

GEM NEWS

John I. Koivula, *Editor*

DIAMONDS

Brazilian diamond find. A diamond-rich kimberlite pipe is currently being worked in the state of Mato Grosso, Brazil, approximately 20 km from the commercial center of Julina. The diamond find was made by Sopemi, a Brazilian mining company that is closely associated with De Beers and Anglo American. The mine is currently producing about 300,000 ct of diamonds per year. The stones are reported to be of excellent quality, comparable to material from South Africa and the Soviet Union. This, the first productive in-situ diamond deposit in Brazil, is a significant development for the country, since diamond mining has heretofore been confined to secondary alluvial workings.

Remarkable morphology. The magnificent 4.98-ct diamond crystal shown in figure 1 has a complex and rare morphology. The ball-like structure shows the development of numerous oriented octahedral faces replete with trigons. The trigon-decorated faces are separated by length-striated grooves, which are the reentrant-angle manifestations of a complex system of twinning. GIA's Dr. Emmanuel Fritsch, an expert on twinning, recognized this form as a type described by Goldschmidt and Von Fersman that is known as a Mohs-Rose twin.

A follow-up. The 64.83-ct D-internally flawless diamond described in this section in the Fall issue sold at auction at Christie's in New York on October 21, 1987, for US\$6,380,000. Please note that this diamond was graded at the GIA Gem Trade Laboratory, Inc., in Los Angeles, not in New York as we originally reported.

COLORED STONES

The 21st International Gemmological Conference. The invitation-only 21st International Gemmological Conference was held in Rio de Janeiro, Brazil, September 20–25, 1987, with representatives from over 20 different countries. Dozens of gemological papers were presented. In addition, field excursions to the major mining areas of Minas Gerais were held immediately after the conference. The alluvial diamond mining operations around Diamantina were explored, as were a number of gem-producing pegmatites in the areas of Araquai, Teófilo Otoni, and Governador Valadares. Special permission was obtained from the Brazilian government to visit the newly discovered alexandrite chrysoberyl deposit near Itabira (see below). The highly sophisticated Belmont



Figure 1. This 1-cm diamond crystal shows the rarely encountered Mohs-Rose twin morphology. From the collection of Jack Greenspan; photo © Harold & Erica Van Pelt.

emerald mine, also near Itabira, was examined from the point of extraction of the ore all the way through to the final emerald-recovery process.

A conference of this magnitude takes a great deal of planning, and Elizabeth and Ian MacGregor of Teresopolis, Rio de Janeiro, Brazil, deserve credit for the smooth operation of the 21st IGC. New gemological information reported at this event will appear in the Gem News section over the next few issues.

More on Brazilian alexandrites. "Arabian Night"-like stories of exotic locales, spun together with tales of gems just waiting to be picked up by the handful, always have a way of making such places seem larger than life. Such is the case with the new alexandrite mine located near Itabira in Minas Gerais, Brazil. This locality has already produced an impressive quantity of fine gem-quality alexandrite, and promises to be prolific for the next several years. The rough material yields beautiful faceted and chatoyant cabochon gems. In appearance,



Figure 2. Delegates from the 21st International Gem-mological Conference inspect the new alexandrite mine near Itabira in Minas Gerais, Brazil. Photo by John I. Koivula.

however, this may also be one of Brazil's least-interesting mining areas (figure 2). The "mine," still in the early stages of development, consists of a roughly rectangular patch of barren reddish brown earth that is surrounded by trees and brush. It measures approximately 180 × 120 m (600 × 400 ft). Beneath the earthy overburden is a layer of white, fine-grained, clay-like material a few feet

thick, below which the alexandrites are found. Several gem pits have been dug haphazardly within this area. Thus far the alexandrites have been recovered from these crude, water-filled pits by local miners using simple hand tools. At the time of our visit, in September 1987, no mining was being done and the area was under military control (figure 3) because several miners had



Figure 3. An armed military policeman stands guard over the Brazilian alexandrite deposit as a group of hopeful would-be miners wait for a chance to dig. Photo by John I. Koivula.

been killed over property disputes. However, would-be miners still show up at the site on a daily basis, hoping to be allowed to dig for alexandrites. A detailed article on this locality, and the alexandrites from it, is scheduled to appear in a future issue of *Gems & Gemology*.

