GEM NEWS

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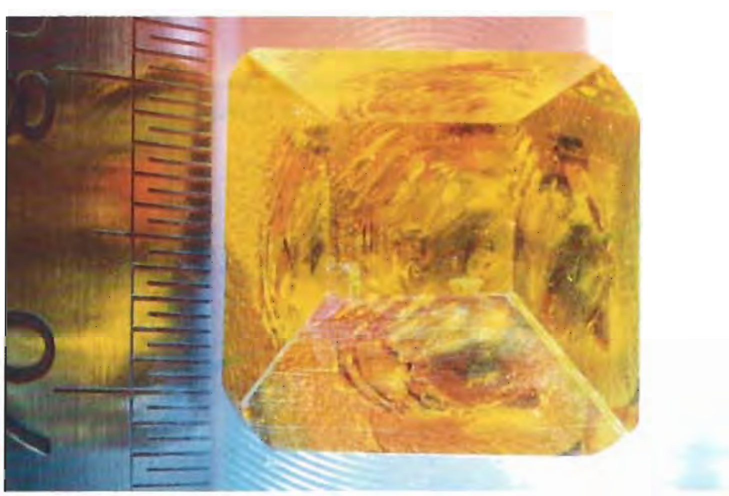
DIAMONDS

De Beers announces world's largest synthetic diamond crystal. Scientists at the De Beers Diamond Research Laboratory (DRL) in Johannesburg, South Africa, have successfully synthesized a 14.2-ct good-quality industrial monocrystal diamond (figure 1). This is believed to be the largest synthetic diamond yet manufactured. Over 500 hours of high-temperature, high-pressure running was required to produce the diamond, which called for prolonged maintenance of the delicately balanced conditions necessary for successful synthesis. This synthetic crystal is considerably larger than the normal industrial monocrystals, which are laser sliced into components for high-tech diamond tools such as high-pressure anvils, scalpel blades, heat sinks, and radiation counters.

According to Dr. Robert Caveney, director of research at DRL, "Synthesizing a stone of this size is extremely expensive and would not in the normal course be commercially viable. However, it is necessary to experiment and test our technology and equipment, to continually push the boundaries further outward, and this was part of such an exercise." De Beers continues to emphasize that crystals of this nature are produced only in the course of experimentation and strictly for industrial purposes.

Figure 1. This 14.2-ct good-quality industrial monocrystal synthetic diamond is reported to be the largest synthetic diamond yet manufactured. Photo courtesy of De Beers Industrial Diamond Division (Pty.) Ltd.



Previous largest synthetics have also been products of De Beers Industrial Diamond Division technology. In the early 1970s, a 6.75-ct synthetic diamond was manufactured; and in 1987, an 11.14-ct stone was produced (illustrated on page 191 of the Winter 1987 issue of *Gems & Gemology*).

In addition to Dr. Caveney, members of the DRL research team that successfully synthesized this diamond include: Moosa Adia, assistant director of research; Robbie Burns, head of large monocrystal development; and Vesna Cvetkovic, Carlton Dodge, Lorraine Donatos, and Dennis Welch.

China-cut diamonds sold in Singapore. Diamonds cut in factories in Shanghai were sold at the first Shanghai Diamond & Jewelry Trade Fair, held August 16–18, 1990, in Singapore. A total of 646 ct of the 1,400 ct offered sold at the fair. Individual stones ranged from 0.03 to 3.0 ct; 596 ct ranged from 0.20 to 0.50 ct, while about 50 ct were over 1 ct. The stones were described as being of good make, F to K color, and VVS to VS clarity. (*Jewellery News Asia*, September 1990)

Guyana mining development. An agreement has been reached whereby Ivanhoe Capital Corp. can acquire a 65% interest in Golden Star Resources' Mazaruni alluvial diamond properties in Guyana, South America. According to the agreement, Ivanhoe will provide up to $C4 million in funding for exploration and development. The three properties are located in the Kurupung-Enachu region about 200 km southwest of Georgetown. (*Mining Journal*, September 7, 1990)

COLORED STONES

Possible foreign participation in Afghan mining. Afghanistan is well known as an important source of a number of gem materials, notably lapis lazuli, tourmaline, kunzite, and emerald. A recent report indicates that vast gold reserves have been discovered in that country as well: Deposits estimated to contain 20 tons of gold have been uncovered by Soviet geologists along the northeastern border of Badakhshan, with an additional 15 tons identified in the region's Samthi area.

