

The New Mexico Facetor

Volume 22, No. 3, May/June, 2002



NMFG President Scott Wilson

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The Prez Sez:

by Scott R. Wilson, Ph.D

There may now be available a newfound freedom for unusual facet designs. I recently ran across a tidbit that opens up new possibilities for the widespread use of non-standard faceted stones in custom mountings. It seems that a man named David Reid is doing research on the use of a kitchen microwave as a casting furnace for precious metals. He has developed a clever approach that starts with a standard wax model (whether commercial, handmade, replicated, or CAD/CAM prototyped), and his idea boils down to using a handmade multi-layered, multi-chambered mold assembly. Basically, his process uses a sphere separated down the middle. One side of the sphere contains the metal to be melted and poured, and the other side contains the mold of the wax.

The mold is prepared by alternately painting a layer of a ceramic slurry onto the mold's surface, followed by a layer of slurry composed of magnetite sand and graphite. After burning the wax (this is NOT done in the microwave), the resulting "shell" is conductive enough to easily pick up the microwave energy. However, it is not so conductive as to get the "tin foil in microwave" result (do not ever do this). The ceramic binder holds it all together at red-orange heat. The hot shell transfers the heat into the metal but does not damage the microwave.

An assembly of the wax replica (set in one side of the sphere) and the metal to be cast (set in the other side) is placed inside the microwave. It is surrounded by an insulating ceramic brick that reduces heat loss from the mold. After "17 minutes in an 850 watt microwave", 330 grams of sterling can be poured by simply turning brick and mold upside down. The brick keeps the mold from cooling down rapidly, so that the metal can run into the mold. Cool and pull it apart to retrieve the casting. {reference is <http://home.c2i.net/metaphor/mvpage.html>}

This approach trades readily accessible equipment against requiring an investment of time in preparing the mould assembly. Faceters are good at investing time in their work. This new casting technique might lead faceters to create custom mounts for their stones cut in non-standard shapes without needing to have a complete metal casting setup. This new freedom to inexpensively render custom, quality mountings could lead to a flood of new facet designs that are no longer bound to the standard shapes and calibrated sizes.



Minutes of the NMFG Meeting

May 9, 2002

by Nancy L. Attaway

President Scott Wilson called the meeting to order at 7:05 p.m. and welcomed all members and guests. He asked everyone to introduce themselves to the group. Several guests attended tonight's meeting.

Old Business

Ernie Hawes reported on the workshop held March 16 at the home of Scott Wilson. With his laptop, Ernie showed how changing the cutting angles for a specific faceting diagram can noticeably change the brilliance of a gemstone. He was also happy with the progress made by members cutting their stones.

President Scott Wilson reported on judging the recent regional science fair and mentioned the two winners of US savings bonds from the New Mexico Faceters Guild. The first place winner's project involved measuring optical data of gems by home-made instruments, and the second place winner's project observed total internal reflection of gems under water. The winners and their projects will be officially announced and further described in the next Guild newsletter.

Vice-President Paul Hlava reported on "TotE 2002", Treasurers of the Earth 2002 Show, hosted by the Albuquerque Gem and Mineral Club. Paul received many positive comments on the new location at the fairgrounds that allowed more space for dealers, customers, and parking. Paul announced that he will serve as the show chairman for next year's AGMC show.

New Business

Ernie Hawes announced that the **next workshop** is scheduled for **May 11** from 9:00 a.m. until 4:00 p.m. at the home of **Steve and Nancy Attaway**. Ernie does not have a morning classroom presentation scheduled but wants to have members facet their stones all day. Members attending workshops are asked to give \$5 towards food and the copies of information and faceting designs, but extra cash donations are always appreciated. Please contact Ernie regarding all workshops and any questions related to workshops. Ernie has two faceting machines available for those who do not own their own machines, so call him to reserve a machine for you at the next workshop.

President Scott Wilson said that the Guild may have books for sale in the future, including one on original faceting diagrams by Guild members and one on gemology by Edna Anthony, our Guild gemologist. Our newsletter publisher is able to print books for us, so we will announce when these will be ready for sale.

Ernie Hawes' "Easy Square Emerald" cut was featured in the May, 2002 issue of *Lapidary Journal*, including four pictures of the cut in citrine with one on the cover. Congratulations! Ernie's "Queen's Fancy" design will be in the August, 2002 issue of *Lapidary Journal*, along with a picture of the cut in blue topaz.

Show and Tell

The Show and Tell Case tonight held many faceted and carved stones and jewelry done by Guild members.

Dylan Houtman displayed a large cushion cut triangle in natural blue topaz, an aquamarine cut in the "Spiral Nebula", and another aquamarine cut in "Houtman's Oval". He cut a small ruby in the "Keystone" cut, several small emerald cut Ceylon sapphires, and some assorted Australian and Mexican opals. He also showed a piece of chromium zoisite rough, a piece of morganite rough, and some Burmese ruby rough.

Gary and Rainy Peters displayed a 14Kt. gold handmade ring set with a square citrine that Gary had re-cut for better symmetry. He faceted large pavilion facets and carved spheres into those facets. Gary and Rainy showed one of their 14Kt. gold dragonfly pendants with bezel-set opals as the lower wings, small pearls for eyes, a large freshwater pearl for the body, and sapphire accents on the tips of the upper wings. The upper wings were cuttlebone castings that exhibited fine details of a dragonfly's wing. Gary and Rainy also showed the carved onyx and 14Kt. gold pendant that was featured in color on the inside cover of the March/April 2002 issue of the New Mexico Faceter.

Ernie Hawes displayed a round bytownite (plagioclase feldspar) and a rhodolite garnet cushion cut square. He cut the bytownite and used angles by Long and Steele for a standard round brilliant to show different angles. The stone was polished on cerium oxide. He cut the rhodolite garnet in "Merrill's Inspiration".

Laura Kirkpatrick displayed her second stone that she has faceted, a large, modified Swiss round Oregon sunstone that she cut on a Facetron during several workshops. Laura is currently learning how different diagrams for faceting appear on the rough stone. Congratulations to Laura on her very good endeavor.

