# GEM NEWS

John I. Koivula and Robert C. Kammerling, *Editors*

## DIAMONDS

**Angola.** The guerilla leaders of the Angolan UNITA movement have announced the discovery of huge deposits of diamonds in the areas of Cuando and Cubango in Angola, which are firmly under their control. They plan to start developing these properties as soon as possible.

**Large Chinese diamond discovered.** A 32.79-ct diamond crystal has been found at the Mengyin mine in Shandong province, People's Republic of China. It is the largest diamond crystal discovered at that mine in the last five years. The rough is said to be of "excellent" clarity with a "light yellowish color." The final disposition of the crystal has not yet been announced. It is unlikely, however, that a diamond cutter outside of China will be able to obtain it because at this time China does not export rough diamonds, only cut goods.

**Mwadui Mine to get new source of power.** The Mwadui mine in western Tanzania (formerly called the Williamson diamond mine) has had a steady decline in output since 1976 because the fuel supply for its diesel generators is very unreliable. Recently, however, the minister of energy and minerals for Tanzania promised that the mine would have a continuous source of electric power when it is connected to the Kidatu hydroelectric plant in late 1988. This could more than double the current output at the Mwadui pipe, which is the major source of diamonds in Tanzania.

**New alluvial deposit in Namibia.** An extremely rich alluvial diamond deposit has been discovered near Luderitz, Namibia, by diver Dirk Lutz, of the Namibian West Coast Diamond Company. Mr. Lutz found the deposit 120 m off the coast in water 5–6 m deep. Within seven hours of his discovery, Lutz and two other divers had recovered 931 diamond crystals weighing a total of 1,550 ct. A spokesman for Namibian West Coast Diamond Company said that if this new area proves to be as productive as it now seems, they would apply to the government to open a diamond-cutting plant in Luderitz.

**News from Murfreesboro.** On the basis of preliminary investigations, geologists report that the deposit at Murfreesboro, Arkansas, may yield as much as $900 million worth of diamonds. To confirm this potential, however, more detailed, and much more costly, exploration will be required.

To this end, in 1987, the Arkansas State Legislature passed a law allowing commercial mining at Murfreesboro, and a seven-member Diamond Mining Advisory Task Force was appointed by the governor. Their job is to examine the possible economic and environmental effects of the proposed commercial mining, to determine how to take bids from private mining companies, and to decide the extent to which diamond mining should be allowed.

Seven different mining companies, with home offices in Australia, Belgium, Canada, Great Britain, and the United States, have expressed interest in the deposit.

## COLORED STONES

**Change-of-color garnets.** Over the past 18 months, the editors of Gem News have encountered four exceptional color-change garnets, all from East Africa and all of similar appearance. Although color-change garnets from East Africa have been known for many years, these four gems are exceptional in that they exhibit a change-of-color much like that of fine Russian alexandrites (green in fluorescent, or day, light and red in incandescent light. Most of the color-change garnets that we have observed are either quite dark or do not exhibit a dramatic change, especially when cut.

GIA's Research Department was able to borrow three of these stones, as shown in figure 1, for closer examination. Two of the stones had a refractive index of 1.770, while the third gave a reading of 1.763. Examination with a Beck prism spectroscope revealed the absorption spectrum shown in figure 2, which is typical of color-change pyrope-spessartine garnets, for all these stones. These absorption features were corroborated by a Pye Unicam UV-visible dual-beam spectrophotometer. Semiquantitative chemical analyses (Carol M. Stockton, analyst) by means of a Tracor Northern energy dispersive X-ray fluorescence (EDXRF) system confirmed the composition to be that of pyrope-spessartine garnets with a fairly high manganese content.

Of even greater interest, however, is the fact that very little chromium was found (0.1 wt.% $Cr_2O_3$). The distinct and unusual color change was induced almost

