Gem Stones

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THE JEWELRY INDUSTRY IN 1949

AT THE close of 1948 business as a whole in the United States was at its all-time peak. The jewelry volume had declined from its sensational 1947 peak. The traditional seasonal pattern of the jewelry industry reasserted itself for the first time in 10 years. Prices in general began to decline in early 1949, and jewelers liquidated their stocks to establish low inventories. During spring and early summer business was quiet but became active in July and August, when business confidence was restored, and was reasonably so during the fall months; the weeks before Christmas saw the traditional rush for jewelry-store merchandise. High-priced diamond jewelry lagged, however, because of anticipated reduction of present excise taxes. According to a survey made by the National Wholesale Jewelers' Association, diamond sales showed a 19-percent decline in 1949 compared to 1948.

The Jewelers' Circular-Keystone, using United States Department of Commerce statistics and Internal Revenue (excise tax receipts) data, figured that the volume done by jewelry stores in 1949 was approximately $1,055,000,000, a decline of 12 percent from 1948.

FASHIONS IN JEWELS

The fashion aspect of the jewelry industry received more recognition in 1949 than ever before. The Jewelry Industry Council appointed a fashion director and began to include jewelry fashion shows and other forms of jewelry entertainment for the fashion press in its regular schedule of activities. A fashion advisory committee of the Jewelry & Allied Industries was organized to bring together designers, artisans, and promoters in the fields of apparel and jewelry. These organizations deal with costume jewelry as well as with diamonds and other precious jewelry.

The fashion picture as a whole was conservative. Paris made no radical change in styles. However, there was a strong trend in America toward the styles of the 1920's, and the persistence of this trend is slowly affecting the design of jewelry. Bracelets are becoming increasingly popular, as are longer chains and pendants. The most noticeable change in jewelry fashion was the return to pendant earrings. The trend is more and more toward white metals for the

[1] Smithsonian Institution; consulting mineralogist to Bureau of Mines.

mounting of diamonds, but in the more elaborate pieces very little metal was visible. Manufacture was ingenious from the standpoint of mechanical construction. Diamonds were set in hundreds of tiny links, invisibly hinged to form mobile showers of baguettes and "trembling" leaves, stems, and petals. Kite, keystone, and triangle cuts were incorporated into this fine jewelry, and the marquise and pear shape continued to be used.

In diamond engagement-ring mountings the locked-together types of engagement ring and wedding band have become more common. Ingenuity continued to make small diamonds look larger. The demand for straight-sided stones, especially diamond, increased.

DOMESTIC PRODUCTION

For many years the United States has produced a large variety of gem materials but has never been an important factor in world gem production. Gem mining has been and probably will continue to be a minor mining industry.

No large gem-mining companies exist in the United States. A few small companies have been organized from time to time to work certain deposits, such as jade, turquoise, sapphire, and tourmaline. Some professional lapidary shops employ a few miners. In addition, thousands of amateur lapidaries spend their vacations and weekends searching for gem materials, particularly for varieties of quartz (agate, jasper, and petrified wood). Many of their products go to local jewelers or roadside curio shops, particularly in southwestern, western, and northwestern States. As a hobby, the lapidary craft is continuing to spread.

No reliable statistics exist as to the value of the domestic output of gem stones; in the rough it may approximate $400,000 to $500,000 and more than double that after cutting.

The many forms of quartz, chiefly the cryptocrystalline varieties, led the field, with jade second and turquoise third. Of the States, Oregon, Wyoming, Washington, and Texas were the leaders.

Agate.—Agate production, including all other varieties of chalcedony, such as jasper and petrified wood, is increasing as interest in the lapidary craft grows. "Thunder eggs" continued to be produced, chiefly in Oregon. The well-known Yellowstone River moss-agate locality in Montana is still producing but in ever decreasing quantity, with few if any full-time agate hunters.