Nancy Attaway displayed twelve stones that she recently cut, seven rhodolite garnets, one tsavorite garnet, and four aquamarines. Nancy remarked that she had to work around inclusions and eliminate some inclusions in the rhodolite garnet and aquamarine rough. The rhodolite garnets included a small emerald cut, a large emerald cut, two large and one small flasher cut (twelve-sided) rounds, a small pearshape, and a large square. The large emerald cut revealed during the polish of the pavilion an iris inclusion on one side, but the top of the iris was barely visible from the table. (An iris is a circular inclusion that creates iridescence by scattering the light from its thin layer. Iris agates are very desirable, and an iris in quartz and in calcite is valued.) The small emerald cut rhodolite began as a much larger piece of rough that became smaller due to fractures in the rough material. Likewise, the aquamarines, two flasher cut rounds and one square barion, had some inclusions that had to be removed, but a few were left in the gems. The 1.67-carat tsavorite garnet pearshape showed a lovely green hue but contained an inclusion. Nancy cut one larger aquamarine into an elongated kiteshape. It was the prototype of a new faceting design for a kite that she is working on, and she plans to finalize the design with another stone.

Nancy also showed one of the CAD/CAM pieces of jewelry that Steve and she designed and cast. It was an 18Kt. gold pendant set with a small flasher cut round dark pink Brazilian tourmaline near the top and a large hot pink Nigerian tourmaline pearshape at the bottom. Steve bead set 18 small, full cut diamonds into the loops of the pendant. The item, known as the Angel pendant, showed a softer style different from the geometric designs that Steve and Nancy usually make.



Refreshments

Rainy Peters, Bill Wood, and Nancy Attaway brought home-baked refreshments to the January meeting. Gourmet coffee was served. Thank you all very much. **Magail Medina** and **Nancy Attaway** volunteered to bring refreshments to the July meeting.

Future Programs

Paul Hlava has scheduled himself for a July talk.

As **Vice President/Programs**, **Paul Hlava** will appreciate any suggestions regarding future programs. If there is any topic or a particular speaker who you want to hear, please notify Paul. Thanks.



Program Speaker

by *Nancy Attaway*

Paul Hlava scheduled gem dealer, Joe Kast, who described his travels in Asia to purchase rubies and sapphires. Joe also related his gem travels in Colombia, where he bought emeralds. Joe Kast resides in Albuquerque. Paul met Joe at the AGTA Show a few years ago during the February "event" in Tucson.

Joe began by passing around two large cushion cut oval sapphires for members to view. One sapphire showed a rich, dark royal blue color. The other one exhibited a very light blue hue with sparkle made by the extra attention paid to faceting. Joe remarked that the darker colored sapphire was priced at \$2,400 per carat wholesale, while the lighter colored sapphire was marked at \$200 per carat wholesale. The big difference in price was duly noted by the audience. Both gems had attributes that were admired by everyone, but Joe's point was that color was the key. The deeply saturated royal blue hue in sapphire commands the higher prices.

Joe displayed several large crystals of sapphire that were blue-gray in color and not at all gemmy. These showed distinct crystal faces of the hexagonal crystal system of sapphire with some terminations. Joe also displayed two Colombian emerald crystals in matrix with pyrite. One crystal in one specimen had formed naturally in place. The other was glued into the matrix.

Joe began his career in gems around 1988. Prior to that, he was a licensed chiropractor for 28 years in northeast Pennsylvania. One of his patients was a gem-cutter, who further inspired Joe's interest in gems.

Joe showed several poster-sized photographs that he took of the mining areas in Thailand. One depicted several miners sifting for rubies and sapphires in a stream bed, standing knee-deep in water. Nearby, mine holes were dug over 30 meters deep with no shoring. Another photo showed the famous open-pit, hard rock mine at Kanchanaburi that is owned by a Chinese. Joe remarked that sapphires from Kanchanaburi are dark.

Joe explained first his gem buying trips to Thailand. He arrives in Bangkok, usually on Thai Airlines, which takes about a day's time to travel from San Francisco or Los Angeles. Sometimes, he takes Cathay Pacific Airlines to Bangkok. He uses an American consolidator for his trip planning and logistics.

Joe described the food in Thailand as somewhat spicy to very spicy. A fork and a large spoon is used.

Joe said that he works with a gemstone broker in Bangkok, who he has come to know and trust after doing business with him for several years. The broker contacts the cutting houses, which are Chinese owned. The gemcutters are all Thai. Joe looks through between 200 and 300 stones in gem papers from 9:45 am until 3:15 pm, when the light starts to change. Joe remarked that once the light of day changes, the color of the stones are affected and will appear different from the morning light. Also, your eyes become fatigued.

Joe explained that the cutting houses worked on a 10% profit margin, a very tight margin. The owners preformed all of the rough and then turned it over to the Thai cutters. The cutters were paid by the carat weight, which is why you see so many large bellied gemstones. Cut stones are placed in the inventory and sent by a runner to the broker. Runners are usually relatives or friends of the cutters who represent the cutters.

Joe described his gemstone purchasing in the following manner. After he selects the stones that he is interested in buying, Joe goes down the list and asks the price for each stone. The runner (remember that he represents the cutter) replies with a very high price to see if he will accept it. Joe usually counters with a much lower price. This banter goes back and forth between the runner and the buyer for each stone. The runner calls the boss back at the cutting house for each counter offer. Joe usually purchases 65% of the stones on his list. One single deal may take only 15 minutes, while other deals may take an entire day of price haggling.

Joe remarked that the cutting houses turn their gemstone inventory over as quickly as they possibly can. Each gem paper that holds a stone is coded in Thai, noted on the cover. Joe pays in (U.S.) dollars to the broker, who then pays the runner in the local Thai currency. Often, wire transfers are used between banks.

Joe mentioned that many of the gemstones he buys in Thailand need to be re-cut to improve the optics and make them more symmetric in overall shape. Joe buys Burma ruby, ruby from Madagascar, and Thai sapphire. He mentioned that ruby from Burma fluoresces under ultraviolet light, but ruby from Madagascar does not.

Joe always faxes to the U.S. commercial customs the list of the gems that he intends to purchase, and he performs this task before he leaves the gem broker in Bangkok. There is no duty paid on loose gems into the United States. Joe is insured with Jewelers Mutual.

