



The District of Gemology

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Ron Harder

Insurance in the Jewelry Industry: Words to the Wise

Well, if you thought the subject of insurance in the jewelry industry was going to be dull, boy, were you ever wrong! On May 16th, Ron Harder, President and CEO of Jewelers Mutual Insurance Company, gave us an invaluable tutorial on the subject, replete with some truly cautionary tales. Talk about a word to the wise — this was a complete lecture! He began with some arresting statistics:

Robbery:

- The worst states for robbery losses are California, Florida, New York and Pennsylvania.
- The most active month is November. The least active month is May.
- The most active time of day is 10am to noon. The most active day is Wednesday, followed by Thursday.
- 45% of all robbery events have some kind of violence involved. 72% have involved a gun.

Burglary:

- The most common type of burglary takes three minutes. The usual point of entry is the front door.
- The most active state is New York.
- The average loss is \$65K (i.e., stores are leaving things out that should be in the safe).

See *Insurance*, pg. 4

Robin Walker

A Passion for Diamonds

How many of us are so blessed as to be passionately in love with our work? Not many, I suspect. But Robin Walker is the shining exception. In love with diamonds, delighting in their beauty, their history and their magic, he has spent 41 years in intimate contact with them and the happiness they have given him shines in his face.

His talk was a rich blend of information about diamonds and wonderful tales of his life among them. He joined de Beers in 1959 and found himself mining diamonds in the swamps of Sierra Leone as General Manager of the Diamond Corp., West Africa. After that, he spent three years more in Liberia. Steadily rising in the company, he became an officer of the corporation and retired just a year ago.

Over his career, he has met and handled essentially all the great diamonds of the world. Each such meeting has been a powerfully moving experience for him. He was able actually to hold the three greatest stones of the Crown Jewels — the Koh-i-noor, the Great and Lesser Stars of Africa -- on a visit to the Jewel House of London on a day when they had been unmounted to be cleaned. They are virtually flawless, he told us, and their cuts were “awesomely symmetrical” despite

See *Diamonds*, pg. 10

Fred Ward

Opals, Opals, and More Glorious Opals!

Opals, opals and more glorious opals! Who knew there were so many types, colors and patterns of this lovely stone? Well, by evening's end on April 24th, Fred Ward's lucky audience did, thanks to Fred's deep expertise, inimitable delivery and superb photographs.

The cover of Fred's newly revised book, **Opals**, set the tone, featuring a striking, triangular-shaped opal with a distinctive angular pattern aptly called “Harlequin.” This is the most popular and the most expensive of all opal patterns. (It was also a challenge to photograph because its beautiful play of color did not show up when it was held still for the camera. The trick turned out to be to shoot it under water!)

But that was only the first in a glorious procession of others, each photographed with Fred's consummate skill. From Australia's Lightning Ridge came “black” opals and “Contra Luz” (“against the light”) opals (so named because they have no particular color in direct light but are dazzling when backlit); “crystal” opals (so transparent you can read through them) and light blue and green opals with gleams of red from Coober Pedy; and boulder

See *Opals*, pg. 5

President's Letter by Carolyn Chappell



WOW!! What a full complement of members and guests we had for the June meeting, featuring Mr. Robin Walker who recently retired from a 41 year career with DeBeers! It was exciting to have such a large crowd in the room.....and just in case you (the members and guests) want to repeat that attendance excitement, we (the Board) stand ready to keep getting you a larger room to make it comfy! Robin Walker was MOST complimentary of our Alumni Club.....he was quite overwhelmed by our turn-out and friendliness. He said we were the biggest and best stop yet in his six-club GIA tour;.....and he only had New York left, to be the guest speaker. It was a treat for those 16 or so of us who went upstairs with him afterwards for "dinner and schmoozing." He was QUITE gracious to keep answering all our questions as he tried to eat his dinner! We also got to meet his charming wife, Ellen, who is from Norway originally. They live about 40 miles outside of London now, in retirement. If you missed this two-hour PowerPoint presentation, you'll have to find your "best-friend-club-member-who-went" to get the nitty-gritty and read Brenda's article elsewhere in this Newsletter.

Upcoming events in the works are for another all day Ivory Seminar in September (run by the famous Bobby Mann!) and a half-day seminar on detecting natural vs. enhanced colored diamonds, possibly in November. More info to come on that at future meetings. Most of our speakers are in place for the rest of the year;.....and the finale comes with the Holiday Party and Auction on Sunday, Dec. 2nd.

July is the time the Board tries to put together its slate of officers for the upcoming two-year term, 2002-2004. If you have any interest in becoming involved in the administrative end of our GIA Alumni Club, please let any of the officers know. We do not want to overlook you!!!! And we certainly have LOTS of jobs to go around! Just make yourself known! See you next meeting?

Carolyn Chappell

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*Member Profile***BRUCE GABER**

by
Cathy Gaber

Curiosity played a big part in Bruce's decision to become a scientist. That he enjoys the challenge of learning about new subjects is clearly seen in his varied interests and accomplishments. He has been picking up interesting rocks ever since he can remember, but he never knew what any of them were until his wife Cathy became interested in minerals and piqued his interest as well. Although it is technically a hobby for him, mineral related activities have become a way of life.

