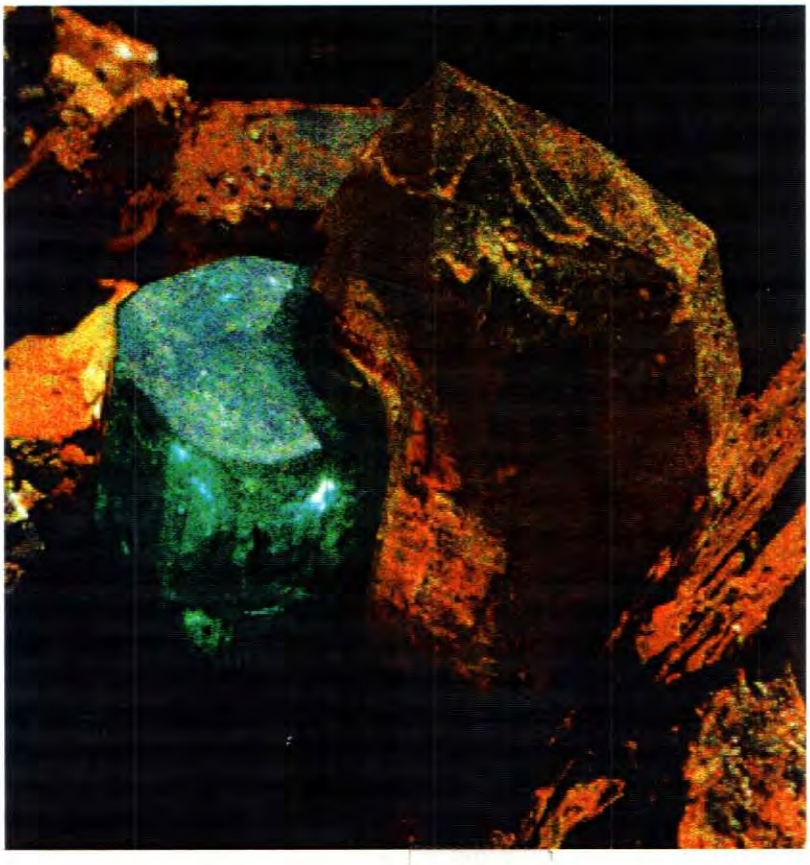
CORNERSTONE
Journal of the Accredited Gemologists Association

Dancing Along the Yellow Brick Road to the Emerald City: Hiddenite, North Carolina... New Source of Gem-Quality Emeralds!

by Antoinette Matlins, PG

Antoinette Matlins, PG, is the daughter of AGA Founder Antonio Bonanno, FGA. She is a highly respected author and educator. Her latest books include Colored Gemstones: The Antoinette Matlins Buying Guide and Jewelry & Gems At Auction: The Definitive Guide to Buying & Selling at the Auction House & on Internet Auction Sites (Gemstone Press, Woodstock, VT, www.gemstonepress.com).

An emerald discovery in Hiddenite, North Carolina is making gemological—and geological—history. Located in the rolling foothills of the Appalachians, among the oldest and most weathered part of this mountain chain, Hiddenite has long been associated with a wide range of minerals, including emerald, ruby, sapphire, and hiddenite (the rare, deep green member of the spodumene family). Yet despite the presence of so many varieties, there has never been anything of particular note in terms of quality or desirability. Until now.



In the late 19th century, Thomas Edison sent professor William Hidden and George Frederick Kunz (the 19th-century gemologist-author who was curator of the gem collection at New York's American Museum of Natural History and chief gemologist for Tiffany & Co.) to the area to seek platinum for light bulb filaments. They didn't find platinum, but Hidden discovered "Hiddenite," which, along with the town itself, was named in his honor. Together Kunz and Hidden noted 63 different gems and minerals, referring to the fault line running through this area as "the most complex geological zone in the world."

Over the years since that time, Hiddenite has attracted several mining companies and thousands of rockhounds, yet no one found anything exceptional, nor did the area appear to be commercially viable as a source for emerald. Until 1998, the most significant emerald to have been unearthed in Hiddenite was a 13+ carat faceted emerald purchased by Tiffany and Co. in the early 1970s and named "The Carolina Emerald." Its unveiling generated extensive publicity and excitement

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AGA is a nonprofit research, education and ethics organization benefiting professional and avocation gemologists as well as consumer interest. Membership programs include advanced gemological education seminars, workshops, and the AGA Certified Gemological Laboratory Program.

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President's Corner

David L. Harris, AGA President

2002 has now become part of history and we begin to move forward into 2003. We have seen this year struggle through stock market uncertainty, corporate scandal, slow economic growth, and loss of confidence in our future. This seems to be the national theme according to the news we see and hear daily.

My outlook is quite different than doom and gloom. Today we have the opportunity to achieve more individually and as an organization if we are willing to plan and work hard. The downturn in any economy is a weeding out of the weak, poorly managed businesses, and of those profiteers who jump in for the quick buck, riding the high times then abandoning the industry. Many in our organization have been in the industry for many years and have survived the ups and downs of several economies, as well as changes in the industry. AGA is now at the point in its history to concentrate on those individuals who wish to make long-term commitments to the industry. We have young people entering the field that need our support, knowledge and guidance.

I have read many times that in order to be considered a successful business or individual, you must have cultivated someone to take your place in business or life. In life, this should be our children to continue on in our names and values. In business or organizations, it should be someone with energy, ethics, sound business skills and knowledge, and enthusiasm.

AGA is at the crossroads. We must select and promote new members with those traits, support them with our knowledge from the previous officers and members, and understand with new voices come new changes. We should continue to be that organization which allows individuals and organizations with new theories to voice them and prove them. We should always promote and sponsor continuing advanced education in gemology.

This *Cornerstone* is an example of the past moving into the future. It is now an annual publication with updated color photography, the most current viewpoints to be studied, and educationally challenging articles. Inside is a form for each member to complete and fax back to me. (See page 23.) Give the questions some thought prior to returning. The Officers and Board of Governors will review them and incorporate this information into future planning.

I look forward to seeing you in Tucson and/or hearing from you via the survey form. Thank you for your continued support of the AGA and the Jewelry Industry.

David L. Harris

The AGA is a society of professional gemologists with the purpose of supporting communication on gemological issues through education and publications.

Gem-Quality Emeralds

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and was described as one of the rarest gems ever discovered in America. Its estimated value at that time was $200,000.

Although several nice emeralds have been found over the years, most are too pale or opaque to have jewelry value. But a discovery in 1998 has changed the emerald landscape. In the fall of 1998, James (Jamie) Hill, President and CEO of North American Emerald Mines(the company created by Hill to market and promote Hiddenite emerald) announced the discovery of a vein yielding large, gem-quality emeralds.

Knowing the history of "North Carolina" emerald, it was hard to believe. Nonetheless, I decided to make the trip to Hiddenite to see the emeralds for myself. My skepticism was quickly replaced with enthusiasm and excitement!

As I stood at the top of a hill overlooking the 94-acre parcel owned by Hill's family on that cool, damp day in 1998, all I could see was a lot of red clay, trees, and hilly terrain with some rock outcroppings. Hill's initial mining operation consisted of a 3-man operation, using shovels, picks, and a couple pieces of second-hand "heavy equipment" that were used to remove surface soil and rock in order to expose a particular type of "vein." Hill followed rock "veins" that contained a combination of limonite (powdery yellow substance from decomposed pyrite), pyrite, mica, and quartz, looking for emerald-bearing "pockets" within the vein. Hill explained that every emerald he'd found at that time had been the result of following veins that contained this particular combination of minerals, until he hit a pocket; he would then reach into the pocket, feel around for crystals, and bring out whatever he felt.

Not all of the pockets he had opened contained emerald, but all of the emerald he had recovered had been found in one of these pockets, alongside small hiddenite crystals and perfectly terminated quartz crystals—smoky and colorless. The formations appeared to be the result of hydrothermal formation.

That first major discovery in the fall of 1998 included two of the largest and finest crystals ever unearthed in North Carolina—a 1000-carat crystal he named The Jolly Green Giant, and a 70+-carat crystal of exceptional color and brightness. The 1000-carat crystal had fine color and was very well formed but it was not fine enough for faceting. The 70-carat emerald crystal was a different matter; it yielded two extraordinary gems—a 7.85 carat oval named "The Carolina Prince," and an 18.88 carat pear-shape named "The Carolina Queen." The Prince sold for $500,000 to a North Carolina collector who wanted a piece of "North Carolina History-In-The-Making."

The Carolina Queen is currently regarded as the rarest emerald ever discovered in America, the largest and finest ever recorded. In size, overall quality, and in its rich, deep green color, this 18.88 carat emerald far surpasses any faceted emerald discovered in America up to this time, including Tiffany's "Carolina Queen," which is much paler in color, lacks the intense brightness of the Queen, and is more included. C.R. "Cap" Beesley, Director of American Gemological Laboratories in New York City, describes this historical gem as "the largest, finest, and most significant emerald ever found in America." A report issued by Analytics Research & Development, Inc., describes the stone as "the largest and finest recorded gemstone to be recovered in North Carolina to date." The Queen is now owned by a North Carolina syndicate.

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In addition to the two large crystals, Hill also extracted other crystals, the total yield at that time being over 3,000 carats.

Unfortunately, that was the end of the story until January 2002, because Hill was temporarily stopped from further mining by the State of North Carolina. Following publicity and the announcement by Hill of his intention to increase his mining activity, the State changed the status of the site from "prospecting" to "commercial mining." This meant Hill had to undertake the expensive and time-consuming task of meeting the State ecological and other requirements in order to obtain the commercial mining permits necessary to continue.

Steps to comply with State requirements resulted in Hill and his team having to move many tons of red-clay, which revealed a massive rock dome that no one knew existed below the clay. It was daunting—the first images that came to my mind upon seeing it in January, 2002, were the early images of the surface of the moon. It revealed geological "folds" of rock going in every direction, and "veins" criss-crossing its surface everywhere. It was certainly easy to understand what Hidden and Kunz meant by "complex geology."

