Gem Stones

By George Switzer[1] and Robert D. Thomson[2]

AS in the past, the United States continued to be an unimportant factor in world gem production. A wide variety of gems was produced but in small quantity.

DOMESTIC PRODUCTION

The efforts of thousands of amateur lapidaries, who spend their vacations and weekends searching for gem materials, yield most of the gem materials produced in the United States. The many varieties of quartz, such as agate, jasper, and petrified wood, are the chief materials recovered in this way. The demand for cuttable rough gem stones by these hobbyists also supports a few small gem-mining companies, which operate deposits from time to time, chiefly for turquoise, tourmaline, kunzite, and jade. Since only a small percentage of the total is produced on a commercial scale, no accurate statistics can be compiled on the value of the domestic output of gems; an estimate may approximate $400,000 to $500,000.

The many forms of quartz, chiefly the cryptocrystalline varieties, represented the greatest quantity and value of gem stones produced in 1952. Other gems included were turquoise, topaz, garnet, jade, tourmaline, onyx, chrysocolla, opal, variscite, idocrase, and spinel. Of the producing States, California, Oregon, Texas, Nevada, Washington, Wyoming, and Arizona, in decreasing order, were the leaders.

Agate.—The Marfa-Alpine area in the northern part of Presidio and Brewster Counties, Big Bend area, in Brewster County, and Laredo-Zapata area in Webb and Zapata Counties, Texas, were among the leading producers of agate in 1952, with an estimated output of 50,000 pounds valued at $0.50 to $60.00 per pound and a total value exceeding $35,000.

In Arizona the Saddle Mountain area, covering parts of Maricopa, Pinal, and Graham Counties, reportedly produced 8 to 10 tons of agate valued at $7,000–$8,000, and total production from this State may have been as much as 100 tons.

Production of agate in California in 1952, largely from the Mohave Desert region, had an estimated value of about $100,000.

Over 10 tons of agate valued at $10,500 were reported produced in the Bend area, Deschutes County, Oreg. Production at the Fulton agate beds (formerly the Priday ranch, Jefferson County) was not reported. However, each visitor was charged a fee and was permitted

[1] Smithsonian Institution; consulting mineralogist to the Bureau of Mines.
[2] Commodity-industry analyst, Bureau of Mines.

to gather up to 30 pounds of agate. Hundreds of visitors collected from the Fulton agate beds during the year, and some nodules reportedly sold for as much as several hundred dollars.

The famous moss-agate deposits along the Upper Yellowstone River in Wyoming produced an estimated 6,000 to 8,000 pounds of agate, valued at $1 to $6 per pound and averaging $2.50 per pound, for a total value of about $20,000.

New Mexico production was reported as essentially unchanged from 1951.

Considerable quantities of agate were produced also in Utah, Michigan, Colorado, and Florida, and almost every State yielded small quantities of cuttable forms of chalcedonic quartz.

Information on agates in the Lake Superior area and the history of the use of agates was published in 1952.[3]

Topaz.—The Streeter-Kotempsie area of Mason County, Tex., known to have produced sizable quantities of gem-quality topaz at various times for over 50 years, produced during all of 1952, largely as the result of the efforts of amateur bobbyists or "diggers" whose findings later were sold to amateurs. Both white and blue topaz were found by washing or sifting stream gravels in small creeks. The 1952 production totaled about 10,000 grams, of which approximately 65 percent was white topaz with a commercial value of about $0.35 per gram. Twenty-five percent of the topaz found was blue-white valued at $0.75 per gram, and about 1,000 grams of high-quality blue material was produced, valued at $1.25 per gram. Estimated value of the 1952 production ranged from $5,400 to $25,000.

A small quantity of fine-quality gem topaz was reported from a locality near Boise, Idaho.

Turquoise.—Turquoise production continued essentially unchanged from 1951. Lee F. Hand, operating a lease near Battle Mountain, Nev., produced about $12,000 worth of turquoise. The Miami-Globe district of Gila County, Ariz., reportedly produced about 3,000 pounds valued at $3 to $15 per pound. Arizona turquoise was stated to be soft and of inferior quality, but a method of oiling it was discovered, which greatly improved its color. Some of the old mines in the vicinity of Mineral Park, Mohave County, Ariz., were opened, and about 2,000 pounds of oiling grade (chalk) turquoise was produced, valued at $2.50 to $3.00 per pound.

