The New Mexico Facetor

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In This Issue

Happy 50th Birthday Moss!!!

The Prez Sez:

By Moss Aubrey, Ph.D.

I often find myself wondering what specific concepts actually account for the appeal of gemstones. I know better than to presume that the reasons gemstones appeal to me are the same reasons they appeal to others. Gems and related materials have been important to human culture as far back as we can trace. Many prehistoric sites show evidence of the ornamental and religious uses of a variety of minerals, shells, and bones. As cultures evolved, so have the specific attributes and beliefs about various gem materials.

It seems to me that there are a few categories that describe our reasons for the allure of gemstones. These include: 1) economic value, 2) spiritual or healing properties, 3) craftsmanship, and 4) pure esthetic or artistic appreciation. Clearly, a person may appreciate a gem for several reasons simultaneously, but I do believe that these four reasons for a gem's appeal are well worth considering.

In regards to value, I find this justification potentially the most problematic aspect of gem appreciation. Customers have approached me and have asked whether a particular gem or a piece of jewelry is a "good investment". They wanted my opinion on its worth compared to the price they paid for it. The whole idea of the economic value of gems is rather frightening, more and more so as I increase my knowledge of gems. In particular, the blatant frauds perpetrated in the gem industry, the misrepresented treatments, and the enhancements, all tend to shake one's confidence in the stability of the economic value of the entire gem industry. At the same time, gems have been around for quite a while, and they have clearly established themselves as holding inherent economic value. It is this relative value with its degree of fluctuation that certainly does pose problems.

The influence of the media and the specific representations of gems as having a designated value or merit greatly influences the economic appeal of gems, as contrasted with other types of appeal. The marketing of "champagne" diamonds is an interesting illustration of this. It shows how a low value and difficult to market type of diamond with an undesirable

color was successfully promoted as having an inherent appeal. Fluctuations in the public taste for different gem materials significantly impacts the economic value of those materials. Recall the fluctuating acceptance of citrine. This stone was very popular in the 1920's, lost its popularity for several decades, and has once again established a good secondary niche in the colored stone market. Another point that comes to mind is the widely circulating concerns of the vast diamond holdings of the Russian government. Although diamonds are often cited with having a value that continues to increase with each passing decade, there is a widely held concern that, if the Russian's were to dump their vast holdings on the open market, prices of even the high quality white diamonds would plummet.

The idea of economic value clearly relates to a combination of supply, demand, and marketing strategies. I have to admit that I enjoy discovering that a stone I cut had substantially increased in value over what I paid for the unimpressive rough pebble. At the same time, economics was not what initially sparked my interest in gems, and it does not significantly influence my ongoing interest in gems and faceting.

The second reason some people are interested in gems is the spiritual properties and their potential for healing. I must admit to having a significant amount of skepticism regarding both claims. As a scientist, I am open to new knowledge from a variety of sources. At the same time, I require that claims be substantiated. I know quite well that human nature tends to promote beliefs that are appealing, despite substantial evidence that contradicts those beliefs. In fact, I was recently distressed to learn that people have been eating mercury compounds in the belief that mercury can heal a wide variety of ailments, prolong life, improve memory and sexual vitality, and numerous other benefits. These people hold these beliefs in the face of long standing clear evidence and wide spread public education that the ingestion of such compounds can be fatal, and, in less serious cases, leads to permanent nerve and brain damage, blindness, and numerous other side effects that I think would be sufficient to outweigh the most desired of these supposed benefits.

At a more subtle level, many people believe that various minerals and gem materials, crystals in particular, possess inherent spiritual, metaphysical, or psychic energy properties. These are not new beliefs, and there are wide spread accounts (as in Pliny's writings) that drinking from an amethyst goblet would prevent drunkenness. This would seem to be an easy claim to verify through empirical testing. Although I have ample supplies of wine I would be glad to test, I do not have an amethyst goblet, preventing me from verifying this claim. Most of the benefits believed to be imbued by crystals and minerals are very subtle. There appears to be little interest in the part of the FDA to investigate these claims, probably because most of the beliefs are harmless at worst. The few studies I am aware of fail to provide any proof of such metaphysical claims. Proponents of metaphysical properties in crystals will cite that acupuncture, chiropractic techniques, and other medical practices outside the mainstream of traditional Western medicine, have been viewed with skepticism and ridicule. However, many of these are now relatively well accepted by the medical community. My response to such an argument is that if such benefits exist and are as potent as claimed, then they should be readily measurable.

A third general basis of appreciation I have heard many people mention is their respect for the craftsmanship and technical merits of gem preparation. This clearly applies very much to gems that are faceted or otherwise shaped. The appreciation may be held for the skill involved in working with such challenging gem material, or the expertise in achieving good symmetry, good meet points, and a superb polish. Successful crafting of rough gem materials into finished gemstones is demanding and requires significant skill and persistence. These are talents worthy of respect, and I always admire the craftsmanship as one aspect of my appreciation of gemstones.

A final reason for our appreciation of gems, minerals, and related materials is more of a pure esthetic appreciation. This cannot be entirely separated from appreciation for craftsmanship, but I do believe that it is sufficiently distinct to warrant discussion. For example, I continue to enjoy viewing gem materials that I have always considered as favorites, despite any inferior technical craftsmanship that may exist in the rendering. I have also enjoyed viewing rather mundane and uninspiring material that exhibited superb craftsmanship (I am thinking specifically of Merrill O. Murphy's exquisitely faceted piece of Coke bottle glass.). I think that esthetic or artistic appreciation of gems can be incorporated into our knowledge of the other reasons for gem appreciation and may reflect a mixture of those reasons.

The more we know about gem materials, the more we can appreciate when a particular piece is exquisite, rare in its formation, its color, and its size. For example, in a previous column, I described the beautiful specimen of rhodochrosite I saw at the Denver museum. This piece is inherently beautiful for its deep red color. However, part of my appreciation of it came also from my knowledge of this amazing specimen as being grand in size, compared with the many other pieces of rhodochrosite I have seen at mineral shows over the years.

Similarly, when viewing a superbly faceted stone, I simultaneously consider the technical craftsmanship of the faceting, the rarity of the particular material, the likely economic value of the piece, and the fundamental beauty of the material. I believe that there is an appreciation for these materials that transcends our ability to articulate why we feel the way we do. It is one thing to say "that's really pretty" and another to be awe-struck by its beauty to the point of speechlessness. It is this last type of appreciation, where I simply gaze without thinking about all the various reasons I enumerated above, and simply appreciate in wonder, without analyzing how, that I am most deeply touched. That raw appeal touching the core of our appreciation of beauty is, I believe, the real force that underlies all of the other identified reasons that we give for ascribing our love of gemstones.

Don't forget: next meeting is November 13 at 7:00 pm. Dues of $20 are now due.

Minutes of the NMFG Meeting

September 11, 1997

By Nancy L. Attaway

Vice-President Susan Wilson, acting in the President's stead, called the meeting to order at 7:15 p.m. and welcomed all members and visitors. Susan then asked everyone to introduce themselves to the group.

Treasurer's Report

Treasurer **Bill Andrzejewski** reported:

Heading	*Total*
Previous Balance	$1,088.57
Expenses	$298.39
Deposits	$57.00
Balance Forwarded	$829.24

The above deposits were from dues collected, and the expenditures above were from the newsletter and for postage. We have 78 members who have paid their dues. **Dues of $20.00 are now due.**

Old Business

Guild Librarian Susan Wilson brought several books and periodicals from the Guild library to be checked out by our members. Susan maintains a database of all the books and periodicals on gems, faceting, geology, jewelry making, etc. in the Guild library. Guild Gemologist, Edna Anthony recently donated several hardback books to the Guild library. Thank you, Edna.

Guild Editor Nancy Attaway still has some back issues available.

Louie Natonek's wife, Harriett is recuperating at home from her emergency abdominal surgery.

Guild members Elaine Weissman and Louie Natonek volunteered to conduct an independent audit of the Guild treasury. They will submit their report to Moss Aubrey.

The Guild still needs a member to place orders for the official New Mexico Faceters Guild badges.

New Business

Guild members Mark Guerin and Arthur Skuratowitz are goldsmiths involved in the New Mexico Jewelers Association. Mark and Arthur brought applications to the meeting for the upcoming jewelry and gemstone design competition sponsored by the New Mexico Jewelers Association. The October competition coincides with the "All That Glitters" extravaganza held at the New Mexico Museum of Natural History. The Museum also features special traveling exhibits of gems and jewelry and will display all entries in the jewelry and gemstone categories from this year's design competition.

The jewelry competition categories include gold, platinum, and silver jewelry valued in several price ranges. This year, three new categories of gemstone design were opened, and these include: 1) traditional gemstone faceting, 2) a combination of gemstone faceting and carving, and 3) a separate category for synthetic gemstones. The deadline for submitting entries to Mark Guerin at Shelton's Jewelry is October 20.

Show and Tell

Glittering gems and beautiful jewelry filled the Show and Tell display case to its capacity, showing a fabulous array of work accomplished by many of our Guild members.

Waylon (Dick) Tracey brought a large oval pendant he cast in sterling silver, and he hand-fabricated leaves and flower petals for it. He set a large round clear cubic zirconia in the center of the flower and set turquoise cabochons inside the leaves.

Elaine Weissman brought a long necklace of peridot, labradorite, and opal beads with an attached hand-wrought silver pendant that featured a carved opal, a peridot cabochon, and a labradorite bezel set in silver. The pendant can be removed from the necklace and worn as a pin.

Will Moats faceted an oval golden beryl. He also faceted a round quartz crystal he found in the Organ Mountains of southern New Mexico that featured pyrite inclusions.

Bill Tordsen brought several thinly sliced and polished banded agates and moss agates that he fashioned using his special tungsten carbide tumbling compounds. We hope that Bill writes an article on his techniques and describes the chemical composition of his compounds, too.

