do	Miami	Turquoise.
Do.	do	San Carlos Reservation	Peridot.
Do.	Greenlee		Obsidian.
Do.	do	Morenci	Shattuckite and turquoise.
Do.	Maricopa	Cave Creek	Plume agate and jasper.
Do.	do	Four Peak Mountain	Amethyst.
Do.	do	New River	Plume agate.
Do.	do	Saddle Mountain	Fire agate.
Do.	do	Agua Fria River	Jasper.
Do.	Maricopa and Yavapai		
Do.	Maricopa and Yuma	Gila River	Agate.
Do.	Pima	Ajo	Shattuckite.
Do.	Pinal	Florence	Chalcedony.
Do.	do	Superior	Obsidian.
Do.	Yavapai	Mayer	Calcite onyx.
Do.	Yuma		Dumortierite and shattuckite.
Do.	do	Yuma	Garnet, petrified wood, jasper, agate, chalcedony (desert roses) and turquoise.
Arkansas	Garland	Hot Springs	Quartz crystal and novaculite.
Do.	Montgomery		Quartz crystal.
California	Alameda	Berkeley hills	Agate.
Do.	Alpine	Markleville	Do.
Do.	Calaveras	Valley Springs	Chalcedony.
Do.	El Dorado	Placerville	Idocrase, vesuvianite, and garnet.
Do.	Humboldt	Along ocean	Agate, petrified wood, jasper, and jade.
Do.	Imperial	Midway Well	Opal.
Do.	do	Ogilby	Petrified palm root.
Do.	do	Picacho Peak	Agate.
Do.	do	Salton Sea area	Desert roses.
Do.	Inyo	Bigpine	Quartz crystal.
Do.	do	Bishop	Garnet.
Do.	do	Death Valley (Wingate Pass)	Agate.
Do.	do	Independence	Turquoise.
Do.	Kern	Boron	Agatized wood.
Do.	do	Mojave	Petrified palm and agate.
Do.	do	Rosamond	Rhodonite.
Do.	Los Angeles	Los Angeles	Agate.
Do.	do	Newhall	Do.
Do.	do	Randsburg area	Agate and rhodonite.
Do.	do	Rosemead (Gem Hill)	Do.
Do.	Marin	Bolinas Bay	Agatized whalebone.
Do.	Mendocino	Covelo	Jade.
Do.	do	Eel River (Round Valley)	Jasper and jade.
Do.	Monterey	Monterey	Jade (nephrite), serpentine, and rhodonite.
Do.	Nevada	Nevada City	Opalized wood.
Do.	do	North Bloomfield	Opal.
Do.	Riverside	Coon Hollow (Wiley Well)	Agate.
Do.	do	Hemet	Agate and jasper.
Do.	do	Midland	Rhodonite crystals and spinel.
Do.	do	Sage	Rubellite.
Do.	Sacramento	Folsom	Opal and agate.
Do.	do	Sacramento	Jade (nephrite).
Do.	San Benito		Benitoite crystals.
Do.	do	New Idria	Jadeite.
Do.	San Bernardino	Needles	Agatized wood.
Do.	do	San Bernardino	Rhodonite.
Do.	do	Yermo (Calico Mountains or Mule Canyon)	Agatized palm.
Do.	San Diego	Himalaya mine (Mesa Grande)	Tourmaline.
Do.	do	Pala	Kunzite, spodumene, tourmaline and lepidolite.
Do.	San Luis Obispo	Nipomo	Sagenite and agate.
Do.	Siskiyou	Happy Camp	Jade (nephrite) and californite.
Do.	Solano	Fairfield	Travertine onyx.

TABLE 1.—Localities in the United States where gem materials were reported to have been found in 1954—Continued

