The New Mexico Facetor

Volume 17, No. 6, July-August, 1998

In This Issue

The Prez Sez:

By Moss Aubrey, Ph.D.

200% OFF, TODAY ONLY!!!

Well, I know you don't believe that teaser. Does 50% off sound more plausible? Maybe, maybe not. Drive down the street, any street in Albuquerque, until you pass a store selling Native American jewelry. Chances are pretty good that the merchants will have erected a prominent sign advertising 50% off. Go ahead and take a look. What you will likely see inside for sale is the more commonly available styles of jewelry marked up to unrealistic prices, then marked down for the "sale" to prices that are pretty much in line with what everyone else in the business is charging. This situation is ubiquitous in Albuquerque, Santa Fe, and other cities that cater to the tourist trade, especially in sales of Native American styles of jewelry. The problem associated with this is the potential to mislead the public regarding the true value of the items. Is this so very different from other forms of misrepresentation, such as failure to disclose stabilization of turquoise or that some of the "Native American style" jewelry is actually made in Taiwan? The state of New Mexico apparently feels that it is not so different after all.

The Albuquerque Journal recently reported that the New Mexico State Attorney General issued regulations aimed at eliminating the perpetual sales that seem almost required in this segment of the jewelry market. Wendy Schwingendorf reported in the July 13, 1998, Business Outlook section on the new legislation, including her interviews with merchants. The reviews appear to be mixed. Some merchants felt that the attention to this situation was misplaced, that no harm was being done. If everyone does it, why the fuss? Other merchants welcomed the tighter regulations in hopes that the new rules

would lend credibility to the more ethical merchants who sell better quality merchandise.

The new regulations do not seem that onerous to me. They require that a sale price must be compared with a realistic price and not with one that was artificially inflated. Items must be offered for sixty days at the "regular" price before being offered at a discounted price. The use of the term "sale" is restricted. It cannot be used if all the items in the store are similarly discounted. There are other restrictions and definitions, but those are the basics.

Let me pull up my soapbox for a minute. I have emphasized in other "Prez sez" columns here my belief that honesty and education of our clients and colleagues is the best approach in our dealings. I believe this applies not only to those of us who sell at retail, but the maxim should apply to all our dealings. If we buy gem rough for our own cutting purposes, never intending to sell it or the finished items, and in bragging about it, then we "adjust" the cost of the rough to make it seem a better bargain. I think that misleads our colleagues regarding the gem market and the relative value of similar gem material when they are shopping. Or, if we inflate the value of a finished product so that it appears to be a better return on the initial investment, then that also will mislead our colleagues when they consider the merits of making a purchase.

This all comes down to competition, and not just competition for money. Competition is a basic human trait, part of our negotiation for status and power. Making money is just one part of that drive. The real problem comes from inflating our egos along with inflating the values of goods, believing that we are more deserving of respect, admiration or money than the person from whom we are "stealing" those commodities.

Maybe, I am just being naive. I still believe that being straightforward is the best approach. Simply stating what something is and what it is worth is the best way to build lasting relationships, be they business, professional, or personal. If we find ourselves hedging on the truth, then it is time to ask ourselves why we are doing that. What do we fear we will lose by being candid? We may lose a sale, or we may lose respect from our colleagues if we make a bad purchase. At the same time, that is how we learn more about ourselves, how we grow and benefit from that knowledge. I, for one, do not want to trade short term profits for long term (personal) losses.

The Guild Picnic

The New Mexico Faceters Guild has scheduled a luncheon picnic for **Saturday, September 12** at the home of Paul Hlava on **4000 Smith S.E. in Albuquerque.** Interested participants may arrive at **11:30 a.m.** Several grills will be prepared for cooking meats. Many Guild members have already volunteered to bring a dish to share. Bring your own lounge chairs and any items of gems, gem rough, or equipment that you want to sell during the tailgate party. This is a social event for the purpose of talking, eating, and swapping items. Don't miss the fun!

Directions to Paul's place: from I-40, drive south on San Mateo Blvd.; halfway between Central Avenue and Gibson Blvd. is a stop light at Kathryn Avenue; drive west on Kathryn Avenue one block to a stop sign; pass through the stop sign to Ridgecrest Drive, where you jog left across the intersection and then drive west on Smith S.E. for two blocks to 4000 Smith S.E., located on your left at the southeastern part of the intersection of Smith S.E. and Sierra.

Minutes of the NMFG Meeting

July 9, 1998

By Nancy L. Attaway

President Moss Aubrey called the meeting to order at 7:15 p.m. and welcomed all members and visitors.

Treasurer's Report

Treasurer **Bill Andrzejewski** reported:

Heading	*Total*
Previous Balance	$1,088.68
Expenses	$105.56
Deposits	$80.00
Balance Forwarded	$1,063.12

Old Business

No old business was discussed.

New Business

Guild Editor Nancy Attaway announced that **Ernie Hawes** received an award during the Northwest International Faceters Conference hosted by the North Puget Sound Faceting Guild in May 1998, printed in the June 1998 issue of the USFG newsletter. **Ernie Hawes was one of twelve award recipients for the best faceting designs for 1997.** Congratulations, Ernie! Well done!

Nancy Attaway learned from e-mail correspondence with **Greg and Hollis Thompson**, the organizers for the annual Texas Faceters Guild Symposium, scheduled October 10th and 11th, that National Geographic photographer and noted gemstone author **Fred Ward** will present three different talks on gemstones during the symposium. **Steve Attaway** has been asked to discuss gemstone carving and the related tools. **Robert Strickland** will speak on Gem Cad.

President Moss Aubrey said that articles written by **Steve and Nancy Attaway, Edna Anthony, Merrill O. Murphy,** and **Scott and Susan Wilson** have been reprinted in the USFG newsletter, the U.K. and Australian Faceters Guild newsletters, and other guild newsletters here and abroad. Congratulations all!

A **NMFG picnic** was scheduled for **September 12** at the home of **Paul Hlava** in Albuquerque. Many Guild members signed up to bring food items to the picnic. More information about the event is posted in this issue of the Guild newsletter.

Heidi Ruffner related that many Guild members have not had the pleasure of meeting our **Guild Gemologist, Edna Anthony**, who resides in Colorado Springs. Edna writes very informative and well researched gemstone articles for the Guild newsletter. Heidi said that the next time Edna visits Albuquerque, Heidi plans to host a reception so Edna may meet the Guild members.

President Moss Aubrey related the business discussed at a recent NMFG board meeting regarding incorporation and liability. He stated the improved changes made to the list of Guild officers and explained why. Moss also addressed the issue of a new slate of officers.

Moss Aubrey spoke with a lawyer regarding the possible incorporation of the NMFG, inquiring as to the liability issue and the necessary paperwork. The laws for incorporation have changed in recent years and no longer offer much in the way of liability coverage. The paperwork required every year has increased.

Paul Hlava mentioned that the Albuquerque Gem and Mineral Club holds a liability policy for their show events and field trips through the Rocky Mountain Federation of Mineralogical Societies. Paul will investigate a liability policy for the Guild.

Moss Aubrey announced several changes to the list of Guild officers. The Field Trip officers and field trips were eliminated because of logistics, availability, and liability. It has become difficult to search for facet grade material in New Mexico. Most of the gem collecting sites have been picked over fairly well. Some sites require four-wheel drive vehicles and strenuous hikes just to get there. Guild members interested in field trips may become members in the Albuquerque Gem and Mineral Club for $16 per year to participate in AGMC-sponsored field trips to mines and mineral collecting sites.

Moss Aubrey and the board initiated a new category of officer: **Special Events Coordinator**, who shall be responsible for scheduling the Guild Christmas party and other seasonal events, such as a Guild picnic. A special field trip, such as touring the facilities of a jewelry manufacturer or a dinner get-together at the February Tucson Show, falls under the jurisdiction of the Special Events Coordinator. Any Guild member who wants to assist during a special event may contact the Special Events Coordinator. This also eliminates the Christmas party chairman.

Moss Aubrey mentioned that a slate of officers will be needed by September to be voted upon during the November meeting. They will be inducted during the Christmas party and serve a two year term. Several cur-

rent officers requested that they remain, and some desired a change.

Nancy Attaway nominated Susan Wilson for the office of President, as Moss declined a re-election. Bill Andrzejewski wants to remain Secretary/Treasurer. Louie Natonek will stay as Vice-President of Workshops, but requests help conducting workshops at his home. Nancy Attaway will remain as Editor, with Steve Attaway as Assistant Editor. Edna Anthony will still be Guild Gemologist, and Paul Hlava will still be Guild Mineralogist. Bill Swantner has nearly agreed to hold the office of Vice-President of Programs, and Heidi Ruffner is seriously contemplating the role of Special Events Coordinator. The Guild needs a Guild Librarian. The Vice-President of Programs and the Special Events Coordinator will need help from Guild members. Nominations from the floor will be entertained for all offices during the September meeting and posted in the September/October issue of the *New Mexico Facetor*.

Show and Tell

Elaine Weissman displayed a pair of unmatched earrings she made with 10Kt., 14Kt. and 18Kt. yellow gold overlays, sweat-soldered to have the copper appear when heated. Tongues of lapis in parabola shapes dangled from the gold overlays of the different yellow hues. A round yellow zircon accented one lapis, and the other had a large marquis chrysoberyl accent.

Charles Bryan brought his first two stones that he has faceted. One was a small amethyst oval that showed a lot of sparkle. The other was a large round obsidian that Charles had collected in the Jemez Mountains. Both were polished with cerium oxide. Well done, Charles.

Will Moats showed a large colorless beryl (goshenite) he cut in a nine mains round variation, also polished with cerium oxide. Beryl has been a favorite gem for Will to facet.

Russ Spiering displayed two pins he made with fine silver, sterling silver, and 14Kt. gold that were fused, reticulated, and fabricated. A round chrome tourmaline accented one pin, and a round hessonite garnet from the Umba Valley in Africa accented the other. Russ showed also a pendant he made with 14Kt. and 18Kt. yellow gold that held a large black opal from Lightning Ridge, Australia that he had carved. A large natural freshwater pearl from the Mississippi River and a small mint green African tourmaline both accented the opal and gold pendant.