Born in Chicago, Bruce moved to Arkansas at age 12. While earning his BA in Chemistry (1963) at Hendrix College in Conway, AR, he was awarded both of the school's chemistry awards. After completing his PhD in Biochemistry (1968) at USC, he studied magnetic resonance at IBM in New York. From 1971-1975, he was an assistant professor of chemistry at the University of Michigan, Dearborn campus. As a visiting scientist at the University of Oregon, Bruce developed new methods to study biomembranes using Raman Spectroscopy.

In 1977, he came to the Naval Research Laboratory in Washington, DC, where he is currently the Head of the Laboratory for Molecular Interfacial Interactions. Bruce specializes in computer graphics and nanotechnology, using Atomic Force and Scanning Electron Microscopy. Several of his more than 100 scientific publications concern the study of minerals such as halloysite, calcite and barite. He has received numerous publication awards and several patents. A number of his molecular graphics illustrations have been accepted in juried shows and/or been published. His most recent project was to cre-

ate a computer animation of crystal growth. In 2000, the U.S. Navy awarded him one of its highest honors, the Meritorious Civilian Service Award.

His first exposure to lapidary arts was in the late 1970's, but it wasn't until 1990 that Bruce joined his first club, the Gem, Lapidary and Mineral Society of Washington, DC. He joined the Micromineralogists of the National Capital Area that same year and acted as vice president from 1994-1996 and as president in 1997. The club honored him with the Each Club, Each Year, One Rockhound nomination for 1999. Other club memberships include the Northwest Micro Mineral Study Group, the GIA Alumni Association, and the Mineralogical Society of the District of Columbia, which he served as president from



Bruce Gaber, Renaissance Man

1999-2000. Bruce became a founding member of the Friends of Mineralogy (FOM) SE chapter in 1998. In 2000, he joined the Rochester (NY) Academy of Science when he and Cathy became Exhibits Chair of the Rochester Mineralogical Symposium (RMS). He was elected as a member of the Mineralogical Society of America (MSA) in 1994, and in 2000, he became the MSA liaison to FOM.

Bruce enjoys sharing by teaching and lecturing. He taught cabochon making at the Eastern Federation of Mineralogical and Lapidary Societies' (EFMLS) Wildacres Workshop in Little Switzerland, NC from 1995-1998. He is a frequent speaker at the technical session of the RMS, at club meetings and at Wildacres. His several lectures on mineral photography, include one on the

use of Photoshop in mineral photography presented at Jeff Scovil's photo seminar in Tucson last February. This summer, his class at the University of Washington at Seattle is titled "Visual Communication for Scientists." A member of the Guild of Natural Science Illustrators, he will teach "The Art of Molecular Illustration" at this year's meeting.

Over the past several years, Bruce has become serious about photography, and has participated in a number of workshops. Though he likes to shoot flowers and other natural objects, his most noted work is with minerals. In the last two years, he has won three awards in the Werner Lieber Photo Contest sponsored by the FOM at Tucson. This year's first place in the digital category featured a composite of two views of a Dal'negorsk galena crystal, which will soon be featured in *Rocks & Minerals* magazine. His photographs, used to illustrate Cathy's articles, have also been published in *Lapidary Journal*, *Mineral News* and *Metal, Stone & Glass*.

On a whim, Bruce tried his hand at auctioneering at Wildacres in the mid-1990s. His success led to his appointment as the Chairman of the EFMLS Auction Committee and chief auctioneer. In 1997, he became an auctioneer at the RMS and in 1999, he was delighted to become part of the auction team at the GIA holiday parties. Bruce's home based computer business, Vision Rising, specializes in scientific illustration. Collecting, exhibiting and judging minerals, travel, cooking, meditation, reading and ham radio are other favorite pursuits. Bruce will always have more projects than time to pursue them.



*Two views of a galena from Dal'Nagorsk, Russia. This picture won the contest in Tucson and will be reproduced in *Rock and Mineral*.*

Insurance, from Page 1:**Shipping losses:**

- Last year, there were 372 shipping losses but only two losses of registered mail totaling \$9K.
- There are probably 15 times more FedEx and UPS losses than registered letter losses.
- The average shipping loss is \$42K (i.e., lots of valuable stuff is being shipped in packages).
- The average credit card loss was \$9K.

Off-premises losses:

- The most frequent crime scene for a traveling salesman is a parking lot. The average loss of this type is \$421K.
- The most active states are California, Florida, Georgia and New York. The DC area is very quiet.

Very few criminals are apprehended. Recovery is equally rare. The fences are known, but it is essentially impossible to track loose stones. Yet despite such risks, *an astounding 40% of the retail jewelry industry has no crime coverage!*

He then gave a series of sobering examples of the perils facing today's jeweler. One concerned a divorce in which the jeweler appraised about 100 pieces of jewelry on the assumption that it was for insurance replacement. After the divorce, the wife discovered she could not sell them for those prices and she sued the appraiser, claiming negligence. The suit was subsequently dropped but not before the jeweler's insurance total was dangerously close to exhaustion. **Lessons learned:** Be sure you ask the purpose of the appraisal. Explain the differ-



Ron Harder and Lynn Sauls



At the podium

ence in the values. Never appraise anything you haven't seen.