A small quantity of turquoise was produced near Villa Grove, Saguache County, Colo.

The famous turquoise mine near Cerrillos, Santa Fe County, N. Mex., was described in an article.[4]

Opal.—During 1952 the famous Rainbow Ridge mine of Virgin Valley, Humboldt County, Nev., produced what is perhaps the world's largest precious opal, weighing 6 pounds. This opal was described as being of exceptional quality and beauty and was valued at $50,000. In addition to this unusual find, several additional pounds of opal was produced. Unfortunately, the Virgin Valley opal is not durable, and for this reason it is not used in the jewelry trade.

[3] Vanasse, T. C., Lake Superior Agate: The Sun, Spring Valley, Wis., 2d. ed., 1952, 66 pp.
Pratt, Ethel M., Agate-Gemstone of the Ancients: Mineralogist, vol. 20, No. 11, November 1952, pp. 394, 396.

[4] Foster, E. E., Famous Turquoise Mine: Mineralogist, vol. 20, No. 12, December 1952, pp. 452, 454.

Jade.—There was a great decline in jade mining in Wyoming owing to depletion of the known deposits. The 1952 production was estimated at 3 tons of black jade, a few tons of dark-green and gray jade, and about 300 pounds of good apple-green material. The price ranged from $1 to $2 per pound up to as much as $60 per pound for the best quality.

In California a small quantity of jade, none of fine quality, was produced in Mendocino, Monterey, and San Benito Counties.

Some black jade with green streaks was reported from near Tonopah, Nev.

Other Natural Gem Stones.—Some rock-crystal quartz was produced in California, Arkansas, and Idaho, but very little was of gem quality. A small quantity of star-rose quartz was reported from the Bumpus quarry, Albany, Maine. No rose quartz was produced in South Dakota during 1952.

The Barton Mines Corp., North Creek, N. Y., reported a 1952 production of 76 pounds of gem-quality garnet valued at $132.20.

Tourmaline valued at approximately $2,000 was produced in San Diego County, Calif. Three mines in San Diego County—the Himalaya at Mesa Grande and the Reynolds and Ashley mines at Pala—were operated part time.

About 5 tons of chrysocolla reportedly was produced at the Inspiration mine, Gila County, Ariz. Only a small proportion of this was good cutting-grade material that sold for $5 to $100 per pound.

Three hundred pounds of californite (idocrase) valued at $0.50 per pound was produced at the Happy Camp, Siskiyou County, Calif., locality.

The Onyx ranch, Murray, Salt Lake County, Utah, reported a production of 20 tons of onyx valued at $2,400, all used in the lapidary trade. Near Salida, Chaffee County, Colo., 500 pounds of black onyx valued at $500 was produced.

A small quantity of variscite was mined in Utah.

No sapphire was produced during 1952 from the Yogo Gulch area in Fergus, Judith Basin, and Meagher Counties, Mont., and no diamonds were mined in Arkansas.

Synthetic Gems.—Synthetic emerald was produced only by the Chatham Research Laboratories in San Francisco, Calif. Production in 1952 was about 60,000 carats, of which 50 percent was very low quality, 40 percent medium quality, and 10 percent fine gem quality. Retail prices of fine-quality stones remained at $90 to $120 per carat. Flawless stones of more than 2 carats are not produced.

Diamonds colored by exposure to bombardment of alpha particles in a cyclotron, or to neutron bombardment in an atomic pile to produce green stones, were made before 1952. A quantity of green diamonds produced in this manner appeared on the market in 1952. One dealer reported that he produced and sold about 500 carats of green cyclotron-treated diamonds in 1952, in sizes ranging from ½ carat to 30 carats each.

Literature.—Articles on gem stones appearing in the press in 1952 discussed amber, beryl, meteorites, obsidian, opal, pearl, peridot,

sinhalite, thunder eggs, tourmaline, quartz, and gem stones in California, Connecticut, and Maine.[5]

CONSUMPTION AND USES

Total sales of gem stones by retail jewelers rose slightly in 1952 as a result of greater than usual Christmas buying, which partly offset slow sales in the early months of the year. The greatest consumption of gems was for decorative purposes, mainly in jewelry. Bracelets, brooches, hair ornaments, necklaces, and earrings were very popular.