Susan Wilson displayed a large, dazzling lab-grown alexandrite she cut in a cushion style barion emerald cut. The stone exhibited an unusual color change that went from a greenish blue to a reddish purple. Since her ceramic lap did not yield a polish on the big table facet, she borrowed a mehenite iron lap from Nancy Attaway that rendered a successful polish with diamond spray. Susan nearly ran out of room for a crown and had to shallow the crown angles, which seemed to work very well.

Susan remarked that this lab-grown stone from Russia was extremely difficult to polish. She also experienced problems with some facets "crashing" during polish, which affected the facets nearby that she had just polished. Susan wondered if the stone had some inherent characteristics of internal stress from the growth process. Merrill O. Murphy mentioned that he knew internal stress problems to be a factor in the production of Russian-grown stones. Arthur Skuratowicz mentioned that some lab-grown stones contained an unorthodox direction of hardness. He recommended buying an entire boule and advised that you anneal it before slicing out a piece to facet.

Susan brought a most remarkable sculpture that stood about six inches tall that she carved from a block of talc. It resembled a miniature version of Washington, D.C.'s Jefferson Memorial. The talc was from Steve Attaway, who obtained a crate of talc from the National Defense Stockpile. Crates of talc had been in storage since World War Two and were sold, among other materials, at a recent Tucson Show. Susan took the very intricate talc carving to a 600-grit finish and yielded a real treasure. She now has a beautiful little sculpture from a very difficult material. Congratulations!

Nancy Attaway had re-cut for a customer two pavilions to enhance the sparkle in a large oval amethyst and a large round blue sapphire. The oval amethyst had a very deep boat-shaped pavilion with many rows of small facets. Nancy cut a new pavilion with larger facets at topaz angles that gave life to a gem of dark color saturation. The blue sapphire was cut at very shallow angles to remove a large inclusion from the culet. Nancy discovered the sapphire to contain stacked, parallel hexagonal blue saturation lines that inhibited the sparkle. She cut a row of large pavilion mains at 40 degrees to brighten the color and cut a snowflake design at the culet at 35 degrees for some sparkle. She also faceted a modified barion emerald cut Tanzanian rhodolite garnet that contained some silky-looking rutile inclusions.

Future Programs

Vice-President Susan Wilson plans to have Scott Sucher speak to the Guild during the September meeting. Scott faceted a specialty collection: replicas of the famous diamonds of the world. The diagrams for these were featured in Lapidary Journal issues from

1960 to 1963. Scott will share his comments regarding those diagrams. He will also talk about grinding and polishing techniques and relate stories from his travels and gem buying trips taken to Southeast Asia several years ago.

Susan hopes to schedule Douglas Irving for the meeting in November, providing he will be in New Mexico. Doug works as a professional geologist and travels throughout the world in search of mineral prospects. Doug will talk about the diamond-bearing kimberlite areas in Canada and will relate his experiences in the countries he visited, like Madagascar.

Refreshments

Susan Wilson, Heidi Ruffner and **Eileen Smith** provided homemade ice cream and baked refreshments for July meeting. Thank you very much. **Elaine Weissman, Karen Fitzpatrick, and Mark Guerin** volunteered to bring refreshments to the meeting in September.

Program Speaker

Arthur Skuratowicz spoke to the Guild on the problems encountered during gemstone identification. Arthur, a GIA Graduate Jeweler Gemologist, taught metalsmithing, gemstone identification, and faceting at GIA for seven years. Arthur is a master jeweler and appraiser at Shelton's Jewelry. A full report of his fine presentation is included in this issue of the *New Mexico Facetor*.

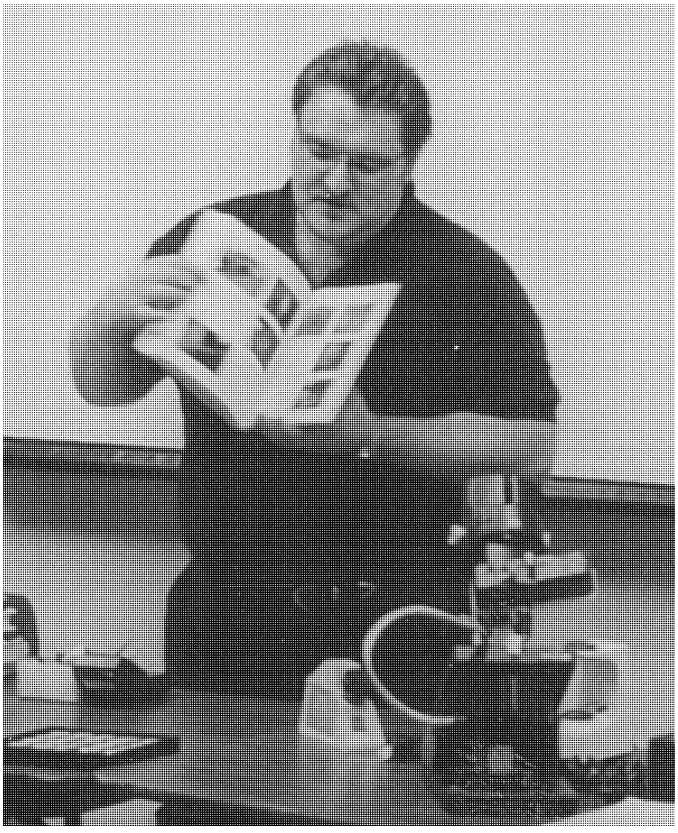
Program Speaker

By Arthur Skuratowicz, G.J.G. (Graduate Jeweler Gemologist) (Text by Nancy L. Attaway)

The terminology and the instruments used in gemstone identification provide clues for the detective work that determine the identity of a gemstone, but it is the actual thought process of how these clues are utilized that enables a final answer. Terminology allows a means to describe in words what we are seeing in a particular way that other people will understand. The clues leading to the identity of a gemstone can be written on a chart and compared with data known for specific gemstones.

Gemologists use different instruments for gathering data during the gemstone identification process. The most useful of these is the microscope, especially a stereoscopic type fitted with special darkfield illumination that permits light to enter the gemstone only from the sides. A microscope serves as the ideal tool for examining inclusions that can provide positive proof in many cases of a gemstone's identity. Magnification also reveals internal features of a gemstone's crystal structure. The most commonly used tool is the small 10X loupe. A loupe allows a close, but limited, inspection of a gemstone, both inside and out, while being very portable.

Several other instruments play important parts in the gemstone identification process. The refractometer is a tool used to measure the refractive index and the birefrin



Arthur Skuratowicz, a former instructor for GIA, is a master jeweler and appraiser at Sheltons.

gence of most gemstones. Gemstones bend light at measurable angles, and this data can be compared to a listing that shows the refractive index readings known for specific gemstones. A gemstone that breaks one beam of light into two polarized beams is said to be doubly refractive, having a birefringence, and this gives yet another clue. The polariscope is a tool used to determine the optical character of a gemstone, and it shows whether the stone is singly or doubly refractive. The spectroscope is another tool that separates white light into a spectrum of component colors with a prism or a diffraction grating, where each slit represents a different wavelength. A gemstone placed between the light source and the slit will absorb certain wavelengths that can be measured to yield another clue. A dichroscope is a small tool that determines pleochroic colors, giving a clue to the crystal system of a gemstone. All these tools provide very useful information for the gemologist. It is important to control the lighting when performing these tests.

Gem buyers can and do make mistakes when purchasing colored gemstones. The more knowledge and experience are acquired, the less mistakes a buyer makes. It becomes important to be familiar with many types of gemstones. We need to view actual examples first-hand.

Many gemstones exhibit telltale or signature appearances. Observe the obvious. Note the crystal habit, the overall color, and the color distribution. Then, look inside. A gemstone may contain inclusions that can provide a key to its identity. Rubies, sapphires, emeralds, and quartz are examples of gemstones that show natural inclusions of how the crystal grew, marked by fingerprint patterns and zonal banding in straight lines. Curved lines could indicate synthetic origin. A gemstone that contains an inclusion of a distinct natural crystal, like calcite in emerald or apatite in ruby, would be an indication that the host gemstone is of a natural variety.

Some inclusions show evidence of heat-treatment. In some cases, heat can cause fractures to heal, occasionally seen in rubies and sapphires. Sometimes the temperatures in heat-treatment become high enough to cause the inclusions to expand, generating fissures inside the gemstone. In the case of ruby, very often these fissures are glass-filled when they reach the surface. The presence of platinum inclusions reveals a gemstone to be synthetic, as platinum crucibles are used in growing gemstones. *The PhotoAtlas of Inclusions* by Gubelin and Koivula is a highly recommended reference book that contains marvelous pictures of many types of inclusions. Comparing the inclusions in gemstones to those in the *PhotoAtlas of Inclusions* can provide keys to a gemstone's identity. Colorless gemstones seem to be somewhat more difficult to determine. The same can also be said of the opaque gemstones cut en cabochon.

Some gemstones need to be heat-treated to improve and/or enhance their color. Tanzanite is heat-treated to improve the overall color, and this treatment is permanent. Sapphire is heat-treated to both improve the color tones and enhance the clarity by melting the rutile, and this is also a stable treatment. Diffusion-treated sapphires usually show color concentrations close to the surface, and this color may disappear when the stone is re-cut. Irradiated sapphire changed to red will fade to yellow in ultraviolet light. The natural color in kunzite will fade with exposure to ultraviolet light, as will morganite. The deep blue color of Maxixe beryl quickly fades in sunlight. Blue topaz is both natural and heat-treated, as well as irradiated, but heat-treatment in blue topaz cannot be proved. Aquamarine is sometimes, but not always, heat-treated to remove the yellow, thus changing the color from light bluish green to blue. Heat-treated amethyst becomes deep yellow citrine. The color that we expect to see in gemstones is usually yielded by heat-treatment.

Diamonds are irradiated to improve or change the color, and these colors remain stable. Diamonds are irradiated inside a cyclotron or in a linear accelerator and later annealed to set the color. In the case of green diamonds, tests cannot prove exactly when the irradiation occurred if green irradiation stains are not present on a facet.