Hill and his team didn't know where to start, but Jamie had an idea: why not use subterranean radar imaging in a small area of the dome to see if it would reveal any of the "pockets" sought by Jamie? Jamie had actually looked into this at an earlier stage, but had abandoned the idea when he learned the radar could not penetrate the red clay. But now, without the red clay, it was a different story. He immediately contacted a

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Gem-Quality Emeralds

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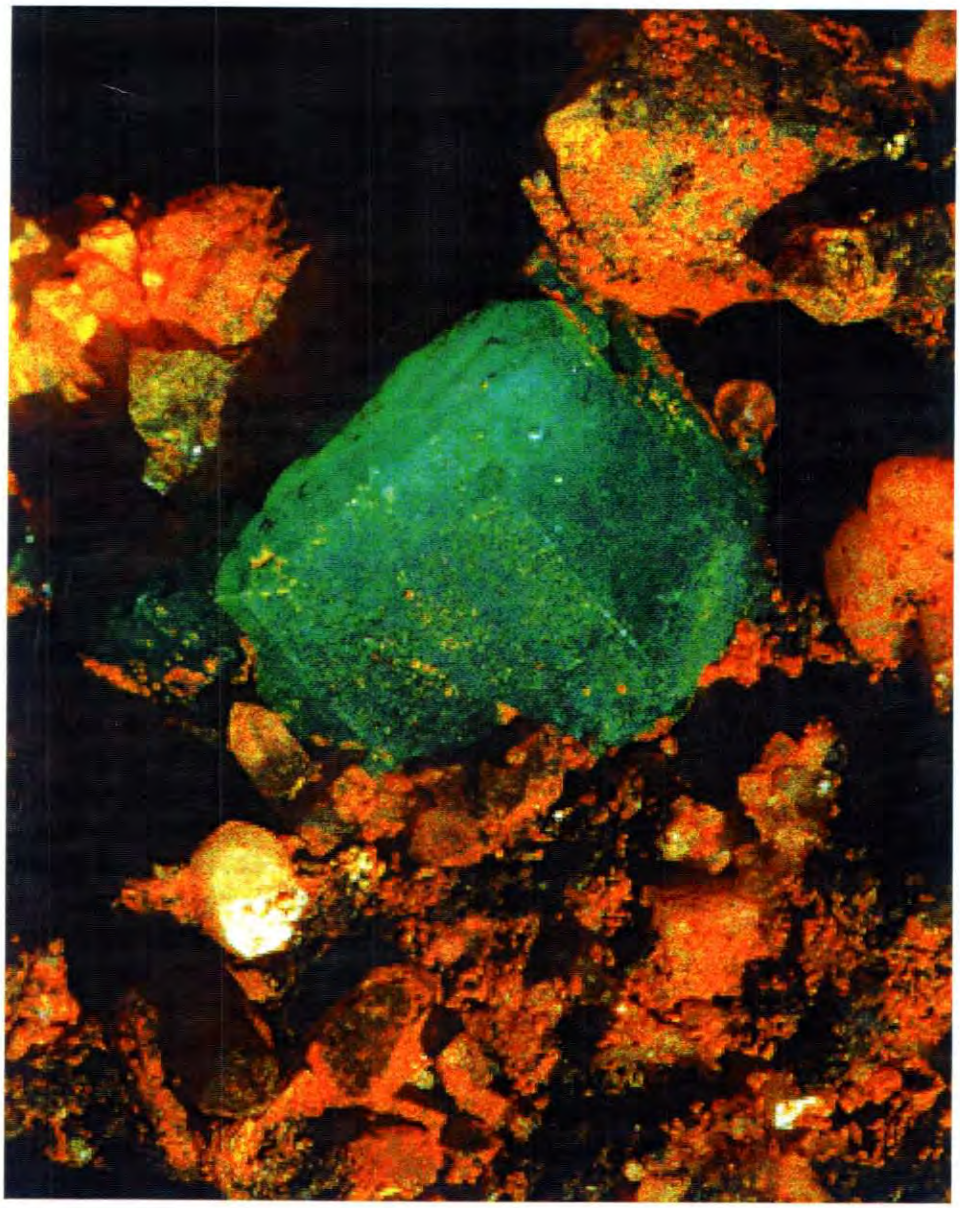


company specializing in this high-tech procedure, and retained them to use subterranean radar imaging across a small section of the rock dome (approximately 1/4 acre). He hoped that the radar would pinpoint the pockets and, in essence, show him where to start digging first.

On Friday afternoon, January 11, they began taking subterranean images of the dome, which revealed numerous pockets. Hill and his team proceeded to pick one of the largest pockets—about 4 feet by 12 feet—to open first. At the entrance to the pocket, two very large, deep green, glow-in-the-dark emerald crystals sparkled at Hill and his two-man team. The 70+-carat emerald rough which Jamie had unearthed in 1998 no longer held the record as the most important emerald ever found in America; the new title was now claimed by the "twin crystals!"

The two emerald crystals remain "in situ," exactly as they were uncovered. The entire "pocket" was excavated from the hardrock dome by removing a huge block from the site, retaining the emerald crystals within the matrix, along with two large, perfectly terminated quartz crystals that crystalized alongside each emerald. There may be additional crystals within the pocket, but it remains unopened, in order to preserve the amazing natural "twin crystal" formation.

It is impossible to know their exact weight, but the exposed area of the largest appears to be about 100 carats, and the smallest about 40 carats. However, depending upon how far they penetrate into the rock wall, they could be larger. In the days immediately following, another 12 large emerald crystals were extracted from the surrounding area.

These initial finds are generating tremendous excitement within the geological and gemological communities. Cap Beesley has conducted extensive research at the site, and studied large numbers of emerald crystals from this locale, as well as all of the gems from this site that have been cut and polished to date. He has already identified several criteria for positive confirmation of origin, and other distinctive identification features may be identified over the coming months. The gemological data given below is courtesy of C.R. Beesley, Executive Director of American Gemological Laboratories and Gemcore, New York City.

The Smithsonian Institution in Washington, DC, has sent chief geologist, Dr. Michael Weiss, to the site to study its unique geology. Of particular interest is the perplexing association of specific minerals. For example, what accounts for the unusual occurrence of very large, perfectly terminated, quartz crystals alongside emerald crystals? Or, Hiddenite crystals in hardrock matrix? And while pondering these questions, a new and even more puzzling discovery was made in June, 2002. A state geologist was brought in to collect some random samples of the hardrock to be sent off for analysis in order to help Hill figure out where/how to best go about removing the tons of hardrock that were piling up at the site and inhibiting the mining operation. The samples were sent to Ledoux & Company to by assayed. Ledoux reported

that the rock samples submitted to them had unusually high concentrations of numerous precious metals, including gold, platinum, palladium and rhodium!

The full potential of the site as a source of precious metals cannot be determined without much more testing, including more core drilling, but it is another "first" at this location from a geological perspective. And it poses yet another question: How is it that gold and platinum occur together here, in such high concentration, and as associative elements in an emerald site?

"...it is another 'first' at this location from a geological perspective. And it poses yet another question: How is it that gold and platinum occur together here ... as associative elements in an emerald site?

These and many other questions are being raised at Jamie Hill's "dome," and the answers may bring a new understanding to geology, and change many current beliefs. It's a story to which we must stay tuned. But whatever unfolds in the future, we now find—100 years after Edison sent Hidden and Kunz in search of platinum—that Edison was right: platinum does, in fact, exist in Hiddenite. But whoever dreamed of Hiddenite becoming America's Emerald City? ▲

Unique Gemological Characteristics of Emerald from Hiddenite, NC, from the "James Hill 'Dome' Site"

What is most extraordinary about these recently uncovered emeralds is not size but overall quality. It is also important to note that "origin" of emerald from this locale can be definitively established from gemological characteristics. Here is a summary of identifying characteristics that have been noted to date, based on extensive research conducted by American Gemological Laboratories and Gemcore (New York City), under the supervision of C.R. Beesley.

Color. The color is particularly noteworthy—a deep, rich green comparable to fine emeralds from important sources such as Colombia. The color results from the presence of chromium, and reactions through the Chelsea filter range from moderate to very strong red, depending upon the depth and evenness of the color. It should be noted, however, that in some crystals the color has been found to occur in zones. In cases where the color-zone is very narrow or confined to a small portion of the stone, you may observe no noticeable reddish reaction through the Chelsea filter, regardless of the face-up color. In the finest material, the reaction through the Chelsea filter is very strong red, comparable to the reaction seen in material from Colombia.

Those present at the AGA presentation in Las Vegas in June saw several cut and polished emeralds from the James Hill location and were amazed by their color and strong red reaction through the Chelsea filter. Perhaps most impressive was a faceted 1.76 carat cushion shape, which exhibited a superb green color and startling brightness.

Refractive Index. The refractive index of this new material is consistently high, and contributes to the unusual brightness seen consistently in the cut and polished material. The RI ranges from 1.579 on the low end to 1.589 at the high end.

Spectral Characteristics. Spectral characteristics are distinctive and provide an immediate key to origin of Hiddenite emerald, and to distinguishing it from other chromium-type emerald, including those from Colombia. However, its unique spectral characteristics may not be seen if observing the stone with a hand-held spectroscope model. The specific spectral characteristics will be published in an upcoming article.

Fluorescence. All of the material examined to date exhibits a unique fluorescence—a faint yellowish or bluish chalky fluorescence under shortwave. Such fluorescence has not been observed in emeralds from any other location. To detect the fluorescence, you must examine the stone in a darkened space, on a flat black surface (such as a black velvet pad), holding the UV lamp right up to the stone.

Distinctive Inclusions. Inclusions of rutile needles provide definitive, positive confirmation of Hiddenite, NC origin; inclusions of rutile needles have not been found in emerald from any other locality. Rutile inclusions may not be present, however, and some of the inclusions seen in this material are consistent with other localities. No three-phase inclusions have been seen in the material examined to date, but as more material is examined, other unusual inclusions or combinations may provide additional keys to Hiddenite origin.

Storm Over Sapphire

The FTC's jewelry industry guidelines require that gemstone enhancements be disclosed. But identifying the new high-temperature-treated sapphires coming from Thailand is turning out to be more difficult than anyone imagined.

by Gary Roskin, GG, FGA, Senior Editor

Sapphire photographs by Gary Roskin, courtesy of Philip Zahm, Sara Gem, and OMI Gems

The controversy over the treated pink/orange "padparadscha-like" sapphire coming from Thailand is becoming more complex as research gemologists in the major laboratories study the stone's chemistry, trying to figure out what's creating the color. In fact, the investigation is expanding to most color varieties, including Mong Hsu and Songea ruby and blue-green, yellow, orange, and purple sapphires.