An outstanding use of gem stones during the year was for gem collections. Enthusiasm of collecting gem stones by thousands of amateur gem collectors for hobby collections or commercial use continued to increase. Supply houses, trading posts, and lapidaries required sizable quantities for resale.

A unique use of jade in 1952 was in the construction of a church window in Chicago by J. L. Kraft. About 446 pieces of beautifully cut and polished jade from his private collection were used. Kraft stated, "From the beginning of time, jade has symbolized truth, goodness, and beauty," and estimated the jade and labor would have come to about $1,500,000.[6]

For the third consecutive year a new high record was established, when the value of diamonds sold in 1952 totaled an estimated £72,000,000, an increase of about 6 percent above 1951. Sales effected through the Central Selling Organization on behalf of South African and other producers amounted to £69,662,000, an increase of £4,604,000 over 1951. The remainder was divided principally between Brazil, Venezuela, and British Guiana. As in previous years, the United States was the principal world market for diamonds. There was no significant change in sales volume of diamond jewelry or diamond engagement rings between 1951 and 1952. Jewelers had no difficulty in obtaining enough diamonds, although some reported a short supply of certain sizes and qualities. Diamond engagement rings continued to produce as much revenue for the typical jeweler as all other diamond jewelry combined.

The outstanding feature of diamond sales in 1952 was the strong advance in industrial diamonds. Sales of industrial diamonds

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[5] Blakemore, Jean, Treasure Hunting in Maine—Gems and Minerals: Smiling Cow Shop, Boothbay, Maine, 1st ed., 1952, 118 pp.
California Journal of Mines and Geology, Gem Stones: Vol. 48, No. 1, January 1952, pp. 111–112.
Dake, H. C., California Gem Trails: Mineralogist Pub. Co., Portland, Oreg., 1952, 80 pp.
Claringbull, G. F., and Hey, M. H., Sinhalite ($MgAlBO_4$), a New Mineral: Mineralogist Mag., (London), vol. 24, No. 217, June 1952, pp. 841–849.
Mihelcic, Lillian, Story of Amber: Mineralogist, vol. 20, No. 9, September 1952, pp. 333–334.
Mineralogist, California Obsidian Deposits: Vol. 20, No. 2, February 1952, pp. 85–90.
Nininger, H. H., Out of the Sky: Univ. of Denver Press, Denver, Colo., 1952, 336 pp.
Patchick, P. F., Mineral Collecting at Crestmore, Calif.: Rocks and Minerals, vol. 27, No. 3–4, March–April 1952, pp. 130–135.
Paugh, F. H., A Short Course in Gemology: Jewelers' Circular—Keystone, vol. 122, No. 7, April 1952, pp. 126, 144–148; No. 8, May 1952, pp. 116, 142–146; No. 9, June 1952, pp. 92, 108–109; No. 10, July 1952, pp. 100, 102, 126–127; No. 11, August 1952, pp. 118, 153; and No. 12, September 1952, pp. 122, 161–162; vol. 123, No. 1, October 1952, pp. 132, 148–151; and No. 2, November 1952, pp. 118, 164–168.
Roots, Robert D., Thunder Eggs: Rocks and Minerals, vol. 27, No. 5–6, May–June 1952, pp. 234–236.
Smith, G. F. H., Gem Stones: Methuen & Co., Ltd., London, 12th ed., 1952, 537 pp.
Sohon, J. A., Connecticut Minerals, Their Properties and Occurrence: Connecticut State Geological and Natural History Survey, Bull. 77, 1952, 133 pp.
Walton, James, Physical Gemology: Sir Isaac Pitman & Sons, Ltd., London, 1952, 304 pp.
Wescott, I. P., Some Beryl-Family Gems: Mineralogist, vol. 20, No. 1, January 1952, pp. 3–7.

[6] Time, Jade in Church: Vol. 60, No. 14, Oct. 6. 1952, p. 76.

amounted to £23,892,000, an advance of more than £5,000,000 over 1951. Sales of gem diamonds amounted to £45,770,000 in 1952, about £1,000,000 less than in 1951.

Although the diamond industry was at a high level, diamond cutting was still troubled by shortage of rough material and some unemployment.