Stern advice followed on shipping methods and claims. UPS will not accept a package of jewelry valued at more than \$50K unless it is registered with them. They also do not accept loose stones in packages. Spring loaded mountings don't work. As for FedEx, always check to see that your recipient does not have a signature on file with FedEx to relieve FedEx of having to get a signature for delivery because once that box is dropped off, it is no longer covered by shipping insurance. The recipient will then complain that they have not received it.

Another warning concerned what can only be called a racket conducted by Nike. The scam works like this. Nike has not authorized any jewelry to be manufactured with their logo; if you have any, it is a copyright violation. Someone will telephone asking if you have any Nike jewelry. If you say no, they will ask if you can make some for them. When the piece is done, they will buy it — and two days later, you will get a summons. If you show them a piece you already, you will get a summons the next day. They will then demand that you pay \$7-10K to settle the case and unless you have appropriate insurance coverage, you'll pay it because it's cheaper than going to court. His com-

pany has defended more than 24 suits like this for their clients. **Moral:** Do not buy, sell or carry any jewelry with a Nike logo!

His company is developing new types of insurance to fit the needs of the jewelry industry such as Manufacturing/Wholesale Trade Defense Liability Coverage to deal with allegations of failing to disclose treatments, and Limited Worker Operations coverage for retailers to cover damage to the property of others outside the jewelry trade by you or your employees (but not work by independent contractors, or work you are doing for others in the trade). Both these are currently being test-marketed.

Proceeding to security and loss prevention, Harder gave us a roster of new technologies to amplify or replace traditional security techniques including digital disk recorders that allow rapid retrieval with no change in resolution no matter how often they are copied, remote video that allows a store to be monitored from another premises, and a 360 degree "bubble" camera that shoots an entire circuit at once. An almost undefeatable system combines an access control system using a card that records who entered and when, with biometrics that measure retina, palm or finger prints, voice or facial features. Tracking devices can now be installed to track the bags you carry, or they can be inserted in individual pieces (e.g., watches). Three companies are offering such coverage: See Track, which uses a GPS signal; Pro Net tracking system which uses LoJack land-based technology, and Iturun which is a real-time locating system.



Sharing a laugh with Carolyn

Opals, from Page 1:

opal from Queensland (ironstone with thin but intensely colorful layers of opal in between).

Then there were exotics such as Koroit nuts (ironstone rocks with swirly patterned opal inside, unique to the Yowah mine); "picture" opals (suggesting portraits or landscapes, and favorites with collectors); opal fossils, including snails, shells, and bones, where all organic material has been replaced by opal; a Brazilian cat's eye opal with no play of color but displaying a very clear cat's eye; and 6-8 inch "thunder eggs" from volcanic deposits in Oregon.

Fred then proceeded to take us on a lively tour of Australian opal mining. We sampled the rather raffish pleasures of "downtown Lightning Ridge," toured mines of all description, and met some of the colorful denizens of this rough and ready industry. It's definitely a frontier environment, says Fred. All transactions are cash only. Nobody has a last name. There's no census and no taxes but the government just shrugs because it wants to encourage mining and figures it will nab its take from the next person down the line.

Most miners dig by hand, alone underground, blasting the rock with sometimes hair-raisingly short fuses. Mines branch off in any direction underground, oblivious to claim boundaries when on the trail of an opal vein. "Free form mining," Fred called it. You mine until your mine gives out and then you leave. And you don't walk around at night because there are thousands of

open shafts to trap the unwary!

Once the ore is mined, the next step is to identify the opal in it. In Lightning Ridge, the rough is wetted to make opal color jump out. The water is held in a pond and returned to the pond afterwards for repeated re-use. Opal fluoresces, so in waterless places like Coober Pedy, an utterly bleak area in the south-central region, a van arrives, with a pitch black interior and equipped with the necessary light, the rough is dropped onto a conveyor belt and inside the van, a couple of guys look for opal.



The cover of Fred's newly revised book on Opals.

In Mintabie, three hours north of Coober Pedy, opal is strip mined because the rock is so hard that none of the equipment used in other mines will work. The miners agreed to strip down to bedrock, look for opal, and then fill it in. But somehow, everybody seems to go bankrupt and leave. The result is a moonscape with huge, dry holes in every direction.

Fred went on to describe how doublets and triplets are made. A doublet has opal on top with a piece of potch on the bottom. A triplet begins with a morsel of opal with some color which



Michele Zabel

... he stuck in his thumb and pulled out....

is sliced literally paper thin with a steel filing mechanism and then incorporated into the triplet "stack" consisting of a piece of glass on the bottom with its back spray-painted black, then a slice of opal, all topped with a second piece of glass or a dome on top. The whole thing is cut out and ground around the edge to match the shape.