Richard Griffin displayed a lovely woman's bracelet of long emerald-cut green tourmalines that he faceted and set in individual hand-fabricated gold settings. He also brought a large supernova oval rhodolite garnet that he faceted and set into a lady's gold ring.

Merrill O. Murphy brought a large display case of his own and filled it with some very interesting mineral specimens. A large clear hunk of Brazilian topaz sat next to a New Mexico sanidine, with a Alma, Colorado rhodochrosite nearby. Merrill included several gorgeous chunks of smithsonite from the Kelly Mine, with one carved into a poinsettia flower, rendered by Steve Attaway. Merrill also showed a piece of moonstone from the Black Range of southwestern New Mexico, as well as a blue-on-amber moonstone and a piece of amblygonite. If these stones could talk, they would tell some entertaining tales. How about stories from these stones, Merrill?

Susan Wilson faceted two aquamarines that had shown identical hues of blue in the rough, but exhibited different blue hues when finished. One aqua shown a brilliant blue, while tubes in the other aqua paled its hue. Susan faceted a green tourmaline, a teal-colored tourmaline, and a yellow beryl all in the square-brite faceting diagram. She also faceted a Russian flux-grown synthetic emerald in a round.

Steve and Nancy Attaway brought many faceted and carved gems and pieces of hand-wrought jewelry. Nancy faceted a matched pair of large Tanzanian rhodolite garnets in the flasher cut round, and Steve set these into gold earrings with diamond accents. Nancy also faceted a matched pair of square barion Tanzanian rhodolite garnets that Steve also set into gold earrings. Steve rendered gold earring jackets for two Apollo-cut triangle Tanzanian rhodolite garnets cut by Nancy, with an accompanying pendant-pearl enhancer in gold that featured a larger rhodolite garnet Apollo-cut triangle that Nancy cut.

Steve hand-fabricated a gold pendant for one of the gorgeous crystalline opals he carved and accented it with a 10 point ruby. He rendered a gold pendant for a kite-shaped Gibeon iron meteorite set beneath a round orange flasher cut Oregon sunstone cut by Nancy. Steve rendered a gold pendant for one of his carved South African blue chalcedony pieces and accented it with a Yogo sapphire, and he set a carved ametrine in a gold pendant with a diamond accent. He rendered a gold pendant for a crescent moon-shaped ametrine that he and Nancy worked on and accented it with a flasher cut round imperial precious topaz that Nancy cut.

Nancy displayed seven Montana sapphires from the Missouri River. She faceted two blue sapphires into kite-shaped tablets, two orange egg yolk sapphires into hexagonal tablets, two orange sapphires into flasher cut rounds, and one blue sapphire into a tribrite cut triangle. The tablets will be carved later by Steve. She faceted a large amethyst into a lozenge-shape design that she created. She cut a large square barion Madagascar aquamarine and modified facets to eliminate inclusions.

Nancy also changed some of the angles on a square barion imperial precious topaz to have a Maltese cross appear in the pavilion. On a barion emerald cut imperial precious topaz, she shallowed the angles to 60 degrees on the large facets of 96 and 48, and she shallowed the angle to 50 degrees on the facets of 24 and 72. This prevented a window effect and kept more sparkle in the pavilion. She noted a much deeper color absorption in the emerald cut imperial precious topaz than what was shown in both the square barion imperial precious topaz and the small round imperial precious topaz. Last, but not least, Nancy faceted a half carat triangular tsavorite garnet that exhibited a rich blue-green hue.

Field Trips

Scott Wilson reported on the Guild field trip to the Waldo Mine. Several Guild members ventured into the Waldo Mine, including Ernie and Becky Hawes, Troy Smith, Scott and Susan Wilson, and Steve and Nancy Attaway. A full report by Scott appears in this issue.

Future Programs

Vice-President (Programs) Susan Wilson scheduled a presentation by Guild member Will Moats for the November meeting. Will plans to discuss interesting data on the unique geology and geyser activity of our amazing Yellowstone National Park.

Guild Mineralogist Paul Hlava will present a lively discourse on the elements responsible for color in gem-

stones for the January meeting. Paul plans a presentation on gemstone phenomenon later in the year.

Jane R Ward, who addressed the Guild in September on the diamonds of Ghana, will present information on Yogo sapphires in the spring. Both Jane and her father, Ken Ward, a facetor, performed inventory counts to help estimate the value of Yogos for Citibank some years ago.

Refreshments

Eva Tordsen and Nancy Attaway brought baked refreshments to the meeting. Elaine Weissman and Merrill O. Murphy volunteered to bring refreshments to the meeting in November.

Program Speaker

Jane R. Ward presented a fascinating and in-depth account regarding the geologic significance of the diamonds found in Ghana. Physical and geochemical analysis of the inclusions found in the diamonds of the Tarkwa and Akwatia deposits indicate the existence of two distinct, highly altered, kimberlite events. This information will further define the diamond potential in Ghana and help direct future exploration.

Situated in the tropics, Ghana is known for its diamonds, its rubber plantations, and its watermelons. The diamonds of Ghana found in the Tarkwa and Akwatia deposits have been dated at 1.9 to 2 billion years of age, making them the world's oldest known diamond deposits. Discovered in 1919 by a British geologist, the diamond deposits of Ghana were not developed by DeBeers into a significant world diamond producer until 1925. During the 1960's, the diamond deposits yielded three and one half million carats per year.

Not recognizing its geologic importance, DeBeers withdrew from the diamond deposits of Ghana in 1995. Geochemical studies conducted in 1996 revealed further mining potential. Global Positioning System (GPS) satellite readings proved crucial in locating the host ore kimberlite pipes. A joint venture between Canadian and U.S. mining companies conducted feasibility studies on the kimberlite tailings.

The diamond deposits of Ghana range through the famous Ashanti Gold Belt. Miners sift gold, blue spinels, spessartine garnets, and chrome diopside along with the diamonds using hand-held mesh trays they dip in water holes. Local mining lore spins tales of the evil diamond spirits who eat gold. The superstitious miners place the first rough diamond found that day inside their mouths and later put it into a vial of holy water to ward off the evil spirits. Men work primarily as miners, but men and women, not married to each other, have also formed diamond mining partnerships. Diamond sifting is best performed after one of the many rains, where the constant erosion weathers out the diamonds. A nearby processing plant sifts the diamonds using modern equipment and operates under very tight security.

The origins of the two kimberlite pipes in the Akwatia and Tarkwa regions indicate eclogitic and peridotite geology. The diamonds appear specific to each area by color and size. The physical attributes studied include weight, color, secondary morphology, and fluorescence. The unique patterns and contents of inclusions reveal the history of two different kimberlite geologic events in the life of the diamonds. Scientists study the surface features and the inclusions using microprobe analysis with scanning electron microscope photographs to yield clues to the origin of the host ore.

Studies also show that the diamonds of Tarkwa are of better quality, in both color and clarity, than the diamonds from Akwatia. Akwatia diamonds are more suited for industrial uses. In terms of physical size, the diamonds from Tarkwa range from one to three points, while the diamonds from Akwatia run from 20 to 30 points. Tarkwa diamonds fluoresce in every color, even vivid red tones, while only half of the Akwatia diamonds fluoresce.

Besides chemical differences, scientists study the primary morphology, growth, and resorption of the diamonds from Ghana. Most of the diamonds form as octahedrons rather than as cubes. The trigons on the octahedrons show negative orientation to the octahedral face. The grain or hardness follows the octahedral face. The presence of lamination lines indicate graining. An experienced diamond cutter knows to cut a diamond perpendicular to the trigons. Along this crystal plane, the diamond has a Mohs hardness of 8, while parallel to the trigons is hardness 10. Crystalline inclusions, such as garnet, pyroxene, and olivine, are much rarer in Tarkwa diamonds than in the diamonds from Akwatia.

Surface features on the diamond crystals yield tremendous insight into the geologic conditions present when the kimberlite pipes transported the crystals to the surface. Corrosion markings on the diamond crystal faces indicate a highly corrosive environment in the magma during transport. The diamonds from Tarkwa are found as broken or fractured crystals, indicating a rough ride from the kimberlite source to the final location miles away. In contrast, the diamonds from Akwatia show more physical features from weathering and are less broken, implying that they were found closer to the original source.

The many industrial uses of diamonds include optical applications,

coatings on magnetic discs used for data storage, and as transducers. Diamonds are also used in acoustic applications, such as speakers. Sound waves can reach very high velocities in diamonds, because the diamond crystal structure does not significantly impede the acoustic wave as it travels through it. The result is clean and crisp sounds from the speakers.

Because diamonds were formed at great temperatures and pressures within the earth, the diamond crystals themselves can withstand great temperatures and pressures. The manufacture of cutting tools and household cooking ware utilizes this feature of diamonds. Cockpit windows on commercial airlines feature diamond coatings as standard equipment. Diamond is also very inert to chemical attack at temperatures below 427 C. Our technology has advanced to now permit the deposition of thin layers of diamond on a variety of materials. Used on ships and other marine equipment, this application prohibits salt water corrosion and barnacle formation.

NMFG Waldo Mine Field Trip Report

By Scott Wilson, Ph.D.

On September 7, 1997, a group of New Mexico Faceters Guild members enjoyed the privilege of touring the Waldo Mine. The Waldo Mine is located in the historic Kelley mining district, just south of Magdalena, New Mexico. The Kelley mining district is especially well known in the gem world for its sea-green translucent smithsonite (zinc carbonate).

The Waldo Mine was particularly active in the early 1900s, being one of New Mexico's major producers of lead, zinc, and copper. The last production was in the 1970s by Bob Chamberlain, a fine gentleman who was present at our tour. He provided a great deal of interesting history and geological and mineralogical information about the Waldo Mine and the surrounding area. Bob had originally worked in the mine during the time of heavy production and later became an independent miner, working high-grade deposits that he discovered in the mine after large scale production had ceased.