Joe usually ships by Federal Express to his customers and insures parcels at cost. He has also shipped by registered mail. He has had one loss by Federal Express

and had two losses from registered mail in the United States. His insurance covered them all.

Joe describes Bangkok as a very polluted city. Many commuters use the old two-stroke engines on motor bikes. The temperature hovers around 92 degrees F during the day and falls to the low 80's at night. He said that the fruit there is most tasty. He thinks that Thai people are very nice, and he feels very safe there.

Joe next described his trips to Sri Lanka, which requires another 24 hours to travel. Joe said that he does not fly on Sri Lankan airlines, as the civil war there, between the Hindu Tamils and the Buddhists, has made local air travel too violent. Joe does not travel on Indian airlines, for similar reasons. He travels on Thai airlines from Bangkok to Colombo, which takes longer in travel time and has several layovers.

Joe remarked that the gem dealers in Sri Lanka were all Muslims. He said that establishing contracts with these dealers was most important. He remarked that there was no electricity at night in Colombo. As a result, Joe said that he did not stay in small hotels but stayed in the large hotels, which own generators. The large hotels, however, charged expensive rates.

Joe said that he has stayed in the home of his Muslim contact. The home had marble floors, and no shoes were worn inside the home. The Muslim homeowner employed several servants. Servants were paid \$30 to \$50 per month there. In contrast, gemcutters in Colombo were paid \$90 per month.

Joe remarked that the pace of life in Sri Lanka was much slower than the pace set in Bangkok, Thailand. He also said that there were less gems in Colombo to view. He stated that the cutters in Sri Lanka mostly cut ovals and cushion cuts, and that most Sri Lankan sapphires were heat-treated to enhance the blue color. Heat-treatment removed the silk (melts the rutile needles) and brightens the stones. Not all sapphire rough was guaranteed to change color under heat-treatment.

Joe said that he usually dressed casually while overseas in Asia. He recommended such attire to better blend in with the locals. He advised that one should not stand out any more than is absolutely necessary.

Joe then told of his gem buying travels to South America for emeralds. His flight took him to Santa Fe de Bogota in Colombia, which lies at an elevation of 8500 feet. The daytime temperatures there ranged between 60 to 70 degrees F. A gem broker picked him up at the airport, and he was flown by military helicopter to the Muzo emerald mine. The Muzo mine is situated in the Andes Mountains, northeast of Bogota,

which is lower in altitude, more humid, and warmer. Both the Chivor mine and the Cosquez mine, noted emerald localities, are located near the Muzo mine.

Joe said that the people there spoke an elegant Spanish dialect and have been very friendly. He said that everyone in Bogota dressed formally. The food was bland, and a lot of potatoes were served. Joe never ventured out at night alone. He advised to be very careful when taking a taxi and always had one or two other people accompanying him when he rode in a taxi.

In Colombia, gem brokers were separated from the gemcutters. Sometimes, the brokers worked directly with the cutters. Joe said that he often had to compete with gem buyers from other countries for Colombian emeralds. The price of emeralds fluctuated with the supply and the demand. Not much in fine emerald goods was available when he was there.

Joe explained that all emeralds were oiled. He said that nitric acid was used to clean the rough emeralds, and then the crystals were oiled in a heated vacuum. Any kind of oil might be used, but cedar oil and balsam oil were usually the ones used. Joe stated that he has even seen 3-in-1 Oil even used in emerald treatment.

Joe said that the Colombian government office checked and sealed the bags of emeralds he bought, and then a government representative brought the purchased parcels to the airport via Brinks delivery. Official government agents even escorted him to the plane. Joe remarked that soldiers armed with semi-automatic weapons guarded the airport, and that their presence was everywhere. Joe also remarked that no pictures of the soldiers was allowed to be taken, and he said that each emerald mine employed its own army of guards.

Joe explained that emeralds have been mined in Colombia for over 1,000 years. The mine tunnels dug into the black shale mountains now have had air pipes installed to bring in fresh air from the outside. Many tunnels have been dug, and some tunnels have been sectioned out and even gated. The host rock for emeralds is a black shale with white calcite veins. Miners follow the calcite veins to locate the emerald crystals. Sulfuric acid made the air in the mines most foul, and the sulfuric acid fumes were extremely hazardous.

Paul Hlava said that pyrite is associated with Colombian emeralds. Paul explained that the black rock is a carbonaceous shale that has been brecciated. Carbonaceous means that it contained carbonate minerals. Calcite is the most common, but dolomite, siderite, aragonite, rhodochrosite are also possibilities. Paul said that Muzo emeralds are formed hydrothermally and are

found in calcite cavities. Iron is “sucked” from the shale and reacts with sulfur-rich ore fluids to form pyrite, but the chromium remains. Chromium enters the beryl crystals and causes the green color. Muzo emeralds, therefore, show a high color saturation of green.

Paul further explained that pyrite (yes, pyrite) helped to make the Muzo emeralds so beautifully green. He said that emeralds from the Muzo District of Colombia are prized for their pure, INTENSE, chromium-green color. Paul remarked that Dr. Terri Ottaway of the Royal Ontario Museum wrote an article, where she explained the geological cause of this pure color. Paul then related the “meat” of her article so most laymen could understand the process.

The article stated that Muzo emeralds are hosted in Cretaceous aged (65 to 135 million years old), carboniferous, and carbonaceous (carbon-bearing and calcite-bearing) shales, as well as similar sedimentary rocks. These shales are full of “dirt”, in addition to the carbon (which may actually be fine graphite) that stains black everything it touches. By “dirt” Paul meant a host of trace elements, such as iron (Fe), chromium (Cr), vanadium (V), manganese (Mn), cobalt (Co), zinc (Zn), copper (Cu), rare-earth elements (REE), et hoc genus omni. Some of these, such as Cr, Fe, and Mn, fit into the structure of beryls. Chromium in the shales is most welcome, as it provides the emerald-green color that we want to see in emeralds. Iron and the others are unwanted, because they “taint” the color. Because iron is so much more abundant than all the others combined, it is considered to be the main problem.