Inlay is a similar technique in which the interior of the design channel is painted black and the opal is then inlaid in the channel. Not exactly a doublet, but then, what do you call it?

Synthetic opals are on the market now. Some display a "lizard skin" look that doesn't occur in nature. Others are plastics imbedded with little spiral metal coils. Opals are also being vacuum permeated with Optikon, an enhancement that is very difficult to detect because Optikon's RI is very similar to opal.

All opals are directional in their play of color and therefore look different depending on the angle from which they are viewed. Fred illustrated how dramatically their appearance can change with four pictures of the same stone, all taken in the same light but with the opal rotated 90 degrees each time. The pattern and shape of colors shifted dramatically. This, therefore, means that the cutter must look at the stone in all possible positions to figure out what orientation will show the stone to the best advantage.



Courtesy of Fred Ward

Hunting opal at Lightning Ridge

Bobby Mann and Bob Weisblut, cofounders of the International Ivory Society (IIS), presented an all-day chapter-sponsored hands-on workshop, "Ivory and Its Substitutes," Saturday, May 12th in Bethesda, Maryland. We had a full house with twenty GIA and IIS members attending. Each participant received a bound workbook filled with information about all ivory types.

Bob Weisblut began the morning program by stating that there is no worldwide agreement for an ivory definition. So the first thing Bob did was to define ivory as "the dentine portion of all mammal teeth." This definition is based on the way the US Government's Fish and Wildlife Forensic Lab defines ivory in its publication, *Identification Guide for Ivory*.

Bob further described a tusk as "a tooth that remains outside the mouth of an animal when its mouth is closed." As is the custom, Bob and Bobby used the words "tooth" and "tusk" almost interchangeably throughout the lecture. Tusks are found on elephants, mammoths, walrus, narwhal, and members of the pig family. Tusks can be either incisors or canines.

Bob next discussed the various ivory "tests" often mentioned in print. Most don't work, but Bob and Bobby discussed each of the tests to explain their strengths and weaknesses.

The usual ivory tests are either destructive (such as the use of a hot needle or sulfuric acid) or ineffective because ivory is only one of many natural and man-made substances that could pass them. Other considerations in identify-

Report on Spring Seminar:

Ivory and Its Substitutes

by
Bobby Mann

ing ivory are size, color, specific gravity, hardness, and cost.

One of the ID difficulties relates to weight. For example, all ivory falls within a known specific gravity range. But just because a piece measures within this range doesn't mean it's ivory. Many objects have similar specific gravity readings just as many unknown samples are just as hard or dense as ivory. Identification can be tricky. Some tests, such as the "flotation" test, are not reliable. Bobby tried to replicate it, so that test is considered unreliable.

Two tests that do work are nondestructive and can answer the questions: Is it ivory? And, What type? First is the use of long-wave ultraviolet light (UV blacklight). Second is learning to identify the morphology (exterior and interior diagnostic characteristics) of each type of tooth and tusk. Both these tech-

niques were explained to the group.

Bobby Mann began his portion of the program by demonstrating Long-Wave Ultraviolet (LWUV) light and its use in ivory identification. The class was shown the classic ivory fluorescence (bluish white). He also demonstrated something not reported in any book, i.e.,

how various patinas can have a big effect on fluorescence. The class saw how some artificial materials can be identified and separated by this test. By absorbing the LWUV, some plastics display an unusual color, such as yellow or mauve. Bobby also stressed that this should be the first test but not the only test because there are always possible exceptions.

Bobby continued with slides and hands-on examination of almost all types of ivory. The class was seated at five round tables to allow small groups to study the examples as they were passed around. The instructors provided enough samples to enable each participant to examine and ask questions as the class progressed through the various ivory types. We began with elephant tusks and continued in the following order: mammoth tusks, walrus tusks, hippo teeth, whale teeth, narwhal tusks, warthog, and boar tusks. The class also saw examples of rare ivories from the babirusa and dong, as well as other smaller teeth such as seal and elk that are only rarely used commercially.

Next on the program was a discussion of natural ivory substitutes. This consisted of slides and a hands-on examination of the following: bone, antler, vegetable, and hornbill ivory as well as a discus-

Continued on page 7



Bobby Mann

All Kinds of Ivory

Ivory, from Page 6:

sion of other, less convincing substitutes such as shell, coral, meerschaum, ivoryite, chalcedony and amber. Each has to be understood in order for people to know they are not ivory.

Bobby finished the slide portion of the seminar with a discussion of the manufactured lookalikes: celluloid and the newer polymer/plastics. They showed examples of the genuine ivories and the lookalikes side by side, comparing the differences, explaining how best to separate them, and showing what diagnostic characteristics to look for or to see which are missing.

Finally, the participants were given time to survey the entire display to appreci-



Bobby Mann

And even more ivory

ate the full range of artistic and utilitarian objects on the market. Participants were allowed to handle every object and compare such items as a real narwhal tusk with a fake one, or a real whale tooth with a reproduction.

