

GEMSTONES

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Humans have been intrigued by gems since prehistoric times. They have been valued as treasured objects throughout history by all societies in all parts of the world. The first stones known to have been used for making jewelry include amber, amethyst, coral, diamond, emerald, garnet, jade, jasper, lapis lazuli, pearl, rock crystal, ruby, serpentine, and turquoise. These stones served as status symbols for the wealthy. Today, gems are not worn to demonstrate wealth as much as they are for pleasure or in appreciation of their beauty (Schumann, 1998, p. 8). In this report, the terms “gem” and “gemstone” mean any mineral or organic material (such as amber, pearl, and petrified wood) used for personal adornment, display, or object of art because it possesses beauty, rarity, and durability. Of the 2,700 mineral species, only about 100 possess all these attributes. Silicates compose the largest group of gemstones; oxides and quartz compose the second largest (table 1). A further subcategory of gemstones is “colored gemstone,” which in this report designates all nondiamond gemstones, including amber, coral, and shell. In addition, synthetic gemstones, cultured pearls, and gemstone simulants are discussed but are treated separately from natural gemstones (table 2). Current information on industrial-grade diamond can be found in the U.S. Geological Survey minerals yearbook chapter on industrial diamond.

Production

Commercial mining of gemstones has never been extensive in the United States. More than 60 varieties of gemstones have

been produced commercially from domestic mines, but most of the deposits have been relatively small compared with other mining operations. In many instances, contemporary gemstone mining in the United States is conducted by hobbyists, collectors, and gem clubs rather than business organizations.

The commercial gemstone industry in the United States consists of several distinct sectors: (1) individuals and companies that mine gemstones or harvest shell and pearl, (2) firms that manufacture synthetic gemstones, and (3) individuals and companies that cut natural and synthetic gemstones. The domestic gemstone industry is focused on the production of colored gemstones and on the cutting of large diamonds. Industry employment is estimated to range from 1,000 to 1,500 workers (U.S. International Trade Commission, 1997, p. 1).

Most natural gemstone producers in the United States are small businesses that are widely dispersed and operate independently. The small producers probably have an average of less than three employees, including those who only work part time. The number of gemstone mines operating from year to year fluctuates, because the inherent uncertainty associated with the discovery and marketing of gem-quality minerals makes it difficult to obtain financing for developing and sustaining economically viable deposits (U.S. International Trade Commission, 1997, p. 23).

The total value of natural gemstones produced in the United States during 2000 was estimated to be at least \$17.2 million (table 3). The production value was 6.9% greater than the preceding year. The production growth was mostly because the

Gemstones in the 20th Century

In 1900, U.S. production of gemstones was valued at about \$233,000. The top five gemstone types, in descending order of production value, were turquoise, sapphire, rhodolite (garnet), aquamarine, and quartz crystal; these accounted for about 85% of total domestic production. Turquoise was produced primarily in Nevada and New Mexico. Sapphire production was in Montana, rhodolite and beryl production occurred in North Carolina, and quartz crystal production was in California and Montana. In 1900, the United States also imported diamond and other gemstones valued at about \$13.6 million. Nearly \$4 million worth of these imports were rough South African diamonds that were all cut in the United States. Opals from Australia that were cut in the United States were also a significant portion of these imports.

In 2000, domestic gemstone production was estimated to be \$74.3 million, of which an estimated \$57.1 million was synthetic gemstone and \$17.2 million was natural gemstone.

The top seven natural gemstone types, in descending order of production value, were shell, beryl, agate, turquoise, quartz, coral, and gem feldspars; these accounted for about 47% of the total natural gemstone production. Output of natural gemstones was primarily from Tennessee, Arizona, California, Nevada, and Utah, in decreasing order. Reported output of synthetic gemstones was from five firms in North Carolina, New York, Florida, California, and Arizona, in decreasing order of production. There was notable production of freshwater pearl in Tennessee, turquoise in Arizona, and beryl in North Carolina and Utah. In 2000, the United States also imported diamond and other gemstones valued at about \$12.9 billion. Of these imports, 79% was from Israel, India, and Belgium, in descending order of gemstone import value. Diamond imports accounted for 93% of the total value of gemstone imports, and slightly more than 10.4% by weight of those diamonds was cut in the United States.

2000 shell harvest was 42% larger than in 1999 and foreign markets for U.S. shell material grew as the demand from Southeast Asia cultured pearl producers increased (Jewellery News Asia, 2000b).

The estimate of 2000 U.S. gemstone production was based on a survey of more than 200 domestic gemstone producers conducted by the U.S. Geological Survey (USGS). The survey provided a foundation for projecting the scope and level of domestic gemstone production during the year. However, the USGS survey did not represent all gemstone activity in the United States, which includes thousands of professional and amateur collectors. Consequently, the USGS supplemented its survey with estimates of domestic gemstone production from related published data, contacts with gemstone dealers and collectors, and information garnered at gem and mineral shows.

Natural gemstone materials indigenous to the United States are collected, produced, and/or marketed in every State. During 2000, all 50 States produced at least \$1,000 worth of gemstone materials. Five States accounted for about 75% of the total value, as reported by survey respondents. These States, in order of declining value of production, were Tennessee, Arizona, California, Nevada, and Utah. Some States were known for the production of a single gemstone material, Tennessee for freshwater pearls and Arkansas for quartz, for example. Other States produced a variety of gemstones, like Arizona, whose gemstone deposits included agate, amethyst, azurite, chrysocolla, fire agate, garnet, jade, malachite, obsidian, onyx, peridot, petrified wood, opal, smithsonite, and turquoise. A wide variety of gemstones also were found in California, Idaho, Montana, and North Carolina.

There were only two operations on significant known diamond-bearing areas in the United States during 2000. The first is the Kelsey Lake Diamond Mine, which straddles the Colorado-Wyoming State line. Kelsey Lake is now the only commercial producing diamond mine in the United States. It is operated by Great Western Diamond Company, a wholly-owned subsidiary of McKenzie Bay International Ltd., who purchased the property from Redaurum Limited in April 2000 (McKenzie Bay International Ltd., May 1, 2000, Kelsey Lake Diamond Mine released from bankruptcy proceedings Yes International to perform investor relations, accessed November 20, 2000, at URL <http://www.mckenziebay.com/news/archive/000501.htm>). Diamonds are present in three of the nine known kimberlite pipes on the Kelsey Lake property. The remaining six kimberlites have yet to be fully explored and tested for their diamond potential. Of diamonds recovered, 50% to 65% were clear gem quality, and almost a third were one carat or larger in size. The identified resources are at least 17 million tons (Mt) grading at an average of 4 carats per hundred tons (J. Taylor, April 11, 2000, McKenzie Bay International Ltd., accessed July 16, 2001, at URL <http://www.mckensiebay.com/reports/jt000411.htm>). Kelsey Lake was reopened and began production again in September 2000, after installing new equipment in the main processing and recovery plant. Maximum diamond recovery rates are expected in 2001 (McKenzie Bay International Ltd., September 6, 2000, Diamond production begins at Kelsey Lake Diamond Mine, accessed November 20, 2000, at URL <http://www.mckenziebay.com/news/archive/000906.htm>). The