The decades-old surface-diffusion treatment of blue sapphire was 100% detectable—we knew how the color was introduced. But the new high-temperature sapphire enhancement performed in Thailand remains a mystery: We don't know how it enhances color.

It's synthetic.

In an online newsletter, Ken Scarratt, director of the American Gem Trade Association's Gem Testing Center, claims the high-temperature-treated sapphire has been altered to the point of recrystallization—using flux melts the surface of the heated sapphire, and when it cools, it recrystallizes, producing a synthetic surface.

"This is nothing new," says Dr. Henry Hänni, director of the Swiss Gemological Laboratory (SSEF) in Basel. But Hänni says the synthetic surface layer is "polished off." He's more concerned about the use of high temperature and flux for fracture healing. Hänni has shown that during heat treatment, fractures are indeed healed by synthetic corundum.

But Scarratt shows that synthetic features remain on the surface of some repolished sapphires that have undergone the new enhancement. And it's not always identifiable. "The aggregate-like deposition of synthetic corundum at the surface of these newly treated stones typically can be evidenced by the multiple grain boundaries seen just below the polished surface of the stones," explains Chris Smith, director of the Gübelin Laboratory in Lucerne. "However, sometimes with this new treatment, as well as with the more conventional heat treatment, the surface deposition of synthetic corundum can be more homogeneous or epitaxial [having the same orientation], and therefore it becomes much

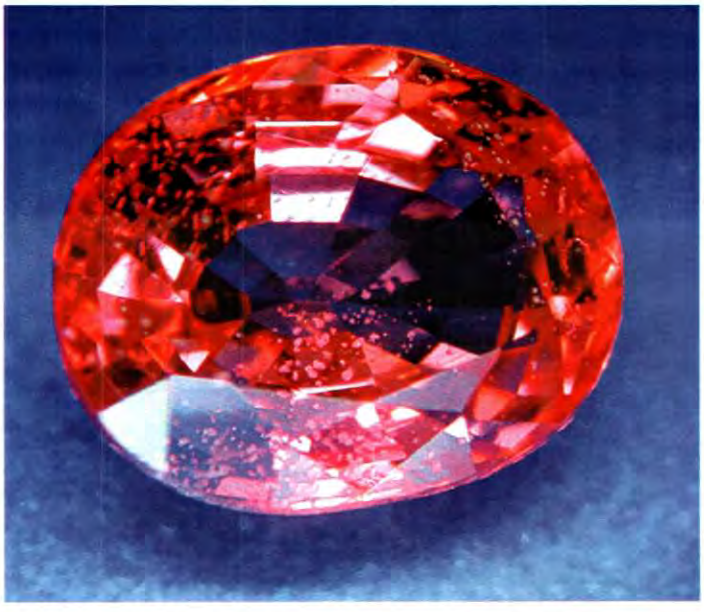
[having the same orientation], and therefore it becomes much more difficult to identify."

Moreover, the color of some treated material is not just confined to the surface layer but is diffused throughout the gem, making it virtually impossible to identify the type of treatment. "You can tell that the stones have been heated," notes smith, "but in relation to their origin of color, when the coloration is uniform throughout the stone, it is very difficult to distinguish it from more traditionally heat-treated fancy-color sapphires and rubies of the same hue."

What controversy?

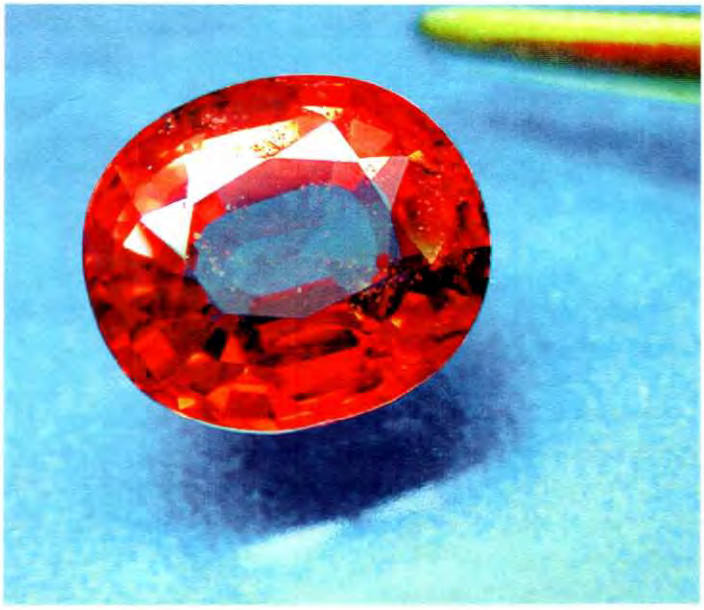
According to a march 15 report from Thaigem.com (an online supplier of colored gemstones based in Thailand), the only controversy about this heat-treated sapphire is whether it "threatened the existing Padparadscha sapphire market." thaigem.com reported that Thai gemstone treaters feel that the brouhaha over their new treatment is a consequence of "an overly hasty tendency, on the part of certain gem labs at the start of the controversy, to question the legitimacy of the heating processes to which the sapphires had been subjected."

Says Scarratt: "We stated clearly that from the evidence that we had before us—the color distribution and the apparent trace element concentrations greater amounts of beryllium at the edge than in the center—the process used in the specific cases referred to was one of surface diffusion."



Gemstone alert.

Prior to February's Tucson shows, AGTA's Gem Testing Center sent out an "Urgent Gemstone Alert" that classified the padparadscha-like material as surface-diffusion treated. That message, later modified to exclude the term "surface-diffusion" (see "Four Labs Agree on 'Padparadscha' Terminology," JCK, May 2002, p. 34), probably was the single most important factor in saving the U.S. gemstone



market from becoming the dumping ground for a gem that now sells for pennies on the dollar.

The Thais cried foul, insisting that the new enhancement uses only high temperature and that no other elements were introduced. Then GIA found that beryllium had been added to the mix. But this effort was too late for some prominent Japanese gem labs that had already identified hundreds—possibly thousands—of carats of the material as solely heat-treated.

"The Thais are quite upset with the 'surface diffusion' identification, but that's because the sapphires are still in Thailand," notes Stuart Robertson, gem research director for The Guide. "And it remains the Thais' problem. It's all unsalable material at this point. The Japanese market has

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These stones and the ones on page 6 are now considered "bulk diffusion treated."

Storm Over Sapphire

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already been devastated." Robertson predicts that the entire sapphire market, ruby included, will take the kind of hit that emeralds—all emeralds, not just Colombian material—took after the Fred Ward emerald case. "Treatments must be accurately disclosed," says Robertson. "It's not just a matter of if, it's a matter of when this one will show up in the consumer news. People just don't accept these types of treatments, and especially not the way this was introduced."

On Feb. 28, the Thai Gem and Jewelry Traders Association (TGJTA) asked representatives from various labs and those performing the new treatment to meet and discuss several aspects of the treatment as well as its disclosure. The gathering included representatives of TGJTA, the Chanthaburi gems and Jewelry Association, AGTA, the Gemological Institute of America (GIA), Gübelin Gem Lab (GGL), the Gemological Association of Japan, Central Gem Laboratory (Japan), Swisslab (Bangkok), and—for the first time—representatives of the gemstone heaters of Chanthaburi, Thailand.

The beryllium factor.

It's unknown at this time if the new heat treatment adds anything to the stone to create more color. beryllium has been found in higher-than-average amounts in the new heat-treated stones, but, according to recent GIA research, beryllium itself does not produce color. "Investigation strongly suggests that beryllium is not the direct cause of the surface-related orange color layers," says AGTA's Scarratt. "However, it is possible that the diffusion of beryllium and perhaps other elements into the stone may be creating a reaction with the inherent chemistry in the corundum that gives rise to the yellow-to-orange coloration."

Crystal manufacturer Swarovski, which is also marketing natural colored gems, has concluded research that may shed some light on the beryllium factor: When natural light-yellow chrysoberyl was, at first, inadvertently heat-treated along with light-yellow sapphire rough, beryllium from the chrysoberyl transferred to the sapphire. But some sapphire doesn't change color, even when the beryllium is diffused into it.

Even if beryllium were the agent, positive identification of light elements like this is difficult and expensive. "No commercial lab today has the analytical capabilities to identify this," says Smith. "Theoretically, SIMS and laser ablation might be able to detect this process." He notes, however, that such services are not readily available to gem labs.

So the exact mechanism responsible for color change remains a mystery. Also unknown is whether any of the other induced elements play a role in color creation or if certain chemical requirements are necessary in the host material. "However," writes Scarratt, "these imponderables are largely academic, as: 1) color has been artificially created; 2) foreign elements have been added (diffused into); and 3) redeposition (synthesis) has taken place.'

AGTA's GTC and GIA's GTL will now identify these gems as "natural corundum, evidence of heating and of surface-related color created by bulk diffusion." When synthetic overgrowth is noted, the lab report will include "areas of synthetic overgrowth are present." For the moment, Hänni doesn't see a need to change policy. "There hasn't really been any new revelation as to the mechanism for this orange change," says Hänni. "Why should we change our policy? We say that it's treated." What about the gems with color change throughout, with no diffusion elements observed? "This happens when you heat silk in Sri Lankan stones," says Hänni. "It's a diffusion process. Color is redistributed."

The laboratory directors agree that much more discussion and research is needed before heat treatment's effect on gemstones is fully understood. This situation is nothing new. Smith notes that there are already many enhanced gems that do not reveal any identifying enhancement characteristics. The list includes chemical bleaching to "whiten" the color of pearls; irradiation to create amethyst from colorless quartz, create or intensify the pink color of kunzite, and create or intensify the pink to red color of rubellite; and thermal enhancement to lighten the color of some dark blue sapphire, create citrine from amethyst, modify the color of "Paraíba" tourmalines, and remove the green color component of aquamarine.