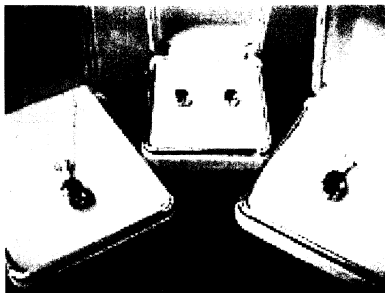
There was a show-and-tell table for participants to place the ivories they brought for discussion and ID. As always, there were some surprises.

If you missed this seminar, it will be repeated in late September. Don't miss the opportunity to participate. Get in touch with Bobby Mann for a reservation. The class size will be limited to 24 people and is expected to fill rapidly.

Earl Saulmon: The Chocolate Jeweler

Remember the sapphires that decorated the "Chocolate Mousse Cupcakes" donated by Fuller and Associates to the Y2K Holiday Auction and which I won? Marty Fuller and I carefully ascertained the exact count/carat weight of the stones and my wife Darlene and I took them home, broke out the tweezers and extracted the stones from their extremely gooey beds. There were a total of 11 stones weighing in at a hefty TCW of 21 carats. We carefully counted and recounted to ensure we had recovered them all and only then did we partake of Mrs. Fuller's culinary excellence. (Nobody wants to munch down on a sapphire!) Then I set them in the jewelry items shown here. They will be given as gifts and not sold.

I have been a member of the Washington DC Chapter of the GIA Alumni Association for three years and am currently pursuing my GG which I hope to finish in late spring/early summer of this year. My interest in gemstones was piqued in the early 1990s during a four-year official assignment to Alice Springs, Northern Territory (aka Dead Center Central Australia or Outback Woop Woop). Darlene and I spent every available weekend out scrounging



Brenda Forman

Earl's sapphire creations

through both known and not-so-known gemstone areas. Believe me, Darlene can swing a 12 pound rock pick with the best of them, and she has the eye of an eagle. We amassed a considerable cache of zircons, garnets, amethyst, green apatite, unakite, quartz and chalcedony subspecies and composites, and several respectable pieces of gem-quality chrysoprase.

I spent a considerable amount of time traveling to the opal fields at Coober Pedy, Mintabie and Labinda. I even helped one of our opal miner friends in Mintabie set the powder charges down in his mine. When the dust cleared, we saw a dazzling seam of opal. I was also fortunate to take lessons from one of the

***Colette, Marty and Earl show off
Earl's creations***

premier opal cutters in the NT and I learned about the lost wax process from one of Australia's best lost wax casters.

After returning home in 1996, I began teaching myself how to facet gemstones. So far, so good, as they say! My dream is to retire "again" (for the third time), head for the four-corners area of New Mexico/Arizona or South Central Oregon, and develop a low-key gemology lab/custom lapidary/custom jewelry venture where I would be able to identify a customer's stone, facet or cabochon it to their satisfaction, and quick-mount or custom-set the finished stone - no big deal, but a lot of FUN. Wish me luck.

In all ancient civilizations ivory was a popular gem carving material; the Greek cultures were no exception. Ivory was used because of its beauty, rarity and ease of carving. Early forms of carved ivories include engraved seals with simple decoration. Later intricate, powerful carvings demonstrate that ivory was still popular, despite the prevalence of hard gemstones. The Greek ivories radiate the pathos of life, the love of elegance, movement and simplicity of form, and the adoration of light, grandeur, tragedy and exultation that the Greeks possess. This article examines the ancient Greek carved ivory production from four eras: the Minoan from the island of Crete, the Mycenaean from the Greek mainland, the Classical age, and the Macedonian. Let us review each creative period, with a brief historical background to each era.

1. MINOAN IVORIES [2600-1400 BC]

History of Crete - At the southern most end of the Greek Aegean Sea lies Crete - a large island with tall mountains and deep gorges, fertile valleys and splendid beaches. Crete was inhabited as early as 6500 BC, and from 3000BC to 1450BC the palaces of Knossos, Phaistos, Malia, Zakros and Archanes served as centers of political, social, economic and religious life in the Minoan civilization. King of Knossos (according to the myth King Minos) was the ruler. Commerce with Egypt, Cyprus and the Middle East was thriving. Around 1450 BC the Minoan civilization suffered catastrophic destruction from earthquakes and fires.

The ivories - Ivory carving appeared in Crete in 2600 BC, reaching a peak around 1600 BC, when magnificent engraved gemstones and carved ivories were created as part of jewelry and objects of art. Carved ivory pieces, some gilded, are found as jewelry boxes, handles on copper mirrors, combs, hair pins, plaques for inlay, seals, pendants, and statuettes, depicting human figures and animal themes. Two whole ivory tusks were found at the Zakros palace [1700-1350BC]. The elephant ivory was probably brought in from Syria, some maybe from Africa, through Egypt. These miniature works capture many of the characteristics of