The announcement of the date for Queen Elizabeth's coronation had an impact on fashion at all levels. Precious jewelry responded conservatively with revivals of diamond-set crown brooches, small baskets of jeweled flowers, increased demand for amethyst (the royal purple) and the Tudor rose as a motif. Tiaras and crownlike ornaments of all kinds were heavily promoted.

In engagement rings, there was a revival of the use of cushion-cut diamonds mounted in platinum. In lower priced engagement rings baguette solitaires were used set with an extension rim to increase their apparent size. Eighty percent of diamond engagement rings sold were set with center stones of 55 points or less, and the price reported by the typical dealer for engagement rings sold in 1952 was $167, exclusive of Federal tax.

The so-called "baroque" jewelry, made by tumbling rough fragments of various gem stones to polish them while maintaining their irregular shape, continued to grow in popularity.

Conditions in the American synthetic corundum and spinel industry continued at low ebb as a result of recovery of the European industry. Sales of synthetic corundum boules manufactured in the United States were very small. There was some sale of synthetic star sapphires and rubies made in the United States, but even this market was impaired by imports of less expensive synthetic star stones made in Europe.

Sales of synthetic rutile remained essentially unchanged. There was no popular acceptance of this material, and it was not a serious threat to the diamond trade.

FOREIGN TRADE [7]

Imports of gem stones, exclusive of industrial diamonds, in 1952 totaled $124,807,761, compared with $128,953,866 in 1951, a decrease of 3 percent (table 1).

Imports of gem-quality diamonds into the United States in 1952 totaled $103,972,623, compared with $110,169,603 in 1951. A distribution of these figures into rough or uncut and cut but unset for the past 2 years is shown in table 2.

TECHNOLOGY

The expanding need for industrial diamonds and the present outlook for only a limited increase in production stimulated a great interest in the synthesis of diamonds. Several research programs concerned with this problem were underway, but no successful synthesis so far had been announced. A more than usual number of dubious claims were publicized, the one receiving the most press

[7] Figures on imports and exports compiled by Mae B. Price and Elsie D. Page, of the Bureau of Mines, from records of the U. S. Department of Commerce.

TABLE 1.—Precious and semiprecious stones (exclusive of industrial diamonds) imported for consumption in the United States, 1951–52

[U. S. Department of Commerce]

Commodity	1951		1952	
	Carats	Value	Carats	Value
Diamonds:				
Rough or uncut (suitable for cutting into gem stones), duty-free	[1] 654, 235	[1]$48,256,746	725, 422	$52, 300, 980
Cut but unset, suitable for jewelry, dutiable	[1] 480, 602	[1] 61, 912, 857	438, 546	51, 671, 643
Emeralds:				
Rough or uncut, duty-free	2, 706	2, 698	8, 790	22, 213
Cut but not set, dutiable	20, 148	264, 527	11, 162	449, 726
Pearls and parts, not strung or set, dutiable:				
Natural		449, 379		465, 165
Cultured or cultivated		2, 747, 653		3, 373, 383
Other precious and semiprecious stones:				
Rough or uncut, duty-free		160, 609		226, 632
Cut but not set, dutiable		2, 686, 137		2, 125, 456
Imitation, except opaque, dutiable:				
Not cut or faceted		87, 162		97, 502
Cut or faceted:				
Synthetic		888, 629		536, 659
Other		[1] 11, 378, 844		13, 412, 914
Imitation, opaque, including imitation pearls, dutiable		26, 394		39, 142
Marcasites, dutiable:				
Real		88, 395		75, 285
Imitation		3, 836		11, 061
Total		[1]128,953,866		124, 807, 761

[1] Revised figure.

notices being that of Herman Meincke and associates working under the auspices of the German Economic Ministry. The method of production, when carried out under the eyes of Government investigators, produced no diamonds.

Methods for producing synthetic sapphires, rubies, and emeralds were described, and distinguishing facts were emphasized.[8] The thermal conductivity of synthetic sapphire was investigated and found at 100° C. to be about 0.07 calorie per second per centimeter per °C.[9]

Experiments reportedly showed that no gem, either natural or synthetic, has more dispersion or fire than synthetic rutile.[10]

Procedures used in cutting a rough diamond into a finished gem and the stages of development of the brilliant cut since the 15th century were described during the year.[11] Details of the index of refraction, angle of total reflection, and inclination of main facets for diamond, zircon, corundum, topaz, and quartz were compiled in 1952.[12]