Be aware of fraudulent treatments now found in colored gemstones. Tigereye, agate, pearls, lapis and jadeite can all be dyed to enhance the color. Look for dye concentrations in the matrix. The calcite absorbs the dye in the matrix of lapis. Dye concentrations in pearls may be spotted at the drill holes. Pearls are also soaked in salt solutions, bleached, tumbled to improve roundness, and sometimes irradiated. The luster and the thickness of the nacre on freshwater and saltwater pearls are dependent upon the temperature of the water and the specie of the mollusk used. Pearls can be x-rayed to see the layers and the seed, but the interpretation of the x-rays is not easy. Turquoise is subjected to a wide variety of treatments, and many are not easily discovered through testing.

Emeralds filled with clear oils and waxes to enhance clarity is accepted as normal, but these are not stable treatments. Emeralds filled with dyed waxes and dyed oils are definitely fraudulent. Some synthetics and imitations made to mimic emeralds are quench-cracked and filled with green oil, again fraudulent. Gems with a crystalline emerald coating have been revealed. The use of Opticon and other polymers and resins are still in question. A treatment not disclosed is now considered fraud.

Laser-drilling of diamonds and fracture-filling of rubies not disclosed is also fraudulent. Laser-drilling improves the apparent clarity of a diamond and raises its saleability. How-

ever, it does not increase the clarity or the value, as a dark inclusion is traded for a hole in the diamond. When a jeweler unknowingly heats a fracture-filled diamond during a repair, the diamond will be damaged. A fracture-filled diamond may exhibit a characteristic flash of color. Treaters argue that fracture-filling of rubies occurs unintentionally during heat-treatment, where borax seeps into the cracks. The fracture-filling of rubies is also done intentionally, and it is not always disclosed.

Opal can be subjected to a variety of treatments. Opal can be soaked in a sugar solution and then dipped in sulfuric acid to darken the color. Such treated opal reveals a peppery black appearance under magnification. Smoke and ashes are also used to darken opal. This treatment shows a flaky surface under magnification. Oils, waxes, and polymers can be injected into opals with heat and pressure, and these are hard to detect. Be familiar with the appearance of crystal opal, black opal, and Mexican opal. Thin layers of opal are also made into doublets and triplets, and these should always be disclosed.

The color-change gemstones include alexandrite, sapphire, and garnet (spessartine/almandine from East Africa). These unusual gemstones change colors when placed in incandescent and then taken to ultraviolet light.

Several gemstones are difficult to determine. Some heat-treated sapphires have tested natural. Synthetic amethyst is now very hard to determine. When amethyst was first grown in a lab, the seed crystals were untwinned. Twinning, then, became a mark of natural amethyst. Amethyst can now be grown twinned, and it is a challenge to determine synthetic from natural. Flux-grown synthetic spinel is another gemstone very hard to identify. Faceted stones of this variety test natural because most of the few inclusions it ever had, left from the growth process, have been removed from cutting.

Some of the inclusions found in nature are now copied in man-made gemstone material. For example, Columbian emeralds grow naturally in a hydrothermal environment. Lab-grown emeralds are grown by man hydrothermally. Likewise, the nailhead spicules found in hydrothermal lab-grown emerald mimic the shapes of phenakite sometimes seen in natural beryl.

The first man-made diamond appeared in 1954, but it was industrial grade. The first man-made diamond of gem quality became a reality in 1971 by cooking carbon under pressure. Nitrogen can allegedly be leached from a industrial grade diamonds to improve the color, fading the yellow tones to white. Hypothetically, if this method can be applied to gem quality diamonds, then it may raise the apparent value of such a diamond, if the treatment is not detected. The color is stable, but the treatment may not be detectable.

The introduction of synthetic moissanite to the gemstone market has upset many jewelers, because synthetic moissanite tests like a diamond. A telltale clue for identifying synthetic moissanite is that it is doubly refractive. Knowing this, cutters of synthetic moissanite are now orienting the table down the axis of the stone to diminish this characteristic. Tilt the stone to one side and look through the crown facets to reveal the double refraction.

Gemstones exhibit a variety of phenomenon, and these can serve as clues to identification. The gemstones that display a six-rayed star include sapphire, aquamarine, and quartz. Garnets show a four-rayed star because they represent a different crystal system. However, garnets can show a six-rayed star if the two crossing needles are oriented with the needle intersecting them perpendicularly. The trapiche emeralds, unique to Columbia, exhibit six sections of green when cut down the C axis. Sometimes, these are divided by six black lines like spokes in a wheel. The gemstones that exhibit a natural cat's-eye include alexandrite, emerald, aquamarine, rose quartz, opal, and chrysoberyl. Some imitation cat's-eye stones are actually fiber-optic glass, and these reveal hexagonal patterns inside of hexagonal patterns under high magnification. Gas bubble striations are seen in synthetic cat's-eye alexandrite. Amber and the natural glasses (obsidian) are the only gemstones that contain a free-standing gas bubble. When chipped, devitreous glass is granular.

A gemologist depends upon observational skills. Practical gemology has no specified order of instrument usage. However, research gemology relies on a specific and conclusive sequence of instrument usage. A gemologist incorporates an acquired knowledge of gemstones with the usage of many different laboratory instruments to obtain clues that yield the identity of a gemstone. The identification process becomes more difficult with the introduction of synthetics, imitations, and treatments that prove hard to detect. A gemologist needs to keep aware of new methods of crystal growth and gemstone treatments to guard against mis-identification and fraud.

In the News

Tanzanite Mine Cleanup

Source: Colored Stone July/August 1998

Water rushing into three mine pits flooded eleven other pits connected by underground tunnels. More time will pass before all the pits are re-opened and the bodies recovered. All pits flooded were part of Block B, with some minor flooding in Block D. Some bodies already recovered were found with parcels of tanzanite crystals. The Tanzanian government mobilized the military and the local police and fire brigade to assist in rescue operations. Dealers conducting business there compared the site to a ghost town. AGTA established a tanzanite miners relief fund. Miners will help instigate new rules and regulations regarding mine safety and will also convince mine owners to upgrade mine conditions.

Gem Pricing Update

Source: JCK July 1998

New wholesale pricing information on diamonds and colored gemstones are listed from *The Guide*. Note the price increases for tanzanites, emeralds, and tsavorite garnets. Diamond prices hold steady with shortages in some sizes and shapes. Emerald cut diamonds are popular.

AZCO Now Does Emeralds

Source: Colored Stone July/August 1998

AZCO Mining, Inc. entered into an agreement with Chivor Emerald Corporation to option Colombia's Chivor emerald mine. AZCO negotiated an option on California's benitoite mine last December.

Updated Buyer's Guide

Source: Colored Stone July/August 1998 and JCK July 1998

Gemworld International has announced an updated version of the *The Guide* to buying colored gemstones with the Spring/Summer 1998 issue. This most recent issue contains more than 200 price grids with information on wholesale prices for gems and jewelry. For more information, contact Gemworld International at 1-888-GEMGUIDE or 1-847-564-0555 or fax at 1-847-564-0557.

New Rhodolite Mine

Source; Colored Stone July/August 1998

More raspberry-colored rhodolite garnet has entered the gem market. A new deposit from Morogor, Tanzania near a national game preserve has yielded six to ten carat chunks with some silky inclusions.

New Arkansas Diamond

Source: National Jeweler July 1, 1998 and JCK July 1998

A 3.03 carat rough diamond crystal from the Crater of Diamonds State Park in Arkansas was recently cut by Lazare Kaplan in New York into a 1.09 carat, D-flawless, round brilliant. This exceptionally high quality rare diamond was named the Strawn/Wagner Diamond. It is expected to sell for more than $33,000. The 40.23 carat Uncle Sam Diamond, discovered in 1924, remains the largest diamond found in North America. A 7.28 carat natural yellow rough diamond was recently found in Arkansas.

Pearl Supply in Trouble

Source: Colored Stone July/August 1998

Pearl jewelry has had a recent increase in popularity, and that has affected supply. Fluctuations in the pearl market have traditionally been blamed on supply problems, because pearl farmers keep their production techniques a secret. The actual blame rests with diseases from parasites or viruses, water pollution, natural disasters, and management failures. Such secrecy impedes new scientific methods for accurately predicting trends in supply, prohibits installing new cultivation techniques, and does not allow a study of existing conditions to solve problems. As a result, pearl producers will face more shortages and further economic losses.

New Tennessee Pearls

Source: National Jeweler July 1, 1998

The American Pearl Company has successfully harvested a new triangular-shaped pearl that requires a three to five year growth period. The new shape is produced by inserting a triangular-shaped mother-of-pearl nucleus into the oyster. The American Pearl Company harvests fancy-shaped natural and cultured freshwater pearls from the Tennessee River. Fancy shapes include cultured dome pearls, blistered pearls, marquise, teardrop, bar, navette, and disks. The pearls are cultivated in the river for eighteen months and then cut into calibrated and designer shapes.

Virus Attacks Akoya Pearls

Source: JCK July 1998

A virus is the suspect in the increasing shortage of Japanese akoya pearls. The Japanese pearl farmers had been importing Chinese akoya, and

these are now blamed for killing so many pinctada martensie oysters in Japan's waters. Cultured pearl production has plummeted 50% this year and could drop again next year. Red tides, hurricanes, and changing water temperatures have also adversely effected production. A price increase has already begun.

Japanese Kasumiga Pearls

Source; JCK July 1998

The Kasumiga pearl is the latest cultured pearl from Lake Kasumigaura, a freshwater lake fifty miles northeast of Tokyo. The round pearls exhibit a high luster and beautiful color range from pure light pink through a medium-dark pinkish purple with few blemishes. The mollusk that produces the Kasumiga pearl is a Japanese and Chinese mixture. The pearl acquires its size and structure from the Japanese shell, and obtains its fine luster and natural pink color from the Chinese shell.

GLDA Expands for 1999

Source: JCK July 1998

The GLDA Show, the largest in the February Tucson Gem and Mineral Show, outgrew its space and plans to expand in 1999. The GLDA will showcase 365 to 375 dealers in the Holiday Inn City Center and 135 to 150 dealers in the Doubletree Hotel. Limo service between the two shows will be available for buyers.

Open Pit Continues at Argyle

Source: National Jeweler Aug 1, 1998

Mine officials at Argyle decided to expand their open pit mining operations, rather than develop underground mining. The cost of an underground mining operation was deemed too expensive and not viable. Work on the pit extension will begin immediately. The open pit expansion involves prestripping more than 100 million tons of waste to access about 17.6 million tons of diamond-rich ore. The ore contains an average grade of 2.58 carats per ton. Open pit mining reserves are estimated at 64 million tons of ore to yield more than 160 million carats.