In an effort to raise funds for mining projects, the Afghan government is expected to amend its constitution to permit foreign investment in mineral resources. While the primary goal may be to develop a gold-mining industry, the proposed legislation could also open up the country to more extensive gemstone mining. (*Diamond Intelligence Briefs*, August 1, 1990)

Novel assembled stone. Some unusual assembled stones have been manufactured to exhibit or enhance optical phenomena. These include cat's-eye opal triplets and "star" stones produced by cementing a thin metal plate etched with three sets of intersecting lines to the base of a synthetic corundum cabochon.

Nanette Forrester of American Lapidary Artists, Los Angeles, showed us what could be described as a new "high-tech" type of assembled stone: quartz cabochons backed by computer chips. When these stones were illuminated from above, some exhibited fairly distinct four-rayed stars as well as subtle interference colors (figure 2).

Ms. Forrester subsequently donated two of these unusual composites to GIA for further examination. Magnification revealed that the asterism was caused by reflections of light from the tightly spaced microcircuitry of the computer chip, which formed complex patterns that intersect at 90°. The tight spacing also produced a diffraction-grating effect, resulting in the interference colors.

Denton J. Anderson of Gemological Services, Denver, Colorado, created and produces these novel "gems." He told us that the computer chips are cut from silicon disks that are 10 cm (4 in.) in diameter and about 1.2 mm thick. They are then topped with a cabochon of hardened glass or quartz (attached with an epoxy resin). Finally, a gold paint-like substance is applied to the back.

Figure 2. These novel assembled stones have been constructed from silicon chips and quartz. Photo by Robert Weldon.

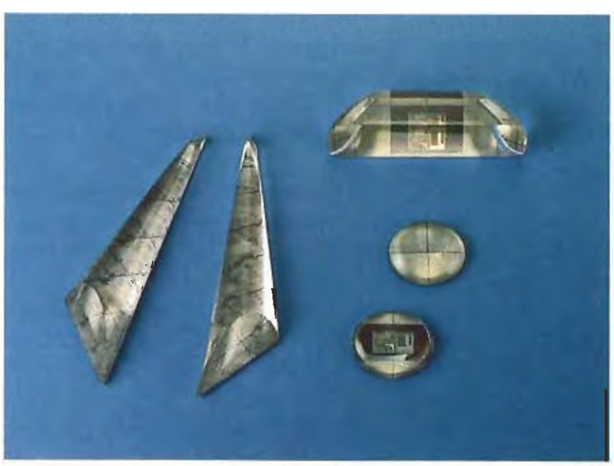


Figure 3. This craftsman in San Miguel de Cozumel uses a lathe-driven cotton buff to polish a piece of Caribbean black coral. Photo by Robert C. Kammerling.

Black coral industry on the Mexican Caribbean. Coral is an organic material that has long been used for ornamental purposes. Black conchiolin coral is less commonly seen than the calcareous varieties; the best-known source is Hawaii, but it has also been found elsewhere in the Pacific Ocean as well as in the Indian Ocean and the Persian Gulf. The types of black coral found in Hawaii belong to the conchiolin species *Antipathes dichotoma* and *Antipathes grandis.*

On a visit to the Mexican Caribbean during the summer of 1990, one of the Gem News editors observed the black coral industry centered on the island of Cozumel. Essentially a cottage industry, numerous "black coral factories" (many no more than small gift shops catering to the tourist trade) were noted on the island as well as in towns along the adjacent mainland coast.

The Mercado de Artesanias "Gonzaloz," in the town of San Miguel de Cozumel, was typical of one of these small "factories." The facility consisted of three individuals working at outdoor benches in front of a small shop where the finished products were sold. First, a hand-held jeweler's saw was used to cut off the desired length of coral for fashioning. The piece was then shaped on a small grinding wheel, and the surfaces were smoothed with coarse-grit emery paper. The pieces were polished on a lathe-driven cotton buff with what appeared to be

Figure 4. Modern, large-capacity equipment is used by S.A.P. Mining Co. to process the gemiferous gravels it mines near Bo Phloi in the Kanchanaburi district. Photo by Robert C. Kammerling.

jewelers' rouge (figure 3). Small detailing and piercing were done by hand using a coarse metal needle.

According to the article "The Black Coral of Cozumel" (by N. Steinhilber, *Lapidary Journal*, January 1981) and promotional literature obtained at one of the shops, noted French oceanographer Jacques Cousteau discovered the black coral at depths of 65 m (about 200 ft.) while studying Palancar reef off Cozumel's southwest coast in 1960. The coral requires approximately 50 years to grow to an average of 3 cm long and 5 mm wide. Today, it is recovered primarily by divers from caves and crevices at depths of 95 m.