These enhancements are undetectable. Many more, such as HPHT-enhanced diamonds, are not 100% identifiable. And as enhancement technologies come closer and closer to recreating the ways in which Mother Nature has created gems, the labws may not be able to identify enhancements 100% of the time. "Today, in most cases we are in a position to identify a blue or fancy color sapphire and ruby as heated," says Smith. "But what exactly the heat treatment has accomplished, we may not always be able to determine." ▲

JCK Editor's note: *A compilation of gemstones and their treaments will be published by Chris Smith and Shan McClure of GIA's Gem Trade Laboratories in an upcoming issue of GIA's Gems & Gemology.*

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Opinion: On the Disclosure of Rubies and Fancy Sapphires Heat-Treated by the 'New' Method

by Ted Themelis

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For more than eight months gemological laboratories and gem trading associations have been trying to resolve issues surrounding the 'new' heat treatment process for yellow, orange and similarly appearing sapphires. Currently, the most pressing issue is how to disclose this treatment to the consumer in a way that is both scientifically correct and commercially acceptable.

The key parameters selected and used in the nomenclature of disclosure have varied widely and have depended, largely, on the target sought and the degree of accuracy desired in describing these treated gemstones. Unified guidelines and agreed methodology for defining the nomenclature of labeling these treated gemstones do not exist; while the disclosure of this treatment is subject to various interpretations that serve differing purposes.

The term *'bulk-diffusion,'* proposed as a description of corundums treated by this 'new' method, represents a generic term that specifies a type of diffusion treatment that can be applied to most substances, including gemstones. Although this term is scientifically correct, it ***does not*** identify the treated gemstone properly; neither is this term commercially acceptable to most gemstone traders.

Another proposed wording *'enhanced,'* although commercially acceptable, does not identify the product adequately. More importantly, it is ***scientifically incorrect*** since the entire lattice of the host corundum crystal treated by this 'new' heat treatment process is rearranged. This is ***not*** a simple 'alteration' of the chemistry and structure of the treated corundum.

Please consider this analogy… What is the difference between a lady who puts on casual make-up to enhance her appearance, and the same lady undergoing major plastic surgery, a face-lift, and/or silicon-injections to achieve the same purpose?

My proposed wording for this new heat treatment is:
HEAT-TREATED (with catalyst)™
(See note 1 on p. 11)

In my opinion, this wording is ***scientifically correct*** and (hopefully) commercially acceptable.

Here are the reasons for my choice of this descriptive term:

- The wording correctly identifies the process, i.e. that the corundum is **HEAT-TREATED**
- The wording indicates that a substance was used externally to influence the post-treatment colour of the corundum, i.e. that it was undertaken **WITH CATALYST**.

What, then, is a catalyst? Simply, it is a substance that accelerates a chemical reaction without itself being affected.

In heat-treating these corundums, the mineral chrysoberyl—that contains beryllium—is used as a catalyst in the chemical reactions taken place during the process. But, beryllium is ***not*** the direct cause of the induced colour; for beryllium is ***not*** a colour-bearing element and therefore it does ***not*** produce the colour in the gemstone.

Here is another analogy: In baking bread, yeast is used to accelerate the

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various enzyme reactions; but yeast does not make the bread.

I hope all gem trade associations will correctly understand and properly use this terminology; so those gemstones treated by this 'new' heat treatment will be described by terminology that is both scientifically correct and commercially acceptable. ▲

Note 1: The term HEAT-TREATED (with catalyst)© is a trademark of T. Themelis. This term can only be used with permission from the copyright holder, and must appear in all related references.

Madagascan sapphires before and after heat treatment with the 'new' method (From left to right above)

Column 1. Natural, non-treated Madagascan colourless, pale yellowish, light pinkish sapphires, before heat treatment, taken randomly from the same lot

Column 2. Natural, non-treated Madagascan colourless, light pinkish and salmon-pink sapphires, before heat treatment, taken randomly from the same lo

Column 3. Natural, non-treated Madagascan greenish to yellow-greenish chrysoberyl

Column 4. Natural, non-treated Madagascan chrysoberyl with significant concentrations of beryllium, i.e. above the normal level

Column 5. Madagascan sapphires taken from the same lot and heat-treated under the 'new' method. Note the abnormal colour concentrations at the rim and at the centre. One treated sapphire developed a 'blue halo' colour patch, while another sapphire turned to blue but with an inhomogeneous colour distribution.

Column 6. Madagascan yellow-orange, orange and padparadscha coloured sapphires heated-treated under the 'new' method

Column 7. Clusters of Madagascan sapphires of various colours, heat-treated under the 'new' method

Column 8. Cut and polished Madagascan orange sapphires heat treated by the 'new' method

NOTE: All above heat-treated stones were processed by Ted Themelis in his thermochemical research laboratory in Bangkok. They represent the result of his research over the last fourteen months.

Anne Dale with Gabi Tolkowsky at JCK Las Vegas

KUDOS:

Anne Dale Named USA Director for GEM-A USA

The Gemmological Association and Gem Testing Laboratory of Great Britain, has appointed Anne Dale as Director of the newly founded USA branch. She is an internationally respected gem and jewelry expert, author, lecturer, and federal expert witness for the United States' Internal Revenue Service. She owns and operates a retail jewelry store in Mandeville, Louisiana.

Having been awarded her diploma in gemology, Dale was elected a Fellow of the Gemmological Association of Great Britain. She holds the title of Professional Gemologist from the Columbia School of Gemology and Graduate Gemologist from the Gemological Institute of America. She has been involved in the jewelry trade since 1985.

Dale's position and travels promote the association's education and gemmological laboratory service to many within the jewelry industry worldwide. Dale says, "This will afford for even greater European and Global business opportunities to be past on to my customers."

We at AGA wish Anne all the best in her endeavors in this new position. ▲

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Tao of Pearl Grading

You're working in your office; the phone rings. It's one of your long time clients cum friend. She's shopping at her local strip mall and discovers a jewelry liquidation sale in progress. She has her eye on a strand of cultured pearls that appears to be a bargain. However, she needs some guidance. Her questions: "What are 'AA' quality pearls?" And, "is $500 a good deal for an 18-inch strand of 7.5 x 8.0 mm, white, 'AA' pearls?"

by Sharon Wakefield, GG

Your first impulse is to give her the 1-minute seminar about what to look for and how the various factors affect pearl value – size, shape, luster, etc. – in order to help her understand whether these pearls are a good deal. But, you realize that's unrealistic via a cryptic telephone exchange.

So, you quickly change your strategy and decide to lob the ball back to her. You'll just tell her that if she likes the pearls and the price is right for her budget – buy them.

Immediately you realize that's probably worse than your first idea. You know you will never hear the end of the 'great pearl debacle' should they turn out to be a poor investment. What, then, is the best way to be responsive without personally examining the pearls?

There is really only one viable response: It is not possible to answer her questions. No, this is not just a ruse to end the phone call and return to work. You cannot, with any measure of confidence, respond otherwise to this inquiry.

This is because there is no universally accepted system for defining and ranking pearl qualities. It's that simple. There is no way for you to discern the actual quality of these pearls based upon the extant 'A-B-C' pearl grading terminology as related by your friend. Not a satisfying reply, perhaps, but reality nonetheless.

Grading Conundrums

On the surface, the current pearl grading scheme appears to do the job. It's possible to know virtually nothing about a product – whether it's pearls or widgets – and still intuit that 'AA' quality must be better than 'A' quality; and A quality outranks B, and so on. This apparent simplicity is why the system is so seductive.

And, it's universal. Most pearl dealers employ some version of the 'A-B-C' shorthand notation to indicate the qualities of their various products. That is, most dealers offer pearls that range in quality from 'AAA' at the top to 'B' or 'C' at the bottom. So, where's the beef? It's straightforward; it's intuitive; it's widely used.

Unfortunately, there is a key element missing from the current incarnation of the 'A-B-C' system: There are no rules. That is, there is no universally applied and adhered to set of definitions for each of these grades. You might ask 10 different pearl vendors to define the elements of their grade 'A' pearls and receive responses ranging anywhere from consensus to cacophony – precisely because there is no standard definition for grade 'A' pearls. So, in effect, each definition is equally valid. In addition, there's no internationally recognized arbiter for these grading standards. No pearl grading police, if you will.

This is why the GIA diamond grading system is so powerful – there are well-known prescribed criteria for assigning diamond grades. And, the only entity empowered to change these criteria is GIA. This does not mean that real-world application of GIA's grading standards is monolithic – we know this is not the case. But, that does not negate the validity of the system – in fact, it underscores its power. Without a generally accepted set of benchmarks, there can be no meaningful discussions about deviations from the standard.

However, this is not the case in the pearl world. Each vendor has the freedom and the

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right to define the requisite criteria for assigning grades to pearls in his or her inventory. And therein lies the conundrum: there's a common language without common definitions.

It is pure coincidence if one vendor's 'AA' quality strands match another's. In fact, the only real information available from any one manufacturer's product line is their specific range of pearl qualities. Their top-of-the-line pearls will bear the highest designation in their product line – regardless of intrinsic qualities. It just happens to be the best quality this particular vendor stocks in inventory.

Sounds pretty chaotic, doesn't it? If there's no universal definition for 'AA' quality pearls, then how can you compare and evaluate based on this system. You can't. That's the point. You have to understand the inherent characteristics that comprise pearl value in order to consistently assess them. To be fair, some pearl vendors do publish the specific criteria they employ for each of their grading categories. And this is helpful; but local information does not mitigate the need for global standards.

Fortunately, the world of pearl grading is not as dysfunctional as it may seem. While there is no unified theory for assigning pearl grades, there are consistent principles that affect overall pearl quality and value. In fact, most dealers would probably agree on many – if not all – pearl quality characteristics regardless of how they allocate grades to their inventory. It is these quality characteristics, or value factors, that are important – not any specific shorthand notation.

The Tao of GIA

Today there's not a GIA pearl grading system with the universal acceptance of their seminal classification protocol for diamonds. But, they have stepped up to this new challenge with a set of guidelines and descriptive terminology as outlined in their revised Pearls and Pearl Grading course offerings.

If you took these courses in the past, much of the grading nomenclature in the current offerings will seem familiar. And, it is to a large extent – because the specific quality ranking parameters haven't changed. But, unlike prior courses that focused solely on saltwater akoya pearls, GIA sought to globalize their definitions to encompass the dynamic range of pearl products available on the market today.