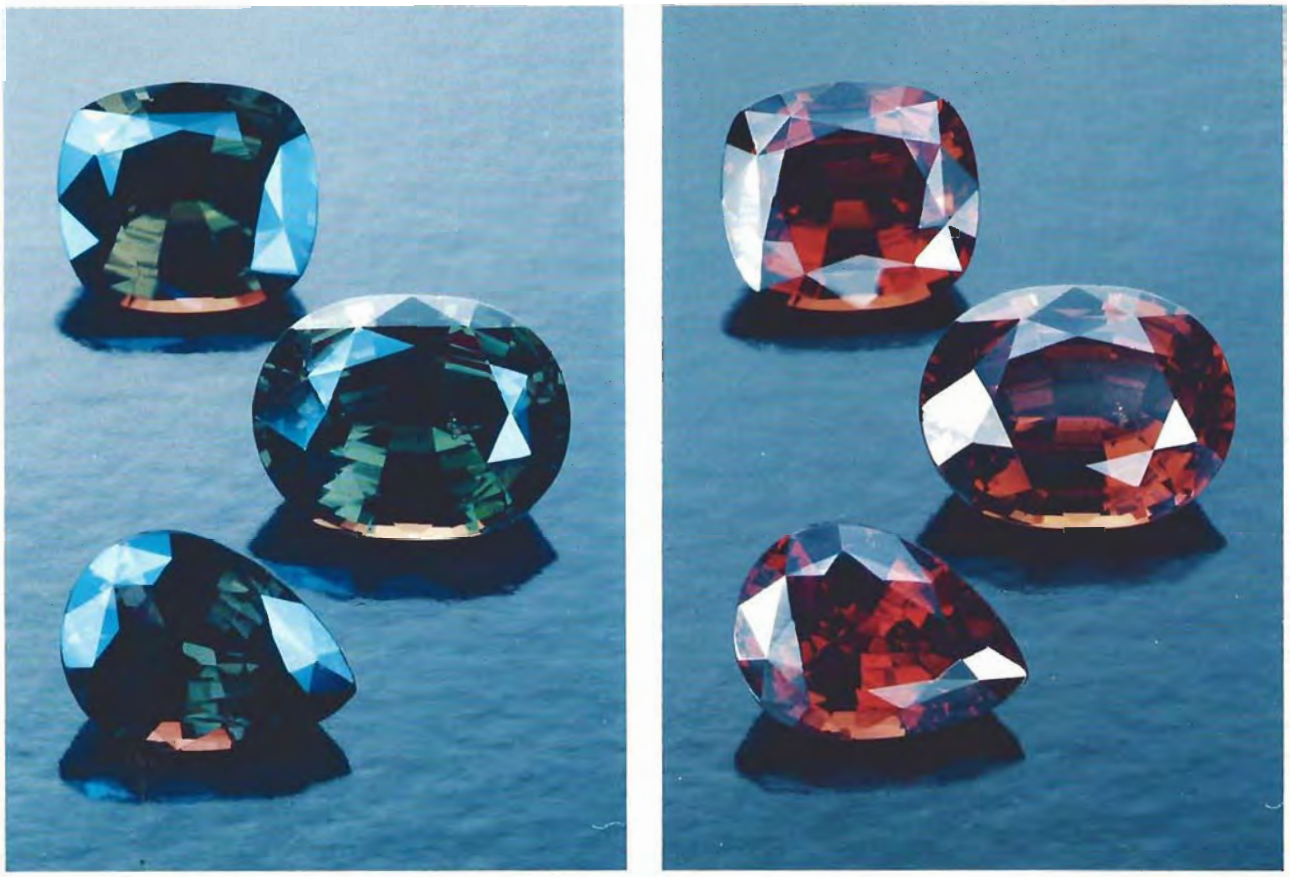


*Figure 1. These three color-change pyrope-spessartine garnets from East Africa (1.65, 2.14 and 1.35 ct, from top to bottom) exhibit an exceptional change-of-color much like that of fine Russian alexandrites. The photo on the left was taken with fluorescent light; the photo on the right with incandescent light. Stones courtesy of Peter Flusser, Overland Gems, Los Angeles, and Horst Krupp, Heidelberg, West Germany. Photo © Tino Hammid.*

*Figure 2. The visible-light absorption spectrum shown by the three garnets illustrated in figure 1 is typical of color-change pyrope-spessartine garnets. Drawing by Carol M. Stockton.*

entirely by the more than 1 wt.% $V_2O_3$ identified in each of these three stones.

**Washington State garnets.** Bright orange to dark yellowish brown grossular garnets and garnet clusters were mined in Washington State between 1975 and 1982 by Bart Cannon of Cannon Microprobe/S.E.M., Seattle, Washington. The garnet mine is a small open cut in an outcrop above a perpetual snowfield near the summit of Vesper Peak, in Snohomish County, Washington.