Cozumel's black coral is a gorgonacean coral, *Gorgonia* species, unlike the Hawaiian *Antipathes* black corals. For additional information on the various types of black coral, see H. S. Pienaar, "African Star Coral, A New Precious Stylasterine Coral from the Agulhas Bank, South Africa," *Journal of Gemmology*, Vol. 17, 1981, pp. 589–601.

The editor was surprised to find numerous specimens of apparently good-quality material while exploring beaches on the southeast coast of Cozumel Island. The January 1981 report previously cited provided a possible explanation, as the author of that article had had similar good fortune in the same area after violent storms had hit the island. It is quite possible that Hurricane Diana, which struck Yucatan only two days earlier, had assisted in this editor's harvesting.

Update on sapphire mining in Kanchanaburi. Thailand's Kanchanaburi Province, located approximately 100 km (60 mi.) west of Bangkok, is a well-known source of sapphires. Small-scale commercial mining activity has taken place continuously for over 30 years in Bo Phloi, which is about 40 km north of Kanchanaburi City.

Activity in this area expanded significantly in the late 1980s, with the introduction of heavy excavating equipment. A report in the April 1990 issue of *JewelSiam* carried a brief interview with the provincial governor, who said that the province has adequate reserves to meet "strong demand" for the next 15–20 years. He also identified that there are 50 mines in the province, of which about 20 are operating profitably.

In January 1990, one of the Gem News editors had an opportunity to visit a large, mechanized operation of S.A.P. Mining Co. The site visited is reached by driving 3 km north of Bo Phloi on route 3086, then traveling about 3/4 km west on an unpaved local access road. Company president Paiboon Pimpisitthavorn and other executives provided information and a tour of their facilities.

This operation uses from 300 to 500 employees, most of whom are recruited locally. At the time of the visit, the firm had identified 72 km^2 of productive area, and approximately 1,000 acres were being worked. Before excavation begins at a particular site, cores are drilled into the sapphire-bearing gravel layer, a secondary deposit weathered from the surrounding basaltic mountains. If this layer is found to be at least 3–5 m thick, the area is worked; if not, it is held in reserve for possible future development.

A promising site is mined by first stripping the overburden—typically 15 m thick—with heavy equipment. The gem-bearing gravels, called *kasa*, are then transported by truck to the on-site processing plant (figure 4), where they are stockpiled to insure continued production even during the rainy season, when flooding often halts mining. (Admirably, because of ecological concerns, excavated areas are refilled with overburden and prepared for agricultural cultivation. Water is also recycled, and no chemicals are used.)

Processing of the gravels begins by washing them with high-pressure water cannons to remove clay and sand and then passing them through a coarse screen to remove larger rocks. The remaining material is transported first to one jig, a cone-shaped rotating grid, for further separation, and then to another, which uses the principle of gravity separation to produce a final concentrate. The final sorting and extraction of gem materials is done by hand. Black spinel, black pyroxene, and red garnet are also recovered.

A visit to the sorting rooms at the site revealed that most of the sapphire recovered was medium to dark blue, with some green and a few (2%–3% of total sapphire yield) light yellow stones. The yellow material can be heat treated to produce light "lemon" yellow to bright yellow to "cognac" orangy brown stones. Some of the sapphire rough is sold as-is to dealers who visit the mine site. Other material is examined by S.A.P. employees, then heat treated and cut in-house.

Some of the faceted stones were examined at the mining facility. Although these stones were somewhat less saturated (more "grayish") than heat-treated Sri Lankan sapphires, they were closer in appearance to the Sri Lankan material than to the dark, inky sapphires people have come to associate with "Thai" sapphire.

The editors thank Messrs. Paiboon Pimpisitthavorn, Ampan Jarukuosol, and Chaiyaporn Chanpen, of S.A.P. Mining Co., for their hospitality. Thanks also to Ms. Songlot Bhayakaporn and Thomas J. Ba Ross, S. P. Color Stones Co., Bangkok, for arranging the visit.

Peace pact for Colombian emerald region. According to Ron Ringsrud of Constellation Gems, Los Angeles, the two major factions that had been fighting in the main emerald-mining region of Colombia signed a peace pact on September 8, 1990, in Chiquinquirá, Boyacá. As of the end of 1990, the pact appears to have halted the often-violent confrontations that took place not only in the Muzo region but also in the streets of Bogotá, the capital and main emerald-trading center. A physician who spent 1989 in the Muzo-Cosquez region estimated that, on average, 120 people died every month as a direct result of the conflict.