In addition, GIA solicited counsel and advice from many active participants in the pearl marketplace to ensure their approach reflected reality. The resulting pearl courses provide the framework for evaluating cultured pearls based upon understanding and describing their physical and optical characteristics – and appreciating the relative importance of the range of characteristics.

GIA's pearl grading syllabus defines seven value factors: Size, Shape, Color, Luster, Surface Quality or Blemishes, Nacre Quality and Matching. While precise labels may differ from vendor to vendor, these same parameters are consistently held up within the industry as the benchmarks for specifying pearl quality. This may not be the pearl community's rendition of "This is the World" – but, it is consensus. And, that is an important step towards standardization.

So, now – thanks to GIA – we have a finite number of defined characteristics that can be evaluated for all types of pearls of all sizes, shapes and colors. The resulting descriptive information paints of picture of where a pearl or group of pearls ranks in the overall value scheme.

If you're curious about the new GIA approach to pearl grading, you should contact the Institute for information on their course offerings. It is not possible to adequately represent their grading system within the confines of this – or any – article.

But, that doesn't mean we're finished exploring the Tao of pearl grading. Without plunging into the specific value factor categories, there are still important and fundamental issues to examine.

For example, any viable pearl grading regimen will inherently reflect the reality of the culturing process. And, in today's global economy, this system will also be required to accommodate sensitivities to characteristics that may affect value differently in different geographical areas.

Down on the Farm

Today's pearl jewelry market flourishes because of the work of Mikimoto and others in the early 20th century to develop a process for 'coaxing' oysters and mussels to produce these gems – not by happenstance, but on a more predictable basis. There would be virtually no pearl market today if it were not for the tenacity of these pearl culturing pioneers seeking to supplement the world's dwindling natural pearl resources.

Although pearl culturing technology has improved over the past century, it is still a high-risk venture. A fact that many in the industry do not appreciate. There's a tendency to equate pearl culturing with laboratory gem synthesis.

On the one hand, it is accurate that cultured pearls owe their existence to human intervention. But, more importantly, it is also true that cultured pearls are produced inside a living

animal. And these animals are not living in the controlled environment of a laboratory – they live and produce pearls in their natural environments – oceans, rivers and lakes.

Mollusks – oysters and mussels – living on pearl farms are subject to the same environmental perils as their non-captive counterparts. Weather, food supply, parasites and disease are all potential enemies of pearl culturing operations and impact the harvest success and failure rates for pearl farmers.

Environmental conditions can and do pose real hazards to the health and productivity of pearl-bearing mollusks. However, even more risky than environmental factors is the culturing operation itself. And make no mistake, it is an operation — analogous to you or I undergoing major surgery.

Pearls – both natural and cultured – are produced by mollusks as a response to an outside irritant or intruder. In order to stimulate an akoya oyster, for example, to produce a pearl, some kind of irritant has to be introduced into the oyster's body. And not just anywhere in the body – but, inside a major organ.

"...cultured pearls that make the cut as jewelry-quality products comprise a minority of the total harvest."

This procedure requires cutting open the organ, inserting a foreign body – in this case a bead nucleus and a piece of live tissue from another oyster, and then stitching up the wound and sending the 'patient' to a recovery area. A sequence of events remarkably parallel to human surgical practices.

In addition, this major surgery must be accomplished quickly to minimize the time the oyster is out of its natural aqueous environment. The oyster will die if it remains out of the water too long.

In the best of circumstances, and with the most skilled implant technicians, there's a significant mortality rate due to this stressful nucleation procedure. In addition, many mollusks that survive the procedure can still reject the nucleus implant – thereby diminishing production levels even more.

Once the mollusks recover from their surgery, they are returned to the farm to live in their natural environment. The culturing cycles range from several months to several years. During this time, the pearl farmers hope their stock will produce many jewelry-quality cultured pearls. But, there's no guarantee this will happen even under the most benign circumstances. There are just too many uncontrollable and unpredictable events in these natural environs.

The Good, the Bad, the Rare

Although surviving mollusks will produce one or more pearls, many of these pearls will be scarred and damaged and basically unusable for jewelry. Even the majority of usable pearls will be misshapen, blemished, or have poor quality nacre. The odds are against mollusks producing round, clean, lustrous pearls. In fact, it is the exception – not the rule. That's why pearls with these physical characteristics normally command higher prices in the marketplace.

At this juncture, you may be thinking "How can round, clean, lustrous pearls be rare? It seems there are enormous quantities of pearls with these characteristics available in the marketplace."

It's a good point – one that needs to be addressed. First, many pearls that appear round and clean at first glance, will actually turn out to be off-round and blemished once they are carefully scrutinized. Perhaps even more important, cultured pearls that make the cut as jewelry-quality products comprise a minority of the total harvest. And, don't forget, the trauma of the implant procedure removes many mollusks from the culturing process altogether.

The combined effect of the trauma, natural perils and unpredictable outcomes forms the basis for the added value attributed to rare quality characteristics. You may personally prefer the aesthetic of baroque shape pearls – but that is separate from the understanding that round pearls are more rare and generally command higher prices than non-round pearls. The same is true for pearls without surface imperfections versus those with noticeable flaws. And so on.

As you can see, rarity and pearl quality factors are inter-related. This applies to such characteristics as size, shape, luster, surface and nacre quality. What about color? Are some colors more highly valued than others? Yes; and no. Yes, when there's a component of rarity associated with the color. Such as the highly regarded peacock color exhibited by a few Tahitian black pearls; or, the unique color palette of South Sea golden pearls.

But, in many cases, the relative value ranking due to body color can be affected by cultural and geographic preferences. For example, in the United States, akoya pearls with a distinct yellow hue are usually priced below white and rosé color pearls. This is because white and rosé pearls are more flattering to the skin tones of the predominately Caucasian US population.

However, in some South American countries the reverse is true. Pearls with a cream to yellow hue are more in demand as these pearls are more complementary to their skin coloring. This variable in market demand in different ethnic centers can affect the relative ranking of pearls due to their body color.

It is probably fitting that the remaining value factor – matching – brings us back to where we began. Like the cultured pearl itself, the quality of matching in multi-pearl jewelry results from human care and intervention. It is the

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Pearl Grading

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one quality factor where humans exert some control. It requires much time and patience to assemble a well-matched strand of pearls – time and patience contributed by men and women.

The Tao of Einstein

There is a quote attributed to Albert Einstein that captures the essence of our pearl grading conundrum. "Things should be made as simple as possible, but not any simpler." The current 'A-B-C' grading system appears simple and straightforward. Unfortunately, it is too simple because it obfuscates a real understanding of pearl quality.

"The current 'A-B-C' grading system appears simple and straightforward... it is too simple"

On the other hand, we know it is possible to develop a workable system that stands up to scrutiny without unnecessarily complicating the process. GIA has already demonstrated this capability with their diamond grading system. We must wait to see if the industry will embrace GIA's pearl grading system or will offer a reasonable alternative. In either case, the time has come for implementing the Tao of Pearl Grading. ▲

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Wakefield regularly conducts seminars on gemstone treatments, synthetics, and specialized identification procedures. She has consulted with the Gemological Institute of America on several distance education courses including Pearls, Diamonds and Colored Stones.

Wakefield serves on the Abstracts Review Board for Gems & Gemology and as a member of the GIA International Executive Council. She developed the Integrity Counts!™ business recognition program for the Better Business Bureau in Idaho, and, was recently elected to the Board of Directors of the International Council of Better Business Bureaus.

Cultured Pearls Galore: A Tucson Retrospective

by Betty Sue King

Preface

Pearl descriptions herein are not meant to convey formal grading nomenclature, such as proffered by GIA's pearl grading course, but more common "trade terms/jargon" used by dealers and buyers. For example trade references to round, drops and baroque pearls would be formally delineated by GIA.

GIA classifies shapes into three categories:

- **Spherical pearl - round or near round**
- **Symmetrical - pearls that look the same on each side if you divided them in half**
- **Baroque - irregularly shaped pearls such as crosses & sticks**

The terminology at the end of this chapter is my personal combination of trade-friendly and scientific terms. For readers who crave a system, I highly recommend the GIA pearl course as the way to study this unique gem in a well organized and systematic manner.

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Cultured Pearls

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If you are a pearl aficionado, I recommend the book, *Pearls: A Natural History* (see bibliography). It is a splendid educational and illuminating experience that weaves science, history, literature, and jewelry into the story of pearls, both natural and cultured.

By all means, attend the exhibition, "Pearls," at the Field Museum in Chicago. It will continue into early January 2003. It has just finished a very popular run at the American Museum of Natural History in New York City. Another venue after that has yet to be announced. At this exhibition you will experience the beautiful and fascinating story of natural and cultured pearls.

As a pearl importer/dealer, these are my experiences as one who is in the trenches of the industry. I communicate regularly with oversea suppliers and have an ear to the ground about the pulse of the pearl farmer and how they deal with the caprices of the most recent collections of pearls. On the home front, I deal with wholesalers, retail stores, manufacturers, designers and the challenges of time to complete all the demands that an entrepreneur wants and needs to meet. I am in the front lines buying and selling these beautiful biological gems from my office and at trade shows. There is no doubt in my mind that I wouldn't want to be in any other business, I love what I do.

"...out of 1,000, half the nucleated Pinctada fucata (Akoyas) in an average Japanese farm will die during the culturing period."

For centuries from the time they were first found in artifacts in Mesopotamia (c. 2300 BC) pearls have enchanted people with their beauty. Their mysterious origins were intriguing. Pearls have been an important part of human history serving as indicators of power, status, wealth and style. Now pearls are available for everyone to enjoy at a multitude of prices and have become fashion in their own right.

Continuing investigation and improvement of culturing pearl techniques have created an abundance of color and pearl choices. Full disclosure on treatment of pearls has contributed to an educated buyer and, in turn, an informed consumer. The pricing of cultured pearls — South Sea, Tahitian, Akoya or freshwater pearls — reflects the intensity and effort needed to bring the pearls to market.

The Tucson GemFair is the mecca where buyers seek new products, as well as add to their tried and true inventory. The vast selection of natural and dyed colors drive sales in every pocketbook and budget. Eclectic contemporary lifestyles reflect how pearls have become integrated into everyday enjoyment.

