

# Gems & Jewellery

Summer 2010 / Volume 19 / No. 2



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gem carving

Scottish Gem  
Conference

New pearl  
challenges



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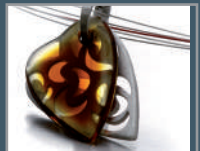
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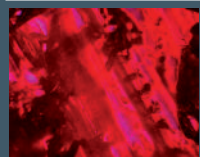
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## On the bright side

Optimism is perhaps the backbone of the gem industry. Recently a gentleman from what we can simply refer to as a gem-producing country arrived at Gem-A's offices holding a large specimen. The stone had been given to him by a gem miner and his mission was to seek its value and, presumably, sale. It was massive (5 kilos) and of a superb emerald-green colour. The bad news was that it was glass — a 25,000 carat lump of green glass. It looked as if it may have been a by-product of old glass production and may well have quite genuinely been thought to be a gem material by the man who dug it up. By-products of glass making do crop up from time to time, mistaken for gem materials — a far cry from the coloured glass embedded in all manner of glued-on detritus being passed off as rough gems to gullible members of the public. Red and green glass varieties of these fakes, probably constructed from broken traffic lights and thus ingeniously named stoplite and golite by Duncan Miller (see *Gems & Jewellery*, May 2006, page 39) are well known. A blue version — being sold as a piece of sapphire rough — also walked into our offices the other day. I hope this wasn't made from the light off a police car. The next time someone is offered a fine piece of rough imperial topaz in a car park, it might well be made from the broken indicator light of the car beside them.

A lighthearted editorial? Yes, perhaps. But not entirely so. Optimism is necessary, and makes this business interesting and exciting. However, the type of optimism, and greed, that leads a usually sane member of the public to buy a fine 'gem' in a pub or car park is usually no different to that which allows a member of the trade to think that they can get an amazing bargain when they buy fine looking gems or gem-set jewellery from a dealer from whom they wouldn't buy a used car. Remember, if a gem looks too good to be true, it's probably not exactly what it's being sold as. Or it's a Gem-A teaching stone. You can get familiar with some of those in our free and flexible one-to-one hands-on Gem Mentoring sessions for Members — the first covers those glass-filled rubies (page 31) — or come to one of our trade evenings (page 24).

**Jack Ogden**

Chief Executive Officer

## Cover Picture

**Marine Ray.** A larimar pendant of 205 ct from the Dominican Republic, carved by Helen Serras-Herman to reflect the shape of a marine ray, mounted as a pendant with chrysoberyls in 18ct gold. The pendant is on a detachable necklace of larimar beads, freshwater cultured pearls and 18 ct gold. Photo by Helen Serras-Herman. © Serras-Herman. See 'Gem Sculpture' on page 35.



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# NATURE'S TREASURES 3

The Flett Theatre,  
Natural History Museum, London

Sunday 12 December 2010  
10:00 am – 4:00 pm

An event for anyone with an interest in minerals and gemstones. Students from schools and universities are particularly encouraged to attend. The day will include a programme of short talks as well as a number of displays and demonstrations.

The stimulating programme of talks will include:

## Morning session: Analysis and Identification

- **Fred Mosselmans**  
Synchrotron in the analysis of minerals and gems
- **Peter Treloar**  
Non-destructive techniques in the analysis of minerals and gems
- **Terry Williams**  
Micro-Computed Tomography (micro-CT) applied to mineralogical samples
- **Douglas Garrod**  
And you thought it was natural!

## Afternoon Session: General

- **Ron Callender**  
Scotland's gold
- **Maggie Campbell Pedersen**  
Gems from life
- **Caroline Smith**  
Meteorites
- **William Burgess**  
Nature's Treachery: Arsenic in the Bengal basin

The event will also include the opportunity to talk to the speakers and others about careers in the geosciences and gemmology, and to view the several displays planned for the day, including the Virtual Microscope (Andy Tindle), real microscopes (Leica), geological specimens for sale (Richard Tayler) and others.