Ancient Greek Ivory Carvings

by

Helen Serras-Herman

the Minoan civilization. A civilization that loved nature, the elegant and elaborate, vitality and movement, color and light, but not monumental dominance. The Minoans used precious materials and all their sculptural art belongs to the realms of miniature art. Among the famous carved ivories is the *Bull Leaper* [1550BC], a gilded ivory statuette of exceptional artistry, carved in the full round, with wonderful anatomical details, and admired for its movement and lightness. He is an acrobat depicted while performing a dangerous jump on the back of the bull. [Archaeological Museum, Herakleion, Crete]

2. MYCENEAN IVORIES [1500-1100 BC]

History of Mycenae - The Mycenaean civilization was the center of the Hellenic world from 1500-1100 BC. [Athens, National Archaeological Museum] Fortified palaces, known as citadels, were built at the cities of Tiryns, Mycenae, Argos, Pylos, and Thebes. Mycenae, and the neighboring city-port of Tiryns, had a strategic location at the eastern part of the Peloponnese peninsula, about 150 miles south of Athens. After the destruction of the Cretan centers, Mycenaean influence increased in the Aegean. But with the end of the Trojan War [approx. 1100BC], Mycenae declined and collapsed. Mycenae was the center of great myths, such as the Labours

of Heracles, the tragic dynasty of the Atreides [Agamemnon & family] and the Trojan War.

The ivories - Ivory works were found at all Mycenaean centers. The Myceneans, as did the

Minoans, imported ivory from Syria. The cities of Mycenae and Thebes and the island of Cyprus had special ivory workshops. Reliefs and miniature figures in the round were the most favored types of ivory carving, created as combs, boxes, and handles for mirrors and swords. Ivory inlay in furniture was also popular, as described by epic poet Homer. Beloved themes were female figures, sphinxes, crested griffins and wonderful hunting scenes. Male figures are very rare, except for warrior heads. The artists' decorative treatment of space, their ability to fill the scenes with an air of serenity and grandeur is noteworthy.

Among the best-preserved ivories is the *Ivory Head of Warrior*, a relief carving of a male head wearing the Mycenaean helmet, which was reinforced externally with wild boar teeth. [Athens, National Archaeological Museum] The ivory group of *Two Goddesses With a Young God* [7.8cm high, 15th - 13th c. BC] is a masterpiece of Mycenaean miniature art in ivory. There are two women embracing, while one holds a small child on her lap. The carving of the dresses that they are both wearing is astounding. [Athens, National Archaeological Museum]

3. IVORIES from CLASSICAL GREECE [6th - 5th centuries BC]

History - Athens gained power from her victorious wars against the Persians from 490-479BC, and during the famous Golden Age of Pericles, the ruler of Athens, the Acropolis monuments were reconstructed, new temples were added, and the Acropolis became the symbol of the triumph of Athens. The arts, literature and philosophy entered a time of greatness. In 445 BC the two great powers, Athens and Sparta, signed a peace treaty. It only lasted until 433 BC when they entered a thirty-year war, known as the Peloponnesian War.

The Ivories - Two of the most famous statues
Cont. on next page:



Cont. from previous page:

in classical Greece were the colossal statues of Athena Parthenos in the center of the Parthenon Temple on the Acropolis of Athens, and of Zeus at Olympia, both created by the famous sculptor Phidias. Phidias lifted the art of ivory carving to a new level of full monumentality, unlike any before or since. Actual moulds, casts and ivory chips were discovered at his workshop in Olympia. Such statues were made with the "acro-elephantine" technique, that is, the exposed flesh parts of the body, head, hands and feet, are made of ivory, and the covered parts, the dress and regalia, are made of wood, or stone. When these parts are covered with gold, the statues



Drawing by Helen Serras-Herman

Mycenaean Ivory Group of Two Goddesses With a Young God

are known as "chryselephantine" (= golden ivory). The Greeks discovered a method of softening, flattening and moulding ivory, possibly by soaking it in boiling water, which allowed them to create large ivory parts.

This statue of Athena no longer exists, but there are several copies in existence. The original statue was about 38 feet tall (12.87m) and showed the goddess standing, fully armed. The part of the statue that was covered by clothing was of wood, while the exposed parts were of ivory. The garments, helmet and other accessories were elaborately covered with gold leaf. The gold weighed 1,150 grams and was removable.

The statue of Zeus is also lost, but images of the statue survive on coins and engraved gems. It was about 37 feet tall (12.38m) and Zeus was depicted sitting on his throne, hold-

ing in his right hand a Winged Victory of gold and ivory, and in his left hand a long scepter surmounted by an eagle. Pausanias, the 2nd century AD Roman travel historian, gave valuable information about the statues of Athena and Zeus.

Three life-size gold and ivory statues from the 6th century BC, the work of Ionian workshops in Asia Minor, were found at Delphi, the oracle center with worldwide fame and power where Apollo was worshipped. The ivory is still in good condition, only blackened by a 5th century BC fire. Gold-gilded silver plates and long tresses represent the hair. One of them is believed to be Apollo and the other Artemis.