Beginnings

When I entered the wholesale market in 1979, pearl choices were limited to Akoya, South Sea and Biwa (Japanese freshwater pearls from Lake Biwa) with a few freshwater from the United States. The Japanese "Biwa" pearl was the reigning queen of the freshwater pearl market through the 1980s. Chinese freshwater pearls were just making their way into the world market at that time.

Early production of freshwater cultured pearls came from Cristaria plicata, a mussel found in rivers and lakes of China, Vietnam, Japan and Korea. This was the source of the "rice krispie" Chinese freshwater pearls cultured during the 1970-80s. Those with a smoother finish sold handily as well as the more irregularly shaped pearls. This was a welcome addition to my inventory. Buyers welcomed something new, affordable and different from Akoyas.

Everything changed in the 1990s with the introduction of the triangle mussel, Hyriopsis cumingi. Pearls grown with this mussel are less wrinkled and typically range in size from 4mm to 10mm. In addition, new technology changed nucleation techniques, resulting in shape, size and quality improvements.

A hardy mussel, Hyriopsis cumingi, thrives in less than perfect conditions. Freshwater pearls are not as delicate as their prima donna South Sea, Tahitian and Akoya aunties. They can survive in two meters of mucky water. They don't need pristine water quality, or constant checkups at the labs.

Freshwater periculture systems are far less costly than saltwater systems. A freshwater pearl farmer doesn't need the professional divers to clean their mussels, the imported grafters, the boats and the variety of complex equipment which adds to the cost of saltwater production. A few hundred meters of shallow water, trained local youths for grafting, a rowboat, some low-tech equipment and a Chinese freshwater pearl farmer is in business.

It is no wonder that saltwater pearls are also more costly than freshwater, because they require more labor to produce. In addition, labor costs are higher in Japan and the South Seas than in China. Consider, too, the mortality rate: out of 1,000, half the nucleated Pinctada fucata (Akoyas) in an average Japanese farm will die during the culturing period. Out of 1,000 Pinctada margaritafera (Tahitian black pearls) 440 will die during the culturing period and 240 will reject the nucleus. The number of gem quality pearls from surviving Akoyas is 50; and only eight gem quality Tahitians are produced from the initial 1,000 oysters.

Akoya pearl oysters are often double nucleated and

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sometime triple nucleated depending upon the size of the nucleus. South Sea oysters almost never receive more than one nucleus at a time. Tahitian oysters are normally nucleated three times in succession.

Records of mortality rates are sketchy from the farmers but the numbers speak for themselves. An estimated 1000 tons of Chinese freshwater pearls was produced in 2000 making China the leading producer of pearls in the world.

The average number of nucleations performed on the Hyropis cumingi, freshwater pearl mussel, was 40. In the past, the mantle tissue from two-year-old mussels was used for nucleation creating rice, oval and baroque shapes. Now, mantle tissue from one-year-old mussels is used for the process. This tissue is thinner, more pliable and is easily shaped into spheres for nucleation.

Further improvements have occurred with the reduction of nucleations to 28 or fewer per mussel. The results are greater quantities of rounder pearls with better shape, luster and color.

In the late 1990s, the increased production of round freshwater pearls led to speculation that poor quality pearls were used for nucleation. A controversy ensued among a group of pearl gemologists because such pearls could pass as tissue-nucleated or natural pearls. Studies conducted by the AGTA Gemological Testing Center, the Gemological Institute of America and others reported in 2000, that the growth characteristics of freshwater pearls are consistent with tissue-nucleated cultured pearls. Some hanks of pearl strands were found at the 2001 Tucson Show indicated the use of pearl bead nucleation. This timely topic is undergoing further analysis.

My pearl suppliers in Hong Kong were astonished that this would be an issue. "Even if this were the case, they're all nacre anyway," was the common thread of consensus. Of the fifteen I spoke to last year, they unanimously agreed that implanting pearls with pearl nuclei was not the normal procedure. On the home front, my clients felt perplexed when this issue was brought to the public eye. Many who did not know much about these aspects of cultured freshwater pearls felt confused by this and were hesitant to buy. What they needed were assurances that they were still buying pearls that were all nacre, essentially all pearl, and that the colors were natural and/or dyed as indicated by disclosure.

Freshwater pearl farms have used shell nuclei for the production of specific shapes such as coin pearls. While there are a few commercial operations for the shell bead nucleation of freshwater pearls, they are the exception rather than the rule. The use of shell for the production of round freshwater pearls is considered only marginally successful. Recently, wax bead-nucleated freshwater pearls have been produced. I have collected a number of freshwater shells that have been nucleated with wax figures of Buddha, Quan Yin and other designs. These are more interesting to me as specimens but can be used as blister pearls where the figure is cut out of the shell outlining its shape or simply with the shell surrounding it in an oval or square. Growing blister pearls in this way is an ancient technique that still works today.

In Kobe, I found not only Japanese Akoya, South Sea and Tahitian pearls but incredible Biwa freshwater pearls as well. I later learned that Biwa were mixed with freshwater pearls cultured in China and sold initially as Japanese Biwa and later as Chinese freshwater pearls. When I saw how freshwater pearls from China were improving in variety and quality in the middle 1980s I gradually shifted my purchasing from Kobe to Hong Kong. Hong Kong offered the new and unusual, more and more exotic pearls that were beautiful and out of the ordinary. Here I found ample suppliers of Akoya, South Seas and Tahitian pearls.

Initially, while I sought better prices for more beautiful, basic cultured Akoyas, my heart was looking for the special, the unusual, the seductively wonderful. I quickly discovered that I wasn't interested in buying pearls just because they were inexpensive. Ultimately, beauty, luster, iridescence and allure, not just price, became my selection criteria. Pearls that have the shimmer of fine orient and brilliant luster simply call out to me like a siren and I cannot resist. It doesn't matter whether they are from China, Tahiti, Australia, Philippines, Japan, or the USA. A beautiful pearl is a treasure.

Post Tucson Thoughts

Today's pearl market has something to offer virtually every pocketbook, every consumer, every designer. Most freshwater pearls suppliers in the Tucson Gem Fair had brisk business. Tahitian and South Sea pearls sold well for dealers with unusual color combinations and well-priced choices. The leveling of Tahitian and freshwater pearl prices made for better buying all around.

Two months after the terrorist attacks of 9/11, the phones seldom rang — we were all recuperating from shock and uncertain of our futures. Buyers, then and now, made commitments previously put off for the future. With tomorrow being uncertain, gifts were expressions of caring and love that needed to be said today. Phone calls received at our office were often prefaced with these comments. We often discussed how sentimental values and their powerful effect on buying were universal themes. These conversations took place daily at the Tucson Gem Fair.

While cash flow problems and fear of flying diminished the numbers of buyers at Tucson, those that came to the exhibit area were dedicated to finding all the pearls they could

fall in love with. Dealers with low quality merchandise had the most challenges with slower sales. On the other hand, those with the better quality pearls generally had very good shows. Not all gemstone dealers could say the same. Pearls are riding a wave of popularity and many who once sold only gemstones have made pearls their primary business. Now there are more pearl dealers than ever before and there is plenty of competition.

Buyers looking for low-end freshwater pearls found them heaped in mountainous peaks at many venues at Tucson. Most of these pearls had very little luster and iridescence, but they were freshwater pearls nonetheless. For a few dollars investment, buyers could leave happy with a ziplock bag filled with strands of freshwater pearls. With 28 venues from which to choose, not all buyers have the time to investigate the variety of pearls available

Experienced and dedicated buyers came with their designs and shopping lists. Many have already had their fill of the low-luster, no-luster bargains and have moved onto better quality pearls.

Variety...Spices...Choices

Offering the full range of freshwater pearls means buyers may purchase 3-4 mm strands of "peacock sequins" for $8 and a strand of 11-13 mm "lavender sky near round" for $6000. Most of our inventory consists of price points that range from $40 to $500 per strand of freshwater pearls. Of course there are numerous choices, for more and less, that are lustrous, colorful and pleasing. Strands of 8-11 mm metallic multicolor Tahitian rounds for $6,000 and a strand of multicolor 10-12 mm sea foam green, white and golden round Philippine pearls for $16,000 were traffic stoppers.

Only this year I have purchased a few hundred, very fine, round Pinctada margaritifera (Tahitian) pearls in unusually small sizes, 7 - 9 mm. Until now, 9 mm have been the smallest size readily available. The luster was fine to very fine, with full saturation of color, few blemishes, and most with shimmering rainbows of orient. When luster is excellent, GIA describes the reflections of light on the surfaces as "bright and pinpoint sharp." At the other end of the light meter, pearls with poor luster have virtually no reflections at all, their surfaces are chalky and dull. They are pearls in name only.

When queried about the new supply of smaller 7-9 mm, Tahitian pearls, the supplier explained that younger oysters, 1.5 years old, are being nucleated. If they receive more than one implant, the pearls will become baroque, so they are nucleated with only one small bead. These are harvested after 10-18 months then re-nucleated two more times, successively with larger nuclei that the oyster accommodates as its size increases with age. Occasionally, they will nucleate a fourth time. By then, however, the luster is inferior compared with the younger oyster's pearls. This being the case, the technology of nucleating younger mollusks in freshwater as well as in saltwater pearls has produced larger freshwater pearls and smaller Tahitian pearls. Both are desirable additions to the marketplace.

A well respected source in Japan explains that Japanese grafters have skills for nucleating beads over 9 mm that produce the larger Tahitian pearls, but Chinese grafters from Chinese Akoya pearl farms have been hired to cut production costs. They are not as skilled as the Japanese to perform the first nucleation so they nucleate the 7-8 mm sizes after the mollusks have already produced the first crop of 9-10 mm and larger sizes. Most nucleations are performed with mollusks that are at least 2-3 years old, anything younger is unable to receive the bead because the gonad is not yet mature. The cultivation period of 10-18 months usually coats the bead with ample nacre because the bead is small. Sometimes the shorter cultivation period produces pearls with thin coatings that can chip. Now his curiosity is peaked and he promises to investigate further. The smaller 7-9 mm sizes are very popular in Japan as an alternative to, as well as a complement to, the Akoya.

Small is still desirable. Many designers incorporate 2-3.5 mm strands of pearls into their designs. Some weave with them, others intersperse these with multiple sizes of pearls, beads and metal elements. Good quality pearls in smaller sizes are not always available because it is not as profitable for the growers to produce them as it is to grow the 10-12 mm sizes. Nonetheless, there were enough colors and shapes in small sizes to satisfy designers and manufacturers.