Colorado amethyst find. A major new find of fine-quality "Siberian" amethyst has been made at the Rainbow Lode amethyst mine in the Red Feather Lakes area of Larimer County, Colorado. As reported by Mr. Mark Jacobson of Littleton, Colorado, in the September 1987 issue of *Mineral News*, this discovery has yielded a significant quantity of doubly terminated crystals, some as large as "softballs" (10 cm [4 in.] in diameter). Multi-crystal matrix specimens of up to one foot in length have also been recovered. In July and August 1987, the mine owners, Nick Finnel of Fort Collins and Bohn Dunbar of Akron, Colorado, dug a 12 to 18 m (40 to 55 ft.) deep pit into the amethyst-bearing vein. From this operation they recovered approximately 900 kg (about 2000 lbs.) of unsorted matrix specimens and another 450 kg of single crystals. Some of the matrix specimens weigh as much as 45–55 kg (100–125 lbs.); the largest doubly terminated single crystal weighs 1 kg. Most of the crystals are undamaged and make excellent display specimens. One 7–9 kg cluster on matrix has eight amethyst scepters. Although most of the crystals are cloudy and internally fractured, the color is still dark and brilliant, and a small percentage of the find is of high gem quality. Several 1- to 9-ct stones have already been faceted from this material.

The "Lowell" effect in amethyst. Jack Lowell, of the Colorado Gem and Mineral Company, Tempe, Arizona, has identified an unusual, previously unreported, phenomenon in amethyst from Artigas, Uruguay. This adularescence-like phenomenon (figure 4) is strictly confined to the area in, and immediately around, the minor rhombohedral faces of the amethyst that show it; it may be related either to twinning or to ultra-fine growth structures within these zones, or both. GIA will continue to study this "Lowell" effect and would welcome any information from Gem News readers regarding previous publications on this phenomenon or observations of it in amethyst from other localities.

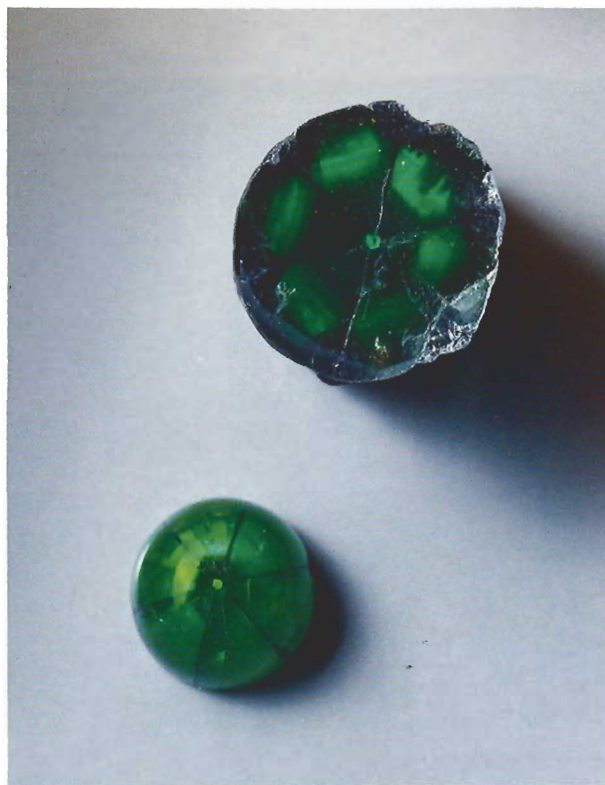
Trapiche emerald crystal. The 59.09-ct gem-quality trapiche emerald shown in figure 5 is remarkable in that it exhibits not only the classic six-rayed figure at the bottom of the crystal, but also the tapered hexagonal core that is associated with the trapiche variety but only rarely seen. Evidence of this core appears at the top of the crystal in the form of a hexagonal depression.

"The Stellenbosch Gem Index." At the 21st International Gemmological Conference, Mr. Herbert S. Pienaar, professor of gemology in the De Beers Laboratory for Gemmology at the University of Stellenbosch,



Figure 4. The adularescence-like effect observed by Jack Lowell in some amethysts from Artigas, Uruguay, has never been described before. Magnified 15 $\times$; photomicrograph by John I. Koivula.