According to Mr. Cannon, the garnets from this area average about half an inch (a little more than 1 cm) in diameter. They occur as isolated crystals or as druses of crystals on a matrix of dark green diopside crystals. The specimens are popular with mineral collectors because of their pleasing color and the bright luster of the crystal faces; some of the crystal druses have been cleaned and set in jewelry in their natural form. The faceted garnets can have very nice color. Thus far, this is the only facetable garnet native to the Pacific Northwest.

**New Mexico moonstone.** Moonstone of very fine quality is currently being mined from the Black Range in New Mexico by David Menzie and Richard Boltz, of Black Range Gems and Stones, Faywood, New Mexico. Moonstones have been mined intermittently on a very small scale from this locality for over 50 years.

The mine owners report that the moonstones occur in small, high-temperature, shallow-seated pegmatites in a rhyolite porphyry plug that was injected into

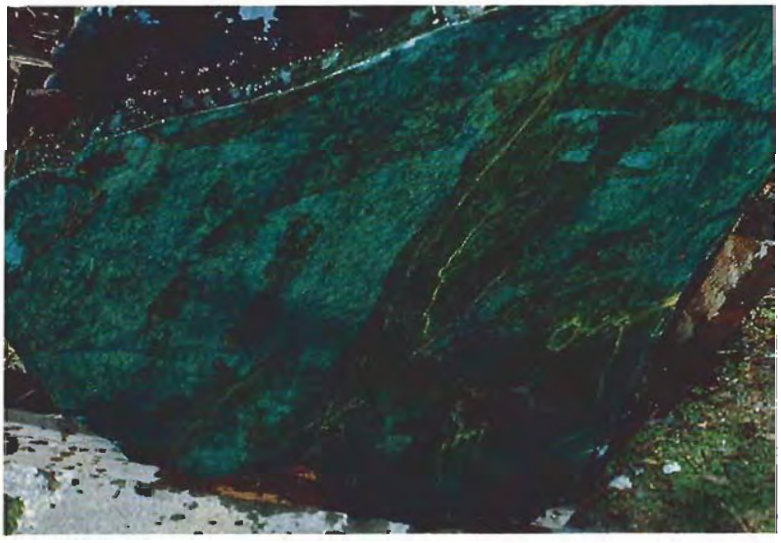
*Figure 3. Sanidine moonstone from New Mexico shows a pleasing blue adularescence and a high degree of transparency that lends itself to faceting, as shown by this 4.39-ct stone. Photo by Robert Weldon.*

rhyolite tuffs of Tertiary age. The pegmatites are chiefly composed of quartz and sanidine: an undetermined percentage of the latter is of gem (moonstone) quality. Minor amounts of biotite, cleavelandite, ilmenite, magnetite, and titanite are also present as accessory minerals.

The rough moonstones have a high degree of transparency that lends itself to faceting. When the adularescence is properly oriented, the faceted material displays the phenomenon beautifully in colors that range from "cool" blue (figure 3) to silvery white (figure 4).

*Figure 4. Moonstones with a bright silvery white adularescence, such as this 3.63-ct gem, are also found in the Black Range in New Mexico. Photo by Robert Weldon.*

*Figure 5. Nephrite from Dahl Creek, Alaska, often comes in a dark, rich green color, as illustrated by this "tabletop"-size boulder. Photo by Mrs. Ivan Stewart.*



**Alaskan nephrite jade.** The main source in Alaska for its state gem, nephrite jade, is Dahl Creek. The Dahl Creek claims, owned by Mrs. Ivan Stewart of Stewart's Photo in Anchorage, are located above the Arctic Circle near the Eskimo villages of Shugnak (an Eskimo word meaning *jade*) and Kobuk.

At Dahl Creek, nephrite is found both as pebbles and as boulders, some weighing as much as 25 tons (22,600 kg). The color ranges from dark, rich green (figure 5) to lighter shades of green, sometimes mottled with "red or black moss." Gold, silver, and copper have also been observed imbedded in the jade. Other minerals found in association with the nephrite at Dahl Creek are coarse actinolite, serpentine (bowenite), rock crystal and rose quartz, and chrysoprase.

Diamond saws are used to slice the large boulders (figure 6) into various items such as table tops, bookends, and paperweights. Smaller pieces, and pieces of high gem quality, are cut into cabochons or are carved into decorative objects or jewelry. Leslie Williamson, a jade carver from England, works as foreman at the claims, overseeing the day-to-day mining operation. Weather

permitting, the Dahl Creek claims are generally worked from May through August. Mrs. Stewart reports that in 1987 they recovered and shipped 8,000 lbs. (3,600 kg) of nephrite to their Anchorage facility. Although much of the lapidary work is done in Alaska, Mrs. Stewart also sends considerable quantities of the rough nephrite to Idar-Oberstein, West Germany.