Also meeting us at the mine were several graduate students from New Mexico Institute of Mining and Technology. The Waldo Mine serves as one of New Mexico Institute of Mining and Technology's teaching facilities, supported by a consortium of mining and industrial concerns.

Each person was fitted with a hard hat and miner's headlamp before proceeding into the mine. The initial trek began on the 9th level, which served as the primary haulage for ores from the mine. We walked along the ore cart rails while our guides pointed out interesting geological features visible in the tunnel walls. Among things found were fossil plant remains and a brilliantly colored mold cluster, which has provided some local biologists with an interesting topic for study.

Getting ready for the Waldo Mine (Troy Smith, Ernie Hawes, Mel Stairs, Nancy Attaway, Susan Wilson: not pictured Becky Hawes, Stephen Attaway, and Scott Wilson)

About 800 feet into the mountain, we arrived at a large room, where the fine points of rock drilling and roof stabilization were discussed. We then proceeded to the machine shop area and to the top of a large incline, which originally provided access to much of the lower mine workings, all now flooded. A short backtrack and around a corner led us to the North-9 stope, an area that had been completely hollowed out by the miners. The ore in this area was primarily sphalerite (zinc sulfide), but many other minerals were in abundance, including specular hematite, pyrite, and fluorescent calcite. We were allowed to collect samples from this area. No masses of smithsonite were found, but we sure tried!

Our guides then escorted us to an ore chute that led up to the 8th level. A 125-foot high ladder next to the chute provided our means of access. Some folks were a bit nervous about the climb, but the ladder was quite sturdy. Diligence paid off as we arrived at the 8th level, where masses of brilliant pyrite were found in abundance. Many fine specimens were collected here. Some of the rocks at the site displayed mixes of sulfide, oxide, and carbonate minerals of both lead and zinc, all in the same specimen!

After negotiating the ladder back down and trekking out, we re-entered the world of sunshine shortly after noon. We enjoyed a nice lunch with the students and Mr. Chamberlain. We also did some collecting on the dumps, mostly for brilliant pyrite and chalcopyrite specimens. Around mid-afternoon, we bid good-bye to our tour guides and drove back to Albuquerque.

The New Mexico Faceters Guild would like to thank Cathy Aimone-

Martin of the New Mexico Bureau of Mines, the graduate students of the New Mexico Institute of Mining and Technology's Mining Engineering Department (Brandon, Patty, Cathy, and Clint), miner Bob Chamberlain, and the support consortium of the Waldo Mine for providing this rare and unique educational experience.

While we didn't find gem quality material (it does happen on occasion), we gained a tremendous insight into the workings and conditions within an underground mining facility. We left with a healthy and deep respect for the people who have worked there.

Designer's Workshop

By Ernie Hawes

In the last issue, I talked about unusual shapes and asked if anyone knew what a heptagon was. Well, for all you curious (or not so curious) folks, a heptagon is a seven sided design. DataVue2 lists a relative handful of heptagon patterns. While it is not necessary for a heptagon to have equal length sides, most do, or at least, they appear to be even sided. For such a design to be truly equal sided, an index divisible by seven is, of course, necessary. Interestingly enough, most of the heptagons were designed with the appearance of having equal sides, but, in fact, do not have equal sides, as the designer generally used either a 120 or 64 gear index. Obviously, the only way to obtain an equal sided design with either a 64 or 120 gear index would require very careful cheating. True even sided designs work with either a 56 or an 84 gear index. Unfortunately, not all machines have a 56 or 84 gear index available. I suspect that is the main reason why more heptagons do not exist. Anyway, I promised you a heptagon, so here one is.

Fred W. Van Sant in his ***Star Cuts IV*** published in 1992 shows a design called **FVS 202** that I find to be a truly beautiful pattern. (I understand Fred's logic in using a simple alphanumeric naming system. However, when he comes up with a design as attractive as this one, I really wish that he would give it a more appropriate name. Of course, he designs so many really attractive gems, finding more attractive names could become a real problem.) Fred designed this to fit an 84 gear index. I have not interpolated the settings, but it might fit a 56 gear index as well. If you have an 84 gear index, this is truly a design that you should cut. I know you will not be disappointed.

Our second design is a briolette to accompany the article by Steve Green called **Briolette Adhesion Technique**, printed elsewhere in this issue. If you are familiar with DataVue2, then you know that the briolette is not a recognized category in the database. As I understand Long and Steele's logic, their categories are based on the shape of the design as it would appear when looking through the table. Thus, a briolette most often would be categorized by Long and Steele as a round design, although some other shapes could result in an effective briolette pattern.

The design I selected is a fairly straightforward brilliant style pattern by A.J. Sanders. He called it simply, **Tear Drop Pendant**. It appeared in the now defunct ***Facetier in February 1969***. If you have never cut a briolette before, then this is a good one to try. When faceting a design like this, always remember that, due to the extended depth, extra care is necessary when cutting the pavilion to avoid knocking the stone off the dop or breaking it.

In the next issue, we will be looking to feature more diagrams for unusual shapes. We encourage faceters to submit for publication new faceting designs with unusual shapes. In the meantime, happy faceting!

Briolette Adhesion Technique

By Steve Green
Rough and Ready Gems, Inc.

Over the years, we at Rough and Ready Gems have specialized in briolettes. One of the big problems found with briolettes is setting them. Many jewelers have expressed their desire for a cap to facilitate setting.

In order to set briolettes, we make a series of cone-shaped caps in 12, 20, 30, 40, 50, ~ 60 degree angles. These caps have 1 mm. thick walls, and are 6 mm. deep from their openings to the bottom. Since the angle is continuous for length of the cap, it may be trimmed to any length to fit the particular briolette size. Only the corresponding cap angle to fit the corresponding briolette angle needs to be determined. The original models were precision milled on a milling machine for accuracy and to fit well a range of briolette tapered angles. These were intended as a starting point for the jeweler from which to obtain a good snug fit and create a design of choice. The caps fit all the round briolettes with no modifications needed. The oval briolettes require that the caps be custom fitted while still in their wax stage, to the oval cross section of the particular briolette. This is a considerable time saver and allows for an extremely accurate fit. Caps come with a sprue at their tip to facilitate turning, as well as for holding them during the jewelry making process. By placing a ring or a bail to the caps, they can be used to make some great looking designs.

Caps are available with the sterling silver at $10 each and the 14 Kt. gold at $25 each. Complete sets of sterling caps are available to allow anyone to make their own molds.

To achieve the best bond possible between the adhesive, the briolette, and the metal of the jewelry, it is necessary to observe a few simple procedures. I recommend that the briolette not be drilled or externally notched. Drilling or notching only removes material from the thin end of the briolette. Weakening it by adding a stressed area will render it prone to shear off when impacted.

If drilling is absolutely necessary, then use an ultrasonic drill and use the following procedure for proper adhesion. Dufault Lapidary in Denver can ultrasonically drill the briolettes. (303) 595-0302

The method I recommend for briolette attachment is to abrade both the inside of the metal cap and the top portion of the briolette with an **air abrasive tool.** This method removes very little structural material from the briolette and does little to weaken it or instill any stressed areas. The abraded surface gives a far superior adhesion than compared to one on a smooth surface.

First, both the briolette and the cap should be cleaned and de-greased with isopropyl alcohol. The briolette can then be masked with tape, exposing only the portion to be abraded. I have successfully used a 180-grit aluminum oxide. Silicon carbide should also work.

After **air abrasion** of the briolette and cap, clean again; de-grease thoroughly with isopropyl alcohol. Acetone or MEK will also work.

There are numerous high quality industrial strength adhesives on the market. I recommend an epoxy for its strength, ability to fill gaps, the 3 to 5 minute working life, shock resistance, and transparency. Epoxies can also be broken down with relatively low heat, between 300-400 F, in case a piece needs to be disassembled. Uncured epoxies can be cleaned with acetone or mineral spirits.

The 3M Company manufactures a full line of epoxies. DP-IOOPLUS CLEAR and DP -100 CLEAR are both good for the job. They come in 50 ml. tubes with a finger plunger for dispensing and are listed for under $15. For longer working times, such as 8 to 10 minutes, DP-110 TRANSLUCENT can be used.

The Loctite Company makes convenient and inexpensive epoxies under the Permatex brand name. Their product QM-50A comes in an easy to use 29.5 ml. dispenser for the low price of $3. It is available at Checker Auto Parts stores.

The telephone number for the 3M Company is 1-800-362-3550 to locate the dealer closest to you. The telephone number for Loctite Company is 1-800-562-8483.

I hope this information and the suggestions are of help. I hope that I can be of assistance in supplying your briolette needs. I have single and matched briolettes in over 50 gem materials, and I am always on the lookout for new materials to offer my customers. Precision-made blank caps are also available in the metal of your choice.

New Address

Rough And Ready Gems, Inc.
P.O. Box 621813
Littleton, Colorado 80162-1813
303 933-7670
FAX 303 933-7056

In the News

Gem Enhancement Disclosure

From Colored Stone September/ October 1997

After years of debate and some eleventh hour compromises, the International Colored Gemstone Association (ICA) announced the first gem enhancement disclosure coding. Debate ranged over possible levels of disclosure, from full written disclosure of all enhancements and treatments, to standardized statements about typical enhancements, to no disclosure at all. Concerns in the industry cited the growing number of lawsuits stemming from a lack of disclosure. The final codes ratified are: "N" for stones that have not been enhanced; "E" for enhanced stones, with subcategories for colorless clarity enhancements and for heat-treating; and "T" for treated stones, with subdivisions for stones having been coated, diffused, dyed, glass-filled, irradiated, lasered, and Joban oiled. While much of the concern focused on cut stones, gem rough is also subject to various enhancements and disclosures. These codes should apply there as well.