As in most mining districts, the Muzo saw a number of episodes of mineralization. Mountain building tectonics fractured the rocks and hydrothermal (hot and watery) fluids intruded along these fractures. These fluids not only introduced mineral material, but they also reacted with the stuff in the shales. The PRIME reaction occurred when the very sulfur-rich early fluids “sucked” most of the iron from the shales and deposited beautiful pyrite crystals in the veins (along with quartz, feldspar, and calcite crystals). Luckily, the beryllium (Be) needed for emerald came along in some of the last episodes of activity.

Paul said that this situation was very fortunate, because the iron was tied up and could not discolor the emeralds. Even later episodes might have broken and/or altered earlier emeralds into worthless grunge. Paul said that one may ask why the early sulfur did not “suck up” the chromium along with the iron. Paul explained that chromium has a very low propensity of forming sulfides. Chromium-sulfides do occur, but they

are rare and found in situations where lots of chromium and sulfur are forced together with little or no chalcophile (sulfur-loving) elements, like iron, present.

Paul said that the next time you see a matrix specimen of Muzo emeralds side by side with lots of pyrite crystals, you should thank those pyrites for helping to make the emeralds so exquisitely pure, intense, emerald-green!

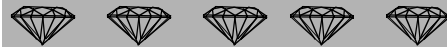
For those interested in reading the article by Dr. Terry Ottaway, her article, "Formation of the Muzo Hydrothermal Emerald Deposit in Colombia" was published in *Nature*, Volume 369, pages 552-554. Dr. Terry Ottaway is the Assistant Curator and Gemologist of the Department of Earth Sciences of the Royal Ontario Museum. The article was authored by her and T.L. Wicks, F.J. Bryndzia, L.T. Kyser, T.K. and Spooner, E.T.C. (1994).

Thank you, Joe Kast, for a fascinating talk of your gem travels. Many of us wished that we could have been with you to see all you that had seen. Such remarkable experiences you shared! Thanks also to Guild Vice-President and Guild Mineralogist, Paul Hlava for pointing out and further explaining the importance of pyrite in Muzo emeralds.



NMFG Awards Two Science Fair Winners

New Mexico Faceters Guild President **Scott Wilson** and Guild member **Bill Swantner** both served as judges during the Annual Northwest Regional Science Fair. They awarded a first place winner and a second place winner with savings bonds from the New Mexico Faceters Guild. The first place winner chosen was **Jane Song** of Sandia High School. Her project was "The Properties of Light", and she was awarded a \$100 savings bond with a year's free membership in the New Mexico Faceters Guild. The second place winner chosen was **Aron M. Hoffman** of South Mountain Elementary School. His project was "Reflection and Refractions of Lasers Through Glass and Water", and he was awarded a \$50 savings bond with a year's free membership in the New Mexico Faceters Guild. Congratulations to our recipients. We hope to have our savings bond winners present their special science fair projects during a future meeting of the New Mexico Faceters Guild.



Faceters Guild Workshop

by Nancy L. Attaway

The New Mexico Faceters Guild held a workshop at the home of **Steve and Nancy Attaway** on **May 11** that lasted all day. **Ernie Hawes** organized the workshop and served as its moderator. He was assisted by **Scott Wilson, Steve Attaway** and **Nancy Attaway**.

Nancy ordered pizza for lunch from Strada's and served coffee, chips and salsa, and baked a lemon cake with lemon frosting. **Rainy Peters** baked an apple crisp coffee cake, **Becky Hawes** made a strawberry cheese cake, **Doug Stone** made banana bread, **Scott Wilson** brought iced tea, and **Carsten Brandt** brought gourmet chocolates. Thank you all very much. We certainly eat well at these workshops!

Gary Peters worked with his Facetron machine on a specific pearshape design, and **Rainy** helped him with the instructions. **Carsten Brandt** worked with his RayTech Shaw on a stone we hope to see at the next meeting. **Laura Kirkpatrick** used one of Ernie's Facetron machines to begin the pavilion of a white topaz. She had to remove a large inclusion in the pavilion and was successful in eliminating almost all of it.

Doug Stone worked with his Ultra Tec machine on a round obsidian from the Jemez Mountains of New Mexico, and his daughter, **Aurelia**, worked on one of Ernie's Facetron machines to cut the pavilion of her stone. Doug finished his obsidian and placed an apex crown instead of a traditional table. Doug hand-constructs medieval musical instruments, like harps, and he plans to set some of his faceted stones into his hand-made musical instruments. A clever thing he did while faceting the crown was to polish each row of facets separately. He used a thin spectra polish lap and place it on top of his pre-polish lap, which hardly involved any re-aligning of the machine for polishing the facets.

Phil Callow worked on a cut corner square citrine on his Facetron machine. New Guild member **Ted Lopez** used Nancy's Facetron machine to cut the pavilion of a citrine in a large round. He was surprised how the rough stone evolved to be shaped, and he was very intrigued at how the facet arrangements were translated from the printed sheet of paper onto the stone.

We had eight folks actively faceting at this workshop. Thanks to all who participated. We all look forward to the next workshop on July 13 at the home of Steve and Nancy Attaway.



In the News

New Deposit of Black Spinel in Mexico

Source: Colored Stone May/June, 2002

When a lawyer in Mexico happened to find a piece of black spinel in the creek behind his house, it led to a sizeable new deposit of black spinel. With a hardness of 8 on the Mohs scale, Mexican black spinel takes a high polish luster, unlike Asian black spinel. Mexican black spinel also costs much less than black diamonds.

New Deposit of Fire Opal in Brazil

Source: Colored Stone May/June, 2002

A new deposit of fire opal was discovered during January, 2001 in the state of Piauí in Brazil. A few years ago, a sizeable deposit of fire opal was found in Rondonia, which is on the other side of Brazil. These developments have led miners to surmise that other deposits of fire opal may yet be unearthed in Brazil. With a hardness of 7 on the Mohs scale, the Brazilian fire opals are harder than the fire opals of Mexico.

New Faceted Emerald from North Carolina

Source: Professional Jeweler June, 2002

A section of emerald crystal was removed the pocket found earlier this year at the famed Hiddenite Mine in North Carolina. The piece yielded a faceted cushion cut gemstone of 1.76 carats. The gem's color is noted as superb with a lively sparkle. The gem contains some eye-visible inclusions under the table facet, including some liquid and a few two-phase inclusions considered typical of fine emerald. The stone has since been enhanced with clear oil. More pockets of emerald crystals are expected to be unearthed there this year.