There is now an abundance of shell nucleated pearls as evidenced by the large selection of coin-type pearls. Not only are there rounds, but also squares, navettes (diamond), and numerous unique shapes. The quality has improved considerably and is more attractive. Now, there is enough material to appeal to a broader audience so that coin pearls are no longer, strictly a novelty item. Creative drilling concepts have broadened the use of pearl shapes. For example, instead of pearls drilled through their length, a drop shape coin pearl is drilled sideways through the smaller top to offer yet another design option. The better and fine quality coins are still very limited but there is enough presentable material to sustain the market.

With few exceptions, such as coin pearls, it is generally accepted that freshwater pearls are all nacre. This is an important selling point in their favor. In general, South Sea and Tahitian pearls consistently command higher prices simply due to all the factors in their cultivation. Even so, Chinese round pearls of gem quality command substantial

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Cultured Pearls

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simply due to all the factors in their cultivation. Even so, Chinese round pearls of gem quality command substantial prices. Fine quality pearls are priced accordingly for beauty that is less than perfection. Good quality pearls leave lots of room for price variation and are priced competitively.

First time buyers at the show were abundant this year. Quickly they discovered that dyed pearls are generally less costly than natural colors. However, just because the color is natural doesn't mean they are going to cost more. Luster, size, shape, color, and other factors affect pricing.

Color, Color — Everywhere!

Peach, pink, mauve, lilac, lavender are the range of freshwater pearls' natural colors. Occasionally, some have brilliant metallic highlights which immediately attract the eye with their unique flash. These satisfy the buyers who only want natural colors. However, once they see the colors that are created by dyeing, they often succumb and have to have the "aubergine sunset nuggets," "platinum near rounds" and possibly some "18K green gold keshi-style" strands.

Pearls with natural or dyed colors often exhibit desirable overtones which are very appealing to buyers. For example, a pearl with white body color may have pink, green or blue overtones. It may also have considerable orient such as the shimmering rainbow of colors you see on soap bubbles. This is how GIA classifies color:

GIA classifies pearl color as having three characteristics:

- *Bodycolor - the dominant overall color of a pearl*
- *Overtone - one or more translucent colors that appear over a pearl's body color.*
- *Orient - iridescent, rainbow colors shimmering on or just below a pearl's surface.*

With experience, buyers learn how to talk pearl talk to get what they really want. When they ask for peach blush coins baroque 13-14 mm, they are requesting a pastel peach body color with a pink overtone that is an off round, slight drop shape between 13-14 mm in diameter. That the strand also exhibits the iridescent shimmer of rainbow colors (orient) only makes it more desirable.

On overseas buying trips, I consistently find colors I have never seen before. New cocktail colors intrigue me. As long as they are lustrous and iridescent, I have no objection to the origin of their color, be it natural or dyed. What is imperative though is that all inventory is labeled with full disclosure to indicate treatment.

Collectors who regularly come to the show seeking something special and unique were pleased with the choices. Last year's expectations for fine freshwater rounds were unrealized. Speculations of stockpiling and selling all the top quality to Japan are some of the rumblings. During the May 2002 buying trip, I asked Hong Kong suppliers about the apparent shortage of finer larger sizes of Chinese freshwater round pearls. Reports of farmers not harvesting their crops were not uncommon. Concerned with the drop in prices they do not want to jeopardize the value of what they have when the prices have leveled. They've taken a "wait and see" approach. The pearls are still growing and may have a greater value later on in the year or even next year.

One explained that the Chinese in China have more money to spend and are buying better pearls from the source(s). Others complained that many of their buyers are going directly to China and selectively buying the better quality at whatever the market will bear. This makes it difficult for the suppliers to collect the large quantity of pearls that is needed to make the special, larger strands that are difficult to compose in the first place. Even though the supply of top quality round freshwater pearls was limited, those available were delicious.

Not everyone wants perfectly shaped pearls. How often have we heard, "they don't look real unless they're not round,"... "have different shapes,"... "are more irregular and free-form." No problem!

The craft industry often bridges jewelry and art in remarkable formats. Pearls become incorporated into objects in art glass such as essence bottles with pearls ornamenting the tops and often the sides of the blown glass. Boxes made of exotic wood, some of stone, precious metal teapots and unique sculptures have pearls as one of their essential components.

With improved techniques in freshwater pearl cultivation, larger sizes are more available. Bigger is simply bigger and that is happily acceptable. Even though these pearls may not be perfectly symmetrical and have brilliant luster, they quickly capture the eyes of the beholder with their presence. Attractive strands of 10-12 mm freshwater pearls in a never-ending variety of baroque shapes and freeform are readily available for reasonable prices and sold well in Tucson. The interest in larger freshwater pearls is very strong. The feeling is that compared with many gemstones, consumers get a lot for their money with pearls.

Glancing Back to Look Forward

In the mid-fifteenth century, the arrival of the Renaissance revived the adornment of pearls as the gem symbolizing wealth, status and taste in an age of splendor. Embracing the pearl's unique shape, baroque pearl pendants resembling

miniature pieces of sculpture, set with gold, enamel and gemstones were among the most popular jewels of this era. Flappers in the 1920's wore long ropes while they danced the Charleston in their short dresses. Festoons of pearls gathered by diamond clips were popular in the 1950's. By the 1960's, the necklace most women wanted was round, white pearls in a uniform size. The pearl market has gone far beyond this classic cultured round strand.

Remember the quintessential elegance of Jackie Kennedy and her signature double strand of round pearls? It didn't matter that they were faux, she was real.

Advances in periculture have brought us rounder and larger pearls. Not only do they have better luster, there are more natural color choices available in pearls. Creative chemists have offered us new colors in pearls with their dyeing and treatment techniques. With full disclosure of these processes, informed buyers select with confidence from the enormous choices in the pearl market.

Enterprising growers eager to capture market share have continued to push the boundaries with offerings of a vast new variety of shapes and styles of pearls. It's no longer just rice, potato, corn and round. While round is still at the top the pricing pyramid - ovals, drops and coins, Chinese Biwa, exotic colors from the South Sea and Tahiti - are but some of the choices that tantalize the buyer with their possibilities.

With their endless variety, pearls can match any color in everyone's wardrobe. South Sea, Tahitian and Chinese freshwater pearls are now combined in single and multiple strand necklaces. Behold the twists of multiple strands, lariats, pearl-chain necklaces, pearls mixed with gemstone beads and precious metal elements. Pearls are readily worn with jeans and tank tops with lingerie, what else? There are no rules for what can be mixed with what, nor how, and where to wear it. Now, it's anything goes. The only limit is one's imagination. ▲

Betty Sue King, a.k.a. the Pearl Goddess, is the owner of King's Ransom. For the past 23 years she has been in the jewelry industry as a wholesaler of pearls and unusual gemstones. While she designs jewelry for selected clients, she is known best as a specialist in beautiful pearls.

She was a former schoolteacher in the San Francisco Unified School District. A fortuitous interruption in her elementary school teaching career provided the impetus to carve out a career in the gem industry. Betty Sue's collective knowledge of pearls is frequently quoted in many trade journals. A popular speaker, she has shared her wit and wisdom about pearls at the AGTA Tucson Gem Fair Seminars, Women's Jewelry Association, GIA Alumni Association, and the International Society of Appraisers' Conference.

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Terminology

Akoya — Pinctada fucata is the mollusk used to produce saltwater cultured pearls. It is found in Japan, China, throughout East Asia, the Indo-Pacific area, the Red Sea, Persian Gulf, Mediterranean Sea, South Africa and in the Caribbean.

Biwa — Pearls cultivated with Hyriopsis schlegeli in Lake Biwa, Japan, the country's largest freshwater lake. Environmental conditions have contributed to the demise of pearl production. Chinese "Biwa" have the characteristic softly rounded rectangular shape and is usually called "Biwa" even though they are not from Japan.

Continued on page 20 —

Terminology *Continued from page 19 —*

FWP — Commonly used abbreviation for freshwater pearls. CFWP is technically the correct form indicating that the pearls are cultured freshwater pearls.

Grafters — Technicians who cut strips of mantle tissue and insert it into the mussel or mollusk.

Hyriopsis cumingi — The Chinese "triangle mussel" used as both donor of the mantle tissue and for culturing freshwater pearls.

Iridescence — The interplay of light and color on the surface of the pearls in which the reflection and interference of light waves produce a rainbow of changing color. This is a component of orient.

Luster — The most important quality in evaluating the beauty of a pearl. It is the reflection of light on the surface layers of nacre. The brightest reflections are the most desirable.

Mollusk — Chiefly salt water invertebrates with a mantle, a soft body, and a protective calcareous shell pearls are grown in oysters, clams and abalone, all mollusks.

Mantle — The tissue surrounding the soft body of a mollusk is also known as the epithelium. It is made of epithelial cells that secrete the nacre that forms the shell and forms the pearl sacs. In this way, the mollusk protects its delicate soft tissues from irritation or infection.

Mussel — A generic name for certain types of freshwater bivalve mollusks with a dark, elongated shell. Most freshwater pearls are cultivated from the freshwater mussel family, Unionide. Today, the species most widely used is Hyriopsis cumingi.

Nacre — The combination of microscopically think platelets of calcium carbonate crystals that are cemented together by conchiolin, an organic protein glue that creates nacre. This is the substance of which pearls are composed.

Nucleus — Most freshwater pearls are tissue-nucleated using the mantle tissue of the mollusk. Some are shell-nucleated using a piece of preformed shell and a piece of mantle tissue. These are typically pearls in specific shapes of coins, squares, hearts, etc. Most saltwater pearls are implanted with a preformed sphere of shell and a piece of mantle tissue as well.

Orient — As light rays strike the surface of a pearl, it interacts with each microscopic layer in a slightly different way. This interference causes light to break up into its component colors, much like a prism. This creates this rainbow effect or orient.

Oyster — A bivalve, saltwater mollusk. This is used for cultivating South Sea, Tahitian, Philippine & Akoya pearls.

Pearl — A nacreous growth that forms around an irritant such as a piece of tissue and/or bead in order to protect the mollusk, produces a pearl. If the irritant occurs naturally, the pearl is a natural/genuine pearl. Most pearls in the marketplace are grown by man and are cultured pearls

Pearl Farm — An operation where mussels are bred and grown in captivity for producing cultured pearls. Another farm may nucleate them and then several other farms may tend to them until the cultured pearls are ready to be harvested.