Figure 5. This exceptional trapiche emerald crystal from the Muzo area of Colombia measures approximately 22 mm $\times$ 16 mm and exhibits a clear hexagonal core in addition to a six-rayed figure similar to that on the accompanying the cabochon (10.03 ct). Crystal courtesy of Colombian Emeralds Co., Los Angeles; photo $\copyright$ Harold & Erica Van Pelt.



South Africa, described a method that he uses to teach beginning students of gemology the basics of gem identification. Called "The Stellenbosch Gem Index," or SGI, this teaching method is designed to narrow the identity of an unknown stone to a few possible choices using a minimal number of tests. Mr. Pienaar combines the specific gravity and mean refractive index of the unknown stone in a mathematically simple formula to come up with a single SGI number. Mr. Pienaar, together with D. A. Glenister, has prepared a booklet that describes this approach to gem identification. The booklet also contains the tables required to match the SGI of an unknown stone to a specific gem or group of gem materials.

Editor's note: This is an excellent way of showing students the close relationship that exists between the properties of specific gravity (density) and refractive index, which, for any gem material, are inseparably linked to structure and chemical composition. For further information, and to obtain a copy of "The Stellenbosch Gem Index," write Professor Pienaar, University of Stellenbosch, Stellenbosch 7600, South Africa.

Double phenomenon in sapphire. The 21.53-ct star sapphire shown in figure 6 is unique in that it also shows a distinct change of color from bluish purple in incandescent light to blue in fluorescent light. The natural star sapphire, an oval double cabochon that measures 14.52 × 12.88 × 10.87 mm, is from Sri Lanka.

Tausonite: A new mineral. Also at the recent 21st International Gemmological Conference held in Rio de Janeiro, Brazil, it was reported that strontium titanate (SrTiO_3), one of the older diamond substitutes, has been found as a naturally occurring mineral. This new mineral, called tausonite after a Russian geochemist, was found in Mongolia. It is listed in the fifth edition of the *Glossary of Mineral Species*, by Michael Fleischer. Usually, synthetics are manufactured to mimic a natural material, but in this instance the synthetic was known first.

Transparent gem thaumasite. As reported in *Mineral News*, the very rare mineral thaumasite, $\text{Ca}_3\text{Si}(\text{CO}_3)(\text{SO}_4)(\text{OH})_6 \cdot 12\text{H}_2\text{O}$, has been found as facet-quality pale yellow crystals as large as 5 mm in diameter and 15 mm in length. Mr. Mike Haritos of S.T.D. Mineral Company, Hyde Park, Massachusetts, received the thaumasites in a June 1987 shipment of minerals from South Africa. He said that, in external form, the hexagonal crystals resemble apatite or yellow beryl. Since thaumasite is listed in mineralogical texts as being colorless to white, with a habit that is acicular to filiform and usually massive and compact, the identity of these transparent yellow crystals was at first in doubt. Subsequent testing, including chemical and X-ray diffraction analysis,



Figure 6. Two separate phenomena can be seen in this 21.53-ct color-change star sapphire from Sri Lanka, shown here in incandescent light. Courtesy of Trent West Jewelry, Capitola, CA; photo by Shane McClure.

proved that the original thaumasite identification was correct. With a Mohs hardness of 3.5, thaumasite is not useful for jewelry.

Topaz from New Hampshire. In the last issue of *Gem News* we made brief mention of a new find of gem-quality topaz from New Hampshire. In the August 1987 issue of *Mineral News*, Mr. Ken Hollman of Center Rutland, Vermont, provided additional details on this deposit, which has become known as the Rainbow Pocket. It was initially discovered in the Conway granite on October 19, 1986, by Mr. Peter B. Samuelson of Conway, New Hampshire. The contents of the naturally opened pocket, which measured approximately 2.4 × 1.0 × 0.6 m (8 × 3 × 2 ft), were found scattered as far as 60 m down the side of a talus slope. No other significant pockets have been found within the half-mile radius that has been investigated to date. Thus far, the find has produced a total of 122 topaz crystals with a combined weight of approximately 8.2 kg (18 lbs.). The crystals have been described as a "rich brown sherry" and blue; in addition, some are bicolored. They are reportedly striated as a result of etching and are of "facet quality." The largest topaz crystal recovered from this locality to date is blue and weighs 1975 grams. In addition to topaz, this pocket has produced 100 kg of smoky quartz, 900 grams of citrine, siderite crystals as large as 2 cm, corroded crystals of microcline feldspar, and muscovite mica.