second operation was in Crater of Diamonds State Park near Murfreesboro in Pike County, AR, where a dig-for-fee operation for tourists and rockhounds is maintained by the State. Crater of Diamonds is the only diamond mine in the world that is open to the public. The diamonds occur in a lamproite breccia tuff associated with an extinct volcanic pipe and in the soil developed from the lamproite breccia tuff. Since the diamond-bearing pipe and the adjoining area became a State park in 1972, over 21,000 diamonds have been recovered. Recent exploration demonstrated that there are some 78.5 Mt of diamond-bearing rock in this diamond deposit (Howard, 1999, p. 62). An Arkansas law, enacted early in 1999, prohibits commercial diamond mining in the park (Diamond Registry Bulletin, 1999).

In addition to natural gemstones, synthetic gemstones and gemstone simulants are produced in the United States. Synthetic gemstones have the same optical, physical, and chemical properties as the natural materials that they appear to be. Simulants have an appearance similar to that of a natural gemstone material, but they have different optical, physical, and chemical properties. Synthetic gemstones produced in the United States include alexandrite, diamond, emerald, moissanite, ruby, sapphire, turquoise, and zirconia. Simulants of coral, lapis lazuli, malachite, and turquoise also are manufactured. In addition, certain colors of synthetic sapphire and spinel, used to represent other gemstones, are classified as simulants.

Synthetic gemstone production in the United States exceeded \$57 million during 2000; simulant gemstone output was even greater and was estimated to be more than \$100 million. Five firms in five States, representing virtually all the U.S. synthetic gemstone industry, reported production to the USGS. The States with reported synthetic gemstone production were Arizona, California, Florida, New York, and North Carolina. At least one U.S. company has developed technology to produce consistent quality and quantities of synthetic diamond and has reported production during 2000. The synthetic diamond stones weight ranged from 1.5 to 2 carats.

In 2000, a North Carolina firm entered its third year of marketing moissanite, a gem-quality synthetic silicon carbide that it produces. Moissanite is also an excellent diamond simulant, but it is being marketed for its own gem qualities.

Consumption

Although the United States accounts for less than 1% of total global gemstone production, it is the world's leading gemstone market. On the basis of indicators, such as trade data and income growth rates, U.S. gemstone markets—bolstered by strong demand among consumers with more personal wealth and more discretionary income—apparently accounted for at least 35% of world gemstone demand in 2000. The U.S. market for unset gem-quality diamonds during the year was estimated to have exceeded \$9 billion, the largest in the world. Domestic markets for natural, unset nondiamond gemstones totaled about \$770 million.

According to a poll conducted by a U.S. jewelry retailers association in the mid-1990s, about two-thirds of domestic consumers who were surveyed preferred diamond as their

favorite gemstone (ICA Gazette, 1996). In 2000, the top-selling colored gemstones, in descending order, were blue sapphire, ruby, emerald, amethyst, tanzanite, tourmaline, garnet, fancy sapphire, pearl, and blue topaz (Prost, 2001). In addition to jewelry, gemstones are used for collections, exhibits, and decorative art objects.

Prices

Gemstone prices are governed by many factors and qualitative characteristics, including beauty, clarity, defects, demand, and rarity. Diamond pricing, in particular, is complex; values can vary significantly depending on time, place, and the subjective evaluations of buyers and sellers. There are more than 14,000 categories used to assess rough diamond and more than 100,000 different combinations of carat, clarity, color, and cut values used to assess polished diamond (Pearson, 1998).

Colored gemstone prices are generally influenced by market supply and demand considerations, and diamond prices are supported by producer controls on the quantity and quality of supply. Values and prices of gemstones produced and/or sold in the United States are listed in tables 3 through 5. In addition, customs values for diamonds and other gemstones imported, exported, or reexported are listed in tables 6 through 10.

De Beers Consolidated Mines Ltd. in South Africa is a significant force affecting gem diamond prices worldwide because it mines about one-half of the diamonds produced each year and sorts and values about two-thirds (by value) of the world's annual supply of rough diamonds through its Diamond Trading Company (DTC), which has marketing agreements with other producers. Estimates based on the reported output of major diamond mines in 2000 indicate that the average value of all diamond produced during the year was about \$71 per carat; by country, the average value per carat ranged from about \$14 in Australia to more than \$276 in Namibia (Luc Rombouts, Terraconsult bvba, May 2, 2001, Diamond annual review—2000, accessed June 19, 2001, at URL <http://www.terraconsult.be/overview.htm>).

Foreign Trade

During 2000, total U.S. gemstone trade with all countries and territories exceeded \$17.4 billion; diamonds accounted for about 92% of the total. In 2000, U.S. exports and reexports of diamond were shipped to 72 countries and territories, and imports of all gemstones were received from 112 countries and territories (tables 6-10).

During 2000, U.S. trade in cut diamonds reached unprecedented levels; the country continued to be the world's leading diamond importer and set export records as well. Record high imports were attributed to a relatively strong U.S. economy that boosted domestic demand for diamond jewelry among consumers with more personal wealth and discretionary income.

The United States is a significant international diamond transit center, as well as the world's largest gem diamond market. The large volume of reexports (table 6) shipped to other centers reveals the significance that the United States has

in the world's diamond supply network.

Synthetic gemstone trade continued to increase for the United States in 2000. Imports of synthetic gems increased slightly during the year. Synthetic gemstone imports from Austria, China, Germany, Switzerland, and Thailand made up about 80% of the total domestic imports of synthetic gemstones during the year. Prices of certain synthetic gemstone imports, such as amethyst, were very competitive. The marketing of synthetic imports and enhanced gemstones as natural gemstones and the mixing of synthetic materials with natural stones in imported parcels continued to be problems for some domestic producers in 2000. Another problem during the year was that some simulants were being marketed as synthetic gemstones.

World Review

The gemstone industry worldwide has two distinct sectors: (1) diamond mining and marketing, and (2) the production and sale of colored gemstones. Most diamond supplies are controlled by a few major mining companies; prices are supported by managing the quantity and quality of the gemstones relative to demand, a function performed by De Beers through DTC. Unlike diamonds, colored gemstones are primarily produced at relatively small, low-cost operations with few dominant producers; prices are influenced by consumer demand in addition to supply availability.