**Opal from Oregon.** A significant discovery of gem-quality opal has been reported by Kevin Lane Smith, of Seattle, Washington. Mr. Smith is one of the individuals who is currently mining and marketing this new opal.

Some of this opal is transparent and of the "contra luz" type that shows its play-of-color in transmitted light (figure 7). Another type is hydrophane. Under normal conditions of humidity, this material appears almost opaque with a white body color. If viewed using surface-incident light, it shows a speckled play-of-color. When it is immersed in water for just a few hours, however, the hydrophane loses its white body color and becomes transparent; it then shows a weak play-of-color in transmitted light, but only a very slight play-of-color with surface-incident light. In the process, it gains a significant amount of weight. If it is removed from the water and left at room temperature to dry out, the hydrophane will once again become white and nearly opaque, regaining the original play-of-color but losing the extra water weight. The sample of Oregon opal that we tested went from 11.21 ct dry to 12.09 ct wet. Some jelly opal, with a strong orange-red body color, has also been found.

Mr. Smith is currently working on an article for *Gems & Gemology* that will provide a detailed description of this new deposit and the opals.

**Sri Lanka.** Our most recent communication from Gordon Bleck, a geologist who lives in Ratnapura, Sri Lanka, was full of interesting news concerning gem-mining activities in that island country.

In particular, Mr. Bleck reports that some unusual materials are being recovered. One of these is clinozoisite, a collector's gem material. It is being mined near Ratnapura, about 20 miles (32 km) from Badulla in the small village of Kandaketiya (town area of Migahakiula). The mining area, along a tributary of the Mahaweli River, is surrounded by very thick jungle and thus is very difficult to reach. Fine gem-quality pieces of any size are rare, but a large amount of specimen material has been recovered. The largest reported faceted clinozoisite from this area is said to weigh 10 ct, but the brownish stone is very flat, badly windowed, and not very attractive.

Small quantities of light purple anhydrite (rare in gem quality) are also being found in this same general area, even though this material is not generally known to occur in Sri Lanka. All of the gem-quality pieces examined by Mr. Bleck to date were less than 1 ct.

Limited amounts of sapphirine are being seen in the Sri Lankan gem market. Mr. Bleck has studied a total of 10 pieces so far this year, but no locality information has been made available to him.

**Sapphirine from Greenland and Canada.** Gem-quality sapphirine has also been found in Greenland and Can-

*Figure 6. A circular diamond saw is used to cut sections from a nephrite boulder at the Dahl Creek mine. Photo by Mrs. Ivan Stewart.*