Colorado Diamond Mine Now Closed

Source: JCK July 1998

The Colorado Diamond Mine at Kelsey Lake, near the state line shared with Wyoming, closed last September, pending a sale by its majority owner. The mine ran for a year at half capacity and produced about 12,000 carats. Majority owner, Redaurum Ltd. of London invested much of its money in exploration and not in equipment, and mining supplies have dwindled as a result. The mine needs costly additions and a large primary ore crusher. The hope is that demand for Colorado diamonds will return once the mine is back into full production. The mine hopes to be profitable once the new owner is in place. No plans exist to market the diamonds out of state.

Azco Mining Completes Benitoite Study

Source: National Jeweler Aug.1, 1998

Azco Mining acquired an exclusive option to explore, evaluate, and purchase the benitoite gem mine in San Benito, California from owners Bill Forrest and Buzz Gray. Azco Mining announced that their market feasibility study is now complete. Azco has until February 1, 1999 to exercise their option to purchase the only benitoite mine in the world.

War in Sierra Leone

Source: The Economist Aug. 8, 1998

A civil war in Sierra Leone has caused over 250,000 people to flee the country. Rebels have looted, killed, and destroyed anything in their path in an effort to control the Koidu diamond mining area.

Radioactive Ruby Alert

Source: JCK August 1998

Rubies with dangerous levels of radiation have entered the U.S. gem market from Indonesia. The rubies were irradiated in the same nuclear reactor that gave dangerous levels of radiation to a batch of cat's-eye chrysoberyls. The rubies had been irradiated to change their color from orange-red to a padparadscha pink-orange color, but the treatment did not take. The rubies exhibit a brown-red color much like rubies from Africa. A Geiger counter is the only way to differentiate these radioactive rubies from other rubies.

Arizona Peridot Mine Expands

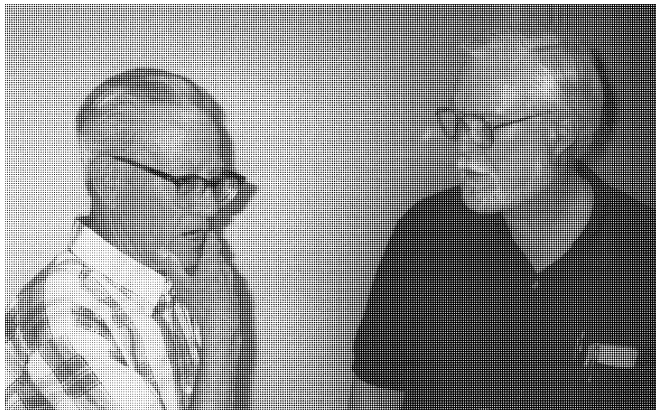
Source: JCK August 1998

The peridot deposit on the San Carlos Apache Indian Reservation ranks as the largest known peridot deposit in the world, where the mining of high quality peridot continues. A high saturation of chromium gives the Arizona peridot a rich green hue, and a blue-green color may at times be seen. Surface mining has been exhausted, and tunnels are being dug, increasing the price of peridot.

The Europeans pronounce peridot as "per-i-doe". The Apache Indians mining peridot in Arizona prefer the pronunciation of "per-i-dot", saying it with a hard "t" at the end.

Facet Designer's Workshop

By Ernie Hawes



Merrill O. Murphy and Ernie Hawes share a moment at the July 1998 New Mexico Faceters Guild meeting.

"Emerald" shaped designs seem to be seldom cut by faceters I know. I am not sure why that is, but I guess there may be at least two reasons. As simple as the basic "emerald" cut is, it is really not that easy to get accurate meets in step cuts. It takes lots of practice and accurate transferring to be able to line up the facets with each other in the same row and between the pavilion and the crown. Secondly, because most "emerald" shaped cuts are step cuts, most faceters seem to have little interest in them due to their lack of brilliance. But getting accurate meets is, as I have already said, a matter of practice, and step cuts are an excellent way to develop a high level of accuracy. But all "emerald" cuts are not totally step cuts, and some are not step cuts at all! Both of our designs this month are in the category of "emerald" cuts, but they may be more appropriately categorized as "mixed cuts," *i.e.*, a mixture of step and brilliant type facets with the step cut portion being usually on the crown.

The first design is by one of our editors, Nancy Attaway, and it is a very interesting and unusual pattern that she calls the Antique Emerald. Here is what Nancy has to say about it.

"I developed this emerald cut for a particular piece of Montana sapphire that had a long and narrow profile with limited depth. I remembered a long and skinny emerald cut stone I saw as a child that was set in an oval pin, and I thought that I could replicate that design.

The "Antique Emerald Cut" design uses a long and narrow emerald cut profile. The length to width ratio of this diagram was 1.0/0.4. The design is easy to stretch since the design in not a meet point design.

The depth was very limited in the sapphire, and I wanted as large a stone as possible. I did not have room for a traditional culet area that comes to a point or to a keel. Instead, I cut a culet facet that had a shape much like the outline of a marquise. I was pleasantly surprised how much sparkle the stone showed when finished. I was fully expecting it to window somewhat, and I had planned to have Steve carve some lines in the flat culet area to brighten it. That was now not necessary.

I faceted a large amethyst and a smaller imperial precious topaz using this long and narrow emerald cut design. For the amethyst, the length was 23.9 by 9.5 mm., 13.29 carats. The topaz was 15x6 mm., 4.38 carats. In both of these gemstones, I followed the guidelines I had set for the sapphire and cut a flat marquise-shaped culet area. As with the sapphire, the amethyst and the imperial precious topaz exhibited a lot of sparkle. Surprisingly enough, the design promotes brilliance through many of the facets as the stone is rolled from side to side, not just through the table facet. The windowing of light through the flat culet area is at a minimum."

(Please note that while Nancy describes cutting this design in sapphire, the pattern angles are for quartz.)

If you were faceting back when our guild was first formed in 1981, you might have encountered our next design. One of the best designers then and now is Jerry W. Carroll. The January, 1981 issue of ***ANGLES***, the newsletter of the Southern California Faceters Guild, featured an excellent example of Mr. Carroll's design prowess called, very simply, ***Barion Type Rectangle***. This design cut will yield a beautiful stone. Because some facets are relatively small and must be cut in carefully, I do not recommend this pattern to the beginner. However, if you have cut a dozen or so gems of various designs, including the standard step cut emerald, then this is a design you should definitely try. There are frequent optical advantages to cutting a brilliant or barion pavilion and a step cut crown. This design is a fine example of that combination.

On an historical note, thinking about this second design and when it was published reminded me of a statement made by a guild member who I will not embarrass by quoting. When the guild was being formed back in 1981, I was discussing the idea of starting a guild with this individual. He had belonged to the original guild that had lasted, perhaps, five years, and was already a somewhat dim memory. He was willing to help, but he did not think the new guild would last any longer than the other one. He told me that interest would wane due to lack of new and interesting programs.

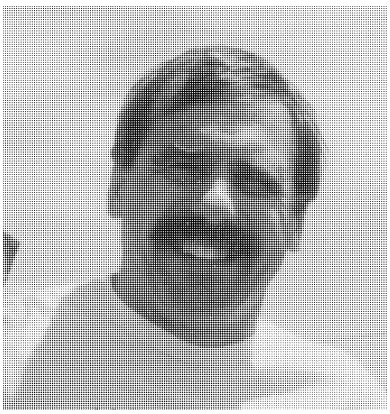
Perhaps, it is good that none of us can accurately perceive the future. I am certain this member is just as glad as I am that the New Mexico Faceters Guild is now into its eighteenth year. Many things have contributed to the continued success of our guild and others around the world. Interest in faceting is probably greater now than it has ever been. Several guilds exist today in various parts of the United States and across the world that were started within just the past few years, and most of the guilds that were in existence back in 1981 are still thriving. We have wonderfully accurate machines to facet on, computer technology to aid in both design and cutting, plus the Internet to help us communicate with fellow faceters and gem enthusiasts. New sources of gem materials have been found (although we still have a very hard time getting any of the best rough). Higher quality laboratory-grown materials have also become available at attractive prices. But, most importantly, a few hard working and persistent members have made it happen, and we have all benefitted from their efforts. I applaud guild members everywhere, not just in the New Mexico Faceters Guild, but in guilds around the world, whose members have given untold time and energy to make their guilds a success. In our own guild, I am pleased to see a new and younger generation taking charge and participating so enthusiastically. (Not that I am old, mind you.) And, I do believe that the fellow who was somewhat pessimistic in those early days would readily agree with me that the future of amateur faceting is more secure than ever, and that we may look forward to even greater achievements than we have experienced thus far.

If you agree with what I have just said, then please take the time to share your interest in faceting with someone else. I am sure that is how most of you got involved. I promise that you will be glad you did.

Gem Myth of the Month

By John Rhoads, D & J Rare Gems, Ltd.

raregems@amigo.net



We received quite a few comments regarding the gem myth column, and many people sent additional gem myth examples. Thank you very much. The following gem myth is one of my favorites, and it has been commented upon many times in our newsletter.

Gem Myth: "We purchased this ring on our trip to Mexico (Egypt, Turkey, Brazil, the Bahamas, as almost any other country can be substituted here). The vendors told us that the alexandrite (sapphire, ruby, emerald, tanzanite, as many other gems may be substituted here) was a real one."

People traveling to nearly any exotic port hope to find bargains on gems and jewelry that they can purchase and bring home to show others. They like relating to other folks about their amazing treasures found on their trip, and they enjoy telling how much cheaper the goods were there. Gemstones seem to be common items on which these travelers focus their search. The vendors working the markets at many of the tourist destinations are very well aware of this and act accordingly.

When I lived in Malawi ten years ago, I would import amethysts, garnets, and rubies from India and sell them to the street vendors. These dealers would then resell the stones to the tourists. It was quite a flourishing business while it lasted.

Where items of gems and jewelry are purchased has little to do with whether or not the items or stones are genuine. Most countries do not have consumer protection laws, which exist in the United States, that guard tourists against fraudu-

lent claims. Even if such laws existed, will the person who overpaid $100 or more for a ring or a stone worth only $15 spend many hundreds of dollars on another trip to return the item and get his money back? I sincerely doubt it.