In 2000, world diamond production totaled at least 118 million carats with an estimated value of more than \$7.86 billion (table 11). Most production was concentrated in a few regions—Africa [Angola, Botswana, Congo (Kinshasa), Namibia, and South Africa], Asia (northeastern Siberia and Yakutia in Russia), Australia, North America (Northwest Territories in Canada), and South America (Brazil and Venezuela). In 2000, Botswana was the world's leading diamond producer in terms of output value and quantity (Luc Rombouts, Terraconsult bvba, May 2, 2001, Diamond annual review—2000, accessed June 19, 2001, at URL <http://www.terraconsult.be/overview.htm>).

Global diamond sales hit a record high of \$25.8 billion, nearly 9% higher than 1999, according to figures released by the Diamond High Council (CNN.com, January 30, 2001, Diamond sales enjoy record year, accessed February 2, 2001, at <http://www.cnn.com/2001/WORLD/europe/01/30/belgium.diamonds/index.html>). Record sales of rough diamond by DTC in 2000 reached \$5.67 billion, 8.2% higher than the 1999 total of \$5.24 billion. The sales record was primarily the result of very strong sales in the first half of the year. Sales in the second half of the year actually dropped by 23% compared with the second half of 1999 (The Diamond Registry, January 2001, U.S. market drives De Beers to record sales increase in 2000, accessed April 25, 2001, at URL http://www.diamondregistry.com/News/sales_record.htm). Retail diamond jewelry sales in the United States grew by 6% in 2000, the ninth consecutive year sales have risen (Diamond Registry Bulletin, 2001a).

Additional events significant to diamond mining and marketing worldwide in 2000 include the following:

! The Ekati Mine, Canada's first commercial diamond mine, completed its second full year of production. The Ekati Mine,

located in the Northwest Territories, was a joint venture between BHP Diamonds Inc. (BHP) and Dia Met Minerals Ltd., but in June 2001, BHP purchased Dia Met Minerals Ltd. (BHP Diamonds Inc., 2001). Ekati has estimated reserves of 60.3 Mt of ore in kimberlite pipes, containing 54.3 million carats of diamonds, and the mine life is projected to be 25 years. In 2000, Ekati produced 2.63 million carats valued at \$454 million, which reflected a record sales price of \$172.52 per carat. Ekati diamonds are sold by the BHP sales office in Antwerp (65%) and by DTC (35%) (Luc Rombouts, Terraconsult bvba, May 2, 2001, Diamond annual review—2000, accessed June 19, 2001, at URL <http://www.terraconsult.be/overview.htm>).

! The Diavik diamonds project is located in the Northwest Territories. Diavik has estimated reserves of 25.6 Mt of ore in kimberlite pipes, containing 102 million carats of diamonds, and the mine life is projected to be 20 years. Diavik received the required permits and regulatory approval in 2000 and began site infrastructure development and project construction. Diavik is an unincorporated joint venture between Diavik Diamond Mines Inc. (60%) and Aber Diamond Mines Ltd. (40%), and it is expected to commence diamond production in the first half of 2003. The mine is expected to produce about 102 million carats of diamond at a rate of 6 million carats per year worth about \$63 per carat (Diavik Diamond Mines Inc., 2000, p. 10-12).

! “Conflict diamonds” continued to partially finance warfare in Angola, Congo (Kinshasa), and Sierra Leone. In 2000, these “conflict diamonds” were discussed in the United Nations (U.N.), the U.S. Congress, the World Diamond Council, and the news media. The U.N. adopted a resolution on the role of diamonds in fueling conflict. A bill that was introduced, but not passed, in the 106th U.S. Congress would have required jewelry retailers to reveal the country of origin for all diamonds sold in the United States. In 2001, a revised version of this bill was reintroduced in the 107th U.S. Congress. The revised bill calls for a comprehensive diamond certification program and says that the United States can only import rough diamond from countries with the proper controls to ensure against importation of “conflict diamonds.” “Conflict diamonds” were also the subject of much television and other media coverage in 2000. Despite all of this discussion and media attention, surveys indicate that during 2000, most diamond jewelry consumers did not ask for the country of origin when making their diamond buying decisions (Diamond Registry Bulletin, 2000a). One survey in 2000 indicated that 93% of consumers who were surveyed had never heard of “conflict diamonds,” but 76% of consumers said that they would not purchase diamonds or diamond jewelry knowing that it came from a country where social injustice had occurred as a result of its production (Diamond Registry Bulletin, 2000c).

! De Beers Canada Mining Inc. acquired the Snap Lake diamond project from Winspear Diamonds Inc. and Aber Diamond Corporation in 2000. Snap Lake is located in the Northwest Territories and will be De Beers’ first mine outside of southern Africa and the first underground diamond mine in Canada. Snap Lake has estimated reserves of 22.8 Mt of ore in a kimberlite dike, containing 38.8 million carats

of diamonds, and the mine life is projected to be 20 years or more. Snap Lake is in its development phase and is scheduled to begin diamond production in the first half of 2003 (De Beers Canada Mining Inc., 2000, Snap Lake diamond project fact sheet, accessed June 13, 2001, at URL http://www.debeerscanada.com/files_new/snap/infrastruct.html).

! E-commerce in diamond and gemstone jewelry continued to grow during 2000. While more jewelry websites started operating online, many of the dot-com businesses overspent on advertizing and went out of business as a result. Preholiday season surveys indicated that the vast majority of 1999 online holiday customers also shopped online in 2000, and they spent more. The entire sum of online holiday sales, however, only amounted to about 1.5% of overall retail jewelry sales in 2000 (Diamond Registry Bulletin, 2000b).

Worldwide production of natural gemstones other than diamond was estimated to have exceeded \$2 billion per year in the late 1990s. Most nondiamond gemstone mines are small, low-cost, and widely dispersed operations in remote regions of developing nations. Foreign countries with major gemstone deposits other than diamond are Afghanistan (beryl, ruby, and tourmaline); Australia (beryl, opal, and sapphire); Brazil (agate, amethyst, beryl, ruby, sapphire, topaz, and tourmaline); Burma (beryl, jade, ruby, sapphire, and topaz); Colombia (beryl, emerald, and sapphire); Kenya (beryl, garnet, and sapphire); Madagascar (beryl, rose quartz, sapphire, and tourmaline); Mexico (agate, opal, and topaz); Sri Lanka (beryl, ruby, sapphire, and topaz); Tanzania (garnet, ruby, sapphire, tanzanite, and tourmaline); and Zambia (amethyst and beryl). In addition, pearls are cultured throughout the South Pacific and in other equatorial waters; Australia, China, French Polynesia, and Japan are key producers.