Contrary to numerous published reports, Mr. Ringsrud's contacts insist that the violence in the area has always been related to the emerald trade, not to drugs. The misperception arose in 1987, when the leader of one of the warring townships joined forces with drug cartel chief Rodriguez Gacha (known as "El Mexicano") in an attempt to take over control of the Muzo mine through terrorism. This ended with Gacha's violent death in May 1989.

Recently, there has been significant progress in the organization of dealers and exporters in Bogotá. A new Emerald Trade Center is scheduled to open in late 1991, and a Colombian Association of Emerald Exporters was recently formed. Emerald production is expected to rise, and miners and dealers alike are more optimistic about the future of the emerald industry in Colombia than they have been in years.

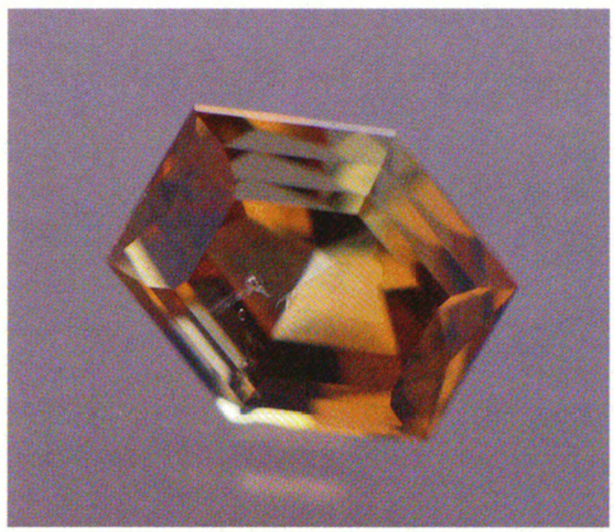
Unusual color-zoned garnet. A number of gem materials commonly display color zoning. Some of these, such as bi- and tri-colored tourmaline, may be cut intentionally to display and emphasize the individual colors; others, such as amethyst, with zones of colored and colorless areas, will be cut in such a way that the colorless areas are masked, producing a stone that "faces up" with uniform color.

Garnets are usually colored uniformly. However, Dr. Byron Butler of World Gems/G.S.G., Scottsdale, Arizona, recently sent us for examination the 1.42-ct garnet shown in figure 5. This modified hexagonal step cut, reportedly from an African locality, displayed strong color zoning in light brownish yellow and medium brownish orange that was only partially masked face-up by the cutting.

Gemological examination of the stone revealed the following properties: transparent; singly refractive; green with some reddish orange "flashes" through the Chelsea filter; very weak brownish red fluorescence to long-wave U.V. radiation, with a similar but slightly chalky reaction to short-wave U.V. and no phosphorescence to either wavelength; no visible absorption features noted with a desk-model spectroscope. Magnification revealed small, colorless, rounded protogenetic birefringent crystals of what may have been apatite; healed fractures were associated with some of these crystals.

We encountered one particularly puzzling gemological property: R.I. readings of 1.738 on the lighter section

Figure 5. Color zoning such as that shown by this 1.42-ct stone is very unusual for garnets. Photo by Maha Smith.



of the stone, and 1.748 on the darker portion. Careless testing could lead one to believe that the stone was doubly refractive with a 0.010 birefringence.

We concluded that this was a color-zoned grossular garnet. It is quite possible that a greater concentration of the chromophore on the darker section of the stone was also responsible for the higher R.I. reading obtained there.

Heavy liquids studied in Australia. Heavy liquids containing organic compounds have long been used in gem identification and in mineral separation, including the separation of diamond from sands. Concerns relating to occupational health and safety, as well as the complex controls required, have limited the large-scale use of heavy-liquid separation.

The Australian Mineral Industries Research Association (AMIRA) is embarking on a two-year study aimed at identifying relatively nontoxic heavy liquids for use in mineral separation. According to the proposal, a range of inorganic compounds—especially the polyanions—are to be investigated to determine their application in producing heavy liquids as solutions in water or other safe solvents. (*Mining Magazine*, July 1990)

Black cat's-eye opal. The Fall 1990 Gem News column described a yellow opal that exhibited true chatoyancy and in earlier columns we have discussed assembled cat's-eye opal triplets. Recently, Neal Dwire of Neal Dwire Gemstones, Tucson, Arizona, showed us an attractive chatoyant black opal (figure 6).

Figure 6. This 2.16-ct black opal exhibits play-of-color in the form of chatoyant bands. Photo by Robert Weldon.