**Fee: £20.00 (under 16s £10.00) including refreshments and a sandwich lunch.**

For further details and to register: <http://www.minersoc.org/pages/meetings/nature3/nature3.html>  
or contact Kevin Murphy at [kevin@minersoc.org](mailto:kevin@minersoc.org)

Rockwatch delegates should register via Rockwatch. Details available from [http://www.rockwatch.org.uk/events\\_main.html](http://www.rockwatch.org.uk/events_main.html)

An event organized jointly by:  
Gem-A The Gemmological Association of Great Britain,  
The Mineralogical Society  
The Russell Society  
Rockwatch  
in association with the Natural History Museum



# The gems of Cambodia

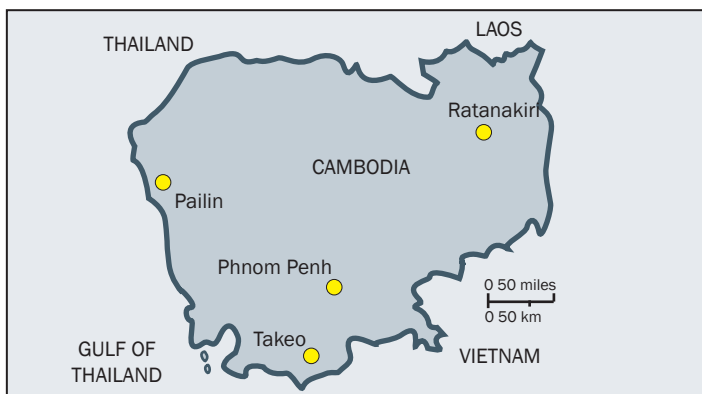
Gem-A graduate David Bright spends his vacations taking fieldtrips around the world that combine his two hobbies – gemmology and photography. Here he reports on the mining areas he visited in Cambodia.

**For many centuries rubies and sapphires have been mined in what is now western Cambodia and zircons in the northeast. More recently an area in the south of the country has been producing gem-quality topaz and aquamarine as well as colourless and smoky quartz.**

## Pailin

Cambodia has an ancient political history and the western area of the country where Pailin is located once belonged to neighbouring Siam (now Thailand). Rubies and sapphires were discovered there centuries ago, so today's Pailin rubies are mined from the same area as the legendary Siam rubies. Indeed they are often still sold as 'Siam rubies'. The blue sapphires from this area are even more famous. In fact, Pailin means blue sapphire in the Thai language. This is the same area that was the stronghold for the Khmer Rouge during their fight against the government. Gem mining was very active during the time of the Khmer Rouge as they needed funds to support their battles. Abandoned mining equipment from the foreign mining companies can still be seen throughout the area. Now that the war is over, this region is once again stable. This stability has seen a reduction in mining activity as locals return to agriculture for income after the fields are cleared of landmines. However, there is still some production of both ruby and sapphire in Pailin.

Mechanized mining with trommels and sluices still occurs around Pailin, but such operations can be difficult to locate. Much of the area has been mined for generations, so to justify mechanization, miners



Map of Cambodia with approximate mining areas marked in yellow.



Top: Ruby and sapphire crystals from Pailin.

Below: Gemstones are found everywhere around Pailin, including the yards of people's homes.

# Gems and Minerals

## The gems of Cambodia (cont.)



### Zircon extraction in Ratanakiri.

1. Simple techniques used by villagers to find zircons near their homes. The pits they dig may be as much as 10 m deep. 2. High pressure water streams are used to break zircons loose from the soil. 3. Gem bearing soil is hand-searched for zircon. 4. An abandoned pit, showing how entire landscapes can be changed by hand-mining activities. 5. A dark brown zircon crystal, typical of those mined in Cambodia.



### Heat treatment of Cambodian zircon.

6. Stones are sealed in a crucible before thermal treatment as it is important to exclude air. 7. The crucible is placed on top of a column of charcoal in the furnace. 8. The furnace: stones are heated to approximately 800–1000 °C for about two hours. 9. Zircon before heat treatment. Inset is the large zircon (upper left), the same stone as that held by the miner in 5 above, after heat treatment. 10. Samples of the colours of zircons that can be achieved by adjusting furnace conditions and time.

## The gems of Cambodia (cont.)

must move out from Pailin to unearth fresh deposits. However, locals frequently search for gems by hand as their free time allows. In fact, in some places, people are literally digging up their yards in search of rubies and sapphires! The local market in Pailin is the best place to see what is being produced.

Some local dealers heat-treat their stones at home. Many of these dealers are quite amicable and will allow visitors to observe the process. Sometimes you may buy some rough stones on your own and have these dealers treat them for you; otherwise there are plenty of stones and finished jewellery available in the local market.

### Ratanakiri

The province of Ratanakiri in northeast Cambodia is the source of most of the blue zircons on the market. Bokheo is situated approximately 30 km east of the provincial capital of Banlung and this is the area where the mining of these zircons occurs. The stones are found in secondary deposits and high-pressure water streams are often used to wash the stones from the soil. As in Pailin, the soil in villages contains many gems. Here small groups of men dig vertical pits where the soil is brought up to the surface by a bucket and winch. Others sift through the dry soil with their hands to find the stones.