State	County	Locality	Gem material
California	Trinity	Trinity River	Jade.
Do	Tulare	Porterville	Jade and chrysoprase.
Colorado	Fremont	Canon City	Agate and onyx.
Do	Mineral		Jasper and petrified wood.
Do	Rio Grande		Agate and petrified wood.
Do	Saguache	Villa Grove-Turquoise mine.	Turquoise and lazulite.
Do	Teller	Florissant	Jade.
Do	Weld	Stoneham	Petrified wood, barite crystals, and agate.
Connecticut	Middlesex	Gillette Quarry (Haddam Neck).	Tourmaline.
Florida	Hillsborough	Tampa Bay (Ballast Point).	Agatized coral.
Do	Pinellas	St. Petersburg	Agatized ancient shark bone.
Georgia	Troup	La Grange	Aquamarine.
Idaho	Benewah	Emerald Creek	Garnet.
Do	Owyhee	Homedale	Agate and jasper.
Illinois	Hancock	Hamilton	Geodes.
Do	do	Nauvoo	Do.
Iowa	De Moines	Burlington	Do.
Do	Fremont		Fossils.
Do	Henry	New Lincoln	Agate, jasper, and petrified wood.
Do	Lee	Keokuk	Geodes.
Do	Page	Clarinda	Agate.
Kansas	Cherokee	Galena	Marcasite and sphalerite.
Do	Wyandotte	Kansas City	Agate.
Louisiana	Vernon (Parish)	Hornbeck	Opalized and petrified wood.
Maine	Androscooggin	Livermore	Cinnamon garnet.
Do	do	Albany	Rose quartz.
Do	do	Kezar Lake	Amethyst.
Do	do	Newry	Rose quartz.
Do	do	Norway	Tourmaline.
Do	do	Stoneham	Smoky quartz.
Do	do	Stow	Amethyst.
Maryland	Allegany	Frostburg	Siderite and barite crystals.
Do	Baltimore	Powder Mill Conversion Tunnel (Baltimore City).	Quartz, garnet, tourmaline, and serpentine.
Do	do	Texas	Calcite crystals.
Do	do	White Marsh	Jasper and quartz.
Do	Garrett	State Line	Williamsite, rhodochrome, micro-lite, and serpentine.
Do	Montgomery	Chain Bridge vicinity	Placer gold.
Michigan	Emmet	Petoskey	Agate, devonion fossils, and Peto skey stones (coral fossils).
Do	Houghton	Houghton	Agate.
Do	Keweenaw	Ahmeek	Domeykite (metal with quartz).
Do	do	Eagle Harbor	Agate, datolite, and thomsonite.
Do	do	Five Mile Point to Keweenaw.	Agate, thomsonite, and chlorastrolites.
Do	do	Mohawk	Domeykite (metal with quartz)
Do	Marquette	Ishpeming	Jasper and jaspilite.
Do	do	Marquette	Jasper.
Do	do	Negaunee	Do.
Do	do	Republic	Jasper and jaspilite.
Do	Ontonagon	Mass.	Datolite, malachite, and tenorite
Do	do	Silver City	Agate.
Minnesota	Cook	North shore of Lake Superior.	Thomsonite.
Do	do	Paradise Beach	Agate.
Do	Lake	Beaver Bay	Agate and thomsonite.
Do	St. Louis	Duluth	Agate.
Missouri	Bollinger		Agate and jasper.
Do	Cape Girardeau		Do.
Do	Clark	Wayland	Geodes.
Do	Crawford	Cherry Valley mine (near Steelville).	Amethyst.
Do	Franklin	Ruepple mine (near Stanton).	Do.
Do	Jackson		Do.
Do	Lewis	La Grange	Agate.
Do	Madison		Agate and jasper.
Do	St. Louis	St. Louis	Geodes, agate, barite, and galena.
Do	Wayne		Agate and jasper.
Montana	Beaverhead		Quartz.
Do	do	Camp Creek	Corundum.
Do	Custer	Miles City	Agate.
Do	Dawson	Glendive	Do.
Do	Deer Lodge	Oro Fino-Dry Cottonwood district.	Sapphire.
Do	Gallatin	Bozeman	Corundum,

TABLE 1.—Localities in the United States where gem materials were reported to have been found in 1954—Continued

State	County	Locality	Gem material
Montana	Granite	Phillipsburg	Sapphire.
Do.	do	Rock Creek	Do.
Do.	Jefferson	Bernice	Barite.
Do.	do	Boulder Basin district	Tourmaline.
Do.	do	Toll Mountain, R. S.	Amethyst.
Do.	Judith Basin	Yogo Gulch	Sapphire.
Do.	Lewis and Clark	Helena	Do.
Do.	Madison	Cliff Lake	Serpentine.
Do.	do	Ennis	Garnet.
Do.	do	Granite Creek	Pegmatite.
Do.	do	Mill Canyon	Tourmaline.
Do.	do	Renova	Orthoclase crystal.
Do.	do	Rochester	Quartz crystal.
Do.	do	Sheridan	Pegmatite.
Do.	do	Silver Star	Jasper.
Do.	do	South Boulder Creek	Quartz.
Do.	do	Sweetwater Creek	"Montana onyx."
Do.	do	Virginia City	Garnet.
Do.	Park	Carbella	Petrified wood, amethyst, and fairy stones.
Do.	do	Clyde Park	Iceland spar.
Do.	do	Gardiner	Petrified wood and travertine
Do.	do	Jardine	Arsenopyrite.
Do.	do	Livingston	Petrified wood.
Do.	do	Springdale	Iceland spar.
Do.	do	Yellowstone Valley	Garnets.
Do.	Powell	Elliston	Agate.
Do.	do	Lost Creek Falls	Amazonstone.
Do.	Prairie	Fallon	Agate.
Do.	Ravalli	Rye Creek	Fluorite.
Do.	Rosebud	Forsyth west to Sidney	Agate.
Do.	Silver Bow	Browns Gulch	Sapphire.
Do.	do	Butte	Amethyst.
Do.	do	Highlands	Epidote and garnet.
Do.	do	Nissler	Fluorite.
Do.	Yellowstone	Billings	Agate.
Do.	do	Custer	Agate and jasper.
Nebraska	Sioux	Orella	Chert.
Nevada	Humboldt	Rainbow Ridge mine (Vir- gin Valley).	Opal and rhodonite.
Do.	Lander	Battle Mountain	Turquoise.
Do.	Lincoln	Fish Lake Valley	Agatized wood.
Do.	White Pine	Ely	Garnet.
New Hampshire	Carroll	Conway	Topaz, smoky quartz, and amethyst crystals.
Do.	do	Passaconaway	Topaz and smoky quartz.
Do.	Coos	Stark	Smoky quartz and amethyst.
New Jersey	Morris	Montville	Serpentine.
Do.	do	Stirling	Carnelian.
Do.	Passaic	Paterson	Prehnite.
Do.	do	Prospect Park	Prehnite, agate, and amethyst.
Do.	Sussex	Franklin	Willemite, garnet, rhodonite, and fiedelite.
Do.	do	Sparta	Ruby corundum.
New Mexico	Luna	Deming	Agate.
Do.	Rio Arriba	La Madera	Dumortierite, pink and green feldspar, and blue-green beryl.
Do.	Sierra	Elephant Butte Lake	Petrified wood.
Do.	do	Engle	Petrified wood and agate.
New York	Warren	Barton mine (North River)	Garnet.
Do.	do	North Creek	Do.
North Carolina	Alexander		Hiddenite.
Do.	Avery	Cranberry Iron mine.	Epidote.
Do.	Buncombe	Goldsmith mine (Democrat)	Moonstone.
Do.	Burke		Amethyst.
Do.	Haywood	Emerald mine (Crabtree Mountain).	Emerald.
Do.	Macon	Corundum Hill	Ruby and sapphire.
Do.	Mitchell	Geo. Howell mine.	Oligoclase.
Do.	do	McKinney mine.	"Moonglo" and "sunstone."
Do.	do	Roan Mountain.	Moonstone, epidote, and unakite.
Do.	Rutherford		Emerald.
Do.	Warren		Amethyst.
Do.	Yancey	Little Gibbs mine.	Oligoclase.
Do.	do	Ray mine.	Emerald.
North Dakota	Adams		Agatized wood.
Oklahoma	Dewey	Seiling	Jasper, agatized wood, jasp- agate, agate, denderite, chal- cedony, and jadite.
Do.	do	Taloga	Do.
Do.	Major	Fairview	Do.