Various standard sizes and shapes for cabochons and methods of drilling holes in cabochons using hollow tubes and silicon carbide and diamond abrasives were described.[13]

[8] Webster, R., Synthetic Gem Stones: Gemologist, vol. 21, No. 249, 1952, pp. 66–70.
[9] Weeks, J. L., and Seifert, R. L., Thermal Conductivity of Synthetic Sapphire: Jour. Am. Ceram. Soc., vol. 35, No. 1, January 1952, p. 15.
[10] Field, D. S. M., Synthetic Rutile: Mineralogist, vol. 20, No. 10, October 1952, p. 378, 380.
[11] Jewelers' Circular—Keystone, How a Diamond Is Cut: Vol. 123, No. 2, November 1952, pp. 112, 114.
Dake, H. C., Development of the Brilliant Cut: Mineralogist, vol. 20, No. 10, October 1952, pp. 373–374, 376.
[12] Dake, H. C., Some Facet Cuts: Mineralogist, vol. 20, No. 11, November, 1952 pp. 421–422.
[13] Sinkankas, John, The Size and Shape of Cabochons: Rocks and Minerals, vol. 27, No. 5–6, May-June 1952, pp. 264–269.
Dake, H. C., Drilling Cabochons: Mineralogist, vol. 20, No. 1, January 1952, pp. 42, 44.

TABLE 2.—Diamonds (exclusive of industrial diamonds) imported for consumption in the United States, 1951–52, by countries

[U. S. Department of Commerce

Country	Rough or uncut			Cut but unset		
	Carats	Value		Carats	Value	
		Total	Average		Total	Average
1951 [1]						
Australia	765	$97,086	$126.91	12	$1,200	$100.00
Belgian Congo	2,645	215,173	81.35			
Belgium-Luxembourg	4,582	409,071	89.28	[2]251,703	[2]31,331,704	[2]124.48
Brazil	[2]6,827	[2]497,726	[2]72.91	452	79,078	174.95
British Guiana	1,563	55,513	35.52	6	646	107.67
British Malaya				161	26,700	165.84
Canada	[2]1,371	[2]154,728	[2]112.86	7	1,751	250.14
Ceylon				9	121	13.44
Czechoslovakia				10	1,150	115.00
Denmark				17	2,348	138.12
France	286	13,990	48.92	3,208	425,507	132.64
Germany				9,691	789,720	81.49
India				2	260	130.00
Iran				30	3,600	120.00
Israel and Palestine	207	1,656	8.00	104,194	[2]9,169,614	[2]88.01
Italy				62	12,372	199.55
Japan				50	5,670	113.40
Kuwait				1	800	800.00
Liberia	180	10,000	55.56			
Mexico				6	1,871	311.83
Netherlands	19,329	1,481,908	76.67	35,940	4,398,388	122.38
Switzerland	[2]62,328	[2]5,325,332	[2]85.44	7,229	1,259,918	174.29
Union of South Africa	[2]58,541	[2]1,810,483	[2]30.93	[2]64,691	[2]13,863,070	[2]214.30
United Kingdom	[2]470,598	[2]37,461,206	[2]79.60	3,120	536,944	172.10
Uruguay				1	425	425.00
Venezuela	[2]25,013	[2]722,874	[2]28.90			
Total 1951	[2]654,235	[2]48,256,746	[2]73.76	[2]480,602	[2]61,912,857	[2]128.82
1952						
Australia				142	41,882	294.94
Belgium-Luxembourg	4,852	430,417	88.71	186,682	22,956,814	122.97
Bermuda	9,545	300,102	31.44			
Bolivia	71	2,119	29.85			
Brazil	9,719	479,114	49.30	2,056	242,763	118.08
British Guiana	1,061	53,855	50.76	22	3,349	152.23
British Malaya	1,723	115,367	66.96			
Canada	3,847	383,463	99.68	169	36,694	217.12
Denmark				15	2,528	168.53
France	50,490	1,075,560	21.30	784	321,310	409.83
French Equatorial Africa	13,976	396,924	28.40			
French Morocco				6	602	100.33
India				2,821	25,539	9.05
Indonesia				14	2,532	180.86
Israel and Palestine	1	47	47.00	128,206	10,017,374	78.13
Italy	359	60,808	169.38	187	29,641	158.51
Japan				5	1,250	250.00
Lebanon				7	1,573	224.71
Mexico				111	13,143	118.41
Netherlands	2,271	219,467	96.64	33,636	4,246,138	126.24
Portuguese Asia, n. e. s				1,021	7,476	7.32
Surinam	135	8,999	66.66			
Switzerland	103,447	7,050,320	68.15	3,319	582,130	175.39
Thailand	1,338	153,564	114.77	968	134,883	139.34
Union of South Africa	53,593	1,300,987	24.28	54,011	10,737,727	198.81
United Kingdom	442,068	39,418,835	89.17	6,706	902,044	134.51
Venezuela	26,926	851,032	31.61			
West Germany				17,658	1,364,251	77.26
Total 1952	725,422	52,300,980	72.10	438,546	51,671,643	117.82