GE Synthesizes Jadeite

Source: GIA Insider (on the Web) June 8, 2002

General Electric Gem Technology recently developed a proprietary process for the manufacture of synthetic jadeite. Early production samples sent by GE to the GIA Gem Trace Laboratory ranged in color and quality, but the finest green material rivaled imperial jade in appearance. The jade manufacturing process was said to involve a high pressure environment.

Recent Tanzanite Mine Fatalities

Sources: Washington Post (on the Web) 6/21/02 and JCK Monday (on the Web) June 24, 2002

Over forty miners are feared dead as a result of an oxygen pump failure in a tanzanite mine on June 20. Reports stated that 32 miners were registered to have been working in the mine when the pump failed. Also, the ten miners who entered the mine for the rescue were believed to have died. The mine is privately owned and located at Mererani in northern Tanzania. The bodies lie about 410 feet down in the mine and 985 feet along the shaft horizontally, and there is only one entrance to the mine. Miners were digging a new entrance above the rescue site. More equipment and manpower is being sought. The actual number of casualties may be higher than reported, due to the presence of illegal miners in the mine at the time of the accident.

Tanzanite Mine Closed After Fatalities

Source: JCK Monday (on the Web) July 1, 2002

The Tanzanian government suspended all mining in the north of the country after the latest mining accident. The failure of a fresh air pump caused the death of about 42 miners. The mining disaster occurred at Mererani near Mt. Kilimanjaro. Mining has been suspended until all the bodies have been recovered. The subjects lie about 410 feet underground and about 985 feet along a horizontal tunnel. Mining officials stated that 32 miners were registered to work in the mine at the time of the tragedy, but another ten miners were believed to have died in the initial rescue attempt.

Tanzanite mines are reported to be relatively primitive and operate without the proper safety equipment. Miners are usually young men who often stay underground while blasting. Miners use oxygen pumps fitted with long hoses to pump air down the shafts. The mines are actually small holes dug hundreds of feet deep and are considered very dangerous. In 1998, more than 50 people died when a heavy rain flooded the mines.

"Easy Answers to Rough Questions"

Lapidary Journal July, 2002

Paul T. Ahlstedt, moderator of Faceters Digest on the Web, wrote an article about a novice's guide to selecting facet-grade rough. He recommended paying attention to clarity, color, shape, and the eventual finished value. He also discussed inspection techniques.



Facet Designer's Workshop

By Ernie Hawes



Inspirations From The Past

Again, in this issue, we have new designs based on old patterns. The first is a new kite design by Nancy Attaway that she created based on old pieces of jewelry she saw as a child, and the second is an emerald brilliant that I designed based on an old pattern by Tom Ricks. As most of you know, Nancy designs by cutting the ideas in her head, while my ideas are first put into the computer, where I may make numerous adjustments and/or refinements before cutting. Both methods work, as you can see in the diagrams we present to you here. Nancy's comments regarding her design follow.

"In my continuation to combine the old with the new, I recently completed the design for the *Antique Kite*. The *Millennium Magic* I designed nearly three years ago combined a square with a marquise shape. I have always wanted to do something similar with a kite design. I faceted several kite designs over the years, but these incorporated a flat culet area for carving (for Steve's reverse intaglio carvings). This time, I wanted to have a kite diagram that used a traditional culet, where several facets met at a point. This kite design does just that. As usual, I began the design with a certain shape in mind, a particular shape for a kite. The design for the pavilion evolved as I found placements for the pavilion facets. I must admit that the flow for this design was somewhat bumpy and did not come in as easy as some designs have. More than a few days was needed for the design to become apparent. This kite diagram was more difficult to design than I had anticipated, but determination prevailed. I finally yielded a design that I am happy with and that will cut a

very interesting stone. The outer shape reminds me of shapes that I have seen in antique jewelry. As many of you may recall, I have a fondness for antique jewelry and have been inspired by the shapes and arrangements of antique jewelry I remember seeing in my childhood. My great-aunts and my grandmother allowed me to play with their jewelry as a very small child, and I can still see some of those pieces in my mind's eye. I do not think that we, as designers, should dismiss the old just because many people think that its time has passed. I believe that the past can live in new designs, that it can inspire new creations in stone and jewelry designs that show a flair for the new with a respect for the old."

Those of us who have been faceting for twenty or more years will likely remember the name, Tom Ricks. Younger faceters should become aware of him, because he was the man who made faceting fancy shapes much less cumbersome by developing the meetpoint method of faceting. Back in the late 1970's and early 1980's, Tom Ricks was designing a number of different patterns and publishing them in his guild's newsletter, *The Stonecutter*, as well as in *FACETS* and the now defunct lapidary magazine, *Gems and Minerals*. Of course, Tom did his design work the old fashioned way with pencil and paper and perhaps a calculator. Then, he cut the design to see if it worked. Most designers based their patterns on recommended angles provided by folks like Glenn and Martha Vargas, John Sinkankas, or Edward Soukup. Of course, ray tracing programs were off in the future, so tweaking a design to get the best scintillation and light return was not possible. If a design of that period did not have some areas with relatively low light return, then the designer was truly lucky. One goal that designers had back then was to come up with emerald-shaped patterns that showed a better light return and scintillation than was obtained with the standard step cut. Tom made some attempts with this with his *Brilliant Pavilion Emerald* and *Octo Brilliant Pavilion*, published in the March, 1978 issue of *FACETS*. Both patterns have significantly more scintillation and appear to be brighter than the step cut emerald, and so these designs were widely used by many faceters.