Update on Sandawana Mine Emeralds in Zimbabwe.

From Gems & Gemology Summer 1997

Since its discovery in 1956, the Sandawana Mines have produced significant quantities of excellent emerald. Located about 100 km. north of the border between Zimbabwe and South Africa, the initial recovery used pit mining, later replaced by underground mining. The area is extremely rich in precious commodities. Most of the emerald crystals recovered show a vivid green with even color distribution. Stones as small as ten points show intense color, the result of high proportions of chromium. Rough usually emerges as crystal fragments, and gem quality material runs 2 to 8 mm. The larger crystals usually have un-cuttable portions, and recovery can be as low as 10 to 20%. Most cut stones run up to 0.25 carat, but sizes of 0.25 to 0.80 carat are not uncommon. One carat and larger is rare.

Gem Rhodochrosite from Colorado's Sweet Home Mine

From Gems and Gemology Summer 1997

Authors Kimberly Knox and Bryan Lees describe the mine's history and relate the recent discovery of gem quality facet-grade rough rhodochrosite. The article described many faceting techniques, including dopping and cutting details.

Rhodochrosite is soft with distinct cleavage in three directions. Some cutters use wooden dops to avoid the vibration easily transmitted through metal dops. Cutters for the mine do rough pre-forming with a 360-grit wheel and cut directly on a 1200-grit lap. Polish is accomplished on a tin lap, a wax lap, or a "Final Lap." Attention to cleanliness is critical, and fingers replace metal tweezers for handling cut stones to avoid scratches. The material is heat sensitive and must be cold-dopped. The cutters soak the stones loose after cutting the pavilion, then remount the loose stones to cut the crown. Setting the cut stones is a challenge, due to its softness and cleavage problems. (See also Merrill O. Murphy's comprehensive article on dopping and transfer in the May/June 1997 Issue of the NMFG newsletter.)

Faceted Cultured Pearls

From Gems and Gemology Summer 1997

Komatsu Diamond Industry of Japan now markets faceted cultured pearls as "Komatsu Flower Pearls". Only pearls with thick nacre layers are faceted to avoid penetrating the surface of the pearl. Each faceted pearl has 108 to 172 facets. A curious optical effect is shown where the facets appear convex. This effect results from the flat facets cutting through the curved layers of nacre, bringing deeper layers closer to the surface and near the center of the facet.

Emerald Rough Buyer Beware

From Gems and Gemology Summer 1997

Imitations of Zambian emerald crystals have been falsely presented as genuine emerald over the past decade. Recent examples included quartz crystals glued together with green epoxy resin and coated with small mica flakes and a fake matrix. One example showed a singly terminated quartz crystal coated with a transparent bluish-green plastic-like material. Knowledge of crystal habit, luster, and junctions of adjacent crystal faces help differentiate fakes from genuine emerald crystals using a 10x loupe. Tourists without the proper gemological training can be easily duped. Experienced gem rough buyers of emeralds should use caution.

Unique Gems International Took the Money and Ran

From The Economist August 30, 1997

Unique Gems International, the now defunct and allegedly fraudulent company that was based in Miami, Florida, made several donations to the

U.S. Democratic party. These gifts led to photo opportunities with President Clinton. The photos were then used to impress prospective customers, who were later cheated out of millions of dollars.

Union Pacific Claims Trespass

From Gems and Gemology Summer 1997

Union Pacific Corporation now claims that the Diamond Mine operators at Kelsey Lake have trespassed upon property in Colorado that belongs to Union Pacific. Union Pacific says it reserved all mining rights when it conveyed the land to private ownership in 1896. Union Pacific Land Resources recently filed a lawsuit in U.S. District Court and expects a complete inventory of the mine's contents, plus compensation for the diamonds already sold. Union Pacific claims that the 1987 mining lease between the landowners and the Colorado subsidiary of Redaurum, Inc. is invalid.

Two Whoppers Found in Colorado Diamond Mine

From National Jeweler September 1, 1997

The Kelsey Lake Diamond Mine in Colorado produced two more large diamonds that weighed 28.2 carats and 16.3 carats, respectively. Found the same week, the stones were sent to GIA for examination.

The Diana Diamond

From National Jeweler October 1, 1997

A 12.8 gram diamond found at a Siberian mine has been named the "Diana" in tribute to the princess.

Diamonds Into Pearls

From National Jeweler October 16, 1997

Harry Winston of New York markets a new line of faceted diamonds called "Adamantine Pearls". The process, discovered by Ronald Winston, involves rough diamonds cut into a spherical shapes and then polished to resemble Tahitian pearls.

New Demantoid Garnet Deposit Found in Africa

From National Jeweler October 16, 1997 and Modern Jeweler October 1997

A deposit in Usakos, Namibia now yields sizable pieces of gem quality demantoid garnets in colors ranging from yellow-green to intense blue-green. Namibia, home to the bright orange Mandarin garnet, is also known as the tourmaline triangle. Two German stone cutting companies, Gebruder Henn and Paul Wild, have successfully negotiated for the exclusive rights to cut and market this rare andradite garnet.

Demantoid garnets, first discovered in the Ural Mountains of Russia in 1854, exhibit a dispersion higher than the dispersion of diamonds. A low content of chromium is the element responsible for the green color. Even though a deposit of demantoid garnets was discovered in Brazil in 1987, no other such deposit, besides the one in Russia, has produced any fine quality gem rough in quantity.

Before the discovery of the Namibian deposit, demantoid garnets were mostly found in antique jewelry. Demantoid garnets will now be available in significant quantities for the first time this century. The "horse-tail inclusions" of chrysolite, characteristic of demantoid garnets from Russia, are not present in the Namibian demantoid material.

More on Gem River Corp.

From National Jeweler October 16, 1997

The 1997 production of mined sapphires by Gem River Corporation expects to run approximately 1.5 million carats, up from 975,000 carats mined in 1996. Landstrom's has negotiated a contract to buy over $1 million in cut sapphires produced by Gem River Corporation.

Diamond Bourses Protest DeBeers' Policies

From National Jeweler October 1, 1997 and Modern Jeweler October 1997

The heads of both the International Diamond Manufacturers Association and the World Federation of Diamond Bourses are protesting DeBeers' pricing and marketing policies. Such policies have rendered low profits that threaten the business for diamantaires worldwide. Both organizations object to DeBeers' tight control of the single-channel marketing system and have threatened to withdraw from the cartel. Two "unprecedented" solutions have been submitted to the new chairman of DeBeers, Nicky Oppenheimer.

The late twentieth century reflects the worst of times for the DeBeers diamond cartel. Russia refuses to sign a new contract, both Australia and Zaire quit the cartel, and Angola continues to dump its rough diamonds on the open market. This time period has also reflected the best of times for DeBeers with successive years of record sales and profits at the expense of their dealers.

Denver Show September 1997

By John A. Rhoads
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We spent a few days at the Denver Show this year as buyers and not dealers. We participated in the Denver Show for six years as dealers, and for one reason or another, we could never generate the traffic or business to make it pay off. Last year, after collecting only six new addresses for our mailing list, we decided that being dealers at the Denver Show just was not worth the trouble. We made this year's show a buying trip, as opposed to a selling opportunity.

We attended the early part of the Denver Show and saw both rough and cut tourmaline for sale marked at what seemed to us as high in price. We saw none of the Namibian material that had been so popular at the Tucson Show last February. However, this could have been a reflection of the limited dealers who are allowed to offer it, as opposed to any indication of scarcity. Afghanistan tourmaline in rough form was being offered at what seemed like very high prices, too. We did see some Brazilian and Mozambique rough at better prices, but the better material was absent. We found one dealer who had reasonably priced tourmaline from Brazil, and we were able to acquire some gems in the 2 to 5 carat range that seemed to be very good buys at the time.

We saw a quantity of beryl rough from the Ukraine, including an impressive piece weighing 1.2 kilograms that was very clean. One dealer offered very fine yellow heliodor from Tajikistan, some of which we now offer as cut gems for sale in our business newsletter.

We also saw two very fine aquamarine crystals, however, prices were marked at $2,500 and $5,000. Each was beyond what we wanted to invest in such gems at this time. We did see aquamarine specimens from a new discovery in Brazil that were impressive. The color was bright and intense, but the clarity was only fair. We did purchase a single piece of this material to see what we could obtain from it in the way of a cut gem.

We saw very little from Tanzania in the form of rough. We did acquire some tanzanite rough at what seemed like very good prices, as well as a few chrysoberyls and a single piece of grossular garnet.

Rare gem rough was just that, RARE! We were able to acquire some rough anglesite and cerrusite from Morocco. We saw little else.

Cut gems, as always, were in plentiful supply. We noticed that spinels seemed to be priced higher than what had been shown at previous shows. Even the Sri Lankan spinals in carat sizes were priced higher then we remembered. We were able to acquire several very fine red spinals from Burma that are ruby red in color.

We spoke to a number of dealers about business. Several said that the numbers of customers were down although business was good. We hope all did well, and that the Denver Show was more for them then past shows had been for us.

Denver Show Report

By Stephen and Nancy Attaway

Attending the September Denver Gem and Mineral Show provided us with an excellent opportunity to visit Tony and Edna Anthony in Colorado Springs. Edna is the Guild Gemologist, and her husband, Tony hand-fabricates beautiful gold-work.