[1] Changes in Minerals Yearbook 1951 are as follows: Bahrein and Southern British Africa revised to none.
[2] Revised figure.

Information on different abrasives and wheels used in polishing gem stones by lapidaries was given in an article.[14] A very high polish can be obtained on an onyx by using oxalic acid and tin oxide.[15]

A book on gem cutting was published in 1952.[16]

WORLD REVIEW

A new record was set for world production of diamonds in 1952, with a total of 18,694,000 metric carats, compared with 16,917,000 in 1951. Details are given in table 3. Belgian Congo was again the leading producer by weight, but 95 percent of the Belgian Congo production was industrial quality. South Africa, although producing less by weight, led in value owing to a higher percentage of gem stones.

Angola.—A comprehensive report on the diamond industry in Angola was published in 1952. Geology, tenor, character of the diamonds, reserves, production from 1916 to 1950, and other detailed information, were discussed.[17]

TABLE 3.—World production of diamonds, 1949–52, by countries, in metric carats

[Including industrial diamonds]

Country	1949	1950	1951	1952
Africa:				
Angola	769,981	538,867	[1] 734,324	743,302
Belgian Congo	9,649,896	10,147,471	10,564,667	11,608,763
French Equatorial Africa	122,928	111,407	[2] 136,000	163,400
French West Africa	94,996	126,346	101,000	136,080
Gold Coast	[3] 972,976	[2] 950,000	[1] 1,752,878	2,189,557
Sierra Leone	494,119	655,474	475,759	451,426
Southwest Africa	280,134	488,422	478,075	541,027
Tanganyika	191,787	[1] 164,996	108,625	143,023
Union of South Africa:				
Lode	964,266	1,516,194	1,967,272	2,093,138
Alluvial	[4] 289,756	[4] 231,674	[4] 289,063	[4] 282,681
Brazil [3]	250,000	200,000	200,000	200,000
British Guiana	34,790	37,462	43,260	38,305
Venezuela	56,362	60,389	63,226	98,291
Other countries [3]	3,000	3,000	3,000	5,000
Total	14,175,000	15,232,000	16,917,000	18,694,000

[1] Revised.
[2] Estimate.
[3] Exports.
[4] Includes an estimated 100,000 carats for State Mines of Namaqualand.

Australia.—Australian opal production continued to diminish. The Lightning Ridge and White Cliffs fields were shut down, and only the Andamooka and Coober Pedy areas were supplying any opal. The number of miners working these deposits becomes smaller each year.

Some Australian sapphires were produced during the year, but they were not of fine quality and did not compete well with Ceylon stones in the world market.

Belgian Congo.—In addition to the productive area around Bakwanga and Tskikapa, Kasai Province, diamonds are known to occur in Katanga Province and along the Lomami, Ituri, Ubangi, and Uele

[14] Mineralogist, Lapidary Hints: Vol. 20, No. 6–8, June–August 1952, pp. 277–278.
[15] Mineralogist, Polishing Onyx: Vol. 20, No. 9, September 1952, p. 330.
[16] Willems, J. D., Gem Cutting: Chas. A. Bennett Co., Inc., Peoria, Ill., 1952, 224 pp.
[17] Bureau of Mines, Mineral Trade Notes: Vol. 34, No. 4, April 1952, pp. 32–46.