TABLE 1.—Localities in the United States where gem materials were reported to have been found in 1954—Continued

State	County	Locality	Gem material
Oregon	Baker	Greenhorn	Tempskya (agatized fern).
Do	do	Huntington	Agate and jasper.
Do	Coos	Bandon	Fossil wood.
Do	Crook	Eagle Rock bed	Agate.
Do	do	Lucky Strike bed	Moss agate.
Do	do	Ochoco bed	Agate.
Do	do	Post	Do.
Do	Deschutes	Hampton	Jasp-agate.
Do	do	Terrebonne	Thunder eggs and agate.
Do	Douglas	Sutherland	Agate.
Do	do	Yoncalla	Do.
Do	Grant	Galena	Agate and petrified wood.
Do	do	Meadow Creek	Agate, petrified wood, and jasp-agate.
Do	Harney	Burns	Agate.
Do	Jackson	Eagle Point and Butte Falls	Petrified wood, opalized and agatized wood, jasper, jasp-agate, bloodstone, and rhodonite.
Do	Jefferson	Ashwood	Opal.
Do	do	Gateway	Agate.
Do	do	Madras	Agate and thunder eggs.
Do	do	Pony Butte bed	Agate.
Do	Lake	Glass Buttes bed	Obsidian.
Do	do	Lakeview	Thunder eggs.
Do	do	Plush (Hart Mountain)	Opal.
Do	Lane	Crooked River at Bear Creek	Agatized petrified wood.
Do	Lincoln	Agate Beach	Agate, bloodstone, sardonyx, jasper, jasp-agate, agatized coral, petrified wood, and fossil bone.
Do	do	Yachats	Agate, jasper agatized wood, and sagenite.
Do	Malheur	Nyssa	Thunder eggs.
Do	do	Sucker Creek	Agate.
Do	Morrow	Peter's Butte (Opal Butte)	Thunder eggs and agate.
Do	Wasco	Antelope	Chalcedony, jade, sagenite, agate, jasper, bloodstone, geodes, amethyst crystals, and quartz.
Do	Wheeler	Clarno bed (fossil)	Agate.
Pennsylvania	Adams	Greenstone	Cuprite.
Do	Bedford		Quartz, calcite, and spar.
Do	do	New Enterprise	Quartz, calcite, and flint.
Do	do	Salemville	Quartz.
Do	do	Waterside	Spar, quartz, calcite, and flint.
Do	Somerset	Confluence	Smoky quartz.
Do	Westmoreland		Petrified wood and flint.
South Carolina	Chesterfield	Jefferson (Old Brewer gold mine).	Topaz.
South Dakota	Custer	Black Hills	Rose quartz.
Do	do	Custer	Agate, tourmaline, and rose quartz.
Do	do	Fairburn	Breccia and agate.
Do	Fall River	Minnekahta	Agatized wood.
Do	Lawrence	Deadwood area	Garnet and rose quartz.
Do	Pennington	Quinn	Jasp-agate, chert, chalcedony, and agate.
Do	do	Scenic	Chalcedony.
Do	do	Sheep Mountain	Do.
Do	Pennington and Shannon	Bad Lands	Agate, jasper, and petrified wood.
Do	Shannon	Pine Ridge	Chert.
Tennessee	Carter	Shell Creek	Unakite.
Texas	Brewster	Alpine	Jasper, agate, labradorite, opal, and amethyst.
Do	do	Marathon	Agate and novaculite.
Do	do	Terlingua	Agate, jasper, agatized and jasperized wood.
Do	Burnet	Marble Falls	Garnet and topaz.
Do	Culberson	Van Horn	Agate.
Do	Duval	Freer	Do.
Do	Fayette	Carmine	Petrified, agatized, and opalized wood.
Do	do	Flatonla	Do.
Do	Gillespie	Fredericksburg	Petrified, agatized, and opalized wood, garnet, and topaz.
Do	Hudspeth	Sierra Blanca	Agate.
Do	Jeff Davis	Fort Davis	Agate and adularia (moonstone).
Do	Live Oak	George West	Agate and petrified wood.
Do	Llano	Llano	Garnet and topaz.