We stopped first at the Merchandise Mart to view the many displays of crystals, minerals and gold specimens. Several were quite extraordinary, including the rhodochrosite beauties from the Sweet Home Mine. We bid hello to Al and Betty Tlush at their booth. We greeted Bob Eveleth of the New Mexico Bureau of Mines and Dr. Virgil Lueth, curator of the Mine and Mineral Museum at the New Mexico Institute of Mining and Technology. They distributed information on the Mineral Symposium November 8 and 9. We also said hello to Kirk Brock of Rock Solid Jade. Kirk spoke to the Guild on jade and related his jade buying trips during the Guild meeting last March. We missed locating Paul Hlava.

We did find Thomas Ames and spent time admiring his reverse intaglio carvings of animals on high quality gem material. From experience as a tool and die maker for the space industry, Thomas renders his wonderful carvings by sandblasting the designs with amazing precision.

Many people strolled the halls of the Merchandise Mart in search of that special deal, and we were no exception. We located the Austrian couple from who we purchased some Gibeon iron meteorite specimens two years ago, and we bought three more pieces. These iron meteorites were found on the edge of the Kalahari Desert of South Africa.

At the Merchandise Mart/Pavilion Building we located Larry Winn, award-winning gemstone cutter. He showcased some of his magnificent cutting techniques he rendered in aquamarine, yellow beryl, amethyst, and citrine. Larry Winn won best of show and first

place in the combination category of AGTA's 1997 Cutting Edge Competition with his "stellate concept" cushion keystone shape. What a remarkable cut!

We visited Lance Davidson at the Travel Lodge to see the treasures he brought back from his most recent buying trip to India and Southeast Asia. The Summer 1997 Issue of Gems and Gemology provided a photograph of a few of the fine plagioclase feldspar moonstone oval cabochons that he purchased in India. We enjoyed seeing these firsthand. Lance also displayed faceted oval moonstones, but the oval cabochons showed the blue sheen better. Lance markets these as "blue rainbow moonstones" because of their intense royal blue sheen.

Lance displayed tsavorite garnets, grape garnets from India, and rubies, all faceted. Among the cut sapphires was a large black double star sapphire cabochon. This unusual gemstone phenomenon resulted from a twinned crystal.

Lance showed us some of the rare green opaque gemstones known as mawsitsit from Myanmar. Found only in Kachin State, in the same area as the Burmese imperial jadeite, Lance explained mawsitsit as an ureyite classed in the same group of minerals as jadeite. Pure jadeite has a chemical composition of $NaAlSi_2O_6$. Ureyite is formed by substituting chromium for aluminum, making $NaCrSi_2O_6$. Mawsitsit is a banded mixture of green ureyite with black amphibole and chromite with a hardness of 5.5. Lance told us that mawsitsit had not yet been a good selling gemstone for him.

The Travel Lodge also housed the booth of Charles Vargas' Apache Gems. Charles acts as the head of the San Carlos Apache Indian Reservation's gemstone mining, cutting, and marketing endeavor. The Apache Indians work mainly with Arizona peridot, but also deal with Arizona pyrope garnet. Charles said that the Apaches were currently not mining the vast quantities of peridot that was mined in the past for the television home shopping channels.

Many vendors had already begun dismantling their booths and packing away their merchandise on Sunday afternoon. We noticed that some had even completely vacated their booths by Sunday morning. The Denver Show seemed to be good for a few but not for others. Many dealers expressed their dismay.

The Denver Show has tried to establish itself as a September tradition, but still falls short on meeting the needs of many dealers. I wonder how this show will further develop.

Thanks, Tony and Edna, the hosts with the most. We greatly appreciated your kind hospitality and thoroughly enjoyed touring the Denver Show with you. Steve and Tony exchanged several goldsmithing techniques, while Edna and I swapped stories and relaxed on the upper deck, admiring the fine view of Pike's Peak.

On our way home, we drove the winding road up to the top of Pike's Peak. We have no plans to join the annual road race up the peak, where drivers race the twelve miles to the top at speeds of over 60 miles per hour. Not in our 3/4-ton suburban!

On the way home, we also visited the Molly Kathleen Gold Mine in Cripple Creek, Colorado. An authentic piggy-back elevator lowered us over 1000 feet below the surface to walk through subterranean passages dug out for gold ore. Our guide was a third-generation miner with a nickname of "Short Fuse". He explained that his nickname had nothing to do with his temper. He had perfected the art of blasting to the point where he only used a 40 second fuse that he lit with a cigar.

Gold mining in the Molly Kathleen began in the mid 1800s and shutdown in 1965. Surface mining continues today in Cripple Creek. Instead of working underground, large trucks build heap-leach piles, and chemical processes now extract the ore. Our guide explained that underground mining was no longer feasible. The limitation is not in the quality of the ore, but the rate at which the ore can be moved to the surface through shafts and elevators.

The mine tour is quite authentic and illustrates well the hazards of underground mining. The gold veins in the Molly Kathleen run vertically, requiring the miners to work from scaffolding. From my perspective, the scaffolding was little more than a log jammed across the mine's walls.

The Molly Kathleen provides an interesting tour for the brave souls willing to ride the old elevator down the mine shaft. The mine shaft is lined with wood and bolted together. Even though the ride is short, it allows plenty of time to see the toil that hundred years of high humidity has left on the rusting bolts that hold the wood elevator shaft together.

Emerald Oiling (In-Fill) Process

By Ted Themelis, A.G.
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Natural gemstone creation, as a rule, is a brutally wrenching process, often as wounding as it is wondrous. Even so, few gems take the amount of abuse that emerald does during its gen-

esis. These emeralds tend to have numerous cracks, imperfections and birth scars. For this reason, many emeralds need their looks improved to become presentable and saleable.

Improvement has long consisted of the so-called "oiling process", which hides their cracks and fractures, in much the same way a beauty parlor mudpack hides skin wrinkles. [Author's note: in this report, the term "oiling" is considered as an external description only, since in most cases, other than true oils are used in the in-fill process]. This camouflage process is so pervasive that it is said that every emerald destined for jewelry is filled with oil, or with some other filling substance(s). While that is an overstatement, it is hardly an exaggeration to say that this process is attempted on just about every emerald as a final step toward market readiness.

And no wonder. All an emerald needs is a surface-breaking crack that will accept the filler media. With nothing to lose and everything to gain, it would almost be foolish not to subject the emeralds to this process. That is why this treatment is standard procedure in the world's main emerald mining and processing centers: Colombia, Zambia, Brazil, Israel, India, Hong-Kong, and elsewhere.

There is just one drawback to emerald "oiling". The beauty it brings is nearly always transitory. Every known emerald filler (oil, oleo-resin, epoxy and plastic) will eventually decompose in time. This means that the constituent elements of the filler start to separate, and that the substance as a whole, begins to lose its bonding strength with the host emerald. Chemists call this breakdown "dissociation".

Once dissociation sets in, the camouflaged emeralds revert to their original unsightly appearance. Since the loss of their filler in emeralds is gradual under normal conditions, consumers may not notice what has happened, or ignore it when it occurs, especially when they have not been told that their emeralds were subjected to "oiling". Granted, disclosure is a rather delicate duty with a treatment as impermanent as "oiling". Yet, it is a duty that must be done, especially since the in-fill media loss can be speeded up from the gradual to instantaneous when uninformed owners bath emeralds in ultrasonic cleaners.

The pity of non-disclosure is that most dried-out emeralds can be restored to their beauty by "re-oiling" them. Members of the jewelry industry must take a positive approach to disclosure, first explaining the benefits of "oiling", then encouraging customers to bring in their emeralds for periodic inspection, and, if needed, reconditioning.

To be blunt, most "oiled" emeralds sooner or later would require a "lube" job. Nevertheless, revealing this fact of life does not have to be an unpleasant chore. Instead, disclosure can be used as a potent sales tool to keep customers coming back, if only to have their emeralds checked.

This is where an understanding and appreciation of "oiling" is important. Contrary to the popular impression, successful "oiling" is a sophisticated process that cannot be done simply by plunking dried-out emeralds in trays of, say Mazola oil. Rather, this treatment should be left to professionals versed in its intricacies. This means that the emeralds must be sent to special labs where residual oil (or other fillers) can be removed and new filler applied.

Consumers and members of the gems and jewelry industry should realize that treatment is a combination of art and science. The processing techniques vary from lab to lab, and range from primitive to highly sophisticated. Nevertheless, this report covers the current mainstream and avant-garde techniques of emerald "oiling", as practiced by the author Ted Themelis, at his laboratory. It divulges some secrets of the treater's art known up to this point only by a few trade insiders, in the hope that de-mystifying the subject of "oiling" will promote disclosure of this increasingly pervasive and essential trade practice.

Ends and Means

Emeralds are "oiled" to reduce the visibility of cracks and internal imperfections, thus improving their overall appearance. Flawed or poor-quality emeralds, which have cracks, crevices, or fissures that break the surface, are candidates for this process, since these openings provide the only entry point for the filling media. Although some treaters restrict themselves to one or two filler substances, most high-tech treaters choose from a wide selection of fillers, depending on the size, configuration of the cracks, their knowledge, available equipment, and other parameters. The success of the "oiling" process in emerald, depends on the ability of the chosen filler to be induced into the surface-breaking cracks of the emerald and remain there as long as possible. Rough, pre-formed, faceted, and cabochon emeralds are all suitable for the "oiling" process, as long as these emeralds have crack(s) reaching the surface.

Fillers (In-Fill Media)

Basic Fillers

Today, emeralds are enhanced using three types of filler substances:

- Organic and synthetic oils (usually Cedar wood oil)

- Oleo-resins (most commonly Canada balsam)
- Synthetic epoxy resins (nearly always Opticon).