4. MACEDONIAN IVORIES

[4th–3rd centuries BC]

History of Macedonia - Macedonia occupies most of northern Greece, north of Mount Olympus, a region with very high mountains, large rivers, lakes and fertile plains. Civilization appeared as early as 6000 BC. In the early 7th century BC, the Dorian Greek tribe of the Macedones began to expand, and their final settling was around the 5th century BC in the region called by the Greek historian Thucydides "Lower Macedonia," or "Macedonia by the Sea".

King Phillip II assumed the throne in 359 BC and until his assassination in 335 BC, he transformed Macedonia into the most important power in the Aegean. This paved the way for his son Alexander III to lead the pan-Hellenic expedition to the Orient. The Greek spirit, culture, poetry, philosophy, the Homeric epics and the great tragedies were spread over three continents. Political rivalry and instability brought Macedonia to collapse and in 168 BC to fall under the rule of the Roman Empire.

The Ivories - The 4th century BC Royal Tombs of Vergina (the site of the ancient Macedonian capital Aigai) in the Greek province of Macedonia, were excavated in 1977-78. The treasures found were unrivaled and reveal the high cultural level of the Macedonians. Today these articles are housed in the Archaeological Museum in the city of Thessaloniki. Along with the famous gold lamakes [bone boxes], the gold wreaths, the silver vases, the armory and other gold ob-

jects, superb ivory carvings were unearthed. Ivory reliefs and 14 ivory heads (3.5cm high) show a very high level of ivory sculpture. Among them are the portraits of Phillip II, of Alexander the Great, and of Olympias, the mother of Alexander and wife of Phillip. These heads are part of a group of relief figures that decorated the royal bed in the 'Tomb of the King' [325 BC].

Another special treasure is the ceremonial Royal Shield, a truly unique piece of art of the 4th century BC. It was found in pieces and it took over five years to restore it to its full glory. The body of the shield was probably of wood, covered with several layers of leather. In the center of the shield, there is a magnifi-



Drawing by Helen Serras-Herman

Ivory portrait of King Phillip II

cent ivory composition, surrounded by a bright background of gold. Around the periphery are intricately carved ivory reliefs, enclosing fine silver and gold foils, showing the 16-ray starburst, the symbol of the Macedonian dynasty.

Epilogue

Hopefully this overview of the ancient Greek ivory carvings has demonstrated the popularity of ivory through the ages and will prompt the readers to search out these Greek art forms in their travels. The majority of them are housed in several Greek museums, while the others are dispersed in museums around the world.

This article is a 2001 revised edition of a 1999 article, first published in the *International Ivory Society Newsletter*, then in the *Dopstick*, the Washington DC Gem, Lapidary & Mineral Society newsletter. It also won an award in the Educational Articles category competition for the Eastern Federation of Lapidary & Mineralogical Societies (EFLMS).

Bibliography on request from Helen Serras-Herman.

**Being introduced by Kusam****Diamonds, from Page 1:**

the primitive nature of the tools available in 1908 when they were cut by the Asscher family of Amsterdam.

Subsequently, he met the Asscher family. They still had the tools used to cut these stones. The rough must have been flawed but since 1908, the Royal Family had never allowed any information about the

rough to be released. On his first visit, though, Edward Asscher took down a huge ledger that turned out to contain every secret of that rough. King Edward VI had not trusted the Asscher family to refrain from saving a bit of the rough for themselves and so he had had a daily record made that was signed each day by both the Asschers and the King's observers. Only now is permission being granted to publish it.

The Hermitage in St. Petersburg has no jewelry on display and all the museum guards insist that there is no jewelry there. It is actually kept in a secret room. However, he had a friend with the right contacts, and there ensued an amazing experience. A car arrived at his hotel, a password was given, he was escorted under armed guard to a road block where a major effort was made to delay him. Finally, surrounded by machine guns, he was met by a young woman who told him, "I don't know how you got here. This room doesn't exist." But in he went and in that room were twelve showcases, each containing one of the greatest pieces of jewelry on earth (for

example, the solid gold caparison of Catherine the Great's horse).

Then there was the recent diamond show at the Paris Natural History Museum. "I thought I'd seen almost everything, but there were diamonds I had never seen before. There were famous paintings each accompanied by the actual jewel shown in them. I came away with two words: wonderment and illusion. I was born again. It convinced me that I had made the best deci-

**Holding the Hope Diamond on a very special tour!**

sion of my life when I went into the diamond trade."

Walker's talk abounded with unexpected facts. For example, did you know that until a few hundred years ago, Indians did not like to cut and facet diamonds? They believed every diamond contained a spirit and if you polished a facet onto it, the spirit would escape through that window. Or did you know that until

1477, women were forbidden to wear diamonds? That only changed in 1477, when the Emperor Maximilian of Austria married Mary of Burgundy and gave her the first diamond wedding ring.

He then gave us a fascinating rundown on the revolutionary changes that have occurred in the diamond trade over the 41 years of his career. Sources have changed dramatically. In 1960, South Africa was king. By 2000, new sources had radically changed the market and the leaders had become Botswana, Canada, Russia and Australia, while South Africa had slipped. Meanwhile, production has exploded. In 1960, a worldwide total of 28 million carats was mined with a value of \$77.3M. South Africa was the leading producer followed by Sierra Leone. In 2000, those totals were 178 million carats, total value \$7.5B and Botswana was king, having overtaken Russia ten years ago.