It is estimated that over 50 tons of agate were produced in New Mexico, plus an additional unknown amount picked up by private collectors. Considerable agate was produced in west Texas, mostly near Alpine, in the Big Bend section, and near Laredo. South Dakota produced some agate, mined by Scott's Rose Quartz Co.

A relatively large amount of agatized wood was collected on the borders of the Petrified Forest National Monument, Ariz. New finds of petrified wood were reported from various localities in Oregon and Washington.

A small amount of chrysoprase was mined at Porterville, Calif.

Red jasper from Vermont was offered in ton lots, mined by the Burlington Gem Co.

Jade.—Allan Branham, Lander, Wyo., stated that the light-green jade (nephrite) in Wyoming is largely depleted but that new finds of dark green and black had been made. The year 1949 was the poorest in the past 13 for Wyoming jade; total sales were approximately $20,000, with the price of light green ranging from $10 to $15 per pound and dark green and black from $5 to $10 per pound.

A large deposit of black jade was found at Kortes Dam, Wyo. A single piece weighing 1,500 pounds was taken out. A newly discovered field at Daniel, Wyo., is reported to be of poor quality.

The American Jade Co., Denver, Colo., reportedly spent over $50,000 developing its jade deposit in the Sweetwater River area, Wyoming.

A new deposit of nephrite jade was discovered on Lewis Hill, 2 miles north of Porterville, Tulare County, Calif.; 1 ton was mined, with several more tons in sight. The jade is reported to vary in color from medium to dark green, with excellent translucency. Operators of the mine are Frank Janolco and F. V. Alston, Porterville.

Some nephrite jade was produced from the Monterey County, Calif., locality, chiefly by amateur collectors.

In November 1949 a deposit of jadeite jade was found on Clear Creek, San Benito County, Calif., by the late L. Ph. Bolander, K. J. Fritsch, and Buck Bleifus. The jadeite mined thus far has been dark green and not of gem quality. Considerable interest is being manifested in this deposit because it represents the first discovery of jadeite jade in the Western Hemisphere other than worked pieces in the tombs of ancient civilizations in Central America.

The Havenstrite Mining Co. (formerly Arctic Circle Exploration Co.) mined no jade in the Kobuk area, northwestern Alaska, during 1949, and reports no known mining by any other organization or individual in the Territory.

Turquoise.—Production of turquoise in the Southwest appears to be steadily diminishing. The Southwest Gem & Jewelry Co. mined 75 to 100 pounds at its Cerebrat ranch, Arizona, property. There was no production reported from New Mexico during the year. Some turquoise is mined in Lander County, Nev.

Diamond.—In October 1948 mining operations in the well-known diamond-bearing kimberlite pipes near Murfreesboro, Ark., were started once again, after a shut-down of many years, by a diamond corporation headed by Glenn L. Martin. Milling was carried on in a washing and recovery mill having a capacity of 1,000 tons a day. Surface-mining methods were used. After 120 thousand tons of various surface ores had been mined from numerous localities in the 60 acres showing peridotite, the enterprise was closed as of September 1949.

The company obtained approximately 840 diamonds, the largest a stone of 4½ carats. Ninety percent of the stones recovered were small industrials from one-tenth to 1 carat in size. Total diamonds produced weighed 246.15 carats. The indicated yield of the ground treated is 0.16 carat per 100 loads (16 cubic feet), compared with 24 carats per 100 loads for the Premier mine in South Africa. The production consisted of 10 percent very imperfect distorted pieces of mixed color, 5 percent seconds of dark-brown tint, 20 percent small-

size mixed industrials, and 65 percent crushing boart. The appraised valuation was $984.60.

A 3.93-carat diamond was found near Peru, Miami County, Ind., in 1949.

Other Gem Stones.—Utah reported that about the normal amount (300 pounds) of variscite was produced, mostly from the Clay Canyon deposit.