TABLE 1.—Localities in the United States where gem materials were reported to have been found in 1954—Continued

State	County	Locality	Gem material
Texas	Mason		Topaz, smoky quartz, amazonite, and cassiterite.
Do	do	Streeter	Topaz.
Do	McMullen	Tilden	Petrified, agatized, and opalized wood.
Do	Presidio	Marfa	Agate.
Do	Reeves	Balmorhea	Agate, onyx, and sardonyx.
Do	Terrell	Sanderson	Agate.
Do	Walker	Huntsville	Petrified, agatized, and opalized wood.
Do	Webb	Laredo	Agate and jasper.
Do	Zapata	Zapata	Do.
Do	Brewster, Presidio, Jeff Davis, Pecos, and Reeves.	Big Bend area	Agate, carnelian, petrified wood, jasper, jasp-agate, moonstone, chalcedony, opal, amethyst, and citrine.
Utah	Beaver		Petrified wood.
Do	do	Blue Valley (Beaver)	Agate.
Do	do	Milford	Quartz crystals.
Do	Emery		Petrified wood.
Do	do	Green River	Agate.
Do	Garfield	Escalante	Agatized wood.
Do	do	Henry Mountains	Barite nodules.
Do	Grand		Petrified wood and agate.
Do	Juab	Jericho	Agate.
Do	do	Levan	Do.
Do	do	Thomas Range	Topaz.
Do	Millard	Black Rock	Obsidian.
Do	do	Kanosh	Do.
Do	Salt Lake	Murray	Onyx.
Do	Sevier	Salina	Agate.
Do	Washington	Hurricane	Do.
Do	do	St. George	Do.
Do	Wayne	Fruita	Barite nodules.
Virginia	Amelia	Amelia Court House	Amazonite.
Do	Madison	Syria	Unikite.
Do	Page	Ida	Jasper.
Do	Rockbridge	Vesuvius	Unikite.
Washington	Chelan	Wenatchee	Thulite.
Do	Douglas	Bridgeport	Thulite and jadeite.
Do	Kittitas	Ellensburg	Petrified wood and jasper.
Do	do	Vantage	Petrified wood.
Do	Klickitat	Lyle	Agatized and opalized wood, jasper, and agate.
Do	Snohomish	Roosevelt	Petrified, agatized, and opalized wood.
Do	Yakima	Saddle Mountain area	Do.
Do	do	Sunnyside	Do.
Do	do	Yakima	Petrified wood.
Wisconsin	Clark		Agate and jasper.
Do	Ashland, Bayfield, Douglas, and Iron.	Lake Superior area	Agate.
Wyoming	Albany	Marshall area	Petrified, agatized, and opalized wood, and agate.
Do	Carbon	Leo	Jade.
Do	do	Medicine Bow	Do.
Do	do	Rawlins	Do.
Do	Fremont		Rhodonite.
Do	do	Lander	Agate, jade, and jade (nephrite).
Do	Natrona		Amazon stone.
Do	do	Casper	Agate.
Do	Sweetwater	Eden Valley	Terrifilla (agatized snails), jade, agate, and petrified wood.
Do	do	Farson	Petrified and agatized wood, jade, jasper, agate, and chalcedony.
Do	do	Granger	Agate.
Do	do	Green River	Agatized wood, agate, jasper and corundum.
Do	do	Wamsutter	Terrifilla (agatized snails) and agate.

Several tons of plume agate, worth \$5 a pound in some instances, was produced in Maricopa County, Ariz. Production from the Saddle Mountain area, Pinal and Graham Counties, in 1954, was estimated to be somewhat larger than in 1953.

About 100 tons of rough agate of undetermined value was produced from the agate fields near Deming, Luna County, N. Mex. Agatized fossils, valued at about \$2,000, were found on the shores of Lake Superior, Mich.

Jade.—Production of jade in Wyoming was about 50 tons in 1954. It was mostly dark olive but included pink and green, pink, and some dark green varieties. Gem-quality, apple-green and black jade were scarce and high priced. Apple-green jade retailed at \$40 to \$100 per pound, good black at \$10 per pound, and other varieties at \$5 per pound.

Alaskan jade production in 1954 amounted to an estimated value of about \$10,000, mostly from the Shungnak district in the Northwestern Alaskan region. There was increased interest in the jade industry, due to the success of the Indian Arts and Crafts Board, which utilized jade from the deposits near Shungnak to produce finished jewelry.

Topaz.—Production of topaz from the Streeter-Kotempsie area of Mason County, Tex., continued in 1954. An estimated 8,000 grams of this gem material, valued at \$4,200, was found, principally by amateur lapidarists.

Tourmaline.—A pocket of gem-green tourmaline containing an estimated 10,000 carats valued at \$20 to \$100 a carat was discovered at Norway, Maine. A 23-carat emerald-green stone was the largest cut from the material.

Turquoise.—Two hundred pounds of turquoise from the Villa Grove area, Saguache County, Colo., was produced in 1954. This was mostly high-grade material valued at \$20 to \$100 per pound. The Royal Blue Mines Co., formerly operated by Lee F. Hand of Battle Mountain, Nev., was operated by the new owner, Wendall King. Production in 1954 was not reported, although it was estimated to be about the same as in 1953. Gila County, Ariz., reported about the same production of chalk-grade turquoise as in 1953. Total Arizona production of turquoise in 1954 was valued at about \$13,000.