Colored gemstone producers continued their recovery from the weakened markets created by the Asian economic crisis of 1997-98. Mining and sales reportedly were disrupted in many nations, particularly in Southeast Asia. Prices of high-quality colored gemstones, however, did not decline dramatically (Cavey, 1998).

Additional noteworthy items in the colored gemstone industry during 2000 included the following:

! Owing to the increased misuse of the terms like “synthetic” and “laboratory-created” in deceptive advertizing and owing to the proliferation of treatment processes to enhance gemstone attributes artificially without disclosure, the Federal Trade Commission has modified its “Guides for the Jewelry, Precious Metals, and Pewter Industries.” The modified regulations went into effect April 10, 2001.

! During 2000, the popularity of colorful gemstones, colored synthetic gemstones, and “fancy” colored diamonds (even black diamonds) increased, as was evidenced by increased sales that are expected to continue in 2001 (Jewelers’ Circular Keystone, 2000; Jewellery News Asia, 2000a, 2000c, 2001).

Outlook

It appears that the 2001 U.S. economy will not be a continuation of the good times we have enjoyed for the last few years. The U.S. diamond industry can take comfort in the fact

that the value of their inventory is holding much better than the stock market (Diamond Registry Bulletin, 2001b).

Historically, diamonds have proven to hold their value despite wars or depressions in the economy (Schumann, 1998, p. 8).

Diamond exploration is continuing in Canada, and many new deposits are being found. There have been additional discoveries in both the core and buffer zones of the Ekati lease. At least 35 kimberlites have been discovered in north-central Alberta, 70 large kimberlites have been found in Saskatchewan, and additional discoveries have been made in Ontario and Quebec (Luc Rombouts, Terraconsult bvba, May 2, 2001, Diamond annual review—2000, accessed June 19, 2001, at URL <http://www.terraconsult.be/overview.htm>). When the Diavik and Snap Lake mines begin production, Canada will be producing at least 15% to 20% of the total world diamond production.

Independent producers, such as Argyle Diamond Mines in Australia and new mines in Canada, will continue to bring a greater measure of competition to global markets. More competition presumably will bring more supplies and lower prices.

Numerous synthetics, simulants, and treated gemstones will enter the marketplace and necessitate more transparent trade industry standards to maintain customer confidence.

More diamonds, gemstones, and jewelry will be sold through online marketplaces and other forms of e-commerce that emerge to serve the diamond and gemstone industry. This will take place as the industry and its customers become more comfortable with and learn the best applications of new e-commerce tools for the gemstone industry (Authority on Jewelry Manufacturing, 2001).

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GENERAL SOURCES OF INFORMATION

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TABLE 1
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

Name	Composition	Color	Practical size 1/	Cost 2/	Mohs	Specific gravity	Refraction	Refractive index	May be confused with	Recognition characters
Amber	Hydrocarbon	Yellow, red, green, blue	Any	Low to medium	2.0-2.5	1.0-1.1	Single	1.54	Synthetic or pressed plastics	Fossil resin, soft.
Benitoite	Barium titanium silicate	Blue, purple, pink, colorless	Small to medium	High	6.0-6.5	3.64-3.68	Double	1.76-1.80	Sapphire, tanzanite, blue diamond, blue tourmaline	Strong blue in ultraviolet light.
Beryl:										
Aquamarine	Beryllium aluminum silicate	Blue-green to light blue	Any	Medium to high	7.5-8.0	2.63-2.80	do.	1.58	Synthetic spinel, blue topaz	Double refraction, refractive index.
Bixbite	do.	do.	Small	Very high	7.5-8.0	2.63-2.80	do.	1.58	Pressed plastics, tourmaline	Refractive index.
Emerald	do.	Green	Medium	do.	7.5	2.63-2.80	do.	1.58	Fused emerald, glass, tourmaline, peridot, green garnet doublets	Emerald filter, dichroism, refractive index.
Emerald, synthetic	do.	do.	Small	High	7.5-8.0	2.63-2.80	do.	1.58	Genuine emerald	Flaws, brilliant, fluorescence in ultraviolet light.
Golden (heliodor)	do.	Yellow to golden	Any	Low to medium	7.5-8.0	2.63-2.80	do.	1.58	Citrine, topaz, glass, doublets	Weak-colored.
Goshenite	do.	do.	do.	Low	7.5-8.0	2.63-2.80	do.	1.58	Quartz, glass, white sapphire, white topaz	Refractive index.
Morganite	do.	Pink to rose	do.	do.	7.5-8.0	2.63-2.80	do.	1.58	Kunzite, tourmaline, pink sapphire	Do.
Calcite:										
Marble	Calcium carbonate	White, pink, red, blue, green, or brown	do.	do.	3.0	2.72	Double (strong)	1.49-1.66	Silicates, banded agate, alabaster gypsum	Translucent.
Mexican onyx	do.	do.	do.	do.	3.0	2.72	do.	1.60	do.	Banded, translucent.
Chrysoberyl:										
Alexandrite	Beryllium aluminate	Green by day, red by artificial light	Small (former U.S.S.R.) Medium (Sri Lanka)	High	8.5	3.50-3.84	Double	1.75	Synthetic	Dichroism, inclusions in synthetic sapphire.
Cats-eye	do.	Greenish to brownish	Small to large	do.	8.5	3.50-3.84	do.	1.75	Synthetic, shell	Gravity and translucence.
Chrysolite	do.	Yellow, green, and/or brown	Medium	Medium	8.5	3.50-3.84	do.	1.75	Tourmaline, peridot	Refractive index, silky.
Coral	Calcium carbonate	Orange, red, white, black, or green	Branching, medium	Low	3.5-4.0	2.6-2.7	do.	1.49-1.66	False coral	Dull translucent.
Corundum:										
Ruby	Aluminum oxide	Rose to deep purplish red	Small	Very high	9.0	3.95-4.10	do.	1.78	Synthetics, including spinel	Inclusions, fluorescence.
Sapphire	do.	Blue	Medium	High	9.0	3.95-4.10	do.	1.78	do.	Inclusions, double refraction, dichroism.
Sapphire, fancy	do.	Yellow, pink, white, orange, green, or violet	Medium to large	Medium	9.0	3.95-4.10	do.	1.78	Synthetics, glass and doublets	Inclusions, double refraction, refractive index.
Sapphire and ruby, stars	do.	Red, pink, violet, blue, or gray	do.	High to low	9.0	3.95-4.10	do.	1.78	Star quartz, synthetic stars	Shows asterism, color side view.