As I have said before, when traveling to foreign countries, you should never spend any more than you can afford to lose, should the item turn out to be a fake. If you absolutely have to make an expensive purchase, then have the item checked by an independent local authority. Such places may be found in most major tourist locations throughout the world. If you find yourself pressured into a quick sale, then you may be fairly certain that what you could be buying is not at all what it is represented to be.

Alexandrites, sapphires, rubies, emeralds, and tanzanites are internationally known gemstones and are priced pretty much the same everywhere. No place, no matter how remote, is going to have these stones available to you at extremely low prices. Either something is very wrong with the stone, or the stone is not exactly what it is represented to be. Buyers should always be wary.

Even I am not immuned to the temptations of foreign vendors. While in Mexico a few years ago, I purchased three bracelets for $12 from a vendor who told me that the items were sterling silver. Within a few months, the silver plating had worn away from these bracelets. My $12 purchase turned out to be worth only a couple of bucks. We all live and learn.

I heard another gem myth a number of years ago when I attended the gem show sponsored by the Tucson Gem and Mineral Society. This gem myth revolves around aquamarine. A dealer I knew was participating in the show, and I decided to visit his booth. While I stood there looking at the items for sale, I heard a sales person tell a customer, "All aquamarines are heat treated."

I knew for a fact that the statement made was not true. At that time, I had many of the aquamarines that I personally collected while living in Africa. After cutting these, I knew that none had been heated to change the color. The more I submerge myself in the gem business, the more I have found the statement spoken by that sales person on that day to be completely untrue. It basically was a case of the dealer trying to discredit any other dealer who had told that customer otherwise in the past.

Aquamarines show a wide range of blue and green colors. The practice of heating aquamarine is used when there is assessable yellow in the gem. The heating removes the yellow, but the process usually leaves behind a steely blue hue or graying blue hue that many people consider less attractive.

From our experience, we found that customers prefer it if the aquamarine is not heated. The green tones caused by the yellow have been very desirable. In a recent newsletter, we offered a green beryl that would have turned a nice light blue color upon heating it. We also offered an aquamarine that had been a green beryl similar to the one just mentioned before heating. The untreated green beryl was by far the more popular of the two gems, even though both were for sale at the same per carat price.

I still have a few very fine pieces of aquamarine rough that I collected during my trip to Africa. I cut many of these over the years, and all of these gems sold quickly. I had one small piece heated when I returned, and I agree with those of you who prefer the natural color.

Ultimately, it can be stated that heat-treatment changes the appearance of many gemstones. However, is that change always for the better? We will leave that question for our customers to answer, as well as the decision to heat a gem or not heat-treat one.

Don't forget: next meeting is on September 10, 1998 at 7:00 pm. Dues are $20.

Lets Talk Gemstones

By Edna B. Anthony, Gemologist

(Contact the author for permission to reproduce this article in any form.)

EMERALD

(A CYCLOSILICATE)

PART 2

PART 1 of my emerald article dealt with contact-metamorphic and hydrothermally-influenced contact-metamorphic emerald deposits located throughout the world. Columbia, South America is the only known source of emeralds created solely by hydrothermal conditions. The interior characteristics of emerald crystals, precipitated from nutrient-saturated hot water solutions into cavities and crevices, created by plate tectonic forces in the Andes mountains, differ markedly from those of emeralds formed by the other processes. Larger, cleaner, more transparent crystals with a more intense color tend to develop under hydrothermal conditions. Fewer solid and protogenetic materials are found as inclusions. A large majority of the finest emeralds marketed are recovered from these Columbian mines.

Despite a long, violent history, studded with acts of extreme cruelty and wanton destruction, the emerald supply seemed inexhaustible until recently. Today, many in the gem industry doubt that an orderly market can be achieved and maintained. The unstable political situation and a disarray in the Columbian industry have created turmoil. Exploration for new sources lags where primitive and hazardous mining conditions still prevail. Rampant smuggling and an "under the table" type dealing in the finest rough and finished gems continue. The lack of industry-wide accepted standards for treatments and disclosure causes much confusion. For the more knowledgeable and wary consumer, this presents short-term difficulties. The first concerted efforts to resolve the problems began only recently. Great changes must take place if the emeralds from Columbia are to remain readily available to those who appreciate these lovely green gems.

Long before the conquest of Peru by the Spaniards, emeralds from the Muzo and Somondoco (Chivor) areas were prized by the Indian cultures throughout Central and South America, including Indians in the Inca, Aztec, Toltec, and Mayan Indian tribes. Emeralds played an important role in the celebrations and religious rites of these cultures. Emeralds were also used extensively for personal adornment. Following the conquest, the insatiable greed of the conquistadors led to unsuccessful efforts by the natives to conceal and preserve their treasures and their sources. Treachery, torture, and murder became the order of the day.

The Somondoco Mine was discovered and seized by an expedition force led by Captain Pedro Fernandez Valenzuela. The mine was developed and operated under incredibly cruel conditions, until it was ordered closed by Charles II in 1675. Jungle growth reclaimed the area. The natives of Muzo fiercely defended their treasures against all attacks by the heavily armed Spaniards. An unsubstantiated report relates that only the release of vicious dogs by the invaders vanquished the defenders.

The Villa de Santisima Trinidad de los Muzos was established, and the exploitation of the prize and the natives soon began. An extensive chronology of the events following the conquest and capture of the mines at Muzo and Chivor is presented in a most excellent book by Dr. John Sinkankas, *Emerald and Other Beryls*, published by Geoscience Press.

The known emerald deposits in Columbia lie in a northwest-southeast belt that crosses the three northern ranges of the Andes, generally north and east of Bogota. Farthest north, the mines at Muzo, Cosquez, Pena Blanca, and the lesser known mines at Ramal, Amarilla, Alumbra, Cuincha, and Isabi are all situated just north of the equator, lying on the slopes of deep ravines of the westernmost range. The mines of Nemocon, Chirvaneque, and Raquira-Tinjaca (due east of Muzo) lie on a line northeast of Bogota between the Muzo and Chivor areas. The mines at Guateque, Chivor, and Gachala form a triangle that lies east and slightly north of Bogota in the southernmost region of the belt.

The geology and the mineralogy differ in each area. However, two characteristics are common to these emeralds of hydrothermal origin, in that they house few protogenetic mineral crystals. Three-phase inclusions frequently occupy the numerous internal fractures caused by great stress both during and after the formation of the emeralds. Emeralds free of inclusions are extremely rare. Primary inclusions develop during the growth period of a crystal

and become trapped in the interior as the crystal grows. Acutely angled perimeters and jagged edges that often resemble saw blades are sure marks of their syngenetic development. Internal fractures that reach the surface of a developed crystal allow mineral-bearing liquids to seep onto cleavage planes and form secondary inclusions having smoother and softer contours. Both types may exhibit two- and three-phase characteristics. Sufficient numbers of tiny inclusions may cause emerald to be translucent or almost opaque. Such material is called "moralla." and is less dense than finer quality emerald. "Canutillos" denote uncut prismatic gem crystals too small and too thin to be faceted, but are sometimes set into jewelry. "Chispas" are tiny fragments of gemmy emerald rough.

In the Muzo area, the emerald occurs in calcite and dolomite veins of severely fractured and alternating layers of black shales and limestones. Dr. Sinkankas states that "in normal Muzo veins, albite is very uncommon", although it is found in minor quantities in the lower layers of the emerald-bearing formations. Upon exposure, the calcite and dolomite veins weather to a yellow-grey or brownish crumbled texture. Though usually short and prismatic, crystals as large as four by two inches have been found. Pyrite, apatite, fluorite, quartz, calcite, albite, and the rare and diagnostic parasite accompany and may be found as inclusions in the emerald crystals. Primary two- and three-phase inclusions, composed of liquid solutions that contain gas bubbles and crystallites of halite, calcite, dolomite, or other minerals, are also common. The yellow-green interiors of some of the finest Muzo emeralds exhibit a pebbled pattern called "oil drops", caused by the dense intergrowth of tiny emerald crystals. Such crystals exhibit fewer inclusions and have a slightly higher specific gravity.

The unusual trapiche emerald is found in both the Muzo Mine and the Pena Blanca Mine. Dr. Sinkankas makes a reference to R. Scheibe, who mentioned in 1926 the occurrence of trapiche emerald crystals in Banco Amarillo and also near Tambre Boliche, Muzo. Dr. Sinkankas also says that Fritz Klein believed Banco la Fragua was the source, but no other information is given. In some trapiche emeralds, inclusions consisting of albite, quartz, and a carbonaceous material outline a hexagonal beryl core, and they extend from it in "spokes" that divide the surrounding emerald material into six trapezoidal sectors. Often, the hexagonal beryl center is transparent and colorless, or it can be green. The cores appear black when they are heavily included by the carbonaceous material. More transparent brownish green cores can sometimes be obtained by heat treatment, which destroys much of the carbon in the crystals. In "coreless" trapiche crystals, the "spokes" intersect at the center of the crystal to create six triangular sectors.

Additional information, found in various references and obtained by personal investigation, is conflicting as well as confusing. On page 152 of *The Internal World of Gemstones,* (1983) Dr. E. Gubelin shows a "basal section through a trapiche emerald from Chivor with a bright central prism." In his book, *Emerald and Other Beryls*, (1989) Dr. Sinkankas tells of a study by Nassau and Jackson of crystals thought to be from Chivor. Later, it was learned that these had been recovered by a farmer on Pena Blanca land in 1963. Their drawings can be seen on page 263. Shown also is a drawing by F. Bernauer (1926) of a Muzo crystal with a tapering central core.

Excellent photographs of the two types of trapiche emeralds appear on page 253 of the *PhotoAtlas of Inclusions in Gemstones* by Dr. Gubelin and J. Koivula (1992, second, revised edition). One photograph shows a "coreless" specimen from the Muzo mine. The other depicts a dark rimmed, clear-cored crystal from Chivor. In 1996, I obtained two small trapiche cabochons, one "cored" and the other "coreless." Their yellow-green color coincides with the information that emeralds from the Muzo area exhibit yellow-green tones. At the 1998 Tucson Show, I discussed the subject with a dealer who claimed to be a partner in the group licensed to mine Muzo emeralds. He stated emphatically that trapiche emeralds were found only in the Muzo area. He believed that "coreless" crystals were found only in the Muzo Mine, and that the "cored" specimens were exclusive only to the Pena Blanca Mine. (The Summer 1998 issue of Gems and Gemology shows on page 138 a picture of a light greyish-green trapiche beryl crystal found at the miming area near Mananjary in Madagascar.)