Scott's Rose Quartz Co. mined about 100 pounds of rose quartz in South Dakota. The Bumpus quarry, Albany, Maine, reopened and produced about 50 tons of rose quartz, much of good color, including a single piece weighing 2,000 pounds.

Some transparent light-yellow labradorite was produced in Utah, probably not over 25 pounds in all.

No sapphires were produced at the Yogo sapphire mine, Montana. The mine has been taken over by a new company, the Yogo Sapphire Mining Co. It is reported that the mine will be reopened and worked during 1950.

Arkansas continued to produce some quartz crystals.

A number of good crystals of green tourmaline were produced in the Pala District, San Diego County, Calif., some of which were cut into stones of over 1 carat. Some golden and pale-pink beryl and a very small amount of kunzite were also produced.

A very fine gem-quality green beryl crystal, weighing 14½ ounces, was found in Riverside County, Calif. The exact locality has been withheld pending further exploration by the discoverers.

Other gem stones produced in small amounts in 1949 in the United States follow: Beryl, Mt. Antero, Colo.; amblygonite, beryl, and spodumene, Maine; idocrase ("californite"), Siskiyou County, Calif.; and topaz, Texas and Utah.

CANADIAN GEM STONES

Again in 1949 Canada produced very little in the way of gem stones. A few tons each of sodalite, peristerite, amazonite, and labradorite find their way each year to dealers in Canada and the United States. The annual value of Canada's gem-stone production probably does not exceed a few hundred dollars.

IMPORTS [2]

Imports of gem stones, exclusive of industrial diamonds, in 1949, as reported by the United States Department of Commerce, totaled $84,185,631, about 27 percent less than in 1948. Of the total, diamonds comprised 83 percent.

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

Precious and semiprecious stones (exclusive of industrial diamonds) imported for consumption in the United States, 1948–49

[U. S. Department of Commerce]

Commodity	1948		1949	
	Carats	Value	Carats	Value
Diamonds:				
Rough or uncut (suitable for cutting into gem stones), duty-free	[1] 909,871	[1] $44,400,481	651,150	$28,299,799
Cut but unset, suitable for jewelry, dutiable	[1] 388,499	56,244,934	335,487	41,427,718
Emeralds:				
Rough or uncut, duty-free	4,937	28,054	80,231	226,233
Cut but not set, dutiable	11,213	286,565	13,723	284,578
Pearls and parts, not strung or set, dutiable:				
Natural		772,763		532,310
Cultured or cultivated		748,302		1,733,698
Other precious and semiprecious stones:				
Rough or uncut, duty-free		258,553		208,124
Cut but not set, dutiable		3,160,778		2,045,476
Imitation, except opaque, dutiable:				
Not cut or faceted		53,133		36,090
Cut or faceted:				
Synthetic		777,224		680,428
Other		8,904,941		8,495,151
Imitation, opaque, including imitation pearls, dutiable		59,610		37,819
Marcasite, dutiable:				
Real		[1] 225,638		170,405
Imitation		19,055		7,802
Total		[1] 115,940,031		84,185,631

[1] Revised figure.

DIAMOND

World production of diamonds was about 36 percent greater in 1949 than in 1948. Output for the Union of South Africa was approximately the same. The large increase came from the Belgian Congo, where production increased from a little less than 6,000,000 carats to over 9,600,000 carats. Tanganyika continued to show a steady rise.

Sales of rough by the principal distributors (Diamond Trading Co. for gem diamonds and Industrial Distributors (1946), Ltd., for industrial diamonds) were £28,446,000 for 1949 as compared with a little over £38,000,000 in 1948.

Cutting.—The number of employed cutters fluctuated throughout 1949 with the course of business, and there was considerable unemployment. The cost of cutting in the United States continues substantially higher than in other diamond-cutting centers of the world. Half the cutters are Belgians. Conditions in the Netherlands' cutting industry were fairly satisfactory, with about 1,500 to 1,600 workers employed. The Israel diamond-cutting industry was beset by many problems, chiefly lack of supply of rough from the Diamond Syndicate. Cutting in Germany caused other diamond-cutting centers considerable difficulty. An effort is being made to revive the diamond-cutting industry in Cuba.