SYNTHETICS

Check your filter. Gem-quality synthetic yellow diamonds have been on the market for about one year now.

As pointed out in the reports published thus far in *Gems & Gemology*, one of the most important characteristics used to separate natural yellow diamonds from the new synthetics is fluorescence. All of the synthetic yellow diamonds tested to date have been type Ib. They fluoresce a greenish yellow to yellow in response to short-wave ultraviolet radiation (253.7 nm) but are inert to long-wave U.V. radiation (366.0 nm). The vast majority of natural yellow diamonds are type Ia; if a type Ia diamond fluoresces to short-wave U.V. radiation, it will react even stronger to the long-wave lamp. Even natural type Ib diamonds can be distinguished in this way because, while they may fluoresce to short-wave U.V. but not to long-wave U.V., like the synthetics, the fluorescence color is orange rather than greenish yellow. The relative simplicity of the test makes this difference in fluorescence an important means of distinction when dealing with a possibly synthetic yellow diamond. Unfortunately, though, when a test is easy it is often taken for granted, and proper attention is not paid to the equipment used.

During a recent lecture, Mr. Gary Roskin, assistant executive director of GIA's Alumni Association, attempted to demonstrate the short-wave fluorescence of a faceted Sumitomo synthetic yellow diamond set in a

gold ring. When the lamp was activated, however, he was surprised to see that the diamond did not fluoresce. At first he thought that perhaps the mounting was in some way either blocking the radiation or masking the fluorescence, but even in a completely darkened room, no fluorescence was observed. He then obtained a new short-wave ultraviolet unit to check the reaction; this time the diamond fluoresced as expected.

The failure of the first unit was caused by the short-wave filter. The newest short-wave lamps have a "lifetime filter" that does not need changing, but in all older units the short-wave filter deteriorates with time and eventually needs to be replaced. It is important, therefore, that you check your lamp filter periodically. This can be done by using a test stone such as scheelite, benitoite, or even a small synthetic yellow type Ib diamond.

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ANNOUNCEMENTS

The Natural History Museum of Los Angeles County celebrates its Diamond Jubilee in 1988 with dazzle, as a spectacular selection of world-famous diamonds from the Smithsonian's collection goes on display in the gem vault. The museum begins the year with the opulent Victoria-Transvaal necklace, featuring a stunning 67.89-ct stone surrounded by 108 smaller diamonds, which will be on display until March 13, 1988. Following this will be three other special diamond sets: the Napoleon necklace with the Empress Marie Louise diadem, March 14–June 12; the Oppenheimer and the Portuguese diamonds, June 13–September 11; and the Eugenie Blue diamond in conjunction with the Marie Antoinette earrings, September 12–December 31, 1988. For information on the museum's hours and location, please call (213) 744-3466.

The World Gems Expo will be held June 3–6, 1988, in Hong Kong. Co-organized by the Hong Kong Diamond Bourse and Headway Trade Fairs Ltd., this is the only international specialized fair on gemstones. For further details, please contact: Headway Trade Fairs Ltd., 9/F Sing-Ho Finance Building, 168 Gloucester Rd., Wanchai, Hong Kong.

The Commission on Gem Materials of the International Mineralogical Association met in Brazil in September 1987 immediately following the 21st International Gemmological Conference. The meeting was chaired by E. Ralph Segnit of Australia; others in attendance were Secretary Henry O. A. Meyer (United States), Pieter C. Zwaan (the Netherlands), Alan Jobbins (United Kingdom), Herbert S. Pienaar (South Africa), Nikolai V.

Sobolev (Soviet Union), Margherita Superchi (Italy), and D. P. Svisero (Brazil). The main topic of discussion was the commission's preparation of a detailed *Atlas of World-wide Gem Deposits*. When completed, this atlas will be indispensable to all gemologists, mineralogists, and any others involved in the earth sciences. To ensure its accuracy, the IMA invites individuals with first-hand knowledge of gem deposits anywhere in the world to contribute. To obtain or provide information concerning the atlas, please write to the project coordinators, Dr. James E. Shigley and Dr. Emmanuel Fritsch, in care of the Research Department at the Gemological Institute of America, 1660 Stewart St., Santa Monica, CA 90404. Your participation in this project is vital for its successful completion and will be greatly appreciated.