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

Name	Composition	Color	Practical size 1/	Cost 2/	Mohs	Specific gravity	Refraction	Refractive index	May be confused with	Recognition characters
Corundum:										
Sapphire or ruby, synthetic	Aluminum oxide	Yellow, pink, or blue	Up to 20 carats	Low	9.0	3.95-4.10	Double	1.78	Synthetic spinel, glass	Curved striae, bubble inclusions.
Diamond	Carbon	White, blue-white, yellow, brown, green, pink, blue	Any	Very high	10.0	3.516-3.525	Single	2.42	Zircon, titania, cubic zirconia	High index, dispersion, hardness, luster.
Feldspar:										
Amazonite	Alkali aluminum silicate	Green	Large	Low	6.0-6.5	2.56	XX	1.52	Jade	Cleavage, sheen, vitreous to pearly, opaque, grid.
Labradorite	do.	Gray with blue and bronze sheen color play	do.	do.	6.0-6.5	2.56	XX	1.56	do.	Do.
Moonstone	do.	Colorless or yellow	do.	do.	6.0-6.5	2.77	XX	1.52-1.54	Glass	Pale sheen, opalescent.
Garnet	Complex silicate	Brown, black, yellow, green, ruby red, or orange	Small to medium	Low to high	6.5-7.5	3.15-4.30	Single strained	1.79-1.98	Synthetics, spinel, glass	Single refraction, anomalous strain.
Jade:										
Jadeite	do.	Green, yellow, black, white, or mauve	Large	Low to very high	6.5-7.0	3.3-3.5	Crypto-crystalline	1.65-1.68	Onyx, bowenite, vesuvianite, grossularite	Luster, spectrum, translucent, to opaque.
Nephrite	Complex hydrous silicate	do.	do.	do.	6.0-6.5	2.96-3.10	do.	1.61-1.63	do.	Do.
Opal	Hydrous silica	Colors flash in white gray, black, red, or yellow	do.	Low to high	5.5-6.5	1.9-2.3	Single	1.45	Glass, synthetics, triplets	Play of color.
Pearl	Calcium carbonate	White, pink, or black	Small	do.	2.5-4.0	2.6-2.85	XX	XX	Cultured and imitation	Luster, structure, x ray.
Peridot	Iron magnesium silicate	Yellow and/or green	Any	Medium	6.5-7.0	3.27-3.37	Double (strong)	1.65-1.69	Tourmaline chrysoberyl	Strong double refraction, low dichroism.
Quartz:										
Agate	Silica	Any	Large	Low	7.0	2.58-2.64	XX	XX	Glass, plastic, Mexican onyx	Cryptocrystalline, irregularly banded, dendritic inclusions.
Amethyst	do.	Purple	do.	Medium	7.0	2.65-2.66	Double	1.55	do.	Refractive index, double refraction, transparent.
Cairngorm	do.	Smoky orange or yellow	do.	Low	7.0	2.65-2.66	do.	1.55	do.	Do.
Citrine	do.	Yellow	do.	do.	7.0	2.65-2.66	do.	1.55	do.	Do.
Crystal, rock	do.	Colorless	do.	do.	7.0	2.65-2.66	do.	1.55	do.	Do.
Jasper	do.	Any, striped, spotted, or sometimes uniform	do.	do.	7.0	2.58-2.66	XX	XX	do.	Opaque, vitreous.
Onyx	do.	Many colors	do.	do.	7.0	2.58-2.64	XX	XX	do.	Uniformly banded.
Rose	do.	Pink, rose red	do.	do.	7.0	2.65-2.66	Double	1.55	do.	Refractive index, double refraction, translucent.
Spinel	Magnesium aluminum oxide	Any	Small to medium	Medium	8.0	3.5-3.7	Single	1.72	Synthetic, garnet	Refractive index, single refraction, inclusions.
Spinel, synthetic	do.	do.	Up to 40 carats	Low	8.0	3.5-3.7	Double	1.73	Spinel, corundum, beryl, topaz, alexandrite	Weak double refraction, curved striae, bubbles.
Spodumene:										
Hiddenite	Lithium aluminum silicate	Yellow to green	Medium	Medium	6.5-7.0	3.13-3.20	do.	1.66	Synthetic spinel	Refractive index.
Kunzite	do.	Pink to lilac	do.	do.	6.5-7.0	3.13-3.20	do.	1.66	Amethyst, morganite	Do.

See footnotes at end of table.

TABLE 1—Continued
GUIDE TO SELECTED GEMSTONES AND GEM MATERIALS USED IN JEWELRY

Name	Composition	Color	Practical size 1/	Cost 2/	Mohs	Specific gravity	Refraction	Refractive index	May be confused with	Recognition characters
Tanzanite	Complex silicate	Blue	Small	High	6.0-7.0	3.30	Double	1.69	Sapphire, synthetics	Strong trichroism.
Topaz	do.	White, blue, green	Medium	Low to medium	8.0	3.4-3.6	do.	1.62	Beryl, quartz	Refractive index.
Tourmaline	do.	Any, including mixed	do.	do.	7.0-7.5	2.98-3.20	do.	1.63	Peridot, beryl, corundum, glass	Double refraction, refractive index.
Turquoise	Copper aluminum phosphate	Blue to green	Large	Low	6.0	2.60-2.83	do.	1.63	Glass, plastics	Difficult if matrix not present, matrix usually limonitic.
Zircon	Zirconium silicate	White, blue, or brown, yellow, or green	Small to medium	Low to medium	6.0-7.5	4.0-4.8	Double (strong)	1.79-1.98	Diamond, synthetics, topaz, aquamarine	Double refraction, strongly dichroic, wear on facet edges.

XX Not applicable.

1/ Small: up to 5 carats; medium: 5 to 50 carats; large: more than 50 carats.

2/ Low: up to \$25 per carat; medium: up to \$200 per carat; high: more than \$200 per carat.