Imports.—Imports of gem-grade diamonds into the United States decreased from $100,645,415 (revised figure) in 1948 to $69,727,517 in 1949, a decrease of 31 percent. The dollar value of both rough and cut decreased, as did the quantity of both. Belgium furnished 47 percent (value) of the cut in 1949.

Diamonds (exclusive of industrial diamonds) imported for consumption in the United States, 1948–49, by countries

[U. S. Department of Commerce]

Country	Rough or uncut			Cut but unset		
	Carats	Value		Carats	Value	
		Total	Average		Total	Average
1948						
Austria				1	$215	$215.00
Belgian Congo	119	$3,870	$32.52			
Belgium				213,207	31,475,999	147.63
Brazil	[1] 12,987	[1] 235,410	[1] 18.13	4,762	578,774	121.54
British Guiana	786	29,219	37.17	116	12,535	108.06
Canada				21	13,388	637.52
China				328	67,032	204.37
Colombia				20	5,683	284.15
Cuba				4,790	657,520	137.27
Egypt				14	1,875	133.93
France				13,471	925,673	68.72
French Morocco				61	13,300	218.03
Germany				[1] 10,809	399,714	[1] 36.98
Hong Kong				324	83,282	257.04
Iran				113	12,724	112.60
Israel-Jordan	1,120	114,921	102.61	39,995	4,139,345	103.50
Italy				3	1,088	362.67
Jamaica				2	230	115.00
Japan				2	539	269.50
Lebanon				23	6,283	273.17
Mexico				80	9,954	124.43
Netherlands				34,246	5,109,945	149.21
Pakistan				1	488	488.00
Portugal				99	10,439	105.44
Sweden				1	450	450.00
Switzerland				18,298	3,044,693	166.39
Tangier				2	1,067	533.50
Thailand				1,049	197,868	188.63
Union of South Africa	832,022	42,379,244	50.94	33,060	7,974,210	241.20
U. S. S. R.				9,303	775,378	83.35
United Kingdom	6,112	310,098	50.74	4,297	724,968	168.71
Venezuela	56,725	1,327,719	23.41			
Yugoslavia				1	275	275.00
Total 1948	[1] 909,871	[1] 44,400,481	[1] 48.80	[1] 388,499	[1] 56,244,934	[1] 144.77
1949						
Argentina				3	1,009	336.33
Belgian Congo	3,100	6,096	1.97			
Belgium				159,189	19,581,847	123.01
Brazil	14,765	430,826	29.18	4,679	615,265	131.49
British Guiana	241	6,464	26.82	30	3,011	100.37
Canada				38	5,303	139.55
Chile				13	3,990	306.92
China				4	700	175.00
Cuba				580	71,099	122.58
Czechoslovakia				44	4,357	99.02
Denmark				139	11,300	81.29
France				2,843	355,899	125.18
French Morocco				63	15,091	239.54
Germany				3,528	283,903	80.47
Gold Coast	6,947	81,936	11.79			
Hong Kong				75	41,172	548.96
Iran				996	82,039	82.37
Israel-Jordan				70,485	5,402,074	76.64
Italy				27	134,933	4,997.52
Lebanon				103	13,829	134.26
Liberia	60	2,500	41.67			
Netherlands				24,789	3,202,227	129.18
Netherlands Antilles	11	3,534	321.27	15	3,689	245.93
Switzerland				14,465	1,932,944	133.63
Thailand				1,142	251,155	219.93
Union of South Africa	595,101	26,938,598	45.27	39,644	8,404,959	212.01
U. S. S. R.				8,663	539,412	62.27
United Kingdom	1,708	118,838	69.58	3,771	449,356	119.16
Venezuela	29,217	711,007	24.34	159	17,155	107.89
Total 1949	651,150	28,299,799	43.46	335,487	41,427,718	123.49

[1] Revised figure.