The Muzo Mine experienced few interruptions of production, despite the presence of violent and cruel conditions following the Spanish conquest. Unlike the Muzo Mine, the Chivor Mine did not return to production until 1911. After Columbia attained its freedom from Spain, its government proclaimed in 1847 that all existing emerald deposits belonged to the nation. Private companies could operate the mines under lease with all production taxed. In 1896, the mining engineer, Don Francisco Restrepo learned through a study of documents, written by a priest

during the Spanish operation, that the Orinoco plains were visible from the mine site through a gap in the surrounding mountains. This important information led to its location atop a mountain approximately 70 miles northeast of Bogota. In 1901, Restrepo and his associates concluded an agreement with the government that bestowed perpetual title of the area to him and his associates. The agreement conveyed title upon the payment of an amount equal to the sum of twenty years of taxes. The mine was then reopened, and operations commenced in 1911. The agreement was upheld by the Columbian Supreme Court in 1913. Further attempts to tax or obtain control of the property by the government were forbidden. The Indian name, Somondoco, meaning "god of the green stones", has been replaced by the company name.

Several sedimentary layers of hard, bluish calcareous shale and iron oxides (pyrite and altered pyrite that consist of limonite and hematite) cover the bands of emerald-bearing shales at Chivor. Emerald found in the upper layers is cemented by the limonite. Great care must be used to extract the crystals deposited in the isolated veins of albite. It is believed that these compact layers prevented the general upward disposition of the nutrient-saturated solutions. Crystallization of finer emerald material took place under more moderate temperatures and pressures in the lower shales and in soft albite-quartz-apatite veins.

Comparable size Chivor crystals usually house fewer inclusions than those from Muzo. Albite, pyrite, quartz, and goethite inhabit the interiors. Veils composed of myriads of tiny three-phase inclusions are characteristic of these emeralds. Color-zoning is common in Chivor beryl, which ranges from colorless through the deep blue-green of the finest crystals. Dark green centers are sometimes surrounded by light green or colorless beryl. The opposite configuration also exists.

The underground Buenavista group of mines adjacent to Chivor in Ubala possess the same mineralogic and geologic characteristics. Mina Buenavista Baja and the Buenos Aires, La Cueva, La Perla, and La Laguna claims all lie across the Rio Rucio. Recovery of the emerald crystals from the argilitic (hard clay) material embedded in slate has proved very difficult.

Mining takes place in situ at several of the Gachala deposits, although the first emerald crystals were found in alluvial debris. Slate beds surround the emerald-bearing ferruginous (containing iron) shale at Mina el Reten. Mina Rio Batatas is a minor source of emeralds. The crystals from this source are found in sandy clay shales in hard sandstone formations. Numerous other sites in the area produce crystals of little commercial importance.

The Nemocon Mine is located on the outskirts of Bogota in a salt column covered by black shale heavily impregnated with pyrite. A search for lime deposits in 1915 led to the discovery of small, poor quality emerald prisms found in fibrous calcite veins. The emerald is accompanied by crystals of pyrite, smoky quartz, and the occasional dolomite.

There are many other little known mines in the very forbidding mountain ranges of the Andes. The possibility exists that more untold treasures wait to be discovered there in those majestic mountains. The incomparable gem emeralds of hydrothermal origin from Columbia are wonderful treasures that are sought after allover the world. These emeralds may become more dear if the recent efforts to bring order to the market prove unsuccessful. Emeralds are fragile stones that require great care to preserve their magnificent beauty. It is a wise emerald owner who learns their characteristics and entrusts their care only to those highly qualified persons of impeccable integrity.

TABLE 1. Gemstone Properties

SPECIE	*emerald*
Composition:	beryllium aluminum silicate $Be_3Al_2(Si_6O_{18})$+Cr, Fe
Class:	silicate; cyclosilicate
Group	beryl
Species:	emerald
Crystal System:	hexagonal; per Schumann, trigonal
Variety:	emerald of hydrothermal origin
Colors:	green
Phenomena:	unusual trapiche patterns; chatoyancy and asterism are rare
Streak:	white
Diaphaneity:	transparent, translucent, semi-translucent, and opaque
Habit:	prismatic columnar
Cleavage:	difficult for basal, brittle
Fracture:	conchoidal to uneven
Fracture Lustre:	vitreous to resinous
Lustre:	vitreous
Specific Gravity	varies from 2.67 to 2.78; Muzo moralla is 2.56
Hardness	7.50 to 8.0
Toughness:	poor; brittle; a very delicate gem

TABLE 1. Gemstone Properties

SPECIE	*emerald*
Refractive Index	varies from o=1.575 to 1.602; varies from e= 1.570 to 1.592
Birefringence:	varies from 0.005 to 0.010
Optic Character	uniaxial negative
Dispersion:	0.014
Pleochroism	varies; is distinct in strong colors
Ultraviolet Fluorescence	SW usually inert, at times weak yellow or green; LW rare weak red or orange; iron content quenches fluorescence
Spectra	diagnostic; thin lines in red; weak lines in blue; broad band in violet
Color Filter	no information
Aqua Filter	no reaction
Chelsea Filter	varies; weak to moderate red induced by chrome
Solubility	affected only by hydrofluoric acid
Thermal Traits	avoid thermal shock; very fragile; remove stone during jewelry repairs; avoid ultrasonic cleaners
Treatments	nearly all material oiled at mine sites; cedarwood oil; palm oil; Opticon; colored oils, waxes, and resins; recently patented Gematrat process
Inclusions	(see preceeding text)

Summer Adventure 1998

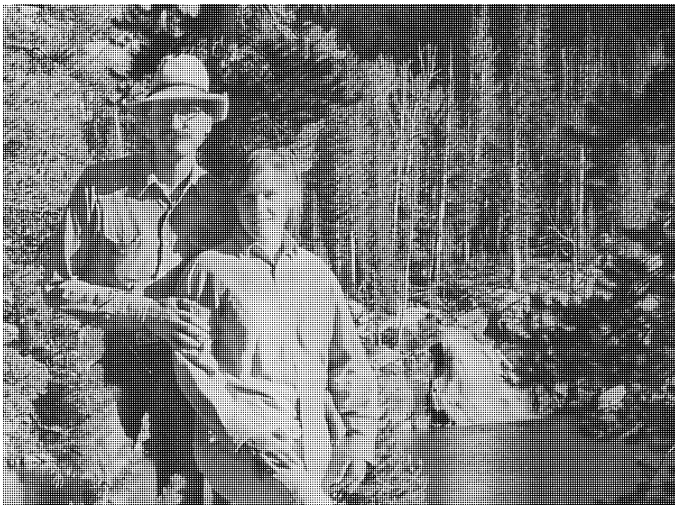
By Susan Wilson, Ph.D. and Scott Wilson, Ph.D.

Ah, sweet, summer vacation...it rolls around only once a year. That time when you try to squeeze relaxation, adventure, fun, sleep, exercise, travel, and education all into one week or two. Is that even possible? Well, once again, we tried to do it all. Decide for yourself if we accomplished our goal.

The plan was that Scott and I would combine a backpacking trip with some gem hunting in Idaho and Montana for our summer vacation. For two weeks, we drove in our pickup truck, stopping at the rockhounding sights around Utah, Nevada, Idaho, and Montana. The main focus of this trip, though, was an extended backpacking trip into the Sawtooth National Recreation Area (SNRA) in central Idaho. The backpacking part of our trip was well thought out and prepared beforehand. We purchased the necessary gear and studied the map earlier in the summer. We broke in our hiking boots with hikes on trails within the mountains nearby. All gear was fully rain-proofed to prevent whining from the participants!

The rockhounding part of our vacation assumed a more relaxed tone. We made plans as we went along, allowing the moment to decide our itinerary. We have found in the past that this type of unscheduled and spontaneous planning often has led us on our most exciting adventures!

Starting out on Saturday, 1 August, we headed west on I-40 into Northern Arizona, heading north once we reached Flagstaff. We stopped to camp in the Kaibab Forest near beautiful Jacob Lake, on Rt. 89A, just short of the Utah border, since we had gotten such a late start. Rt. 89A is a beautiful, scenic route, and we highly recommend it. The next morning, we drove to I-70 and then on to Rt. 15 into Delta, Utah, where we had lunch once again at the highly recommended Top's City Cafe.



Scott an Susan by Hidden Lake, ID.

We drove west out of Delta on Highway 215 to Topaz Mountain, Utah's most famous topaz collecting area. Here, one can find perfectly-shaped crystals of topaz that are transparent and clear, but most are unfortunately small (~5mm long). The best collecting we found was midway up the slope on the east side of the mountain. As we walked around the area to determine how extensive the topaz crystal occurrence was, Scott spotted a red fox cruising along the rock ledges. Evidently, it had heard us hiking up the hillside and had come over to investigate us.

After reading through the "Gems Trails of Utah" by James R. Mitchell, we drove to the nearby Apache tears collecting area only six miles west on Rt. 215 from Topaz Mountain. Both black and mahogany colors of Apache tears were scattered across the graded, dirt road.

Interestingly enough, we also found topaz crystals here weathered out from the road. By now it was getting late, and the sun's angle in the sky was making it difficult for us to spot objects on the road. We then decided to return and camp at Topaz Mountain for the night and then do a bit more topaz crystal collecting in the bright morning sun.

Once Monday afternoon rolled around, we knew we had to make headway and get to Idaho for our backpacking expedition. We drove back to Delta to pick up Rt. 50 west to Ely, Nevada. Then, it was northward on I-93, through Twin Falls, Ketchum and Sun Valley, Idaho. You have not seen mansions until you have seen the ones in Sun Valley.

It was Tuesday afternoon by the time we arrived at the Sawtooth National Recreation Area Ranger Station near Stanley, Idaho. Here, we spoke with Forest Service personnel about backpacking trails and weather conditions. Things looked good.