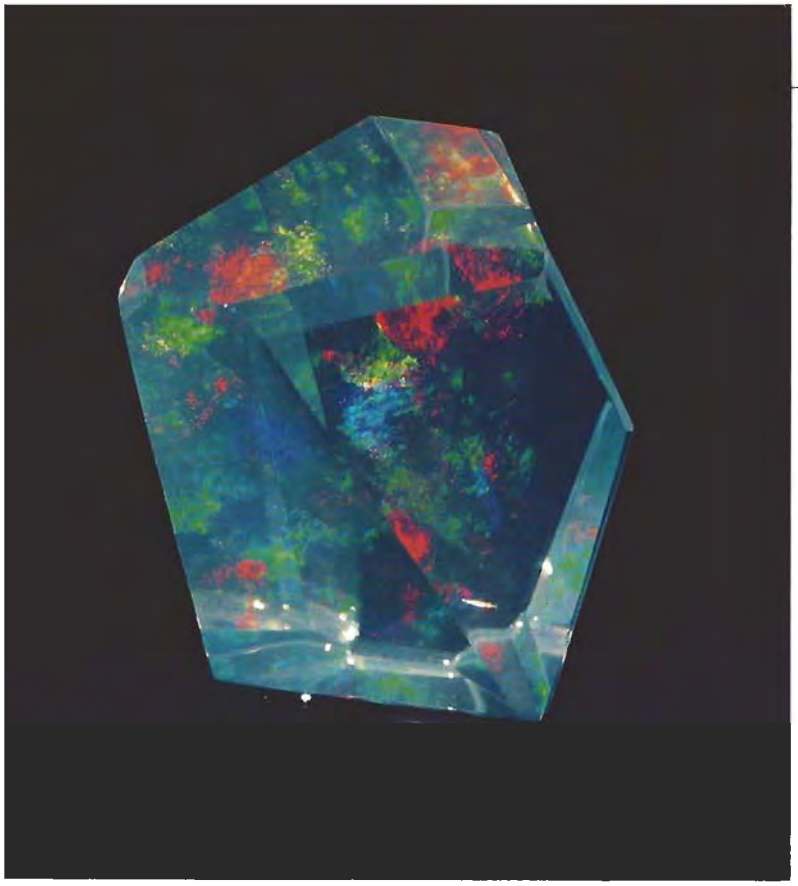


*Figure 7. Much of the opal from the new locality in Oregon is transparent and shows considerable play-of-color. Specimen (approximately 5 cm in longest dimension) courtesy of Kevin Lane Smith; photo © Tino Hammid.*

ada. Richard K. Herd, curator for the Geological Survey of Canada, recently reported to the Rochester Academy of Science on these two sapphirine deposits. Fiskenaesset, in western Greenland, is the type locality for sapphirine. According to Dr. Herd, over 80 highly metamorphosed, stratigraphically controlled rock layers and lenses in the region are known to contain sapphirine. A number of associated minerals, including cordierite, corundum, garnet, chatoyant gedrite, kornerupine, and spinel—some of which are gem quality—have also been identified.

Geologic conditions similar to those encountered in Greenland also exist in the Canadian Arctic, where sapphirine-bearing metamorphic rocks have been known since the 1950s. This area is currently being investigated for sapphirine and any potentially gem-quality associated minerals. Dr. Herd collected some very fine blue-gray sapphirine crystals on Somerset Island, south of Resolute. These crystals, which show a tabular, pseudohexagonal habit and are up to several centimeters across, are thought to be the best Canadian sapphirines ever found.

**New find of zircons.** At the Northwest Faceters' Convention held this last May in Vancouver, British Columbia, Australian master cutter Max Faulkner reported that a new deposit of zircons had been discovered in Australia's Northern Territory. Individual crystals have been found in large sizes; most of these are suitable primarily for use as mineral specimens, but some are of faceting quality.

Mr. Faulkner subsequently provided the editors of Gem News with a great deal of information concerning these new zircons, as well as an excellent representative sample of the rough for the GIA research collection. These gem zircons are found in a wide range of colors, from pink through purple and also from yellow through brown (figure 8); even colorless crystals have been reported. Apparently no one has yet tested these new Australian zircons to determine if they can be heat treated to turn them blue, as is possible with some of the zircons from Kampuchea. Because of the lack of internal

*Figure 8. These gem zircons (ranging from approximately 3 to 7 ct) are from the new Harts Range locality near the town of Alice Springs in Australia's Northern Territory. Photo by Robert Weldon.*

radioactivity, these zircons do not show the metamict structural breakdown that is so common to gem zircons from Sri Lanka.

These Australian zircons are found in a carbonatite host rock in the Harts Range, near the town of Alice Springs, close to the same area where ruby was found several years ago (see *Gems & Gemology*, Fall 1979). Commercial mining is not allowed in this "reserved area," which is known as Zircon Hill, and the crystals are presently being recovered only by collectors and hobbyists using picks and shovels. In view of this, it is not likely that significant quantities of these gem zircons will be available for faceting.

**Erratum.** In the Spring 1988 Gem News report on some of the gemstone carvings encountered at the most recent Tucson Gem and Mineral Show, we misspelled the name of one of the award-winning artisans, Michael M. Dyber. An example of Mr. Dyber's talent as a gem carver is the magnificent smoky rutilated quartz sculpture shown in figure 9.

*Figure 9. Michael M. Dyber carved this 491-ct rutilated smoky quartz sculpture. Courtesy of Ledge Studio; photo by Larry Croes.*

## PEARLS

**New form of cultured pearl.** In a recent ICA alert, Nobuo Horiuchi, of the Central Gem Laboratory in Tokyo, advised the gemological community that a new type of cultured pearl is being grown and marketed. Of particular interest is the nucleus that is used in the culturing process.

The pearl farmers prepare the nuclei for these cultured pearls by first finely powdering the shells of edible oysters and then mixing an inorganic blue (cobalt) or green (cobalt and copper) pigment into the shell powder. Next, the powder is baked and sintered into spheres that, with continued heating, become colored ceramic nuclei. These nuclei are then placed into the pearl oyster and a thin layer of nacre is allowed to form. The thin nacre layer provides orient and also allows the color from the nucleus to reflect through, giving the cultured pearl a pleasing body color.