1) Oils (Organic and Synthetic)

In the past, just about every conceivable organic oil (including castor oil, coconut oil, cottonwood oil, mineral oil, palm oil, peanut oil, olive oil, whale's oil, and other oils) or a combination of these oils, has been used as filler in emeralds. Unfortunately, most of these oils have two strikes against them and discourage use by professional treaters. First, their refractive indices are under 1.50; second, their viscosity is too low. While the former has some bearing on the treatment's effectiveness, the latter influences both its stability and longevity. If the viscosity is too low, then the filler will tend to be thin and loose, likely to dry-out quickly and exit from the emerald's substance. Treaters prefer high-viscosity fluid fillers that, at room temperature, are thick, syrupy, and sticky in their natural state, but which lend them to thinning during induction into the emerald's substance. Of the scores of natural organic oils that can be used as emerald fillers, Cedar wood oil has merged as a favorite, although the quality and physical properties vary, as received from the suppliers.

Cedar wood oil is transparent, colorless to slightly yellow, volatile (readily vaporized), somewhat viscous, insoluble in water, but soluble in ether and pure alcohol (which make the latter two ideal solvents to clean out Cedar wood oil residues before re-oiling), sensitive to other than normal room temperature, and prone to chemical alteration from light exposure. Cedar wood oil has a refractive index of 1.495-1.510, and its specific gravity is about 0.94-0.95 gr/cm3.

2) Oleo-resins

Canada balsam is another favorite filler among treaters. Canada balsam is not exactly an oil, but rather an oleo-resin, a solution of resin in essential oil extracted from the North American balsam fir tree. Canada balsam is transparent, yellowish to slightly greenish, viscous, slightly fluorescent, sensitive to both light and temperature, insoluble in water, completely soluble in ether or oil turpentine, and only 90% so in alcohol (making all three good cleaning agents for stones filled with this oleo-resin). Specific gravity is about 0.980-0.994 gr/cm3, and its refractive index ranges from 1.52 to 1.54.

3) Epoxy/Resin Fillers

In recent years, epoxy resins (polymers used as adhesives) have begun to vie with traditional oils and oleo-resins as standard in-fill mediums. The most popular of them is a synthetic polyester epoxy resin, marketed by the tradename "Opticon", famous as a fracture sealer that has endeared itself to treaters because it is more stable than oil. Opticon is transparent, light amber in color, slightly fluorescent, and comparable in viscosity to that of Canada balsam. It has a refractive index of about 1.545.

Despite its virtues, Opticon is still an impermanent emerald filler. Treaters can extend its life by adding in its companion hardener, at one part to every 10 parts of Opticon or any other desirable ratio. Few do so, however, because removal of hardened Opticon is very difficult should it become necessary, as a result of chemical breakdown of the filler. Ethyl-based ketones have been used as cleaning agents and in chemical condenser apparatus, but only with limited success.

Plasticizers/Hardeners

Various agents, such as plasticizers and hardeners, have been added to these fillers, which contribute to their penetration and life expectancy.

Because oil and epoxy resin fillers prove unstable over time and exit partially from the emeralds, treaters are experimenting with additives known as plasticizers that act both as filler-stabilizers and sealants. These additives, mixed with fillers, increase their viscosity and resistance to breakdown. When they are applied as a surface coating over the filler, they form a closure that reduces seepage greatly, and in some cases, stops seepage altogether.

Although plasticizers extend the life of impregnation treatment, they do not make them permanent. In time, these stabilizers/sealants lose their initial strength and dry-out, creating dust-like whitish particles within voids. Painstaking cleaning is then required, before the emeralds can be "re-oiled".

Dyes

Multitudes of pale low-grade beryl can be converted to emerald by adding green organic dyes to conventional filler substances. In general, "greening" emerald by means of artificial coloring is condemned by many gem dealers and consumers as unethical, although widely employed in India, Brazil and elsewhere. Defenders of this practice argue that it is arbitrary to approve of "oiling", but not of dyeing, when each serves the same purpose of improved looks. Yet, there is a rationale for censuring this treatment. Organic dyes speed up the breakdown of the fillers to which they have been added, jeopardizing the beauty they helped create.

Choosing Fillers

Although the range of these in-fill media vary widely, treaters narrow their choices according to certain criteria, such as:

- Refractive index (which should be as close to that of emerald as possible)
- Viscosity (flow characteristics)
- Solubility
- Fluorescence
- Environmental sensitivity (light and temperature).

In choosing fillers, treaters determine the following:

- Single or multiple fillers (type and ratio)
- Hardener to be used in the in-fill process
- Dye to be used in the in-fill process

Cedar wood oil and Canada balsam are sometimes mixed at approximately a 3:1 ratio for use as emerald in-fill. What's more, Canada balsam has been mixed with other oils as an in-fill for other gems. An untold number of mixing combinations and ratios involving oils, oleo-resins, epoxies have been applied to produce the final filling media. The results after the treatment vary significantly and depend on many parameters.

Identification of the Filled Emeralds

Generally, an experienced gemologist can identify whether or not the emerald in question is "oiled". This is achieved by observing its inclusions residing at or near the cracks, crevices, and fractures, using any microscope equipped with a dark-field illumination and a fiber optic unit. Some dry-out filler media in emerald's cavities stand prominent as minute, white dots, or specks, having a characteristic appearance and configuration. Other fillers appear as "rusty", "burnt", especially when heating was incorporated during the "oiling" process.

Immersion microscopy techniques may be used to identify "oiled" emeralds. The emerald to be examined is embedded in a glass transparent crucible with flat walls containing an immersion liquid, whose refractive index is very close to that of the emerald. A suitable liquid would be bromoform, whose nD=1.56 is very close to that of emerald, which is around 1.57. Once an emerald is observed embedded in bromoform, all that will be visible are those areas that contain lower refractive index filler. As for the emerald whose fillers have green dyes with lower refractive indices mixed into them, these dyes will give themselves away as small, localized patches of color confined to the small areas of cracks into which the dye was forced.

Fluorescence is also used to determine the fillers in the emerald substance. Some treaters mix purposely the selected filler with fluorescent dyes, such as "fluo-resin", to aid the identification.

In many cases, the use of the hot-point instrument is very helpful. The hot-point is applied at the emerald's surface cracks. The thermal reaction causes the oil to "bead-up", producing characteristic inclusions.

When one of more fillers were mixed together with or without added hardener to compose the final filler media, the precise determination of these filler ingredients residing in the emerald's substances is extremely difficult and cannot be achieved using conventional gemological instruments. Furthermore, it is impossible to determine when the filler media was induced into the emerald's substance. The determination of these fillers may be achieved using various spectrophotometer techniques and employing sophisticated instruments by distant to average gemologists.

The "Oiling" Process

Before the typical crack-infested emerald is "oiled", it looks a lot like an ice-skating rink in need of surfacing. Stones show feathers running in every direction and configuration. The goal of "oiling" is to conceal or minimize all of the emerald's surface-breaking fissures and also hide inclusions trapped within them.

Basically, "oiling" is a three-step process involving: 1) removal of air and gases from the cavities of the emerald, 2) application and induction of the filler using high-pressure, and 3) final cleaning and waxing. Emerald oiling experts are well aware that among treatable emeralds some are far more enhancement-friendly than others. Acceptance of the filler substances depends on the dimensions of permeable openings. What's more, residues from decomposed or incomplete previously treatments frequently obstruct penetration of new filler. Furthermore, if stabilizers are used, "oiling" becomes a five-step process that begins with a thorough cleaning of the emerald:

Cleaning. This step is necessary only for previously "oiled" stones. No matter what the filler, it almost always leaves sediments behind when it decomposes. So, before previously filled emeralds can be re-treated, they must be thoroughly cleaned. Removal of plain oil residues is a relatively easy task; as cleaning emeralds of leftover oleo-resins and epoxy resins are much harder jobs. But the hardest cleaning job, by far, is the elimination of filler remnants to which hardening agents (stabilizers and plasticizers) were added.

Cleaning emeralds involves presoaking them in the appropriate solvent solution. Heating the solution to a low temperature, say 150 to 250 F, helps the solvent interact better with the remaining filler and quickens cleaning.

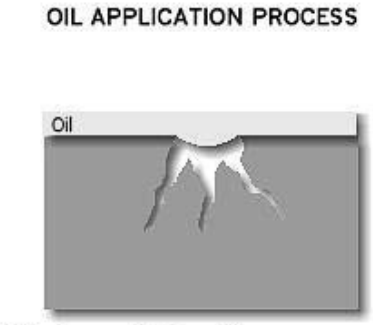
Selection of the solvent is determined by the nature of the filler being removed. The author has found best

results using the chemical condenser incorporated with automatic control heating apparatus, utilizing ketone-based cleaning agents, methylene chloride, super-saturated xylene, and lacquer thinner. Because a single immersion in a solvent usually does not rid stones of all foreign matter, the cleaning process must often be repeated several times. The entire process can take from hours to days. There is no specific rule, method, or pattern to follow.

1) **Removal of air process**. Once a previously "oiled" emerald is cleaned of lingering filler, it is placed in a vacuum chamber, where air and gases are removed. It is important that no air remain in fissures meant to receive filler, because the presence of air will create bubbles in the substance. Only powerful and efficient vacuum pumps will ensure air-and gas-free fissures.

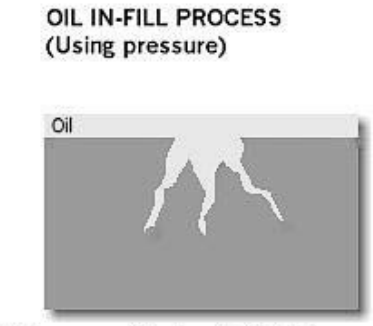
Vacuum removal of air and gases from surface crack

2) **Filler application process**. Immediately following the suction of air and gases from cracks, the emerald is embedded into the filler substance for induction. Pressures of up to 3,000 pounds per square inch are used. To reduce its viscosity (resistance to flow) and boost its penetration power, the filler is thinned by heating to anywhere from 150 to 250 F while it is pressurized. After being forced into the emerald, the filler is allowed to cool, and its viscosity level rises high enough to prevent seepage. Although the filler process follows the same outline in most labs, the actual procedures may be performed slightly differently, depending on the treater's skill and technical know-how.