Similarly major changes have occurred in the retail market. In 1960, world retail jewelry sales worldwide were \$2B; in 2000, they were \$57B. In 1960, the US was more than half the world retail market; in 2000 it still is but India is now \$800M, i.e., the third most important retail market. In 1960, de Beers sold \$250M in diamonds, i.e., 90% of the world market; in 2000, de Beers sold \$5.07B, but that is now only 60% of the world market.

In 1960, a buyer spent eight days out of every 50 days at sea. They had very few clients. Now they have a very large num-

Cont. on next page:

**Greeting Faith Wilkison**

Fred Ward

Diamonds, from Pg. 10:

ber of clients who come in from around the world, and nobody comes by sea! Everything is different — except the traditional brown cardboard boxes the diamonds are sold in.

Prospecting, mining and processing have changed fundamentally. You no longer go out on the ground and grub around looking for possible kimberlite pipes. Now you buy satellite photos and analyze them for land masses older than 2.5B years. Then you take out prospecting licenses, send planes in with equipment that sends back echo pings, and dig where it looks promising.

You dig entirely differently now, too. In the former South West Africa, he once saw 200 Sherman tanks with snowplows attached, mining the desert. Now, though, they are replaced by a single mammoth excavator that does the work of those 400 tanks.

In 1960, you separated diamonds from the rough ore by rushing water and crushed rock over a grease table where the diamonds would stick to the grease. Now it's all done by an automated processing plant using X-rays instead of grease.

Along the same Atlantic coast 40 years ago, de Beers tried to hold back the sea from a shoreside mining area with a sea wall. But they only had 24 hours between tides to get diamonds out and there were too many accidents, so they had to stop. At the time, a Texan, Sammy Collins, was building an oil supply line for a diamond mine in Africa. He figured that if de Beers was trying to build sea walls, it meant there must be diamonds in the sea, so he quietly bought licenses for offshore drilling. He didn't have the technology for it then but now, off Namibia's coastal waters, there are huge rigs at work. All their mining is done by satellites.

Machines now weigh the diamonds and grade color and clarity. There are now 16,000 classifications of diamond be-

cause no two diamonds, sources or mines are the same. The computer, though, still cannot do the final assessment and price. That remains a human's job and is likely to for some time to come.

The cutting workforce has fundamentally changed as well. India now has about a million diamond cutters, followed by China with 13,500 and Thailand with 6800. (New York City has the most cutting skills in the world, however, despite having only a few hundred cutters. Amsterdam never recovered as a cutting center after World War II and Antwerp is much diminished.) India has turned the trade upside down. From 1947 to 1962, diamond cutting was



Robin Walker

Fred Ward

The man with a 1000 carat smile

banned. The ban was lifted in 1962 and by 1965, cutting was ready for takeoff. Before 1962, tiny diamonds were crushed to make abrasive powder, but India turned those into gem diamonds. Ninety percent of the world's polished diamonds are now cut in India. India has possibly the most modern factories in the world, using high-tech laser cutting technology. High tech can now do cleaving, bruting, cutting and polishing.

Walker told some wonderful tales of how some of the major new deposits were found. The big new Russian pipe was actually found by mistake. Women, he remarked, are far better than men at find-

ing diamonds. A Russian woman prospector noticed a white fox run by her with odd blue-grey smears on its fur. She followed it back to its lair and discovered that the fox had built its lair on top of a kimberlite pipe. Its body heat had warmed the kimberlite into a paste that had stuck to its coat. Elsewhere, a new pipe was discovered when termites were discovered building nests with diamonds and indicolite fragments brought up from 200 feet down.

Then he went on to some of the major challenges confronting the industry today. There is need now for better consumer education on simulants and treatments. In 1960, there were no irradiated natural diamonds. Now there are treated natural diamonds. Less than 1% of diamonds are treatable by high pressure annealing but they fool everyone. GIA finally found out what's happening and most can now be detected. But it was the toughest challenge ever. Now comes the prospect of cuttable, polished synthetic diamonds. At present, these are easily detectable. Two machines are still ahead of the game: Diamond Sure and Diamond View. But it will get harder. This will make GIA's role increasingly important for consumer confidence.

The other danger to the industry is conflict diamonds. This is a deeply personal issue for Walker for he loves the land and people of Sierra Leone. "I cannot comprehend how the people I loved could do these things," he said. "The diamond industry has a duty to stamp this out."

Later in Robin's stay, Fred Ward arranged for him to have a very special behind-the-scenes after hours tour at the Smithsonian Hall of Gems and Minerals with Smithsonian Curator Jeff Post. All the doors were locked and the Hope Diamonds was taken out of its case and handed to Robin so that he could hold it and personally sense its magic. As you can see from the picture on page 10, this was a most reverent moment!

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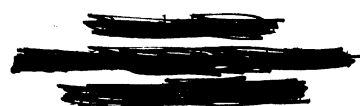
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