



Rubies, Emeralds, Sapphires, Diamonds & Pearls

The World of Gems Conference Updates it All

Left to Right: This fine Mogok Burma ruby of 5 cts. is now banned from importation into the U.S.

Photo by Fred Kahn and Sun Joo Chung.
Courtesy Chris Smith-AGL.

Many choices of pearl varieties and colors are available today.

Courtesy of American Pearl Company.

A collection of fine emeralds from Colombia..

Courtesy of Ronald Ringsrud Co.

The first gem conference co-hosted by Gemworld and the AGTA Gemological Testing Center was a great success. Knowledge was shared by industry speakers on the title topics. The theme was "Integration of Information" and topics were covered in great detail. An extensive book will be prepared but for this newsletter, we offer a brief look at the most up-to-date information affecting the industry.

By Richard B. Drucker, GG

Rubies

The Burmese ruby and jade ban now in effect, will severely restrict the importation of these gems into the U.S. While jade is not as significant overall to most U.S. markets, rubies certainly are. Until we see the

total effect of this ban, at least there are many other ruby sources. Some of these sources are geologically similar to Burma based on the location of the gem deposits and the events of millions of years ago. Afghanistan, Pakistan, and Vietnam are a few of these sources. Other sources of rubies include Thailand,

Cambodia, Sri Lanka, Madagascar, Tanzania, and Malawi. Limited production even exists from countries that include Russia, the U.S., and now, Greenland.

Originally done with primitive methods, heating of rubies is now done in elaborate controlled temperature furnaces. The elements may be

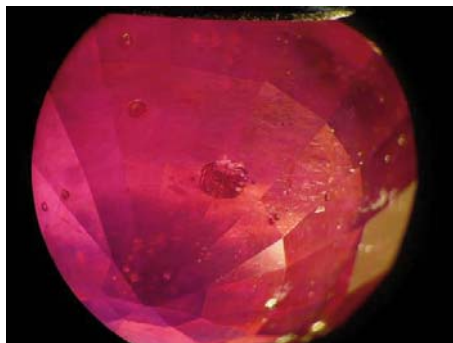
partially dissolved, in essence diffusing into the crystal structure and improving the color of the stone. The Mong Hsu deposit requires flux to be used in the heating process, and this material will melt and fill in fractures that would otherwise be problematic when cutting the rubies. Most laboratories will identify the flux residue and quantify it as minor, moderate, or significant. The AGTA-GTC uses a TE system (Thermal Enhancement) that quantifies the residue from TE1 (Minor) to TE5 (Significant).

In 2001, beryllium treated rubies and sapphires started to appear. In some cases, this deep diffusion method can now penetrate throughout the stone, whereas earlier diffusion methods only diffused into the surface. In 2004, lead glass began to appear as filler in rubies to completely fill fractures, but leaving a solid mass internally. The treatment is done to the rough and often allows a larger stone to be cut.

In pricing the ruby treatments, heat has historically been the standard. An unheated ruby is rare and premiums for these continue to rise. Today, it is common to pay premiums of 100% to 150% for a *fine* to *extra fine* quality ruby. When flux residue first appeared in the Mong Hsu stones, the trade was uncertain how to price these. Deductions at first were significant. However, soon these became the ruby of choice in the marketplace and comprised an estimated 70-75% of the available ruby. Flux healing became the norm and the trade soon became very tolerant of the residue. Today, minor and moderate levels of residue generally carry no discount, while significant may be discounted some. The glass filled rubies are much more problematic. They are abundantly found in the market today and prices can be as low as \$2.00 per carat. Even the best of the bunch have not exceeded \$200.00 per carat. Size is not an issue. We have observed *good* quality 3 carat rubies for \$100 per stone or less at the Tucson gem shows.

While disclosure unfortunately remains limited throughout the industry, the glass filling process is easy to identify. Beryllium treatment may be more difficult. The American Gem Trade Association (AGTA) requires its dealer-members to disclose all treatments. A series of codes exist that must be followed and labeled on all

invoices. Most labs will also quantify the amount of lead-glass filler found as *minor*, *moderate*, or *significant*. The GIA Gem Trade Laboratory will also classify the lead-glass filled rubies into three categories and the most filled are classified as stones that would not hold together if not filled. Glass-filled rubies are not stable and require special care. They are easily damaged by heat or ultrasonic cleaning.



Lead glass filled ruby in transmitted light.
Photo Lore Kiefert-AGTA-GTC.

Sapphires

Considering the historic and pricing hierarchy of origin, the sapphire order has Kashmir on top followed by unheated Burma, and then the other locations such as Sri Lanka and Madagascar. Yogo sapphire from Montana is unique and rare and generally will sell for prices above the Burma sapphires. Kashmir stands alone far above the rest. A three carat sapphire recently was offered for \$28,000 per carat by Pala International. The velvety texture is what sets these apart from the rest. However, when it comes to origin, be cautious. Even a prime location will produce low quality gems and these should not command a premium simply due to the name.