Preliminary application of oil

For instance, in some cases the author uses a radio-frequency thermal wave transmitter of his own design to heat the filler and reduce its viscosity during induction. A custom-made hydraulic pressure apparatus ensures the maximum impregnation of the filler into the emerald (see photo of emerald enhanced apparatus, appearing in my web page).



High pressure injection of oil into fissure

3) **Stabilization process**. In some cases and under suitable conditions, various stabilizers are applied in emerald. The selected "add-on filler-plasticizer" is actually a cured sealant that is usually applied after the filler is induced into the emerald substance under suitable conditions.

Application of plasticizer to seal in oil

4) **Application of wax process.** After induction of the filler, the emerald is cleaned thoroughly and externally. Either wax or Vaseline is applied to its surface with a chamois cloth to give the stone its final finish and luster.

Removal of excess "sealer" and application of wax to impart luster

Proper Handling

Since the majority of emeralds are "oiled", caution should be exercised when they are handled loose or mounted. Stone setters should be instructed to assume emeralds are all "oiled", unless told otherwise, to prevent damaging these emeralds whose cracks have been successfully concealed. Bench men should also be warned that undue heat applied to "oiled" emeralds during jewelry repair or fabrication can char stones, causing serious and irreversible damage.

Cleaning treated emeralds even with simple solvents, such as benzene or ether-based compounds, is to be avoided, especially in an ultrasonic

cleaner. This process may remove the filler and leave stones in their original unsightly condition.

When storing treated emeralds in stone papers, do not wrap them in cotton. Cotton absorbs oil (as well as dye) over a period of time. Also, keeping oiled emeralds in hermetically sealed plastic bags is not recommended; as these tend to build up moisture that weakens and draws out the oil.

Since most of the fillers are light-sensitive, it is best not to display "oiled" emeralds under flood lights or any other strong heat-producing lighting conditions, such as tungsten lamps. Strong lights produce excessive heat that dry out the oil very quickly and, in time, turn the emeralds dull and opaque.

From the Editor: Ted Themelis granted permission by e-mail to publish his article. Ted's articles on inclusions appeared in Lapidary Journal's "Inclusion of the Month" series for years. The May 1990 Issue of Modern Jeweler published "A Jeweler's Guide to Emerald Oiling" by Ted Themelis Gem Lab, Inc.

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PC Gemologist

A Reveiw By Stephen Attaway, Ph.D.

Peter Wennerhome of Goteborg, Sweden (http:/www.netg.se/~gemma/index.html) has collaborated with some of the world's best gemologists to produce an easy to use computer program that contains a lot of information about gemstones, accessed by a collection of useful tools relevant to those with gemstone interests.

P.C. Gemologist is designed for Windows 95 and Window NT, requires 4 MB of hard disk space, and works best on a system with at least 8 MB memory and a 486-66 processor. The full program costs $250. A "shareware" version can be downloaded from the Web for $50, payable to the author.

The heart of P C Gemologist is its Gem Identifier, an internal database containing some 440 varieties of gemstones, ornamental stones, and fakes. The Identifier can work with as many as 15 test readings or as few as two: color and transparency.

The Library tool provides a customized property list of gemstones. For example, the user can request the program to display the hardness of all gems that may have chatoyancy. In addition, you can sort the list in Density order.

The Name Search Screen contains 2400 trade names, variety names, alternative names, and misnomers. Gems can be displayed at anytime as Gem Data Cards that tell of the gemstone's optical and physical properties and its variety names. The cards inform you if the stone can be placed in an ultrasonic or may be steam cleaned. Several potentially radioactive gemstones exist, and the program warns you when it finds one.

P C Gemologist provides the gemcutter with important information about 280 gem varieties, from recommended angles and polishing compounds to the degree of heat sensitivity and any existence of cleavage, plus expert tips and warnings.

The Gem Scale unit gives the weight of cut and mounted gemstones without removing them from their settings. The Pearl Calculator can calculate weights of single pearls and "once-the-weights" of necklaces, including graduated ones.

What do the terms of an expert diamond graded certificate actually mean, and does it matter where in the world it was graded? The Diamond Grading unit allows an easy comparison of GIA's rules for diamond grading with those of Scan DN, IDC, and CIBJO. (*The version available for down load did not include this particular feature.)*

The program does not need a manual. It has context-sensitive help. The extensive help file includes a gemological dictionary with some 240 entries.

Hello, Fellow Photographers

From Fred Ward, G.G., GIA

Do not despair, as there is hope. There are answers, and somethings actually work when trying to get accurate color prints. Let me run through a number of things that you may find useful:

1.) The idiot boxes and the teenage operator-idiots are simultaneously the greatest benefit for amateur photographers ever, and the greatest disaster for anyone who knows anything about photography, who wants good prints

and not just average indications of average subjects.

2.) What Kodak and Fuji have done is to make systems that any double-digit I.Q. minimum-wage employee can master in an hour. They produce acceptable results 80% of the time for 80% of the customers.

3.) This will never work for you, unless you are willing to take pictures of gray cards and want gray prints in return. Therefore, if you want more, you have to do more.

4.) There will be one or more custom labs in your area. They will charge much, much more for making your prints right. They may charge so much that you do not want to use them. But, they will produce good results.

5.) One hour machine run prints cannot and will not ever give you accurate color for most pictures. They are set up for daylight snapshots and pictures made with the small built-in strobes found in most point-and-shoot cameras. Anything else is a stretch for them and a horror for you. Live with it. You are not going to change them very much.

6.) Happiness will only come at a one-hour place if you find a friend, make a friend, or buy a friend at one of them. If you can make it attractive to someone who will be working there for more than a week, you can strike a deal. Here is what you need to know and what you can do to help.

7.) The machines have automatic exposure controls to compensate for wild swings in cheap point-and-shoots. Always deliver properly exposed film because it will help everything that follows. Ultimately, you will need to either shoot your jewelry on backgrounds that approximate the tone of an 18% gray card (any medium color will do) or get the store to cut off its automatic exposure for your film. It is only a switch, and they can do it if they know how to do it.

8.) The machines also have automatic color balancing. This is the major cause for misery. The machine expects to see daylight balance, either actual daylight or strobe. It also looks for yellowish light and indoor tungsten at night. It makes an attempt to adjust for either. Where you really get into trouble is giving the machine something it does not expect, such as light or a colored gem.

9.) You can approach the color temperature in one of several ways, depending on how well you are getting along with the teenage ninja operator who is screwing up your film. Unless you are using actual 3200 degree Kelvin floodlights as your light source, you have little chance of properly balancing the light with filters. All filtration back to daylight assumes you are using either the standard professional 3200 degree bulbs or the now non-standard 3400 degree bulbs for Kodak-chrome A film.

10.) You cannot mix light, use regular household lamps, or do anything non-standard here and hope to standardize later. Get a system and stick with it. Work with the processor to standardize him for your work. For instance, if you actually used 3200 degree bulbs and did not use a filter and told the processor that, then he has a setting that adjusts for color negative film shot at 3200 degrees. But, if you have a 60 watt bulb (approximately 2400 degrees) or a 200 watt bulb (at perhaps 2800 degrees) or a candle (at maybe 1200 degrees Kelvin), then your mix would be impossible to ever correct. All your light must be the same.

11.) You could make life easier by using daylight or strobes, but you might have trouble adjusting for reflections.

12.) If you use one standard color of light, then you can explain that to the processor operator and tell him or her that you will pay for one special run of marked prints, where you turn in properly exposed film and he turns off automatic exposure control during printing. Then you have the operator start with all flat settings, with color automation turned off. Then have him add one notch more red, then 2, then 3, and then 1 less red, 2 less red, 3 less red, then do the same for blue and the same for green.

13.) Keep track of all the settings and make sure the operator does it right and keeps the prints lined up in order. Then take them to a good light, not florescent, and look at your original gem and compare it to the print. Once you get one you really like, mark the settings and tell the operator you are always going to shoot your pictures the same way and want him to always print them the same way.

14.) And, Bingo, you will now look like a real pro, and you will also be able to get great prints at least half the time. Good luck, and let me know what happens.

Fred Ward, G.G.
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From the Editor: Fred Ward is a respected authority on gems and gemology. He travels the globe to personally view artifacts, observe gem mining, and explain the gem trade. His reports have appeared in many of the major jewelry trade journals and in several issues of National Geographic. Fred Ward has published six books as a series on gemstones, including "Emeralds", "Rubies and Sapphires", "Diamonds", "Pearls", "Opals", and "Gem Care". Fred Ward began his work as a photographer for Life Magazine in 1963. To order these books, e-mail Fred or contact him at:

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Fred Ward personally granted permission to the New Mexico Faceters Guild to publish this private e-mail he sent to Steve and Nancy Attaway. Any re-printing of this article needs Fred Ward's permission to do so. Thanks.

Lets Talk Gemstones

By Edna B. Anthony, Gemologist

Axinite: A Cyclosilicate Group

On an excursion in the Alps in 1797, mineralogist, R. J. Hauy discovered some highly vitreous, piezio-electric wedged-shaped crystals that resembled schorl, the dark variety of tourmaline. The incorrect designation, "vitreous schorl", was used even after axinite (Ca,Mn,Fe,Mg)3Al2BSi4O15(OH) was identified as a complicated borate silicate group of minerals. The characteristic axe shape of its crystals gave it its name.