This 2.16-ct oval double cabochon (9.79 × 7.79 × 5.12 mm) was mined in Jalisco, the major opal-producing state of Mexico. The stone was acquired from another dealer who had had it in his personal collection for several years.

The opal appears opaque and almost black when viewed face-up in reflected light; in intense transmitted light, such as that provided by a fiber-optic illuminator, it appears translucent with a dark orange-brown body color. The base exhibits broad areas of play-of-color in green, yellow, and orange, while the dome shows three chatoyant bands of color, one across the dome and the other two near the base (the latter two are not visible in figure 6). The top band is red in the center and green on either end; both side bands are predominantly green, one with a slightly yellowish orange center and the other with a blue area at one end.

Magnification with darkfield illumination revealed minute, short stringers of whitish particles; direct transmitted light revealed a mottled layer that was vaguely reminiscent of the structure seen in tortoise shell. The opal had a spot R.I. of 1.44; gave a singly refractive reaction in the polariscope; was inert to both long- and short-wave U.V. radiation; appeared brownish orange through the Chelsea filter; and exhibited an absorption cutoff below 500 nm, transmitting virtually nothing in the blue region.

The specimen also had a specific gravity of 2.02, rather low for opal. This, combined with the high transparency and the knowledge that porous opal from Jalisco may be treated, caused us to suspect enhancement. Near-infrared spectroscopy, performed by Dr. Emmanuel Fritsch of the GIA Research Department, revealed no indication of either polymer impregnation or carbonaceous enhancement (such as smoke or sugar treatment). We therefore concluded that this was a natural cat's-eye black opal. It is the first such stone from Jalisco that either editor has seen. Opals with this type of chatoyancy have been reported from Idaho.

In addition to Dr. Fritsch, the editors would like to thank Sam Muhlmeister, of the GIA Research Department, and Christopher P. Smith, of the GIA Gem Trade Laboratory, for assistance in examining this stone.

Exceptionally large white opal. Steven Sodokoff, of San Francisco Diamond Exchange, recently gave the editors the opportunity to examine an exceptionally large, gem-quality opal (figure 7). The stone, a free-form cabochon, measures approximately 5-1/2 × 4 × 1-5/8 inches (14.0 × 10.2 × 4.1 cm) and weighs approximately 1 lb. 10 ozs. All of its surfaces are polished and there are no areas of matrix. Mr. Sodokoff reports that the original rough was recovered in 1976, from the Boi Morto mine (about 3.5 km north-northwest of the town of Pedro II) in Piauí State, Brazil. It was cut by Scott Cooley, and is being called "Galaxy."

The opal is translucent with a brownish white body color. Face-up it displays a predominantly pinfire play-of-color across its entire surface. When the stone is examined from directly overhead, approximately 30% of the top surface displays a predominantly orange play-of-color, while the remainder shows primarily green with lesser amounts of yellow flashes as well as some violet and red.

What is even more unusual for a stone this size is the fact that the opal appears gemmy throughout: Play-of-color is also seen from the sides and base of the stone, the latter predominantly green pinfire.

It is interesting to note the pronounced layering in the stone. The layers run roughly parallel to the base of the cabochon.