Montana sapphire gem deposits can be found in several areas within the state. They are known as Rock Creek, Dry Cottonwood Creek, the Missouri River deposits, and Yogo Gulch. Yogo has attained the highest status as these richly colored sapphires are natural in color. Other deposits are routinely heat treated. Prices for Yogo can be significantly higher than other Montana locations. Melee will have premiums of at least 50% and larger stones from a half carat up can be 5 to 10 times higher or more.

Untreated blue sapphires do command a premium but these premiums are lower than ruby. The availability of untreated ruby is better, and the Burma embargo does not apply to sapphires. Untreated sapphires in the extra fine category could command premiums of +30% to +60%.

In the evolution of sapphire treatments, we have gone from heat to surface diffusion to beryllium diffusion. Corundum treatments have advanced beyond that seen in any other gem product. These treatments create alteration of color and/or clarity at the molecular level. With yellow sapphire, the diffusion method has now displaced other methods of treatment. It is very effective and diffi-



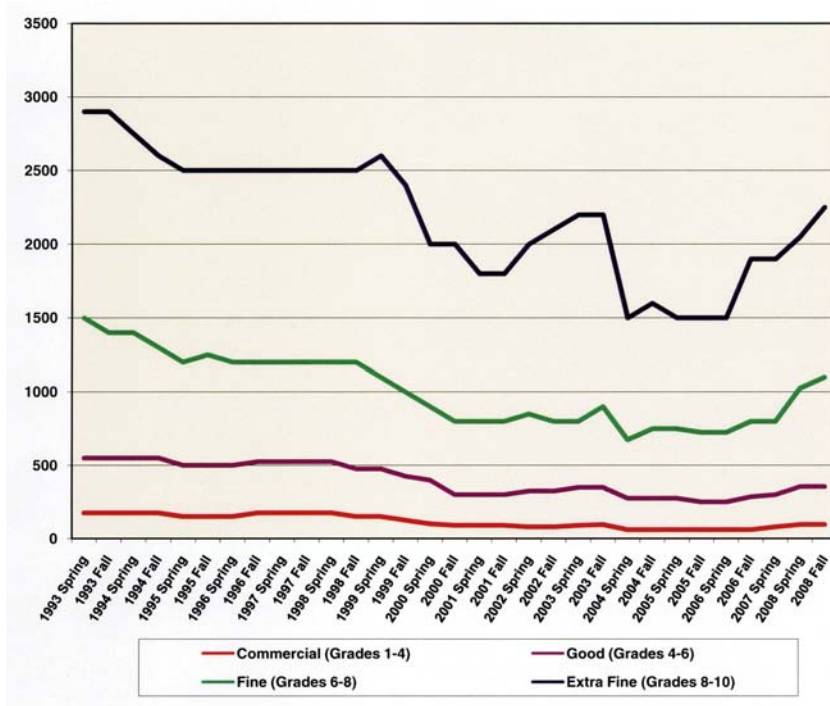
This 3.30 carat Kashmir sapphire is the king of the sapphire in the origin hierarchy.
Stone courtesy of Pala International.
Photo: Wimon Manerotkul.

cult to detect. Today, anyone buying or selling yellow sapphires might be best advised to disclaim this information by explaining that they might be treated by the beryllium method.

Beryllium treated sapphires typically sell for about \$30-\$100 per carat. The pinks and padparadscha colors can sell for more—up to \$200 per carat. The issue with all these beryllium treated sapphires is disclosure as relatively few are disclosed outside of the AGTA wholesale dealer pool.

At the retail level, most sapphires are sold as “heat only.” Beryllium is still not fully understood at the retail level even though so much publicity has surrounded this topic in every trade journal. Many internet sellers, discount jewelers, and home shopping television stations sell this product without disclosure. I stress that this is not a statement that all entities in these three categories are guilty of this non-disclosure, nor does this imply that all other retail categories do comply. It is merely a generalization as a greater percentage of those categories do not disclose properly and in almost all cases as independent appraisers, we rarely see written disclosure statements for heat or beryllium.

The following chart shows the blue sapphire price trends since 1993. This fifteen year graph shows that prices did slowly come down over time. Mostly, this was due to the very good supply of sapphires and the introduction of Madagascar goods to the market. Beryllium is keeping the commercial and good qualities down in price. Rarer, non-beryllium treated fine and extra fine are increasing.



Diamonds

Synthetic diamonds today are grown by either the high temperature high pressure method or the chemical vapor deposition method. The HTHP method produces primarily yellow colors but can be treated to other colors. Sizes are mostly between .50 to 1.50 carats when faceted. The CVD synthetic diamonds are usually colorless but production is very limited. The CVD diamonds are more challenging to identify, though the major gem labs can still do so by spectra analysis.

Natural diamonds may be treated to improve their colorless appearance or to produce a variety of colors. Methods include HTHP, irradiation, annealing, and combinations of treatment methods. Because of this, the identification of treated diamonds poses the greatest challenge to the gem labs today.