Other Natural Gem Stones.—About 600 tons of opalized wood was produced in Yakima County, Wash., from the prehistoric shoreline of Lake Bonneville. Limb sections $\frac{1}{2}$ inch to 3 inches in diameter and up to 6 inches long retailed for about \$2 per pound. Minnesota reported the production of thomsonite valued at \$3,000 in 1954. The use of gem material in the St. Paul-Minneapolis area increased about 200 percent during the year owing in part to the increased use of tumblers to polish rough stone, which previously was unused because of slow methods of finishing. The polished stone was marketed in baroque form. Production of 1,300 pounds of aquamarine was reported from Troup County, Ga., mostly for markets in Ohio. The Idaho production of moss agate, opal, thunder eggs, and garnet had a retail value of about \$3,000. About 500 pounds of gem quality and over 2 tons of specimen quartz crystal was reported mined at Crystal Springs, Ark. About 5 tons of onyx valued at \$1,500 in the rough was mined in Utah County, Utah.

A deposit in Arizona of serpentine containing chrysolite was discussed as to location and occurrence in the *Mineralogist*.⁴

Details on a deposit of onyx in California were published in the *Mineralogist*.⁵

The use of *tempeskya*, a petrified palm root, as a gem material was reported from Pasco, Wash. The only reported occurrence of this material in the United States is the old "Chinese diggings" near the former town of Greenhorn in the southwestern part of Baker County, Oreg. Total production through 1954 was estimated at 8 tons and valued up to \$2 per pound.⁶

Synthetic Gems.—Diamonds were synthesized in 1954 by the General Electric Co., Schenectady, N. Y., although the accomplishment was not announced until February 15, 1955.

Of fundamental importance to success of the project was development of a vessel that could be operated at pressures up to at least 1,500,000 pounds per square inch and temperatures about 5,000° F. and the ability to maintain these pressure-temperature conditions simultaneously for long periods. Details of the design of the pressure vessel were not revealed.⁷

A new synthetic spinel closely resembling lapis lazuli was produced in Idar-Oberstein, Germany. The stones could be differentiated from natural lapis lazuli by X-ray powder photographs or observation under a Chelsea color filter. Genuine lapis lazuli has specks of iron pyrite that usually can be detected at some point on the surface. The makers of lapis-colored spinel can provide the stones with specks of gold if so desired, in which instance pyrites (fool's gold) would indicate the genuine stone and gold would represent the imitation.⁸

The world's second largest synthetic emerald, weighing 1,014 carats, was added to the Smithsonian Institution's mineralogical collection. The crystal was produced by the Chatham Research Laboratories in San Francisco, Calif.⁹

CONSUMPTION

Total sales of diamonds and gem stones by retail dealers increased slightly in 1954 compared with 1953. Sales of gem and industrial diamonds during 1954 totaled approximately \$182 million compared with \$176 million in 1953. The proceeds realized from sales of diamonds effected through the Central Selling Organization on behalf of South African and other producers and diamonds drawn from stocks held by the Diamond Corp. were as follows: Gem diamonds, \$127.6 million; industrial diamonds, \$46.4 million; total, \$174 million. Corresponding figures in 1953 were: Gem, \$121 million; industrials, \$49.9 million; total, \$171 million.¹⁰

The rise in the sales of gem diamonds in 1954 more than offset the decline in sales of industrial diamonds.

⁴ *Mineralogist*, Arizona's Chrysolite Asbestos: Vol. 22, No. 6, September 1954, pp. 297-300.

⁵ *Mineralogist*, California Onyx Location: Vol. 22, No. 3, March 1954, pp. 99-100.

⁶ Gentzier, Joseph S., letter to Bureau of Mines, Mar. 10, 1955.

⁷ Switzer, George, 30th Annual Report on the Diamond Industry, 1954: Jewelers' Circ.-Keystone, 1955, pp. 12-13.

⁸ Anderson, B. W., A New Substitute for Lapis Lazuli: Gems and Gemology, vol. 8, No. 3, Fall 1954, pp. 88-89.

⁹ *Mineralogist*, vol. 29, No. 5-6, May-June 1954, p. 244.

¹⁰ Switzer, George, 30th Annual Report on the Diamond Industry, 1954: Jewelers' Circ.-Keystone, 1955, p. 3.

The consumption of semiprecious gem stones by amateur lapidarists increased in 1954. The chief factor in the increase was continued development of mechanical tumbling and faceting equipment. Commercial semiprecious gem cutters considered that the larger volume of their sales came from gem collectors rather than jewelry manufacturers.

PRICES

The first appreciable change in diamond prices since 1945 occurred in December 1954, when the Diamond Corp. announced a 2½-percent increase in the price of rough diamonds. This price increase was attributed to the unexpected high demand for gem stones in the United States.

United States excise tax on jewelry was reduced from 20 to 10 percent in April 1954.

FOREIGN TRADE ¹¹

Imports of gem stones into the United States increased in 1954 compared with 1953 (table 2). Because of changes in tabulating procedures by the United States Department of Commerce, the 1954 data were not comparable to those for earlier years. Diamonds ranked first, with 85 percent of the imports, based on value, followed by other precious and semiprecious stones, 12 percent; and pearls (natural and cultured), 3 percent.