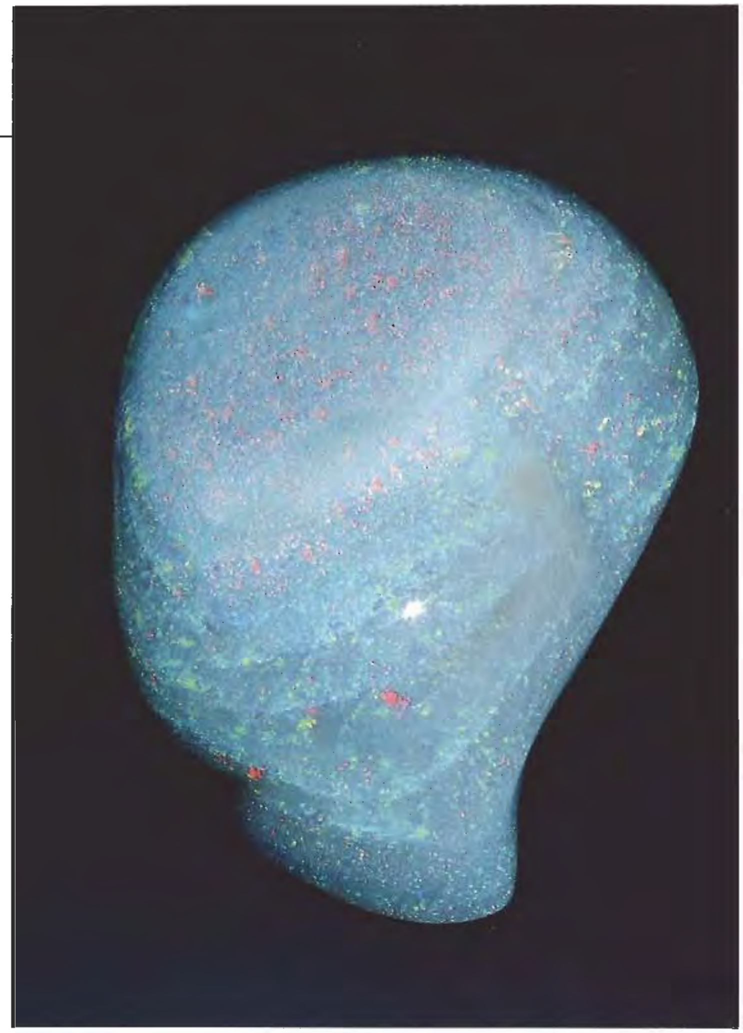


Figure 7. This unusually large (14.0 × 10.2 × 4.1 cm) opal shows pinfire play-of-color throughout. Photo © GIA and Tino Hammid.

Color-change cobalt spinel. Efraim Katz of African Gem Cutters, Miami Beach, Florida, loaned us an interesting spinel for examination. The 16.41-ct rectangular cushion-shaped mixed cut (15.72 × 13.51 × 10.58 mm), appears medium dark violetish blue in fluorescent light and medium dark purple in incandescent illumination (figure 8).

Gemological investigation revealed some interesting properties: R.I. of 1.714 (lower than what is typical for blue spinel); red appearance through a Chelsea filter; bright red transmission luminescence; moderate to strong chalky red fluorescence to long-wave U.V., none to short-wave U.V., and no phosphorescence; and, when examined through prism and diffraction-grating desk-model spectroscopes, a diffused absorption band at 454–461 nm, a faint fluorescent line at 552–554 nm, and a strong fluorescent line at 686 nm.

The U.V.–visible absorption spectrum recorded at the

Figure 8. This 16.39-ct spinel appears medium dark violetish blue under fluorescent light (left) and medium dark purple in incandescent illumination (right). Photos © Tino Hammid.

Figure 9. This faceted and carved topaz sculpture weighs more than 35,000 ct. Photo by Robert Weldon.

GIA Research Department with a Pye-Unicam 8800 spectroscope revealed features known to be due to Co^{2+}, which is undoubtedly the cause of the predominantly violetish blue color. EDXRF analysis revealed the presence of minor amounts of chromium and possibly vanadium, one or both of which are probably responsible for the color change. The EDXRF analysis did not reveal any cobalt, probably because it is present in such a low concentration.

Large topaz sculpture. Gem minerals form in a number of geologic environments. Pegmatites – small igneous bodies representing the end phase of crystallization from a solidifying magma – are particularly interesting to the gemologist because of the sometimes huge, high-quality crystals that form in pockets within them. In fact, these pockets in pegmatites are sometimes referred to as "nature's jewel box."

Recently we had the opportunity to examine an exceptionally large topaz that was fashioned from a crystal that originated in a Brazilian pegmatite. The stone, a transparent very light blue-green sculpture that had been both faceted and carved, measures 24.6 × 10.6 × 15.8 cm and weighs approximately 35,000 ct (figure 9). The sculpture was fashioned by Lawrence Stoller and Glenn Lehrer, of Marin County, California. It has properties typical of blue-green topaz, including several eye-visible two-phase inclusions and one eye-visible three-phase inclusion.

Edward Swoboda, co-owner with Stoller and Lehrer of the gem, informed us that the original rough was a 79-lb. (35 kg), slightly waterworn, singly terminated crystal recovered from the Barra Vermelha area of Minas Gerais more than 40 years ago. Mr. Swoboda obtained the crystal in the 1950s. He had the stone sawn in the 1970s and cut a 20,000+-ct gem (known as the "Princess") from one portion. The sculpture recently cut by Stoller and Lehrer represents one of the largest fashioned specimens of any gem species.

The artists found the stone to be a real challenge, especially the large front viewing face. Said Stoller, "This topaz played by its own rules. We could not apply the same techniques that we use in cutting smaller topaz gems." Added Lehrer, "The process of cutting and polishing took place over a two-year period. We found that the difficulties began at the final polishing stage." Invariably, they encountered scratching when the polished surface would pit and then the material from these pits would drag across the face. Several polishings were required of the large front face in particular.