The Forest Service employee we spoke with was a young lady in her mid-twenties, who amazingly had hiked more than 500 miles of trails in the SNRA over the years! She was able to describe sights not to miss along the way and good places to camp. The Sawtooth Mountains are one of the most popular backpacking destinations in Idaho right now. Last summer, while staying at Lake Payette in Northern Idaho (another

beautiful place), we heard wonderful things about the Sawtooth National Recreation Area and were anxious to hike there.

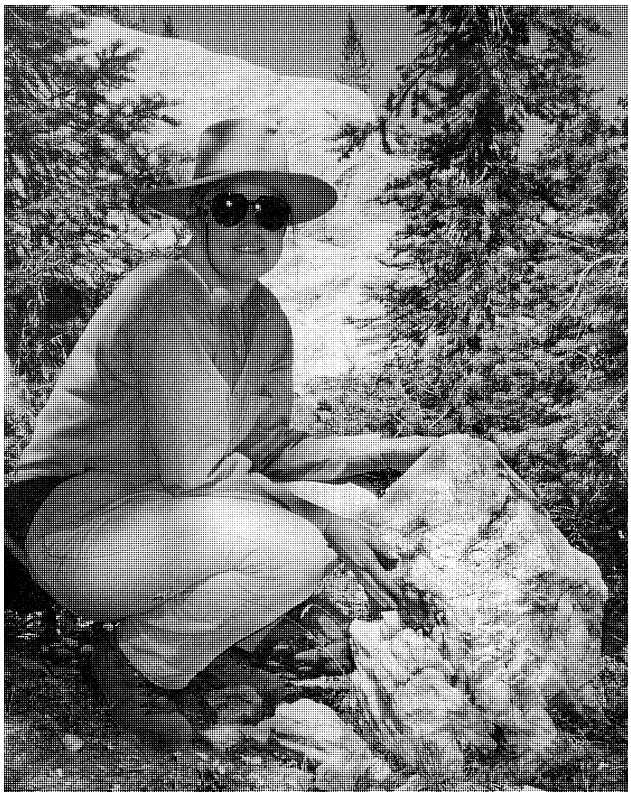
Our plan was to spend six days in the Wilderness Area camping and hiking. Over the summer, Scott and I purchased new internal frame backpacks with all the backpacking goodies: freeze-dried grub, hiking boots and socks, water purifier, etc. My pack ended up weighing in at 45 pounds fully loaded, while Scott's pack was a bit more heavy at 55 pounds. We headed out on the trail from the parking lot at 3:00p.m. on Tuesday. We were not to emerge again from the Wilderness until the following Sunday at 5:00p.m.

Nature provided all the beauty one could hope for: clear, blue alpine lakes, soaring, jagged "sawtooth" mountains, snow fields, cirques, mountain meadows full of colorful blooming flowers, cascading waterfalls, mountain goats, and lightning storms. Exquisite beauty surrounded us in full splendor. The backpacking trip was worth all the sore muscles! For added adventure, we had to negotiate a 50-foot wide stream crossing barefoot with full backpacks on. I had never done this before and was quite apprehensive about the whole thing, at first. I searched in vain for a 50-foot tree trunk to sling across the stream instead. In the end, the water was colder than I had imagined. The rocks were more slippery than I had wanted, but we both made it across without falling!

One of the other hazards on the trail was animals. We would be cruising along down the trail, deep in our own thoughts of when we could get that awful, heavy pack off of our back, when, all of a sudden, we had to put the brakes on quick. For there, standing right in front of us on the trail was a mother grouse with her 5 little ones (grouselets?)! The grouse are not afraid of people and do not run or hide; but they stand there and make cooing noises at you. This was cute and charming for awhile as we stood there with our heavy packs on our shoulders. But it got old real quick! It was good though to see that the presence of so many backpackers had, at least, not affected the grouse population.

We set up our main campsite at Upper Cramer Lake, about fourteen miles from where we had parked our truck. From this main camp, we were able to take day trips that allowed us to hike even further into the Wilderness, carrying much smaller packs with only water, rain gear, a camera, and lunch.

We made one exciting discovery while out on one of these day hikes. We were hiking up some switchbacks and had paused to catch our breath and enjoy the view. We saw not quite five feet off the trail a HUGE quartz crystal. This crystal had a double cap on it, was opaque, white, and over two and a half feet tall, with a diameter of one foot. It must have weighed about 400 pounds! It was quite a sight just sitting there next to a pine tree! After we investigated the crystal and its surroundings, we realized that it had weathered out of a massive quartz- bearing pegmatite located further up the hillside. For some reason, I could not persuade Scott to carry it back for me. It would have looked so nice in our yard near the flowers.



Susan by the HUGE quarts crystal that was too heavy for Scott's backpack.

During one night, our slumber was interrupted with the arrival of several mountain sheep. We had inadvertently camped near one of their trail destinations to water. The morning sunlight revealed their hoofprints.

In retrospect, the most disillusioning part about the whole backpacking trip for me was when we would hike the extra four or five miles into a remote area, like Hidden Lake. While stopping for a water break, we would sit still and think that we were the only people around for miles. Then, we would see several hikers come up over the pass and down the trail right in front of us!

It became apparent that the SNRA was a popular area for both backpackers and fishermen. For instance, on another day hike, we met a boy scout troop comprised of nine young men, ten to fifteen years old, and their scout master, all of whom had been backpacking for nine days in the Wilderness. They told us stories of catching one 16-inch trout and two 15-inch trout in the same day at the same lake! The lucky, young fishermen proclaimed to us that the trout were "big and dumb, just the way we like them!"

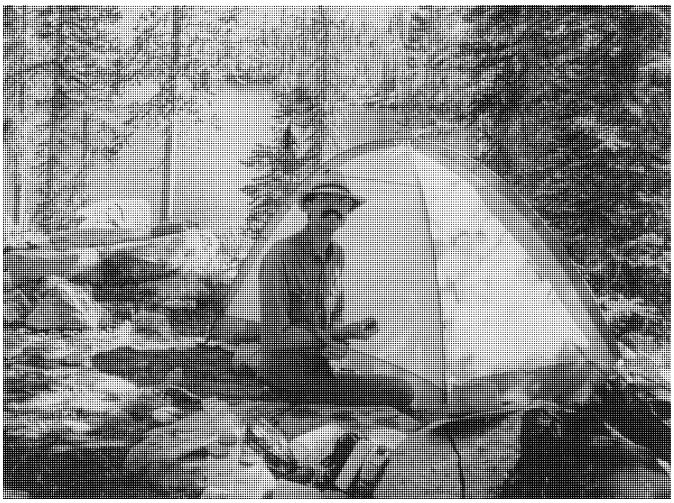
During our stay in the Wilderness, the weather was wonderful: sunny days and evenings of moderate temperatures. The timing for our departure turned out to be perfect on Sunday. Rain began to fall just as we returned to the main trailhead near one end of Redfish Lake.

As a courtesy to backpackers, the Lodge at Redfish Lake operates a speedboat that ferries people and their gear between the Lodge and the main trailhead. One may opt to take the boat ride instead of hiking the full length of Redfish Lake, which runs around five miles.

At the beginning of our journey, we had hiked the five miles. On our return, we were pretty tired. It was beginning to sprinkle, and we were in major need of showers! We opted to pay $5 a head and catch the speedboat back to the Sawtooth Lodge, situated within yards of where we parked our truck. After unpacking our gear and resting briefly, we decided to head into the nearest town of Stanley and treat ourselves to a cabin for the night (a hot bath!) and a restaurant dinner. Once in our cabin, the skies opened, and the rain fell with a vengeance! Then came the hail in large chunks. It rained on and off all night, and we enjoyed the shelter of the cabin. The next morning, the fog was so heavy that the visibility was reduced to 50 or 60 feet. After washing some clothing in the bathtub and refilling our water tanks, we jumped in the truck and headed to Dismal Swamp.

Dismal Swamp was not far at all, as the crow flies, from where we were in Stanley, but to drive there was a much longer proposition. We arrived at Dismal Swamp the next morning and surveyed the digging areas. Here, it is possible to find complete topaz crystals, as well as, quartz crystals, both smoky and with scepters. There are actually three different areas where people dig. All are in old stream beds where the crystals were deposited long ago after weathering out of the pegmatite. The area we dug in last year looked the same in terms of the amount of dirt turned over, but the amount of trash was staggering!

Dismal Swamp has been a favorite rockhounding site for a long time, and, thus, it has become more difficult every year



Scott ponders if he can have mail delivered to his new home.

to find good stuff. One has to dig deeper and hope that you are not in someone else's overburden! I was so appalled by the litter that I spent a few hours picking up two garbage bags full of trash from this site.

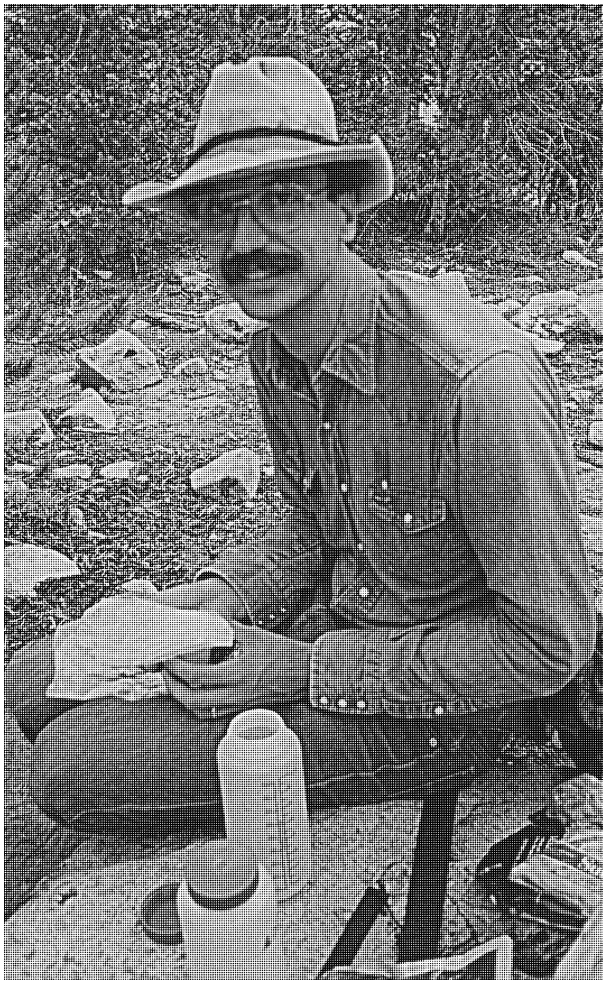
Scott dug and screened dirt enthusiastically for a while with all his efforts being rewarded with a small (15mm long) smoky quartz crystal. At this point, he decided that the reward was not worth the effort, and we decided to make spaghetti for dinner. As we were sitting on our tailgate, enjoying our spaghetti dinner, we heard a branch snap behind us. As far as we knew, we were the only rockhounds in the area, but as we turned to look, we were surprised to see a white tailed doe. She was heading down to drink water from the stream, and we had surprised her. She did not run, and her curiosity got the best of her. She decided to check out us and our tent, while she munched on the bushes nearby for about an hour before heading over the top of the hill. Just a short time later, we heard another branch snap, looked around, and saw a buck heading toward us. He was looking for his mate. He did not pay much attention to us and headed immediately over the hillside.