I was looking in *DataVue2* for an emerald brilliant design recently and came across the designs by Tom Ricks. I had cut one of them a number of years ago and remembered that it looked really nice. However, that was before the invention of GemCad. I was also looking for a design that would fit an 8x10 mounting, which Tom Ricks' patterns would not. I decided to use the basic arrangement of the facets in Tom Ricks' pavilion,

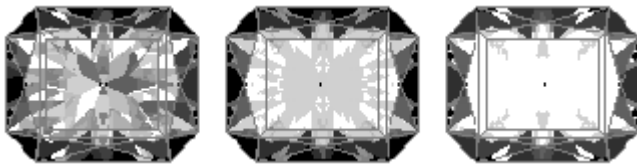
but I reworked the angles so that they would fit an 8x10 ratio and hopefully give better scintillation and light return. I also adjusted the index settings of the corner girdle and pavilion facets so that they would fit the traditional outline of the emerald cut. I chose to use a modified scissors crown to complete the design. As I cannot claim much originality for this pattern, I have decided to just call it **8x10 Emerald Brilliant**. The angles are for quartz, as that is what I was planning to cut when I went looking for a design. It is not the brightest pattern that I have ever come up with, but it has enough scintillation and light return to be a really nice looking stone. The design improves if the angles are changed for tourmaline or other higher RI stones. Just for comparison, here are the brightness percentages for a **Standard Step Cut Emerald** pattern, Tom Ricks' **Brilliant Pavilion Emerald**, and **Octo Brilliant Pavilion**, and the **8x10 Emerald Brilliant**.

Standard Step Cut Emerald



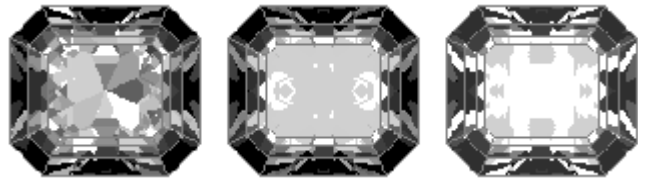
GemRay Brightness: COS = 66.8% ISO = 76.5%
 GemFrame 10 Degree Tilt Average Brightness:
 COS = 51.3% ISO = 62.2%

Brilliant Pavilion Emerald - (modified brilliant crown)



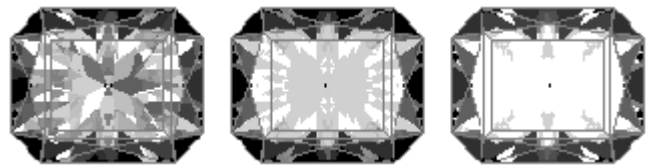
GemRay Brightness: COS = 47.6% ISO = 54.4%
 GemFrame 10 Degree Tilt Average Brightness:
 COS = 47.3% ISO = 56.7%

Octo Brilliant Pavilion - (step cut crown)



GemRay Brightness: COS = 52.8% ISO = 61.1%
 GemFrame 10 Degree Tilt Average Brightness:
 COS = 47.2% ISO = 56.5%

8x10 Emerald Brilliant



Brightness: COS = 59.7% ISO = 66.3%
 GemFrame 10 Degree Tilt Average Brightness:
 COS = 50.3% ISO = 59.6%

Examining these percentages, it becomes obvious that the **Standard Step Cut Emerald** is the brightest stone, both face up and tilted over a range of ten degrees. What the brightness percentages do not show is scintillation. All three of the designs with brilliant style pavilions have considerably more scintillation than the step cut design, and this results in a greater perceived brightness. Comparing the patterns, I find the step cut design to be fairly dull appearing, while the brilliant pavilion designs are all rather interesting. Obviously, the brightness figures alone do not tell the whole story.



Next NMFG Workshop

The next workshop of the New Mexico Faceters Guild will be held July 13 at the home of Steve and Nancy Attaway. We will begin at 9:00am and continue until 4:00pm. Ernie Hawes will have a sign-up sheet at the meeting July 11. See you there.



Photos of the NMFG Workshop



Top left photo: Carsten Brandt has a great time faceting and smiles as he works.

Bottom left photo: Scott Wilson instructs girlfriend, Kathy Luecki on faceting the girdle of her first stone.

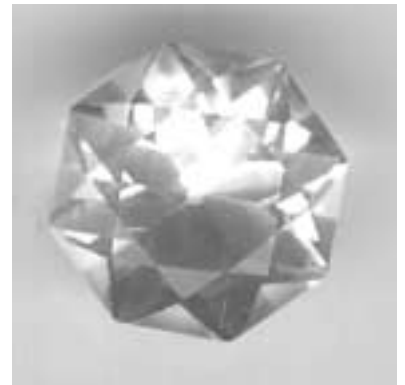
Photos by Gary Peters



Top right photo: Ernie Hawes instructs Aurelia Stone on a fine point of faceting.

Photo on right: Aurelia Stone's faceted white topaz, her first stone.

Photos by Gary Peters



New Guild member, Ted Lopez learns to facet his first stone on Nancy's Facetron.

Photo by Gary Peters





Obituary: John Sinkankas (1915 - 2002)

Sources: *JCK Monday (on the Web)* June 10, 2002; *GIA Insider (on the Web)* June 8, 2002; *Lapidary Journal* July, 2002; *Rock and Gem* August, 2002

John Sinkankas, famed gemologist and author, died in San Diego two days after his 87th birthday. John Sinkankas was a noted expert in the fields of gemology, mineralogy, and the lapidary arts. He made lasting contributions to gemological and mineralogical literature, bookbinding, and gem and mineral collecting, as well as gemological and mineralogical history.

The minerals he found near his home town of Paterson, New Jersey inspired John Sinkankas' interest in mineralogy, geology, and gemology. As a boy, he would collect the various rocks and minerals found while he scouted the nearby hillsides and quarries. He earned a B.S. degree from New Jersey State Teachers College. After a 25-year career as a pilot and commander in the US Navy, John Sinkankas moved with his wife Marjorie to San Diego in 1961. He served in World War II as a submarine hunter, and he retired with the rank of captain.

John Sinkankas joined the staff of *Lapidary Journal* in the early 1960's and wrote many articles on gems and gem cutting. He continued his writing and had hundreds of articles published in the hobby and professional journals that included *Lapidary Journal*, *Gems and Gemology*, *Journal of Gemology*, *Gems and Minerals*, *Rock and Gem*, *Rocks and Minerals*, *Mineral Digest*, *Mineralogist*, *American Mineralogist*, and *Mineralogical Record*.

John Sinkankas and his wife operated Peri Lithon Books, one of the country's finest dealers in antique books on earth sciences. For forty years they collected nearly every book and major work related to the study of gems and jewelry. Their fabulous collection of over 14,000 books and manuscripts included 29 different editions of *Pliny's Natural History*, considered the most highly regarded academic treatise of all time. GIA acquired their collection in 1988, which now resides in the specially designed humidity- and temperature-controlled Cartier Rare Book Repository and Archives.