TABLE 2
SYNTHETIC GEMSTONE PRODUCTION METHODS

Gemstone	Production methods	Company/producer	Date of first production
Alexandrite	Flux	Creative Crystals	1970s
Do.	Melt pulling	J.O. Crystal	1990s
Do.	do.	Kyocera	1980s
Do.	Zone melt	Seiko	1980s
Cubic zirconia	Skull melt	Various producers	1970s
Emerald	Flux	Chatham	1930s
Do.	do.	Gilson	1960s
Do.	do.	Kyocera	1970s
Do.	do.	Seiko	1980s
Do.	do.	Lennix	1980s
Do.	do.	Russia	1980s
Do.	Hydrothermal	Lechleitner	1960s
Do.	do.	Regency	1980s
Do.	do.	Biron	1980s
Do.	do.	Russia	1980s
Ruby	Flux	Chatham	1950s
Do.	do.	Kashan	1960s
Do.	do.	J.O. Crystal	1980s
Do.	do.	Douras	1990s
Do.	Zone melt	Seiko	1980s
Do.	Melt pulling	Kyocera	1970s
Do.	Verneuil	Various producers	1900s
Sapphire	Flux	Chatham	1970s
Do.	Zone melt	Seiko	1980s
Do.	Melt pulling	Kyocera	1980s
Do.	Verneuil	Various producers	1900s
Star ruby	do.	Linde	1940s
Do.	Melt pulling	Kyocera	1980s
Do.	do.	Nakazumi	1980s
Star sapphire	Verneuil	Linde	1940s

TABLE 3
VALUE OF U.S. GEMSTONE PRODUCTION, BY TYPE 1/

(Thousand dollars)

Gem materials	1999	2000
Agate	47 r/	(2/)
Beryl	3,360 e/	(2/)
Coral (all types)	54	(2/)
Diamond	(3/)	(3/)
Garnet	90	78
Gem feldspar	187	314
Geode/nodules	69	59
Jasper	49	30
Opal	147	219
Quartz	674	416
Sapphire/ruby	117	65
Shell	2,600	3,270
Topaz	8	8
Tourmaline	W	54
Turquoise	860	(2/)
Other	7,820	9,210
Total	16,100	17,200

e/ Estimated. r/ Revised. W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Included in "Total."

3/ Included with "Other."

TABLE 4
PRICES OF U.S. CUT DIAMONDS, BY SIZE AND QUALITY 1/

Carat weight	Description, color 3/	Clarity 2/ (GIA terms)	Representative prices		
			January 2000 4/	June 2000 5/	December 2000 6/
0.25	G	VS1	\$1,500	\$1,500	\$1,500
.25	G	VS2	1,380	1,380	1,380
.25	G	SII	1,130	1,130	1,130
.25	H	VS1	1,400	1,400	1,400
.25	H	VS2	1,250	1,250	1,250
.25	H	SII	1,050	1,050	1,050
.50	G	VS1	3,400	3,400	3,400
.50	G	VS2	3,000	3,000	3,000
.50	G	SII	2,500	2,500	2,500
.50	H	VS1	3,000	3,000	3,000
.50	H	VS2	2,700	2,700	2,700
.50	H	SII	2,400	2,400	2,400
.75	G	VS1	3,800	3,800	3,800
.75	G	VS2	3,600	3,600	3,600
.75	G	SII	3,300	3,300	3,300
.75	H	VS1	3,650	3,650	3,650
.75	H	VS2	3,450	3,450	3,450
.75	H	SII	3,100	3,100	3,100
1.00	G	VS1	5,700	5,800	5,900
1.00	G	VS2	5,300	5,400	5,700
1.00	G	SII	4,800	4,900	5,000
1.00	H	VS1	5,200	5,300	5,500
1.00	H	VS2	4,900	5,000	5,300
1.00	H	SII	4,500	4,600	4,800

1/ Data are rounded to no more than three significant digits.

2/ Gemological Institute of America (GIA) color grades: D—colorless; E—rare white; G, H, I—traces of color

3/ Clarity: IF—no blemishes; VVS1—very, very slightly included; VS1—very slightly included; VS2—very slightly included, but not visible; SII—slightly included.

4/ Source: Jewelers' Circular Keystone, v. 171, no. 2, February 2000, p. 58.

5/ Source: Jewelers' Circular Keystone, v. 171, no. 7, July 2000, p. 46.

6/ Source: Jewelers' Circular Keystone, v. 172, no. 1, January 2001, p. 52.

TABLE 5
PRICES PER CARAT OF U.S. CUT COLORED GEMSTONES

Gemstone	Price range per carat	
	January 2000 1/	December 2000 2/
Amethyst	\$7-\$14	\$7-\$14
Aquamarine	75-200	75-250
Emerald	1,000-2,400	1,000-2,400
Ruby	1,800-2,800	1,800-2,800
Sapphire	650-1,800	450-1,450
Tanzanite	250-350	325-400

1/ Source: Jewelers' Circular Keystone, v. 171, no. 2, February 2000, p. 58.

Amethyst and aquamarine prices are from The Guide, Spring/Summer 2000, p. 12, 72. These figures represent a sampling of net prices that wholesale colored stone dealers in various U.S. cities charged their cash customers during the month for fine-quality stones.

2/ Source: Jewelers' Circular Keystone, v. 172, no. 1, January 2001, p. 52.

Amethyst, aquamarine, and tanzanite prices are from The Guide, Fall/Winter 2000-2001, p. 12, 72, 104. These figures represent a sampling of net prices that wholesale colored stone dealers in various U.S. cities charged their cash customers during the month for fine-quality stones.

TABLE 6
U.S. EXPORTS AND REEXPORTS OF DIAMOND (EXCLUSIVE OF
INDUSTRIAL DIAMOND), BY COUNTRY 1/

Country	1999		2000	
	Quantity (carats)	Value 2/ (millions)	Quantity (carats)	Value 2/ (millions)
Exports:				
Belgium	9,260	\$10	114,000	\$248
Canada	81,700	30	123,000	39
France	16,700	10	30,300	67
Hong Kong	29,600	34	111,000	150
India	56,200	13	109,000	36
Israel	14,600	28	268,000	354
Japan	5,460	22	23,100	60
Singapore	11,400	5	15,000	14
Switzerland	42,000	79	73,100	143
Thailand	102	1	13,100	12
United Arab Emirates	1,360	3	1,540	6
United Kingdom	20,200	21	74,600	64
Other	199,000	47	319,000	89
Total	487,000	303	1,270,000	1,280
Reexports:				
Belgium	980,000	669	3,850,000	666
Canada	97,400	41	105,000	49
France	40,800	40	75,100	21
Hong Kong	822,000	308	3,260,000	396
India	902,000	134	600,000	79
Israel	1,120,000	1,020	4,770,000	1,010
Japan	109,000	62	259,000	34
Singapore	43,100	27	259,000	32
Switzerland	184,000	265	477,000	187
Thailand	177,000	22	247,000	28
United Arab Emirates	25,300	10	72,100	13
United Kingdom	111,000	97	455,000	94
Other	346,000	75	551,000	89
Total	4,950,000	2,770	15,000,000	2,700
Grand total	5,440,000	3,080	16,300,000	3,980

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Customs value.

Source: U.S. Census Bureau.