TABLE 2.—Precious and semiprecious stones (exclusive of industrial diamonds) imported for consumption in the United States, 1953-54

[U. S. Department of Commerce]

Item	1953		1954	
	Carats	Value	Carats	Value
Diamonds:				
Rough or uncut (suitable for cutting into gem stones), duty-free.....	1 730,350	1 \$57,001,329	887,273	\$59,428,768
Cut but unset, suitable for jewelry, dutiable.....	1 444,362	1 50,571,535	594,772	62,758,349
Emeralds:				
Rough or uncut, duty-free.....	15,561	27,987	(²)	(³)
Cut but not set, dutiable.....	26,952	320,739	24,460	385,063
Pearls and parts, not strung or set, dutiable:				
Natural.....		264,873		503,753
Cultured or cultivated.....		3,769,758		\$4,333,890
Other precious and semiprecious stones:				
Rough or uncut, duty-free.....		203,667		\$ 265,837
Cut but not set, dutiable.....		2,218,868		\$ 1,848,989
Imitation, except opaque, dutiable:				
Not cut or faceted.....		40,720		\$ 37,902
Cut or faceted:				
Synthetic.....		677,029		\$ 283,302
Other.....		14,872,795		\$ 13,651,937
Imitation, opaque, including imitation pearls, dutiable.....		127,641		\$ 35,014
Marcasites, dutiable:				
Real.....		94,813		} 61,073
Imitation.....		2,589		
Total.....		1 130,194,343		\$ 143,593,877

¹ Revised figure.

² Effective January 1, 1954, not separately classified; included with precious and semiprecious stones, rough or uncut.

³ Due to changes in tabulating procedures by the U. S. Department of Commerce data known not to be comparable to earlier years.

⁴ Due to changes in classifications data not strictly comparable to earlier years.

¹¹ Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, Division of Foreign Activities, Bureau of Mines, from records of the U. S. Department of Commerce.

TABLE 3.—Diamonds (exclusive of industrial diamonds) imported for consumption in the United States, 1953-54, by countries

[U. S. Department of Commerce]

Country	Rough or uncut			Cut but unset		
	Carats	Value		Carats	Value	
		Total	Average		Total	Average
1953						
North America:						
Bermuda.....	8,985	\$502,677	\$55.95			
Canada.....	4,744	448,338	94.51	95	\$88,241	\$928.85
Dominican Republic.....				1	235	235.00
Mexico.....				165	10,239	62.05
Total.....	13,729	951,015	69.27	261	98,715	378.22
South America:						
Argentina.....				18	4,263	236.83
Brazil.....	398	99,448	249.87	34	8,722	256.53
British Guiana.....	2,307	83,958	36.39	30	2,847	94.90
Venezuela.....	51,779	1,587,872	30.67	3	745	248.33
Total.....	54,484	1,771,278	32.51	85	16,577	195.02
Europe:						
Belgium-Luxembourg.....	19,116	1,818,663	95.14	215,438	25,554,634	118.62
France.....	11,631	280,922	24.15	1,098	170,306	155.11
Germany, West.....	167	1,667	9.98	22,196	1,633,341	73.59
Italy.....				48	30,647	638.48
Netherlands.....	4,171	374,437	89.77	29,365	3,491,370	118.90
Switzerland.....	7,820	841,026	107.55	493	171,765	348.41
United Kingdom.....	524,826	47,625,107	90.74	3,271	526,641	161.00
Total.....	567,731	50,941,822	89.73	271,909	31,578,704	116.14
Asia:						
Hong Kong.....				1	93	93.00
India.....				2,974	52,853	17.77
Israel and Palestine.....				122,218	10,276,874	84.09
Japan.....				55	4,919	89.44
Malaya.....	560	65,162	116.36			
Total.....	560	65,162	116.36	125,248	10,334,739	82.51
Africa:						
Belgian Congo.....				300	63,603	212.01
British West Africa.....	121	726	6.00			
French Equatorial Africa.....	39,963	940,002	23.52			
Gold Coast.....	450	4,219	9.38			
Union of South Africa.....	1 53,312	1 2,327,105	1 43.65	1 46,556	1 8,477,426	1 182.09
Total.....	93,846	3,272,052	34.87	46,856	8,541,029	182.28
Oceania: Australia.....				3	1,771	590.33
Grand total 1953.....	1 730,350	1 57,001,329	1 78.05	1 444,362	1 50,571,535	1 113.81
1954						
North America:						
Bermuda.....	6,231	118,899	19.08			
Canada.....	4,984	514,120	103.15	275	59,487	216.32
Mexico.....	100	750	7.50			
Total.....	11,315	633,769	56.01	275	59,487	216.32
South America:						
Brazil.....	6,890	161,606	23.46	350	28,985	82.81
British Guiana.....	2,064	63,581	30.81			
Venezuela.....	81,442	2,421,299	29.73			
Total.....	90,396	2,646,486	29.28	350	28,985	82.81

Revised figure.