Microscopic examination provides useful clues in the identification of this type of cultured pearl. In addition, the nucleus is opaque and will not transmit light in any direction, so a negative result from candling may also serve as an indicator. In some samples, however, the nacre layer may be so thin that the underlying colored nucleus can actually be resolved with a high-intensity fiber-optic light source.

These cultured pearls are being produced by Catalysts & Chemicals Industries Co., Ltd. in Japan, and are being marketed under the trade name "Maricen Pearl."

## SYNTHETICS

**A new hard material.** David McKenzie, a physicist at Sydney University, in Sydney, Australia, has manufactured a material that can readily scratch diamond. Like diamond, this new material is a form of carbon; unlike diamond, it is amorphous with a glassy structure. According to Mr. McKenzie, the overall structure of this substance "is not regular like a diamond. Instead, it is a tangled network [of carbon atoms] which makes the glassy diamond film harder than the crystalline diamond because it is more resistant to distortion." This new hard material is largely transparent and, like diamond, is resistant to chemical attack. It could have important commercial applications.

**New use for synthetic quartz.** With the widespread interest in the so-called healing and metaphysical properties of quartz, it was bound to happen eventually: Si and Ann Frazier, gem, mineral, and rare book dealers from El Cerrito, California, have reported seeing an obviously synthetic rock crystal quartz pyramid that was cut in Korea. The pyramid, which belonged to one of their customers, had a portion of the seed plate clearly visible as an inclusion. This same customer also reported to the Fraziers that quartz spheres have been cut from synthetic rock crystal, too.

**The United States Nuclear Regulatory Commission** (NRC) has announced that it plans to license domestic firms and individuals that reactor-irradiate gem materials, as well as importers who distribute irradiated gems within the United States. Retail jewelers and jewelry manufacturers will not be required to obtain a license if they purchase their irradiated gems from a licensed firm or distributor.

The NRC's new regulations will require that those involved in domestic irradiation and importers of irradiated gems use detection devices capable of reading very low radiation levels. Under these new regulations, it will be illegal to release gem materials that emit more than 0.4 nanocuries of radioactivity per gram of gem weight. At present, the safety standard in Europe is equivalent to 2.0 nanocuries per gram. The NRC is also exploring options for disclosing these new requirements to the buying public.

**Gemological Digest, a professional journal geared to gemologists,** is now available from the gem-rich country of Thailand. Published by the Asian Institute of Gemological Sciences in Bangkok, under the guidance of editor-in-chief Richard W. Hughes, it has been completely restructured from its original "bulletin" format (first published in 1987) into a magazine that will be of interest to all practicing gemologists.

The first copy of this newly revitalized publication, designated volume 2, numbers 1 and 2, 1988, contains four articles, an editor's note, and a "Bangkok Gem Market Review." Considering the importance of Bangkok as a gem center, this last column alone will probably draw quite a readership.

New subscriptions and back issues are available free of charge, both in Thailand and abroad, and can be obtained by writing to: *Gemological Digest*, Asian Institute of Gemological Sciences, 987 Silom Rd., Rama Jewelry Building, Fourth Floor, Bangkok 10500, Thailand.

**The Tucson Gem and Mineral Show** will be held February 9–12, 1989, at the Tucson Community Center. The featured mineral for the show is galena. For more information, contact the Tucson Gem and Mineral Society, P.O. Box 42543, Tucson, AZ 85733.

The Gemological Institute of America will present various lectures and seminars in Tucson February 4–11. For information, call (800) 421-7250, ext. 227, or write GIA, 1660 Stewart St., Santa Monica, CA 90404. The American Gem Society will have seminars and other activities on Friday, February 3, at the Viscount Suite Hotel. Contact Marjery Lemlech of AGS at 5901 West Third St., Los Angeles, CA 90036, (213) 936-4367.

The American Gem Trade Association will be in Tucson February 4–9, at the Doubletree Hotel. They will announce the winners of the Spectrum Awards (a jewelry contest aimed at the effective use of colored stones) at that time. For information, contact the AGTA headquarters at the World Trade Center #181, P.O. Box 581043, Dallas, TX 75258, (214) 742-4367; for reservations call (800) 972-1162.