TABLE 7
U.S. IMPORTS FOR CONSUMPTION OF DIAMOND, BY KIND, WEIGHT, AND COUNTRY 1/

Kind, range, and country of origin	1999		2000	
	Quantity (carat)	Value 2/ (millions)	Quantity (carat)	Value 2/ (millions)
Rough or uncut, natural: 3/				
Australia	945	\$1	12	(4/)
Belgium	118,000	121	431,000	\$190
Brazil	11,600	5	29,500	9
Congo (Brazzaville)	25,500	2	7,860	15
Congo (Kinshasa)	53,200	74	2,290	10
Ghana	110,000	102	699,000	36
Guinea	10,100	16	4,390	8
India	18,600	(4/)	276,000	(4/)
Israel	38,000	25	19,200	20
Russia	3,080,000	4	4,240	1
Sierra Leone	4,420	6	668	1
South Africa	40,500	73	136,000	194
Switzerland	2,520	18	5,200	23
United Kingdom	663,000	229	538,000	185
Venezuela	3,290	1	6,870	2

See footnotes at end of table.

TABLE 7--Continued
U.S. IMPORTS FOR CONSUMPTION OF DIAMOND, BY KIND, WEIGHT, AND COUNTRY 1/

Kind, range, and country of origin	1999		2000	
	Quantity (carat)	Value 2/ (millions)	Quantity (carat)	Value 2/ (millions)
Rough or uncut, natural--Continued: 3/				
Other	88,900	\$56	116,000	\$47
Total	4,270,000	734	2,280,000	741
Cut but unset, not more than 0.5 carat:				
Belgium	771,000	208	769,000	221
Brazil	3,720	2	13,400	3
Canada	1,260	1	2,070	1
Germany	6,290	1	4,590	1
Hong Kong	289,000	47	466,000	79
India	12,400,000	1,900	11,600,000	2,050
Israel	1,080,000	608	1,150,000	693
Japan	12,100	3	3,950	2
South Africa	3,280	3	1,480	2
Switzerland	36,400	10	133,000	9
Thailand	103,000	14	127,000	18
United Kingdom	1,650	1	11,700	3
Other	245,000	42	217,000	42
Total	14,900,000	2,840	14,500,000	3,120
Cut but unset, more than 0.5 carat:				
Belgium	1,030,000	1,630	1,330,000	2,170
Botswana	--	--	2	(4/)
Canada	1,780	6	2,830	9
France	2,530	6	2,110	16
Hong Kong	81,000	117	105,000	139
India	664,000	383	639,000	461
Israel	2,290,000	3,650	2,740,000	4,630
Japan	1,910	7	14,800	13
Russia	29,000	44	45,100	61
Singapore	2,210	7	4,180	14
South Africa	24,800	67	34,100	140
Switzerland	35,100	254	34,200	263
Thailand	16,700	18	23,800	27
United Kingdom	20,800	75	22,100	100
Other	34,100	55	48,500	90
Total	4,230,000	6,320	5,040,000	8,140

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Customs value.

3/ Includes some natural advanced diamond.

4/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES, OTHER THAN DIAMOND,
BY KIND AND COUNTRY 1/

Kind and country	1999		2000	
	Quantity (carats)	Value 2/ (millions)	Quantity (carats)	Value 2/ (millions)
Emerald:				
Belgium	14,000	\$2	10,600	\$2
Brazil	601,000	6	6,750,000	8
Canada	803	(3/)	1,120	1
China	955	(3/)	1,060	(3/)
Colombia	601,000	59	11,300,000	66
France	7,040	1	3,180	1
Germany	25,800	3	40,700	2
Hong Kong	252,000	10	240,000	9
India	2,860,000	35	3,110,000	32

See footnotes at end of table.

TABLE 8--Continued
U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES, OTHER THAN DIAMOND,
BY KIND AND COUNTRY 1/

Kind and country	1999		2000	
	Quantity (carats)	Value 2/ (millions)	Quantity (carats)	Value 2/ (millions)
Emerald--Continued:				
Israel	272,000	\$26	181,000	\$30
Japan	8,370	(3/)	48	(3/)
South Africa	183	(3/)	78	(3/)
Switzerland	34,300	27	137,000	15
Taiwan	3,760	(3/)	526	(3/)
Thailand	201,000	4	258,000	4
United Kingdom	52,800	3	3,630	1
Other	102,000	6	76,400	5
Total	5,040,000	183	22,100,000	176
Ruby:				
Belgium	6,120	1	2,120	1
Brazil	7,350	(3/)	6,020	(3/)
Burma	4,290	14	55,900	4
Canada	373	(3/)	120	(3/)
China	3,260	(3/)	1,170	(3/)
Colombia	2,140	(3/)	1,840	(3/)
France	1,790	(3/)	1,710	(3/)
Germany	54,400	7	16,300	1
Hong Kong	270,000	6	253,000	10
India	1,320,000	4	1,600,000	5
Israel	24,000	3	37,800	3
Japan	3,160	(3/)	9,280	(3/)
Switzerland	46,200	20	32,100	7
Thailand	2,250,000	48	2,450,000	46
United Kingdom	29,300	3	5,590	4
Other	59,800	2	31,200	4
Total	4,080,000	110	4,500,000	85
Sapphire:				
Australia	8,540	(3/)	7,320	1
Belgium	12,500	2	3,000	1
Brazil	6,920	(3/)	6,590	(3/)
Burma	1,830	2	8,720	2
Canada	44	(3/)	699	1
China	15,200	(3/)	30,000	(3/)
Colombia	2,110	(3/)	43,100	(3/)
France	815	(3/)	1,740	1
Germany	143,000	3	53,700	1
Hong Kong	301,000	9	326,000	11
India	862,000	3	1,160,000	4
Israel	100,000	6	63,100	5
Japan	16,300	(3/)	105,000	1
Singapore	285	(3/)	147	(3/)
Sri Lanka	480,000	19	492,000	25
Switzerland	38,600	15	50,400	17
Tanzania	822	(3/)	238	(3/)
Thailand	5,080,000	64	6,000,000	81
United Kingdom	14,100	4	13,800	3
Other	81,700	2	28,900	4
Total	7,160,000	129	8,400,000	156
Other:				
Rough, uncut:				
Australia	NA	4	NA	4
Brazil	NA	26	NA	15
China	NA	1	NA	1
Colombia	NA	2	NA	2
Fiji	NA	2	NA	2
Hong Kong	NA	1	NA	1
India	NA	1	NA	1
Kenya	NA	(3/)	NA	(3/)
Nigeria	NA	(3/)	NA	(3/)
Pakistan	NA	(3/)	NA	1

See footnotes at end of table.