TABLE 3.—Diamonds (exclusive of industrial diamonds) imported for consumption in the United States, 1953-54, by countries—Continued

[U. S. Department of Commerce]

Country	Rough or uncut			Cut but unset		
	Carats	Value		Carats	Value	
		Total	Average		Total	Average
1954—Continued						
Europe:						
Belgium-Luxembourg.....	67,969	\$7,232,086	\$106.40	335,173	\$35,110,962	\$104.75
France.....	14,563	346,162	23.77	4,405	594,543	134.97
Germany, West.....				38,724	2,645,535	68.32
Netherlands.....	11,673	802,417	68.74	25,866	2,973,356	114.95
Switzerland.....	1,455	82,314	56.57	208	124,199	597.11
United Kingdom.....	632,394	44,923,762	71.04	4,732	1,267,999	267.96
Total.....	728,054	53,386,741	73.33	409,108	42,716,594	104.41
Asia:						
Ceylon.....				12	1,717	143.08
India.....				1,156	216,743	187.49
Israel.....	4,066	42,836	10.54	137,073	11,620,417	84.78
Japan.....	186	2,779	14.94	398	34,751	87.31
Lebanon.....	1,325	146,867	110.84	53	22,271	420.21
Malaya.....	453	55,351	122.19			
Total.....	6,030	247,833	41.10	138,692	11,895,899	85.77
Africa:						
Belgian Congo.....	204	24,717	121.16			
French Equatorial Africa.....	16,812	731,630	43.52			
Liberia.....	2,843	35,729	12.57			
Union of South Africa.....	31,619	1,721,853	54.46	46,347	8,057,384	173.85
Total.....	51,478	2,513,929	48.84	46,347	8,057,384	173.85
Grand total 1954.....	887,273	59,428,768	66.98	594,772	62,758,349	105.52

TECHNOLOGY

H. C. Dake described methods for calculating the potential value of large masses of gem materials.¹² The techniques of sawing, grinding, sanding, polishing, and setting malachite were published.¹³ The art of cabochon making was described.¹⁴ The techniques, equipment, knowledge, and tools required for the amateur to collect mineral specimens in various parts of the United States were listed.¹⁵

A new gem stone, sinhalite, has been found and identified by the British Museum and the Smithsonian Institution.¹⁶

A historical and technical article, Turquoise in Nevada, was published.¹⁷

The historical and technical properties of jade were reviewed.¹⁸

An exhaustive list of gem stones that are luminescent under ultraviolet light was published.¹⁹

A new pearl weight estimation chart and table for drilled and un-drilled pearls was developed that provided the weight of pearls of any size in pearl grains, mommes, carats, and grams. Momme is a

¹² Dake, H. C., Calculating Rough Gem Values: Mineralogist, vol. 22, No. 2, February 1954, pp. 57-62.
¹³ Sinkankas, John, The Treatment of Malachite: Rocks and Minerals, vol. 29, No. 11-12, November-December 1954, pp. 599-601.

¹⁴ Bingham, W. J., Cabochons: Earth Science, vol. 7, No. 4, January-February 1954, pp. 34-38.

¹⁵ Dake, H. C., Where to Collect Minerals: Mineralogist, vol. 22, No. 11, November 1954, pp. 400, 406.

¹⁶ Rocks and Minerals, Sinhalite, A New Gem Stone: Vol. 29, No. 5-6, May-June 1954, p. 251.

¹⁷ California Mining Journal, Turquoise in Nevada: Vol. 23, No. 8, April 1954, p. 23.

¹⁸ Parker, R. J., The Nature of Jade: Gems and Gemology, vol. 8, No. 2, Summer 1954, pp. 38-46.

¹⁹ Webster, Robert, Gemstone Luminescence: Gemmologist, vol. 23, No. 273, April 1954, pp. 77-78.

Japanese term used in cultered-pearl wholesaling. One momme equals to 0.0132 ounce.²⁰

Three methods were devised to distinguish naturally colored diamonds from those colored by nuclear bombardment.²¹

A new brilliant cut was calculated that has a light output improvement of 21 to 28 percent. In addition, the cut enabled smaller stones to be utilized because of its lower height.²²

A modified electrostatic separation process was developed at the Diamond Research Laboratory, Johannesburg, South Africa, to treat the finer sizes of gravity concentrate at various alluvial diamond mines. The new electrostatic separator recovered diamonds too small for satisfactory recovery by grease belts.²³

WORLD REVIEW

Total world diamond production in 1954 was the highest on record and slightly higher than in 1953. Most of the increase came from the Union of South Africa and Tanganyika.

Table 4 shows world production of diamonds, with accurate figures from most countries. The total world production was estimated to be 1 to 2 percent higher than the figures given in the table.

Angola.—A report on the 1954 operation of the Companhia de Diamantes de Angola was published.²⁴

TABLE 4.—World production of diamonds, 1951–54, by countries, in metric carats
(Including industrial diamonds)

	1951	1952	1953	1954
Africa:				
Angola.....	734, 324	743, 302	729, 337	721, 607
Belgian Congo.....	10, 564, 667	11, 608, 763	12, 580, 256	12, 619, 378
French Equatorial Africa.....	136, 000	163, 400	140, 144	152, 529
French West Africa.....	101, 000	136, 080	180, 000	216, 000
Gold Coast.....	1, 752, 878	2, 189, 557	2, 180, 728	2, 135, 141
Sierra Leone.....	475, 759	451, 426	472, 934	398, 608
South West Africa.....	478, 075	541, 027	617, 411	683, 536
Tanganyika.....	108, 625	143, 023	172, 304	326, 009
Union of South Africa:				
Lode.....	1, 967, 272	2, 093, 138	2, 397, 755	2, 544, 305
Alluvial.....	2 289, 063	2 282, 681	2 300, 000	2 314, 000
South America:				
Brazil.....	200, 000	200, 000	200, 000	2 200, 000
British Guiana.....	43, 260	38, 305	35, 306	30, 073
Venezuela.....	63, 226	98, 291	84, 790	96, 983
Other countries.....	3, 000	5, 000	5, 000	5, 000
Grand total.....	16, 917, 000	18, 694, 000	20, 096, 000	20, 440, 000

¹ Pipe mines under De Beers control but including 75,225 carats from alluvial diggings at Kleinsee.