We decided the next morning to head to Spencer, Idaho and check on the status of the opal mining in that area. We spoke with Bob Thompson, one of the opal miners and shop owners there, and found out that there is no fee digging anymore at the Spencer Opal Mine. Therefore, we thought we would check out a nearby labradorite site. We had read that one could find gem quality crystals of labradorite in the Cinder Butte located SE of Spencer. There is a cinder cone right off the road that is being aggressively mined for the red and black volcanic rock now popular landscaping accents. By the

time we located this cinder cone, it was early evening, making the angle of the sun with respect to the crystal fragments in the road ideal.

I immediately found two rather large (~20 carat each), clean pieces of labradorite, which got us excited and intensified our search. Alas, this must have been a fluke, because we found only one additional nice piece of rough after that initial find.

Our vacation time was running out all too quickly, and we still had not made it into the great state of Montana! We left Spencer Thursday morning with the goal of reaching Phillipsburg, Montana to hunt for sapphires. We had received conflicting information about the status of fee digging for sapphires at the property now owned by American Gem Corporation (AGM). As some of you will recall, this property used to be owned and operated by Gem Mountain Sapphire. It seemed to us that the only way to determine whether AGC was open to the public was to go there directly ourselves. We camped Thursday night at the beautiful Georgetown Lake, and we rose early Friday morning and drove to Phillipsburg.



Scott with a big bag of rocks.

As we pulled into the parking lot of AGC at 9:00 a.m., we were greeted with shouts of people wanting to know if we were going on the fee dig. As it turns out, we had stumbled unknowingly upon the 9:00a.m. group of visitors going out to dig sapphires in the AGC claims. AGC does no advertising of this fee digging opportunity. We hurried inside the shop to sign up and pay for joining the dig. The cost was $65 for a couple to dig and sift gravel from 9:00a.m. to 3:00p.m. in virgin dirt. Unfortunately, the group we had met outside found it impossible to wait a few minutes for us. When we emerged from the shop after paying our fee, we were alone in the parking lot and unaware of where to go.

Help was not immediately forthcoming. Actually, when I inquired why we were left behind and where the fee digging was located, well, let's just say I was not overly impressed with the response and the desire to remedy the situation. Finally, a young woman appeared and told us to follow her up to the digging area. Suffice to say, one can dig a tremendous amount of dirt, get a fantastic workout, and by the end of the day, have some mighty achy muscles and some small bits of sapphire in a plastic film container.

So, was our vacation fun? You bet it was! There are still some great rockhounding locations left and some really wonderful people out there to meet. We hope that your summer vacation was as wonderful as ours!

Market Place

Survey Paints Portrait of the U.S. Jewelry Market

According to a survey of the jewelry market in the United States, commissioned by Jewelers of America, most Americans rate emeralds as their favorite colored gemstone. The survey found that 10% of those surveyed picked emerald as their favorite gemstone, 9% chose sapphire, and 7% chose ruby. Only 61% chose diamond, despite the massive annual advertising budget spent by De Beers.

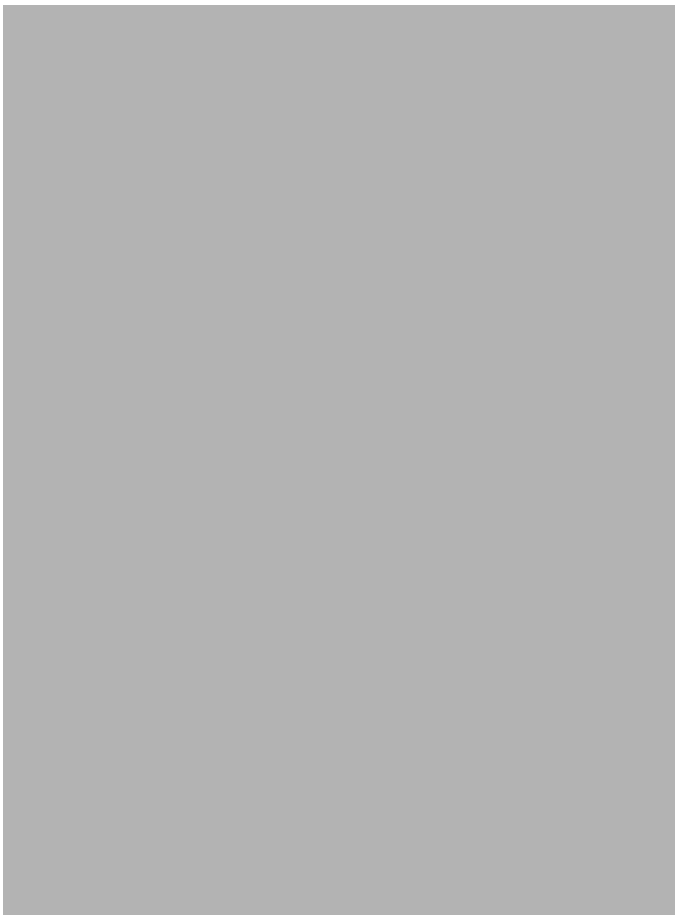
The study found that 38% of all Americans purchased at least one piece of fine jewelry in 1995. The average amount

spent on jewelry was $1,690, with a median (half over and half under) value of $670. Men spent more than women ($2,050 versus $1,320). The jewelry purchased was a gift for 42% of the individuals questioned, and 40% purchased jewelry for both themselves and someone else, while 17% purchased it for themselves alone. Two in five (42%) indicated that they purchased more jewelry in 1995 than in the previous year. One in four (25%) said they purchased less.

U.S. consumers prefer traditional independent jewelry stores run by the owner over any other type of outlet as the place to purchase fine jewelry (77%). The most popular sources for purchasing jewelry after independent jewelry stores was at stores "with multiple locations, often in malls" (23%), followed closely by department stores (22%). Over 50% of those individuals surveyed said they would shop at the same location again.

Jewelry consumers in the U.S. buy jewelry most often as a Christmas purchase (28%), followed by birthday (19%), and "no special reason" (15%). Engagements, weddings and anniversaries are cited 3% to 6% of the time, while Valentine's Day and other holidays are only cited 1% of the time.

Necklaces and neck chains are the most popular purchases (53%), followed by earrings (48%), rings (46%), bracelets (35%) and watches (32%). Gold is the favorite precious metal at 89%, followed by silver (8%) and platinum (3%).



Meet Bill Swantner.

Meet new member and future Program Chairman Bill Swantner. In addition to being an expert sharpshooter, Bill is an authority in optics design and equipment.

We exchange newsletters with the following guilds and organizations:

Anglic Gemcutter, Beaver Creek, Oregon
Facets, Portland, Oregon
Tacoma Faceters Guild, Tacoma, Washington
Stoney Statements, Houston, Texas
The Permain Faceter, Midland, Texas
Angles, Woodland Hills, California
Texas Faceters Guild, Cedar Park, Texas
Albuquerque Gem and Mineral Club, Albuquerque, New Mexico
The Roadrunner, Big Springs, Texas
Intermountain Facetors Guild, Port Townsend, Washington
The Midwest Faceter, Birch Run, Michigan
The Transfer Block, Sacramento, California
USFG, Kalispell, Montana
Facet Talk, Ashgrove West, Queensland, Australia
Calgary Faceters Guild, Saskatoon, Saskatchewan, Canada
North York Faceting Guild, Markham, Ontario, Canada
Ottawa Gem Facetor's Guild, Ottawa, Ontario, Canada

E-Mail Addresses

Edna Anthony:	hsanthony@juno.com
Steve and Nancy Attaway:	attaway@highfiber.com
Moss Aubrey:	drsaubrey@aol.com
Charles Bryan:	crbryan@swcp.com
Ernie Hawes:	hawes@apsicc.aps.edu
Merrill O. Murphy:	momurphy@flash.net
Jim Summers:	commish1@flash.net
Scott and Susan Wilson:	swilson@flash.net
Bill Andrzejewski:	sierragm@twrcom.com
Will Moats:	gemstone@flash.net
Mariani Luigi:	ENVMA@IOL.IT
Stephen A Vayna:	Vayna@transatlantic.com

TABLE 2. Shows of Special Interest

Name	*Location*	*Date*
Grant County Rolling Stones Society's Gem and Mineral Show	Silver City, New Mexico	Sept. 5 - 7
Gem and Lapidary Wholesalers	Tucson, Arizona	Sept. 10 - 13
Colorado Mineral and Fossil Show	Denver, Colorado	Sept. 16 - 20
Denver Expo 98	Denver, Colorado	Sept. 16 - 20
31st. Annual Denver Gem and Mineral Show	Denver, Colorado	Sept. 18 - 20
Texas Faceters' Guild Annual Faceting Symposium; Featured Speaker: **Fred Ward**, G.G., famous National Geographic photographer and noted author of books on gemstones; contact Greg & Hollis Thompson e-mail: gthompson@mail.utexas.edu	Austin, Texas	Oct. 10 & 11
19th Annual New Mexico Mineral Symposium	Socorro, New Mexico	Nov. 7 & 8
AGATE; Albuquerque Gem Artisans Trade Expo	Albuquerque, New Mexico	Nov. 21 & 22
Los Alamos Geological Society's Show	Los Alamos, New Mexico	Dec. 5 & 6