TABLE 8--Continued
U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES, OTHER THAN DIAMOND,
BY KIND AND COUNTRY 1/

Kind and country	1999		2000	
	Quantity (carats)	Value 2/ (millions)	Quantity (carats)	Value 2/ (millions)
Other--Continued:				
Rough, uncut--Continued:				
Philippines	NA	\$1	NA	\$1
Russia	NA	(3/)	NA	(3/)
South Africa	NA	1	NA	2
Switzerland	NA	(3/)	NA	(3/)
Taiwan	NA	(3/)	NA	(3/)
Tanzania	NA	(3/)	NA	1
Thailand	NA	7	NA	11
United Kingdom	NA	(3/)	NA	1
Zambia	NA	2	NA	5
Other	NA	11	NA	9
Total	NA	57	NA	56
Cut, set and unset:				
Australia	NA	8	NA	18
Brazil	NA	10	NA	10
Canada	NA	1	NA	1
China	NA	11	NA	13
French Polynesia	NA	5	NA	5
Germany	NA	14	NA	17
Hong Kong	NA	44	NA	56
India	NA	66	NA	81
Israel	NA	6	NA	11
Japan	NA	16	NA	10
Kenya	NA	2	NA	1
Sri Lanka	NA	3	NA	6
Switzerland	NA	2	NA	3
Taiwan	NA	3	NA	2
Tanzania	NA	8	NA	13
Thailand	NA	30	NA	33
United Kingdom	NA	6	NA	6
Other	NA	7	NA	9
Total	NA	243	NA	294

NA Not available.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Customs value.

3/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 9
VALUE OF U.S. IMPORTS OF SYNTHETIC AND IMITATION
GEMSTONES, BY COUNTRY 1/

(Thousand dollars) 2/

Country	1999	2000
Synthetic, cut but unset:		
Australia	488	97
Austria	7,180	6,670
Brazil	2,110	136
China	13,300	13,500
France	500	1,020
Germany	10,500	10,300
Hong Kong	2,110	2,990
India	971	795
Italy	104	289
Japan	6	69
Korea, Republic of	2,720	2,510

See footnotes at end of table.

TABLE 9--Continued
 VALUE OF U.S. IMPORTS OF SYNTHETIC AND IMITATION
 GEMSTONES, BY COUNTRY 1/

(Thousand dollars) 2/

Country	1999	2000
Synthetic, cut but unset--Continued:		
Spain	39	10
Sri Lanka	89	612
Switzerland	4,260	6,410
Taiwan	828	708
Thailand	4,490	3,820
Other	331	1,000
Total	50,100	50,900
Imitation: 3/		
Austria	50,800	59,100
China	1,180	990
Czech Republic	11,700	11,200
Germany	1,710	1,250
Japan	495	756
Spain	36	45
Taiwan	336	274
Other	1,090	2,580
Total	67,300	76,200

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Customs value.

3/ Includes pearls.

Source: U.S. Census Bureau.

TABLE 10
 U.S. IMPORTS FOR CONSUMPTION OF GEMSTONES 1/

(Thousand carats and thousand dollars)

Stones	1999		2000	
	Quantity	Value 2/	Quantity	Value 2/
Diamonds:				
Rough or uncut	4,270	734,000	2,280	741,000
Cut but unset	19,200	9,160,000	19,500	11,300,000
Emeralds, cut but unset	5,040	183,000	22,100	176,000
Coral and similar materials, unworked	NA	7,090	NA	8,920
Rubies and sapphires, cut but unset	11,200	239,000	12,900	241,000
Pearls:				
Natural	NA	2,120	NA	960
Cultured	NA	44,800	NA	46,100
Imitation	NA	1,420	NA	2,020
Other precious and semiprecious stones:				
Rough, uncut	1,330,000	43,500	1,070,000	39,400
Cut, set and unset	NA	196,000	NA	247,000
Other	NA	6,110	NA	7,840
Synthetic:				
Cut but unset	287,000	50,100	329,000	50,900
Other	NA	7,370	NA	6,190
Imitation gemstone 3/	NA	65,900	NA	74,200
Total	XX	10,700,000	XX	12,900,000

NA Not available. XX Not applicable.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Customs value.

3/ Does not include pearls.

Source: U.S. Census Bureau.

TABLE 11
NATURAL DIAMOND: ESTIMATED WORLD PRODUCTION, BY TYPE AND COUNTRY 1/ 2/

(Thousand carats)

Country	1996	1997	1998	1999	2000
Gemstones: 3/					
Angola	2,250	1,110	2,400	3,700 r/	5,400
Australia	18,897 4/	18,100	18,400	13,403 4/	12,014 4/
Botswana	12,388 r/ 4/	15,111 r/ 4/	14,772 r/ 4/	16,000 r/	19,700
Brazil	200	300	300	300	300
Canada	--	--	300	2,000	2,000
Central African Republic	350	400	330	400	400
China	230	230	230	230	230
Congo (Kinshasa)	3,300 r/	3,300 r/	5,080 r/	4,120 r/	3,500
Cote d' Ivoire	202	207	210	210	200
Ghana	142	664	649	518 r/	178
Guinea	165	165	300	410 r/	410
Liberia	60	80	150	120 r/	120
Namibia	1,402 4/	1,350 r/	1,390 r/	1,550 r/	1,520
Russia	10,500	11,200 r/	11,500	11,500	11,600
Sierra Leone	162 4/	300	200	450 r/	450
South Africa	4,400	4,500	4,300	4,000	4,300
Venezuela	99	158	80 r/	59 r/	60
Zimbabwe	300	321	10	15 r/	7
Other	165	124 r/	106	207 r/	258
Total	55,200 r/	57,600 r/	60,800 r/	59,200 r/	62,600
Industrial:					
Angola	250	124	364	400 r/	600
Australia	23,096 4/	22,100	22,500	16,381 4/	14,684 4/
Botswana	5,000	5,000	5,000	5,350 r/	4,950
Brazil	600	600	600	600	600
Central African Republic	120	100	200	150	150
China	900	900	900	920	920
Congo (Kinshasa)	18,940 r/ 4/	18,677 r/ 4/	21,000 r/	16,000 r/	14,200
Cote d' Ivoire	100	100	100	100	100
Ghana	573	166	160	128 r/	712
Guinea	40	40	100	140 r/	140
Liberia	90	120	150	80 r/	80
Namibia	--	71	73	89 r/	80
Russia	10,500	11,200 r/	11,500	11,500	11,600
Sierra Leone	108	100	50	150 r/	150
South Africa	5,550	5,540	6,460	6,020 r/	6,480
Venezuela	73	90	17 r/	36 r/	40
Zimbabwe	137	100	19	30 r/	13
Other	120	105	97	141 r/	143
Total	66,200 r/	65,100 r/	69,300 r/	58,200 r/	55,600
Grand total	121,000 r/	123,000 r/	130,000 r/	117,000 r/	118,000

r/ Revised. -- Zero.

1/ World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

2/ Table includes data available through May 25, 2001.

3/ Includes near- and cheap-gem qualities.

4/ Reported figure.