² Includes an estimated 100,000 carats from the State mines of Namaqualand.

³ Estimate.

⁴ Revised figure.

SOURCE: Jewelers' Circ.-Keystone, 30th Annual Report on the Diamond Industry, 1954: 1955, p. 7.

²⁰ Small, J., Weight Estimations of Pearls: Gems and Gemology, vol. 8, No. 4, Winter 1954-55, pp. 99-105.

²¹ Custer, J. F. H., and Dwyer, H. B., Discrimination Between Natural Blue Diamonds, and Diamonds Colored Blue Artificially: Gems and Gemology, vol. 8, No. 2, Summer 1954, pp. 35-37.

²² Parker, R. L., Suggestion for a New Brilliant Cut: Gemmologist, vol. 23, No. 279, October 1954, pp. 177-179.

²³ Optima, Recovery of Small Diamonds: Vol. 4, No. 1, March 1955, pp. 33-34.

²⁴ Bureau of Mines, Mineral Trade Notes: Vol. 40, No. 2, February 1955, pp. 46-49.

Brazil.—Increased prices for industrial diamonds in Brazil encouraged expansion of diamond mining in 1954.²⁵

There was a minor diamond rush in the Diamantino area, in the State of Mato Grosso, where the population was reported to be increasing at the rate of 1,000 a month. Miners found it more profitable to search for alluvial diamonds than to recover quartz crystals, which had been their chief mainstay before the diamond rush.

British Guiana.—Diamond production in British Guiana during 1954 amounted to 27,400 metric carats, a decrease of 8,000 carats from 1953.²⁶

Canada.—In 1954 a substantial deposit of garnet was discovered in Dana township, 25 miles north of Sturgeon Falls, Ontario. The garnet, of almandite type, was found in a zone of soft mica schist suitable for open-cut mining.²⁷

Ceylon.—Gem-stone mining in Ceylon was limited to small-scale open pits operated by 5 to 10 men. The pits, usually rectangular, were limited to a depth of 10 to 15 feet by ground-water conditions. Usual operations consisted of two men bailing while the other men dig and pile the gravel on the surface. When a pit was completed, the gravel was washed in cone-shaped baskets of bamboo or cane, and the gem stones were picked out.²⁸

No production statistics were available, but it is estimated that the value of annual output was approximately \$400,000 in 1954.²⁹

Principal gem-stone localities in Ceylon follow:

Sabaragamuwa Province

Ratnapura	Kotamulla	Marapona
Balangoda	Karangoda	Pathakada
Pelmadulla	Hangomuwa	Elapatha
Adandawela	Urupollalawn	Modduwa

Southern Province

Ambalangoda } There were several moonstone and amethyst mines near these
Meethiyagoda } villages. The most precious moonstones are found here (dark
Karadeniya } sky-blue).

Central Province

Matale }
Rattota } Fine color amethysts have been mined near these
Gammaduwa } villages.
East and West Matale }

Colombia.—It was announced that the Muzo emerald mine, operated by the Banco de la Republica, had reopened in November 1953. The operations were being expanded gradually, and production was expected to equal that of 1949. The mine was closed in 1949 because of internal disorders throughout Colombia.³⁰

²⁵ Bureau of Mines, Mineral Trade Notes: Vol. 40, No. 4, April 1955, pp. 41, 42.

²⁶ Mining Journal (London), Annual Review, May 1955, p. 178.

²⁷ Engineering and Mining Journal, vol. 155, No. 11, November 1954, p. 160.

²⁸ Jayasinghe, W. D. S., Communication to E. R. Ruhlman, dated Oct. 27, 1955.

²⁹ Mining Journal (London), Annual Review, May 1955, p. 198.

³⁰ Bureau of Mines, Mineral Trade Notes: Vol. 38, No. 2, February 1954, p. 51.

India.—The Indian Bureau of Mines investigated the area near Ramaelakota (Andhra), and found evidence of a once-flourishing diamond-mining industry. It recommended a careful search for volcanic plugs; the original source of diamonds in Andhra.³¹

Japan.—The Japanese pearl-shell expedition that had been operating in the Arafura Sea under the terms of an interim agreement between the Governments of Australia and Japan discontinued diving in October 1954, when its quota was reached. The limit of shells agreed upon was 975 tons.³²

Madagascar.—Production of precious and semiprecious gem stones in Madagascar was valued at \$30,000 in 1954, about the same as in 1953. Among the stones produced were beryl, tourmaline, topaz, opal, sapphire, garnet, and amethyst.³³

A comprehensive report of the gem stones of Madagascar was published.³⁴

South-West Africa.—Industrial Diamonds of South Africa, Ltd., discovered a raised diamond-bearing marine terrace near Luderitz. The diamonds were similar in quality to those mined at the Saddle Hill Terrace.³⁵

³¹ Chemical Age (London), vol. 71, Aug. 21, 1954, p. 368.

³² Bureau of Mines, Mineral Trade Notes: Vol. 39, No. 4, October 1954, p. 56.

³³ Bureau of Mines, Mineral Trade Notes: Vol. 38, No. 6, June 1954, pp. 56-57.

³⁴ Jeannelle, H. F., Mineralogist: Vol. 22, No. 2, February 1954, pp. 85-90.

³⁵ Mining World, vol. 16, No. 12, November 1954, p. 37.