Pricing of HTHP colorless diamonds is thought to be about 30-50% below the price of an untreated diamond. When you consider that these diamonds began as off color, below M, the transformation to D, E or F color suggests that this discount is fair. The only branded HTHP diamond is marketed by Lazare Kaplan. While we do not agree with their marketing statements regarding the treatment process as shown on their website, as a branded product, they can sell the diamonds for any price they would like to. They do not set retail prices but suggest that “rarity” should keep these prices very high in relation to untreated diamonds.

HTHP colored diamonds are more common and several companies currently market these. Lucent Diamonds markets the Imperial Red. Other colors, mainly yellows, are marketed by Sundance among others.

The Imperial Red sells for about the same price as a G-VS white diamond. The yellows are between 40% and 65% below the price of its natural color counterpart.

Diamond cut grades for round diamonds now include *excellent*, *very good*, *good*, *fair*, and *poor* as shown on GIA reports. Based on our research of several thousand diamonds, *excellent* cut sells for about 0% to 15% premium; *very good* sells for about our *GemGuide* prices; *good* sells for a 5% to 15% discount. Very few diamonds can be found with GIA reports of *fair* or *poor* so discounts for these are more theoretical. The large spread in pricing of the *excellent* grade is due to the *ideal* cuts falling into this category and getting a higher premium.

Laser drilling by the newer KM method that leaves an etched appearance can be tricky to identify in some cases.

For years, we debated the pricing of laser diamonds because there is a misconception that drilling drastically reduces the price of a diamond by 30% or more. However, no diamond manufacturer would ever drill a diamond if it meant losing money. It is not a logical conclusion. When we do our pricing research, what we find is that the large discount is often only a perceived discount as these diamonds are usually graded incorrectly and the grades are embellished. Since laser drilling often will not change the grade or in some cases might improve it slightly, the discounts are minimal. Disclosure is the real issue as often, these are not disclosed. Drilling does not really make much sense and is not a big problem but it is still done in the industry.

In the diamond sessions, diamond grading techniques discussed how to be more consistent in your own practice, to grade more like a professional laboratory. Remember that diamond grading, when done in a professional laboratory, is still only an opinion. From a good lab, the opinions will be consistent opinions. After all, they are grading diamonds eight hours a day, five days a week, 52 weeks a year.

While we all know that diamond cutting proportions affect the quality of the diamond, what we are learning is that other not-so-traditional cutting standards can still lead to a beautiful diamond. Light performance technology is now a part of several laboratories. We can measure or predict how light will perform within a diamond using advanced technology. Brilliance, fire, and scintillation are the terms we have come to accept when discussing the beauty of a diamond. Now, there is also efficiency, a term developed by one company, Diamond Technologies, Inc. This component of light performance rates the distribution of the light and dark areas of a diamond.

Pearls

China is now the largest source of freshwater cultured pearls. Annual production is up to 1,500 metric tons or more than two billion pearls. Freshwater pearl culturing methods include blisters, tissue nucleation, bead nucleation, and second generation nucleation. After harvesting, the mussel may be discarded or nucleated a second time with either a bead, tissue, or nothing

(the pearl sac left will continue to produce nacre, creating another pearl).

Worldwide environmental concerns continue to grow with pearl farming. As pollution kills off mussels, some species have even reached endangered proportions. Since mussels are bottom feeders, they are sensitive to changes in the water when they become polluted. By suspending mussels in nets near the surface of the water, the pearl farms are actually helping to increase the health and population of these species. They are kept off the floor of the lakes and rivers and are thus given enhanced feeding and breeding conditions. Plankton and oxygen are abundant.

Natural color black cultured pearls from the Sea of

Cortez started about ten years ago. They can be found in shapes of round, drop, baroque and mabe. Production is very limited and this year, less than 3,000 round and baroques were harvested.

Treatment identification of pearls remains challenging. Some treatments are done in secrecy. Others are not available specifically for gemological testing and many require advanced techniques for identification. Treatment methods today include: color bleaching, dyeing and tinting to add color, chemical reaction to change color, heating under uncertain conditions to lighten color, radiation exposure to darken the color of the bead nucleus, coating with foreign materials, and luster improvements.

With most cultured pearl varieties, since treatments are so prevalent, the pricing is not affected. However, on some rare varieties such as conch or abalone, treatments would have a huge impact on price. Today, approximately 80% of golden South Sea pearls are treated and the price is about 30% of the natural color goldens. A fine strand of 10mm natural golden color pearls is priced at \$9,000 to \$12,000.

In akoya strands, prices for the Chinese and Japanese products are both stable. In the past few years, we have seen some price increases but mostly due to the U.S. dollar being weaker. ♦

A post-conference comprehensive book is available for purchase. This book, which will have at least 50 pages of information and photographs, can be ordered online at www.worldofgemskonference.com.



Sea of Cortez cultured pearl jewelry.
Courtesy Columbia Gem House.