John Sinkankas authored a list of fifteen books that included *Gem Cutting: A Lapidary's Manual*, 1955; *Gemstones of North America*, 3 volumes, 1959, 1976, and 1997; *Gemstones and Minerals: How and Where to*

Find Them, 1961; *Mineralogy for Amateurs*, 1964; (*Van Nostrand's*) *Sinkankas' Standard Catalog of Gems*, 1968, retitled in 1988 as *Standard Catalog of Gem Values*; *Gemstones and Mineral Data Book*, 1972; *Emerald and Other Beryls*, 1981; *Gemology: An Annotated Bibliography*, 2 volumes, 1993; and *Humboldt's Travels in Siberia: 1837 - 1842*, 1994; *Prospecting for Gems and Minerals*, 1970, revised in 1989 as *Field Collecting Gems and Minerals*.

The mineral *sinkankasite* was named in his honor in 1984. It was a new phosphate mineral so named.

John Sinkankas was also a watercolor artist. He used his precise line drawings and beautiful watercolor illustrations for *Gemstones of North America* and *Emeralds and Other Beryls*.

John Sinkankas was a Graduate Gemologist of GIA. He was made a Fellow of the Mineralogical Society of America in 1967 and was an honorary Fellow of the Gemological Association of Japan. He held many honorary memberships in numerous professional mineralogical, gemological, and science organizations. He was given the first individual Carnegie Mineralogical Award in 1988, and he received GIA's Distinguished Associate Award in 1982. William Paterson College awarded John Sinkankas an honorary Ph.D. in 1982.

Two of John Sinkankas' gem carvings are on display in the Gem Hall of the Smithsonian's Natural History Museum. These are a 7,478-carat rock crystal quartz egg on a sapphire-studded stand and the world's largest faceted step cut golden beryl of 2,054 carats.

The list of contributions made to the fields of mineralogy and gemology by John Sinkankas is very long and quite remarkable. John Sinkankas channeled his passion for gems and minerals through his writing, his research, and his skills in the lapidary arts. He inspired people the world over with his multi-faceted talent. He will be missed by family, friends, and colleagues. John Sinkankas left an amazing legacy for us all to treasure.



New Mexico Faceters Guild Website

The New Mexico Faceters Guild website may be accessed at: www.attawaygems.com/NMFG. The site contains many interesting articles written by Guild members, informative reports on our guest speakers, and gemological articles composed by Guild Gemologist, Edna Anthony. We plan to update the archives.



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 Elaine and Al Weismanalmgtcons@aol.com
 Scott Wilsonswilson@copper.net

Alpha Taurus For Sale

As many local faceters know, I have more machines that anyone with good sense needs. I just bought a new Alpha Taurus to use as my primary machine. Although I want to keep some of the other machines to use in the Guild's workshops, I have decided to offer the two older Alpha Taurus machines for sale. Both have been carefully calibrated by me and are in good working condition. Each has a 96 index gear and comes with a basic set of laps and a standard set of dops. New Alpha Taurus machines, without laps, list in Alpha Supply's catalog for \$2,250. I will take \$1,100 for the older one and \$1,200 for the newer one. I will even throw in some gem rough to sweeten the deal. Call me, Ernie Hawes, at (505) 821-3201 if you are interested. I can also be reached by e-mail at ehawes7@comcast.net.



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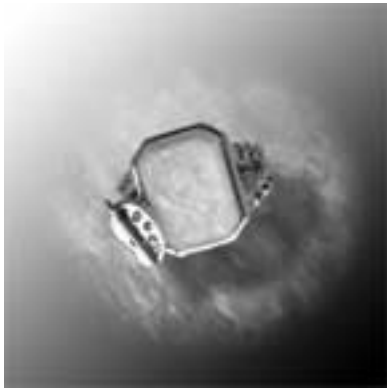
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FOR SALE

Graves Mark IV

John Roberts, a former member of the New Mexico Faceters Guild has for sale a Graves Mark IV faceting machine. Ernie Hawes has examined the unit and believe it to be in very good condition. The machine comes with 96, 64, 32, 80, and 120 index gears, 65 dops with a wood holder, two 45 degree dops, a transfer block, and two notebooks full of faceting designs. No laps are included, as John will use them on another machine. John is asking \$500 or best offer. For those interested, please call John at (505) 299-8209.



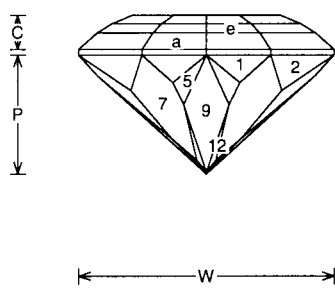
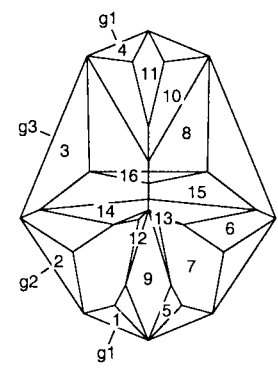
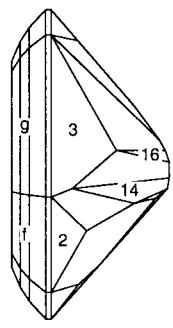
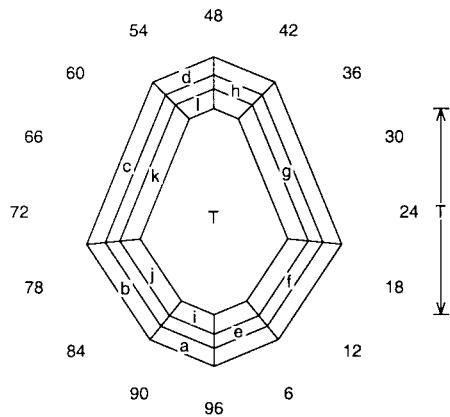
Top photo: A custom ring in 14Kt. yellow gold designed by Edna Anthony and rendered by Henry (Tony) Anthony, set with a faceted opal tablet that was cut by Nancy Attaway. The opal serves as an artist's canvas, with an artist's palette and paintbrush in gold beside it. A yellow sapphire, a ruby, an emerald, and a sapphire are flush set in the palette to represent four paint colors.