Rivers, but these localities are regarded to have no economic importance.[18] In Kivu Province, some small concentrations of rubies, white zircons, sapphires, and pink and green tourmalines are known to have been found. Garnets occur around Boma, in the Leopoldville Province, and in the District du Kibali-Ituri. Amethyst is known to occur in the Bas Congo of Leopoldville Province and in Kasai and Kivu Provinces. Agate has been found at Tshala on the Bushimaie River, and often in the alluvials along the rivers of Kasai, Kwango, and Moyen-Congo.[19]

Data on diamond production in the Belgian Congo by individual companies in 1951 was published during the year.[20]

Brazil.—Brazil continued to produce a large caratage of amethyst, aquamarine, citrine, topaz, and tourmaline, and smaller quantities of chrysoberyl, andalusite, euclase, and other gems.

Canada.—Properties and localities of gem stones, such as zircon, cat's-eye, tremolite, and scapolite, were discussed in an article.[21]

Gem-quality serpentine occurs at Kilmar, Quebec, associated with magnesite. The material ranges in color from dark green through pea green to citron yellow. Some of the stones have been made into ornamental objects, such as book ends.[22]

Ceylon.—Ceylon continued to be the principal world producer of ruby, sapphire, chrysoberyl, spinel, and zircon, and produced lesser quantities of garnet, topaz, and tourmaline. The gems came from the alluvial gravels of the Ratnapura district. Mining was done mostly by individuals, and no official production figures were available.[23]

Colombia.—Operations at the famous Chivor emerald mine, owned by Chivor Emerald Mines, Inc., were suspended. The Government-owned Muzo and Cosquez mines produced some emeralds, but output was erratic.[24]

French Equatorial Africa.—According to reports of Grivar Exploration Development Corp., the United States and France agreed to develop jointly a new diamond mine in this country. The mine is near the Ubangi River, about 220 miles southeast of Berberati.[25]

Madagascar.—Garnet was produced by Syndicat Minier Carlo Borsa near the village of Miary.[26] A small quantity of opaque black tourmaline for industrial uses was produced on the island.

Portuguese West Africa.—Harry Winston, Inc., a New York diamond dealer, was reported to have negotiated for distributor's rights for rough diamonds from Portuguese West Africa. The diamonds are mined by Angola Diamond Co.[27]

Tanganyika.—It was announced in 1952 that the diamond production from the Williamson mine at Mwadui, Shinyanga, would be sold

[18] Bureau of Mines, Mineral Trade Notes: Vol. 35, No. 5, November 1952, p. 48.
[19] Bureau of Mines, Mineral Trade Notes: Vol. 35, No. 5, November 1952, p. 50.
[20] Bureau of Mines, Mineral Trade Notes: Vol. 35, No. 5, November 1952, pp. 31–37.
[21] Field, D. S. M., Miscellaneous Gem Stones in Canada: Canadian Min. Jour., vol. 73, No. 5, May 1952, pp. 78–80.
Field, D. S. M., More Canadian Gem Stones: Canadian Min. Jour., vol. 73, No. 11, November 1952, pp. 86–88.
[22] Canadian Mining Journal, vol. 73, No. 11, November 1952, p. 87.
[23] Seymour, John, Gem Mining in Ceylon: Mine and Quarry Eng. (London), vol. 18, No. 11, November 1952, p. 349.
[24] Bureau of Mines, Mineral Trade Notes: Vol. 35, No. 1, July 1952, p. 35. Mining World, vol. 14, No. 2, February 1952, p. 62.
[25] Mining World, vol. 14, No. 1, January 1952, p. 70.
[26] Bureau of Mines, Mineral Trade Notes: Vol. 35, No. 3, September 1952, p. 40.
[27] Mining World, vol. 14, No. 10, October 1952, p. 75.

on the open market. John T. Williamson stated he refused to agree to new terms to sell the diamonds through the Diamond Trading Corp. controlled by DeBeers diamond interests. Production from this mine has averaged about $8,400,000 per year.[28]

Venezuela.—The Minister of Mines and Hydrocarbons of Venezuela announced that the Government would grant a concession to the Compania Venezolana de Diamantes to exploit diamonds at Perantepuy. These deposits are in the southeastern part of the State of Bolivar near the Brazilian border.[29]

[28] Mining World, vol. 14, No. 2, February 1952, p. 56.
[29] Bureau of Mines, Mineral Trade Notes: Vol. 35, No. 5, October 1952, p. 29. Foreign Commerce Weekly, vol. 47, No. 12, June 23, 1952, p. 30.