World Production.—Official figures on diamond production are not available for all countries, but the figures in the accompanying table are believed to be reasonably accurate as they have been compiled from Government reports, information supplied by officials of producing companies, and other authoritative sources. World production (gems and industrials) is estimated to have been 13,635,000 carats (3.01 short tons), which compares with 10,047,000 carats (2.21 short tons) for 1948, an increase for 1949 over 1948 of 36 percent.

Belgian Congo was the leading producer by weight but not by value since only about 7 percent of the Belgian Congo production is of gem quality. South Africa, on the other hand, although producing much less by weight led in terms of value.

Industrial Diamonds.—Sales of industrial diamonds in 1949 were very large, although considerably less than in 1948. Total sales in 1949 by Industrial Distributors (1946), Ltd., the industrial-diamond sales organization for the DeBeers group, were valued at £8,469,811. The United States purchased a large percentage of the total quantity, both for private industry and for the National Stockpile.

World production of diamonds, by countries, 1946–49, in metric carats

[Including industrial diamonds]

Country	1946	1947	1948	1949
Africa:				
Angola	806, 961	799, 210	795, 509	769, 981
Belgian Congo	6. 033, 452	5, 474, 469	5, 824, 567	9, 649, 896
French Equatorial Africa	87, 381	107, 076	118, 800	123, 000
French West Africa	51, 834	53, 749	77, 970	94, 996
Gold Coast	[1] 653, 196	[1] 852, 493	[2] 850, 000	432, 530
Sierra Leone	559, 229	605, 554	465, 518	494, 119
South-West Africa	163, 611	179, 554	200, 691	280, 134
Tanganyika	119, 446	92, 229	148, 169	191, 787
Union of South Africa:				
Lode	1, 025, 019	918, 042	[2] 930, 000	964, 266
Alluvial	256, 768	[3] 286, 692	[2 3] 270, 000	[3] 289, 75[illegible]
Total Union of South Africa	1, 281, 787	1, 204, 734	[2] 1, 200, 000	1, 254, 022
Brazil (estimated)	325, 000	275, 000	250, 000	250, 000
British Guiana	30, 958	24, 669	36, 562	34, 790
Venezuela	20, 912	61, 634	75, 513	56, 362
Other countries (estimated)	1, 600	3, 500	3, 500	3, 000
Grand total	10, 135, 000	9, 734, 000	10, 047, 000	13, 635, 000

[1] Exports.
[2] Estimated.
[3] Includes an estimate of 100,000 carats for State Mines of Namaqualand.

The use of diamond drills for exploring and breaking ore is expanding, and the use of diamond-impregnated wheels is increasing. The only significant new use of industrial diamonds is for drilling in oil fields. Bits up to 12 inches in diameter have been used, although the common sizes are 6- and 8-inch. These bits are being used not for core recovery but for "making hole."

Figure 1 shows the increase in the quantity of industrial diamonds imported into the United States in the past 27 years, as contrasted with the price per carat.

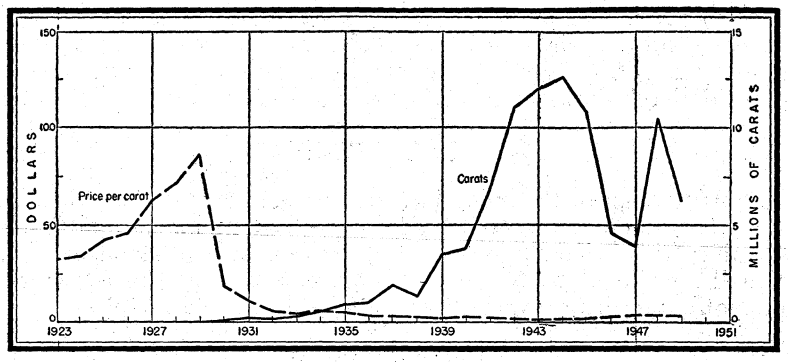

FIGURE 1.—United States imports and average price per carat of industrial diamonds, 1923–49.