Cat's-eye bicolored tourmaline. Bicolored tourmaline occurs with some frequency, the often distinct color zones resulting from changes in the environment of the growing crystal. However, such changes may also be noted as differences within the inclusion scenes in the different color zones.

Recently, Ralph Mueller of Ralph Mueller & Associates, Scottsdale, Arizona, loaned us a 20.65-ct bicolored tourmaline with a sharp chatoyant band at the juncture of the two color zones (figure 10). Examination with magnification revealed that the hollow tubular inclusions running parallel to the c-axis were confined to the blue portion of the stone, stopping abruptly where the pink coloration begins.

The editors thank Robert Weldon for bringing this stone to their attention.

More gems from the USSR? In a move that could result in more gemstone production in the USSR, Wales-based Robertson Consultancy Group has entered into an exclusive agreement to market Soviet mineral deposits.

Figure 10. Careful orientation by the lapidary placed the chatoyant band of this 20.65-ct bicolored tourmaline along the division of the two color zones. The inclusions that cause the band are actually confined to the blue portion of the stone. Photo by Robert Weldon.

The firm will work with the Soviet Ministry of Geology to provide foreign mining concerns with data for assessing project potential. Although the Soviets reportedly prefer joint ventures, it appears that there is no longer any legislation that would preclude 100% foreign ownership. Seminars, exhibitions, and field trips are being planned to help interested parties gain an understanding of Soviet operating conditions and mining laws. (*Mining Journal*, July 20, 1990)

ENHANCEMENTS

Diffusion-treated sapphire update. The Summer 1990 issue of *Gems & Gemology* contained a comprehensive article on blue diffusion-treated sapphires. Although this article discusses and illustrates the identification of loose sapphires so treated, the same identification techniques described can also be used quite effectively in detecting mounted stones. Robert Crowningshield, of the East Coast GIA Gem Trade Laboratory, provided us with a photograph of a diffusion-treated stone mounted in a ring. As can be seen in figure 11, the combination of immersion and diffused illumination reveals the color concentrations along facet junctions that are a key identifying feature of this enhancement.

"Rainbow" quartz: A new enhancement. In the Fall 1990 Gem News column we provided an update on colorless quartz gems on which a thin film of gold had been

Figure 11. Immersion and diffused illumination reveal the characteristic color concentrations along facet junctions that prove that this ring-set sapphire has been diffusion treated. Photo by Nicholas DelRe.

Figure 12. "Rainbow" quartz is reportedly produced by allowing molecules of silver/platinum to adhere to the external surface of the quartz. This cluster weighs 17.86 grams. Photo by Robert Weldon and Maha Smith.

Figure 13. The base of this 2.78-ct synthetic ruby (face up) and that of this 2.53-ct synthetic blue spinel (face down) have been rough-ground to give these cabochons a more natural face-up appearance. Photo by Robert Weldon.

applied. These treated stones display both the blue to greenish blue transmission color of gold and surface iridescence.

The Gem News editors recently became aware of another, similar surface treatment that is being applied to colorless quartz, including single crystals, crystal clusters (figure 12), and some fashioned pieces. According to promotional literature provided by TransGem Corp. of West Bend, Wisconsin (vendor of this material as well as "Aqua Aura" quartz), "Rainbow" quartz is produced by "allowing molecules of silver/platinum to adhere to the natural electric charge which surrounds the quartz crystals. The extremely thin, transparent bond breaks light into a rainbow of colors."

Like "Aqua Aura" quartz, "Rainbow" quartz exhibits moderate to strong superficial iridescence in surface-reflected light. It differs from "Aqua Aura," however, in that it does not alter the apparent body color of the quartz, leaving it essentially colorless. EDXRF analysis of the sample, by Sam Muhlmeister of the GIA Research Department, did not show the presence of platinum or silver. This may be due to the fact that the applied layer is so thin that it is not detectable by this method.

Figure 14. The jewelry "stones" pictured here are all glass imitations of jadeite. Photo by Robert Weldon.

Figure 15. The 4.07-ct cabochon of "Imori Stone" glass on the right bears a strong resemblance to some pectolite from the Dominican Republic, as exemplified by the 28.59-ct specimen on the left. Photo by Robert Weldon.

Figure 16. Sold as "purple onyx," this 8.87-ct purple dyed quartzite could be mistaken for sugilite. Photo by Robert Weldon and Maha Smith.

Jade "processing." It appears to be a somewhat widespread practice to wax- or paraffin-coat many ornamental gem materials to improve their apparent luster. Nephrite and jadeite, the two jades, are often seen so treated.