Periculture — Pearl cultivation or pearl farming: the practice of inducing pearl formation in mussels/oysters by implanting with tissue and/or shell.

Pinctada margaritifera — Mollusk that is used to produce the Tahitian black pearl found in Tahiti, the Cook Islands and other parts of the South Seas.

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ASA Course Offerings at Universities

The American Society of Appraisers now offers their courses in conjunction with University Appraisal Certificate programs.

Appraisers can earn membership in ASA by two methods: the full academic schedule (PP/GJ201-204, which must be taken sequentially) and a 1/2 day membership exam in the appraiser's specialty (e.g. Gems & Jewelry). The other option, for appraisers who already have extensive appraisal training, is by way of an ASA "accelerated review course" and passing a full-day membership exam: half on the appraiser's specialty and the other half on appraisal theory, methods and techniques. The Gems and Jewelry accelerated review course is PP/GJ205, which will be offered February 1-4, 2003, in Tucson. USPAP and an ethics exam are required for all members, regardless of the academic track.

ASA members holding *Master Gemologist Appraiser* certification privileges must re-certify every five years by successfully taking the lab course (GJ206) or by the accelerated course (GJ205).

The ASA Master Gemologist Appraiser® program consists of achieving ASA Senior Member status plus GJ206, the lab course. Fast-track for experienced appraisers is the GJ205-206 courses. GJ205 and 206 may be taken in any order or at any time between GJ201-204 courses.

University of California at Irvine, "UCI" (not far from Carlsbad, CA) is the latest to offer a certificate program based on the ASA courses. Their next series begins February 20-23, 2003, with PP/GJ-201, and finishes in October. On the East Coast, both George Washington University — "GWU," and Rhode Island School of Design — "RISD," offer the courses. GWU has a concentrated series beginning with PP/GJ-201 on June 19-22, 2003, and ending on August 7-10, 2003, with PP/GJ-204. Their year-plan begins on October 2-5 and ends in 2004. RISD's program begins November 6-9, and ends in 2004.

As in the past, the ASA courses may be taken at any location as an ASA offering for students not desiring a university certificate. (To obtain a University Appraisal Certificate, it is necessary to take all the courses at that university, plus some additional connoisseurship courses.)

For course descriptions, please visit the ASA website at http://www.appraiser.org/courses (Some course descriptions are on page 22.) The university course schedules are located at http://www.appraisers.org/education/university.htm Contact the appropriate university to register for their courses—register for non-university session on the website. Books for all courses are also available at the ASA on-line bookstore.

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CLASS	DATE in 2003	LOCATION	EXTRA
GJ-205	Feb. 1-4	TUCSON	MGA: Valuation Theory Course
GJ-302	Feb. 24-25	UC IRVINE	Jewelry Fashion & Flair
GJ-303	May 19-20	UC IRVINE	Jewelry Myth & Metaphor
GJ-206	May 26-29	LAS VEGAS	MGA: Lab Course
GJ-301	Oct. 6	GWU	Advanced Estate Appraisal
GJ-307	Nov. 17-18	UC IRVINE	Computer Automation for Appraisers
PP/GJ201	Feb. 20-23	UC IRVINE	Principles of Value
	June 19-22	GWU	
	Oct. 2-5	GWU	
	Nov. 6-9	RISD	
	Continuous	On-Line	
PP/GJ202	Feb. 20-23	RISD	Research & Analysis
	May 15-18	UC IRVINE	
	June 26-29	GWU	
	Nov. 13-16	GWU	
	Continuous	On-Line	
PP/GJ203	Apr 3-6	GWU	Appraisal Writing
	Apr. 24-27	RISD	
	July 24-27	GWU	
	Sept. 18-21	UC IRVINE	
PP/GJ204	May 1-4	GWU	Legal Aspects of Appraising
	Aug. 7-9	RISD	
	Oct. 16-19	UC IRVINE	

ASA Courses *Continued from page 20 —*

GJ-302: *19th & 20th Century Jewelry: The Fashion & the Flair*

(Mona Miller-Smith, ASA*)

2 Days, UC Irvine, Orange County, CA

All dressed up with someplace to go? Women and men throughout the ages have added that last flair—the jewelry that certified one's place in society and established at a glance the individual's position in society and expression of self. Jewelry styles have changed over the years, and recognizable periods have emerged. To fully asses jewelry, it must be examined in the context of the historical, social and cultural fashions of the day. In this overview introductory course, you'll identify jewelry of the Georgean, Victorian, Art Nouveau, Arts & Craft, Edwardian, Art Deco, Retro and Post-WWII periods within the historical and social context of the fashions of the day. You'll interpret the figural themes closely identified with these major jewelry periods and discuss the concept of jewelry as both individual and societal self-expression. From the belle in hoop skirts and plunging neckline to the ephemeral sylph in filmy gauze tot he flapper, you will discover how women have answered the age-old question, "What in the world am I going to wear?"

GJ-303: *The Message & the Metaphor: 18th & 19th Century Jewelry in a Social Context*

(Lynne Loube, ASA*)

"Diamonds Are Forever" was the message in the latter half 20th Century, and the metaphor was "love." this course explores the social context of the jewelry popular in the 19th century. Powerful forces were driving world events. War, industry, and science resulted in changes in social structure, attitudes and beliefs. These, in turn, were expressed in the arts of the period and jewelry was no exception. What were the social forces behind the Georgean, Victorian, Art Nouveau, Arts & Crafts and Edwardian jewelry? Who were the personalities of the day, and how did their passions (and their scandals) influence the jewelry that fascinates us today? This course utilizes a treasure-trove of images, and enables the student to appreciate them with the sensibilities of yesteryear.

GJ-307: *Appraisal Computer Automation: Time-Saving Skills for Appraisers*

(Nancy Stacy, ASA*)

This course targets the computer skills especially valuable to the professional appraiser. In a computer-equipped classroom, the appraiser will learn how to: 1) reduce the time spent on routine appraisal tasks; 2) insure the completeness and accuracy of client data; 3) use data without error-causing repetitions; 4) collect all information required for professional object identification in a systematic, complete and time-effective manner; 5) assure that the appraisal is a professional-looking document; 6) automate table of contents, footers, bibliography and glossary; 7) easily copy Web pages and insert into a document; 8) transmit electronic copies of appraisal reports; and 9) attach a legally acceptable electronic signature.

GJ205: *Gems and Jewelry Appraisal Theory, Methods and Application*

This course, in conjunction with GJ206, constitutes the course of study for obtaining the Master Gemologist Appraiser® certification mark. An intense, concentrated course, prior study of required texts or completion of GPP/GJ201-204 is essential for successful completion. The course examines: the forces that create, support and diminish value, the economic principles of value, property identification, market analysis and research, data analysis, appraisal writing, forensic appraisal, appraising for specific intended uses, the business aspects of appraisal practice, professional code of ethics and the proper use of the Master Gemologist Appraiser® certification mark.

Who should take this course:

- Experienced ASA appraisers who nave not had an appraisal theory course in the past 5 years.
- Appraisers who have taken the ASA, NAJA or AGS courses.
- Experienced jewelers without formal training, but who want to explore advanced appraising.
- Attorneys, bank officers, estate managers, and others who want an in-depth understanding of appraisal.
- Members of the public who desire to know what to expect from a personal property appraisal.

GJ206: *Gems and Jewelry Appraisal Techniques and Standards*

Formerly known as the Master Gemologist Appraiser® course, GJ-206 has been training the top jewelry appraisers in the profession for nearly 25 years. This course offers an opportunity to refresh gemological skills, review professional appraisal requirements, and prove one's expertise by correctly identifying 4 pieces of jewelry and preparing an appraisal that meets professional standards. Successfully completing this class, plus an accredited gem laboratory and ASA Senior status (Accredited Senior Appraiser) bestows the right to use the Master Gemologist Appraiser® certification mark.

Prerequisites: Graduate Gemologist diploma (GG), Fellow of the Gemmological Association of Great Britain or equivalent. (Equivalency of other diplomas is determined by the ASA International gems and Jewelry Committee.) Recommended but not required: PP/GJ210-202 or GJ205.

Who should take this course:

- Gemologists who aspire to the highest regarded Gems and Jewelry certification. ▲

AGA Member Survey — 2003

This survey is for members to make suggestions for the future of the Accredited Gemologists Association. The Officers and Board would like for members to give us an idea of how YOU feel AGA can be an effective organization within the industry. This is not a complaint form, but a forum for constructive suggestions. Please be detailed in your suggestion(s), for example; if you suggest that we create an advanced education program, explain how you see it established, the program you propose, the estimated cost, etc. (this may require attaching/faxing an additional page). This will allow the Board to review and make decisions with a full understanding of your suggestion.

How do you see the AGA role in the new Millennium?

What suggestions or programs do you feel will be beneficial in meeting the AGA role?

COMMENTS:

What officer position, committee chairperson or member, function, or program would you volunteer for to see the AGA meet its role?

- ❑ ADMISSIONS & MEMBERSHIP
- ❑ AGA — CERTIFIED GEM LABORATORY
  - ❑ Gem Tech R&D — Equipment Review
  - ❑ Gem Science R&D — Gemological Research
- ❑ CONSTITUTION & BY LAWS
- ❑ EDUCATION & CERTIFICATION
- ❑ ETHICS & GRIEVANCES
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- ❑ CONFERENCE PLANNING
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Application Guidelines:

Membership with full voting privileges is available to professionals holding gemological diplomas from accepted institutions.
Associate Membership is available to students of gemology and avocational gemologists.
Supplier Membership is available to providers of goods and services to the gem & jewelry industry.

Membership Dues & Fees:

$25 Processing Fee (one-time, non-refundable) will be retained by AGA.
$100 Initial Voting Member Dues.
$75 Initial Associate Member Dues.
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Make checks payable to Accredited Gemologists Association, in U.S. funds.
Membership is renewable annually (Voting $100, Assoc. $50, Supplier $150).

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AGA will not discriminate against any applicant based upon race, creed, color, national origin, age or gender. Applicants are required to meet substantial member qualifications, and to adhere to the AGA Code of Ethics.