Industrial diamonds (glaziers', engravers', and miners') imported for consumption in the United States, 1945–49

[U. S. Department of Commerce]

Year	Carats	Value		Year	Carats	Value	
		Total	Average			Total	Average
1945	10,733,411	$12,823,962	$1.19	1948 [1]	10,421,207	$32,581,385	$3.13
1946	4,625,282	14,297,536	3.09	1949	6,261,689	17,339,219	2.77
1947	3,999,119	13,312,668	3.33				

[1] Revised figures.

RUBY, SAPPHIRE, AND EMERALD

The precious stones, other than diamond, continued to increase in price owing to short supply of newly mined stones of fine quality.

A 2-ounce particolored sapphire was reported found along the bed of a gully near Tomahawk Creek, Central Queensland, Australia, a locality where gems had not been previously known to exist.

A star sapphire was found in a mine in the Ratnapura District, Ceylon, weighing nearly one-half pound. It is believed that two stones of about 400 carats each can be cut from it.

Mining has been resumed at the famous Chivor-Somondoco mines in Colombia according to reports. The old "terrace" type of mining has given way to conventional underground methods.[3] Production for 1949 was reported to be 91,656 carats compared with 82,370 carats for 1948.[4]

The emerald mines at Muzo, Colombia, have been closed by the Banco de la Republica, after operating for the year at a considerable loss.

Emeralds were mined in India, at Kaliguman, a small village in the Udaipur district in the State of Rajasthan. A small proportion of the production reportedly yielded stones of fine quality. Production of all qualities for 1948–49 was approximately 15,000 carats.

South Africa and Brazil continue to produce a few emeralds.

[3] Bureau of Mines, Mineral Trade Notes: Vol. 30, No. 1, January 1950, pp. 29–38.
[4] Bureau of Mines, Mineral Trade Notes: Vol. 31, No. 1, July 1950, pp. 31–32.

Ceylon produces not only ruby and sapphire but also alexandrite, cat's-eye, and a variety of less valuable gem stones. Most of these are recovered from gravels by placer mining. An estimated half million dollars' worth of gems is produced each year.

LESSER GEMS

The Australian opal-mining industry continues at a low ebb. Only about 100 miners are active. The once famous black-opal fields at Lightning Ridge, New South Wales, are almost exhausted.

Brazil continued to produce a large caratage of the lesser gems, principally amethyst, aquamarine, citrine quartz, and topaz.

TECHNOLOGY

Synthetic rutile (titania) was made in quantity by the Linde Air Products Co. and the National Lead Co. The material is grown in boules by a modification of the well-known Verneuil technique. No completely colorless material has been made, the nearest to this being tinged with yellow. Other shades such as red, blue, green, brown, and yellow have also been made. The refractive index of synthetic rutile is considerably higher than diamond, while its dispersion is approximately three times that of diamond.

Several experiments were reported in which the color of topaz, sapphire, and other gems was changed by exposure to radium radiation. The turning of yellow diamonds green and colorless quartz purple by bombardment in a cyclotron was also reported.

Education and Laboratories.—The Gem Trade Laboratory of New York consolidated with the Gemological Institute of America, the new laboratory to be known as the Gem Trade Laboratory of the Gemological Institute of America, 5 East Forty-seventh Street, New York, N. Y.

The Diamond Research Laboratory of Johannesburg, Union of South Africa, was established recently by the leading diamond companies of the world for two purposes: (1) To assist the mining companies in problems concerning their extraction processes and in investigations leading to increased output and reduced cost and (2) to act as a research and service center for all who use diamonds in any form.

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