If magnesium is the predominant element of the incorporated ions into its four-member tetrahedral "ring" silicate structure, then it is magnesioaxinite. In ferroaxinite, the iron content is greater than manganese. Manganaxinite is the result if manganese exceeds the iron content. In tinzenite, manganese exceeds the iron content, and calcium is less than 1.5. Since axinite develops in the triclinic crystal system with its low degree of symmetry, and its angles are very acute. Its habit is beautifully illustrated in a picture of rich brown crystals in matrix on page 67 of the *Color Treasury of Crystals* by Vincenzo De Michele of the Natural History Museum of Milan, Italy.

Massive material in lamellar to granular form is found. Homogeneous growth of the crystals almost always causes feathers and zoning. An excellent photograph of zoning and large two-phase inclusions in a yellow-brown Sri Lankan stone can be found on page 415 of *The Photo Atlas of Inclusions in Gemstones* by E.J. Gubelin and J. I. Koivula.

Axinite, a metasomatic (replacement) mineral, occurs in contact metamorphic areas in basic rocks and veins. Gem quality material is found in several counties in California, Sri Lanka, and in the French Alps. Deposits of massive material are located in Luning, Nevada, Pennsylvania, and New Jersey. Other sources are Cornwall, England, Finland, Norway, Germany, Japan, Russia, Tasmania, and Mexico. Tinzenite is found in Switzerland and magnesioaxinite in Tanzania.

Crystals large enough to cut gems over ten carats in size are extremely rare. Dr. Joel Arem states in his *Color Encyclopedia of Gemstones* that "clean stones over 5 carats are ---- worthy of museum display". Despite being a bit brittle, its brilliance and sumptuous colors make it a unique and exquisite gemstone.

TABLE 1. Gemstone Properties

SPECIE	*Axinite*
Composition:	(Ca,Mn,Fe,Mg) 3Al2BSi4O15 (OH).
Class:	Silicate {Cyclosilicate}.
Group:	Axinite.
Species:	Magnesioaxinite, Ferroaxinite, Manganaxinite, Tinzenite.
Crystal System:	Triclinic.

TABLE 1. Gemstone Properties

SPECIE	*Axinite*
Varieties:	By color, species names & crystallography
Colors:	Colorless, yellow, olive green, cinnamon brown, violet brown, pale violet to reddish violet, and blue.
Phenomena:	None.
Streak:	White.
Diaphaneity:	Transparent and translucent
Habit:	Distinctive wedge-shape crystals, crystalline aggregate, & massive.
Cleavage:	One perfect and some poor.
Fracture:	Conchoidal and brittle.
Fracture Lustre:	Vitreous.
Lustre:	Highly vitreous.
Specific Gravity	Varies between 3.26 to 3.36; Magnesioaxinite is 3.18
Hardness	6.5 to 7.0
Toughness:	Fair
Refractive Index	Alpha at 1.674 to 1.693; Beta at 1.681 to 1.701; Gamma at 1.68
Birefringence:	0.010 to 0.012
Optic Character	Biaxial negative; positive if high in magnesium.
Dispersion:	High.

TABLE 1. Gemstone Properties

SPECIE	*Axinite*
Pleochroism	Usually strong trichroic in reddish-brown, yellow-brown, olive green, yellow, & colorless; In Luning, Nevada material: reddish-brown, deep brown, pale brown, or colorless; In Sri Lankan material: reddish brown, deep violet, & colorless to pale yellow.
Ultraviolet Flourescence	In Franklin, New Jersey material: SW=red; LW=inert; In magnesioaxinite from Tanzania: SW=dull red; LW=orange-red.
Spectra	broad lines at 4150, 4660, & 4920; narrow line at 5120; possible lines at 4440 & 5320.
Color Filter	no information
Solubility	dissolves slowly in HF; use HCl with caution.
Thermal Traits	avoid thermal shock; fusible with intumescence (swelling) at 2.5 to 3.0.
Treatments	none known
Inclusions	is seldom flawless; has color zones, feathers, & rare two-phase inclusions.

Gems and Jewelry in Turkey and Greece

By John A. Rhoads
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I recently had the opportunity to travel to both Turkey and Greece. Although it was an actual vacation, I had plenty of opportunity to view the jewelry and gems that were available in both of these countries.

My first stop was Istanbul, where we traveled to the bazaar. Well over 2,000 vendors were reported to be located. I do not doubt these numbers, as the halls seemed to go on forever. We ventured into a few to examine jewelry, as it would take weeks to thoroughly visit each and every shop. Therefore, my comments are based upon just the six I visited, plus a few more where we looked into the windows.

I was impressed by the quantity and quality of the antique jewelry showcased within the stores. I saw many very fine pieces of antique jewelry set with beautiful rose cut diamonds. Many of these diamonds weighed five carats or more, which was something I had not previously seen outside of museums. We priced a few pieces, and in comparison to similar quality diamonds of modern cut, these were priced well below the current diamond markets.

I also saw a number of very fine platinum pieces with quite a variety of gemstones that ranged from aquamarine to topaz and more. Obviously, due

to the age of the pieces, the cuts of the gems were poor. However, the beauty and the color of the gems were very impressive. The assortment of antique jewelry available is an indication of the time when Turkey stood as one of the major powers within the world.

I saw many vendors who offered modern styles of jewelry set with modern cut gems. Prices were somewhat below retail prices found in the United States. The lower prices reflect a higher risk of purchasing something that is not what it is represented to be. If you wait until returning home to verify the purchase, then the expense of recovering any loss may make it prohibitedly expensive to pursue any recovery.

We made an additional stop in Kusadasi, Turkey, a resort town on the west coast of Turkey. Kusadasi houses many jewelry stores, as well as other stores of interest to the tourists. Our guide was asked a question about alexandrites, and her answer both puzzled and enlightened me.

She informed our tour group that the alexandrites in the local stores were all "semi-precious", that real alexandrites would cost thousands of dollars per carat. I had never heard the term "semi-precious" used to describe synthetic or imitation gems, as the term "semi-precious" is considered archaic. It has been used to describe gems other than diamonds, rubies, emeralds, and sapphires. This may explain why so many tourists to foreign countries, such as Turkey, will purchase synthetic alexandrites, thinking that they are the genuine article. I doubt that this is always the case.

One shop in particular in Kusadasi offered some very fine hand- made jewelry pieces. I tried on a ring that was fabricated piece by piece out of 18 Kt. gold. It was an impressive piece set with three diamonds of very high quality, weighing approximately one carat total weight. The price quoted was $7,500 U.S., hardly a bargain, although it was surely worth the price at the retail level.

In Greece, I visited stores on the islands of Rhodes and Santorini. The modern jewelry displayed was, again, very impressive and all set with very fine rubies, emeralds, sapphires and diamonds. Much of the jewelry was composed of bi-color metals. I saw one store on Santorini that showed particularly high quality gems, such as rubies, emeralds and sapphires, but I did not price any of the items.

Other impressive jewelry items were those pieces that were replicas of jewelry found in the ancient cities of Pompeii and elsewhere around the Mediterranean Sea. Beautiful Byzantine pieces duplicated to exact standards were featured in many of the stores. We also saw a few pieces that contained ancient coins of Greek and Roman origin.

One thing I did notice was that the range in variety of gemstones was very limited. You would see a few blue topazes, amethysts, garnets, and citrines, but rarely anything else. I do not believe I saw a single tanzanite during the entire trip. Fine tourmalines were almost non-existent, and I saw fewer than six imperial precious topazes. Well cut gems were limited to synthetics, which I found puzzling. The amethysts, citrines, and blue topazes could all have benefited from proper cutting without losing much weight and would have gained in value.

My recommendation for anyone traveling to these areas and considering a gem or jewelry purchase would be to establish an amount to be spent prior to arriving and sticking to that amount. Check out the bazaar in Istanbul, and if traveling to Rhodes or Santorini, allow the time to shop. Resist the high pressure sales techniques at each shop. Generally, they will bargain up to about 25% of the price, but don't expect the 70% or more discounts often found in Mexico when shopping.

Remember that these areas are to the Europeans much like Jamaica, Puerto Rica, Grand Cayman, the Bahamas, and Mexico are all to us. Although the customs and practices are a little different, be as aware in these countries of what you are purchasing as you would anywhere else.

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Christmas Party

The Guild Christmas Party is scheduled for:
December 13
at the
Rio Grande Yacht Club
on
Yale Blvd.
from
3:30 p.m. -7:00 p.m.

TABLE 2. Shows of Special Interest

Name	*Location*	*Date*
New Mexico Institute of Mining and Technology's Eight Annual New Mexico Mineral Symposium	Socorro, New Mexico	Nov. 8 & 9

TABLE 2. Shows of Special Interest

Name	*Location*	*Date*
Old Pueblo Lapidary Club's 25th Annual Gem Show	Tucson, Arizona	Nov. 7 - 9
First Annual Best Bead and Glass Show	Albuquerque, New Mexico	Nov. 7 - 9
International Gem and Jewelry Show	Denver, Colorado	Nov. 14 - 16
Albuquerque Gem Artisans Trade Expo (AGATE)	Albuquerque, New Mexico	Nov. 29 & 30
Los Alamos Geological Society's Earth Treasure Show	Los Alamos, New Mexico	Dec. 6 & 7
Society of Glass Beadmakers' Crash of Metal and Glass	Albuquerque, New Mexico	Jan. 1- 18, 1998
Quartzite's Cloud Jamboree	Quartzite, Arizona	Jan. 15 - Feb. 15
Quartzite's Main Event Gemboree	Quartzite, Arizona	Jan. 17 - Feb. 1
Quartzite's Hobby, Craft, and Gem Show	Quartzite, Arizona	Jan. 17 - 25
Crystal Magic Gem, Mineral, Jewelry, and Fossil Show	Las Vegas, Nevada	Jan. 20 - 31
Gila County Gem and Mineral Show	Globe, Arizona	Jan. 23 - 25
Quartzite's Prospectors Panorama Gem Show	Quartzite, Arizona	Jan. 24 - Feb. 8