The prevalence of this practice was brought home to the editors when glancing through a Hong Kong trade publication, *Jewellery Review*. The magazine included a one-page pictorial on how a jade hololith bracelet is produced. The first step in this eight-step process is cutting a slab of appropriate thickness. In step 2, the center of the bracelet is drilled out with a cylindrical bit. In steps 3 through 6, the bracelet takes its final form through four grinding operations, followed by polishing (step 7). The final step, most interestingly, is described as "waxing;" the accompanying illustration shows a heavily encrusted bracelet being removed from a pot of liquefied wax. (*Jewellery Review*, Vol. 2, 1990)

SYNTHETICS AND SIMULANTS

Natural-appearing synthetic cabochons. While looking through a "turmali" box of inexpensive flame-fusion synthetics at a local gem show, one of the editors spotted some oval cabochons that had a reduced transparency not normally seen in flame-fusion synthetics. Two of the cabochons were purchased for examination: a 2.78-ct synthetic ruby and a 2.53-ct synthetic blue spinel.

Standard gemological testing confirmed the identities of the two specimens. Visual examination and magnification verified the cause of the reduced transparency: While both synthetics were essentially inclusion-free, they had irregularly shaped, rough-ground frosted bases (figure 13). The cabochon cut contributed to the rather natural appearance of the stones, as included material of lower transparency is often cut in this fashion rather than faceted.

We remember hearing several years ago about a clever deception being used on some nice-colored faceted Sri Lankan sapphires. These stones had had their pavilion facets rough-ground to increase light scattering, giving them a "velvety" appearance like that exhibited by fine sapphires of Kashmir origin. They were then bezel-set to conceal the deception and passed off as Kashmir sapphires.

Thailand cutting CZ. In addition to being a major cutting center for colored stones and an increasingly important country for diamond cutting, Thailand is also fashioning significant amounts of cubic zirconia. In 1989, Thailand exported 13,256 kg (66,280,000 ct) of polished CZ, according to the Thai Department of Business Economics. The major market was the United States, which imported 4,326 kg. Both figures represent an approximately 13% increase by weight over 1988. (*Jewellery News Asia*, September 1990)

Glass imitation jadeite. From time to time, the Gem News editors see interesting glass imitations. Recently, one of the editors spotted some attractive imitations of "Imperial" jadeite (figure 14) being offered by street vendors both in the Chinatown area of Los Angeles and in Hong Kong.

The color of the piece fashioned as a saddle-cut hololith ring was fairly uniform and similar to that of very fine green jadeite. Another piece, a "carved" circular disk set in an imitation gold bale for use as a medallion, exhibited a less saturated color in a mottled pattern, a color distribution common in jadeite jade. Magnification revealed the gas bubbles and swirled striae (schlieren) typical of glass imitations in all pieces.

A glass imitation pectolite? Pectolite is a translucent to opaque greenish blue ornamental material that often shows one or more fibrous radial patterns. It has been marketed under the trade name Larimar.

"Imori Stone" is a partially devitrified glass into which fibrous inclusions are induced to give it a fibrous appearance overall. "Imori Stone" has been produced in a number of colors, with the greenish material used to imitate jade. In the course of studying "Imori Stone," we noted that it also occurs in colors that make it look quite similar to pectolite. Figure 15 shows a cabochon of this glass imitation next to a cabochon of pectolite.

Dyed quartz imitation of sugilite? One of the more novel stones we have examined recently is a semitranslucent, dark purple oval single cabochon (figure 16) that was purchased as "purple onyx." The stone was donated to GIA by Ed Barker, whose father obtained it in New Mexico. The material is being set in Indian jewelry and sold in considerable quantities.

Standard gemological testing identified the gem as a quartzite. While the color appears uniform in overhead illumination, strong transmitted light reveals a dense mass of dark purple color concentrations in fractures surrounding what seem to be essentially colorless grains. The stone appears brownish orange through a Chelsea color filter and is inert to both long- and short-wave U.V. radiation. Spectroscopic examination revealed a very weak, diffused absorption band at approximately 491–503 nm, a prominent band at 529–572 nm, and some extremely weak general absorption through the yellow-green region. A slight purple discoloration was produced on an alcohol-dipped cotton swab rubbed across the stone's base; an acetone-dipped swab produced a similar but darker and more noticeable discoloration.

While this dyed quartzite may be marketed as "purple onyx," it could easily be mistaken visually for manganoan sugilite. Since receiving the original specimen from Mr. Barker, we have seen more of this material in the trade.