A custom pin in 14Kt. yellow gold designed by Edna Anthony and rendered by Henry (Tony) Anthony that represents an amaryllis flower. A carved Oregon sunstone done by award-winning gem carver, Will Cox, serves as the actual flower.



A custom pin in 14Kt. yellow gold designed by Edna Anthony and rendered by Henry (Tony) Anthony that represents cattails bending in a breeze. Three freshwater pearls in a soft pink hue serve as the actual flower tops.



Antique Kite

By Nancy Attaway

Angles for R.I. = 1.54

55 facets + 8 facets on girdle = 63

1-fold, mirror-image symmetry

96 index

$L/W = 1.205$ $T/W = 0.801$ $T/L = 0.665$

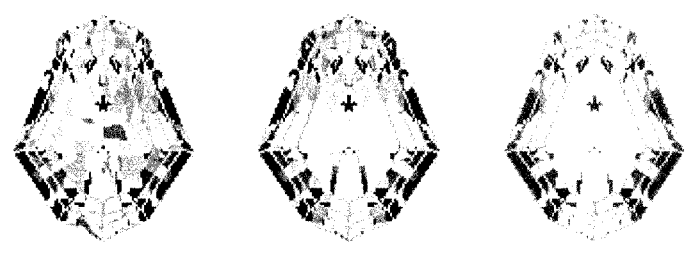
$P/W = 0.464$ $C/W = 0.133$

$H/W = (P+C)/W + 0.02 = 0.618$

$P/H = 0.752$ $C/H = 0.216$

$Vol./W^3 = 0.236$

Average Brightness: COS = 55.1 % ISO = 71.8 %



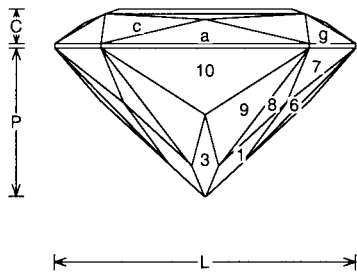
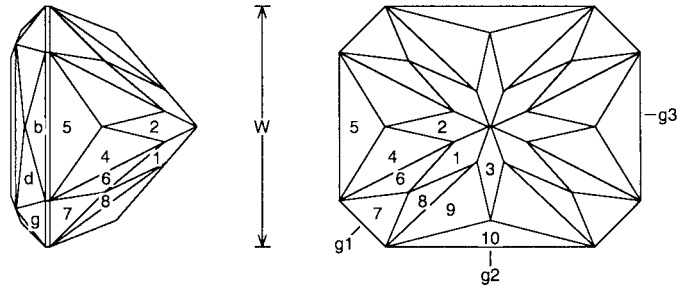
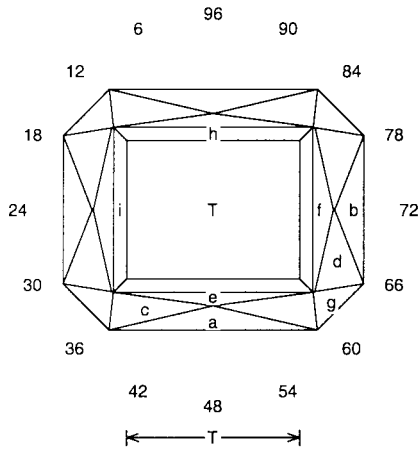
PAVILION

g1	90.00	06-42-54-90
g2	90.00	15-81
g3	90.00	30-66
1	55.00	06-90
2	55.00	15-81
3	55.00	30-66
4	50.00	42-54
5	45.00	03-93
6	45.00	18-78
7	45.00	12-84
8	45.00	33-63
9	42.00	96
10	42.00	39-57
11	41.00	48

12	42.00	09-87
13	42.00	15-81
14	42.00	21-75
15	42.00	24-72
16	42.00	30-66

CROWN

a	45.00	06-90
b	45.00	15-81
c	45.00	30-66
d	45.00	42-54
e	35.00	06-90
f	35.00	15-81
g	35.00	30-66
h	35.00	42-54
i	25.00	06-90
j	25.00	15-81
k	25.00	30-66
l	25.00	42-54
T	00.00	Table



8x10 Emerald Brilliant

By Ernie Hawes

Based on pavilion design by Tom Ricks

Angles for R.I. = 1.54

57 facets + 8 facets on girdle = 65

2-fold, mirror-image symmetry

96 index

$L/W = 1.250$ $T/W = 0.720$ $T/L = 0.576$

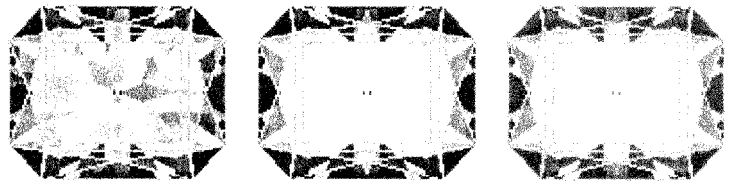
$P/W = 0.615$ $C/W = 0.143$

$H/W = (P+C)/W + 0.02 = 0.778$

$P/H = 0.790$ $C/H = 0.184$

$Vol./W^3 = 0.414$

Average Brightness: COS = 59.7 % ISO = 66.3 %



PAVILION

1	42.00	12-36-60-84
2	42.60	24-72
3	40.90	96-48
4	43.70	22-26-70-74
5	49.00	24-72
6	42.45	14-34-62-82
g1	90.00	12-36-60-84
7	45.00	12-36-60-84
8	43.75	10-38-58-86
9	46.00	06-42-54-90
10	68.30	96-48
g2	90.00	96-48
g3	90.00	24-72

CROWN

a	45.00	96-48
b	35.00	24-72
c	38.00	01-47-49-95
d	31.00	23-25-71-73
e	22.00	96-48
f	23.00	24-72
g	45.00	12-36-60-84
h	20.00	96-48
i	20.00	24-72
T	00.00	Table



**Don't forget:
next meeting
is July 11,
2002 at 7:00 pm.**

**Meeting Location:
New Mexico Museum of
Natural History.
Fees are \$20.**