Just out of the ground, zircons can be various shades of brown. These stones require thermal treatment to achieve the striking blue colour that makes gems from this area so famous. The stones to be heated are placed into an alumina crucible with a lid. The lid is sealed with wet fireclay and dried on a stove. This crucible is then sealed by the same method inside a second larger crucible before being placed in the centre of an oil drum that has been converted into a heat-treating furnace. The furnace is charged with charcoal and ignited from the bottom with a gas torch. Because high temperatures are not needed for the zircon heat treatment process, forced air is not used to increase the combustion temperature of the charcoal.

After approximately two hours the crucible is removed from the furnace and allowed to stand for a few minutes. If the crucible is opened while the stones are still hot, a colour change can be seen right in front of your eyes. While hot, the stones are an intense blue, but this colour lightens as they cool. These same zircons may take a yellow or orange colour by adjusting the heating process.

### Takeo

A relatively new mining area is situated in the very south of Cambodia in the Takeo province along the border with Vietnam. This new mining area is just south of the ancient Khmer temple of Phnom Bayang. Rumour has it that this source was discovered by a gem dealer visiting the area on holiday who found a gem in the stream near the Churous Phaûk Waterfall. Now locals are prospecting the streambeds and other alluvial/eluvial deposits in the surrounding mountains.

These gem deposits have been created through the weathering of pegmatites. Quartz and topaz are the most common gem minerals



**Gemstones in the Takeo area.**

11. Miners excavate placer deposits to find quartz, topaz and aquamarine.

12. Topaz is found both as well-defined prismatic crystals and as rolled pebbles.

found. The quartz crystals are either colourless or smoky and can be tens of centimetres long. The rounded and colourless to very slightly blue topaz pebbles can weigh hundreds of grams. Smaller topaz crystals with pristine faces are also available. Aquamarine is also found in this deposit, but because it is in high demand it can be difficult to find in the local market.

More detailed information about these and other mining areas can be found at the author's website at <http://sites.google.com/site/gemwanderings/cambodia>

# Innovation in bead-cultured pearls

Henry Hänni, Michael Krzemnicki and Laurent Cartier report on pearls with baroque-shaped cores, freshwater cultured pearls and natural pearls ready for an overgrowth.

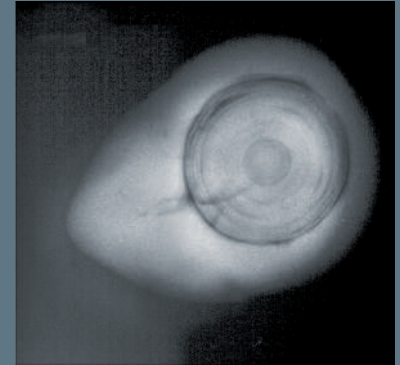
1. Pearl testing is becoming more difficult! In the radiograph of a string of pearls (left) the bead cores in some pearls are visible. The white shape is the outline of the clasp which is opaque to X-rays. © H.A. Hänni and SSEF.



Pearl testing is getting more difficult with the option of natural pearls overgrown with a new skin. © H.A.Hänni, SSEF



2. A cultured pearl with a natural pearl as a bead, 10 mm in length. The X-radiograph on the right clearly shows the concentric growth zones of the bead and its clear boundary with the nacre overgrowth. © M.S. Krzemnicki, SSEF.



A range of different materials have been used as cores in beaded cultured pearls. Classically, these are shaped from Mississippi bivalve shell material, but two new alternative options are baroque-shaped shell beads and Chinese freshwater cultured pearls. Experiments with beads of approx. 6.5 mm have been carried out with marine *Pinctada maxima* and with *Pinctada margaritifera* oysters. After 13 months, nearly 200 pearls of each kind were harvested. X-radiographs and micro X-ray tomography are found to generally deliver clear evidence for identification. These pearls have been found to be excellently suited to subsequent drilling.

Market demand for large, fancy-shaped cultured pearls has stimulated the use of baroque-shaped pieces of shell to use as nuclei for South Sea cultured pearls. On radiographs this material is easily identified as cultured pearl.

Chinese freshwater cultured pearls (CFCPs) can be used for the first beading in saltwater cultured pearl production, where a pearl sac has to be formed from a tissue graft around a spherical hard nucleus. These CFCPs have been found to be a viable replacement for beads cut from shell material. Experiments have shown that the new bead material gives good results in white South Sea oysters *Pinctada maxima*, and dark South Sea oysters *Pinctada margaritifera*. In a gemmological laboratory the presence of CFCP beads can be identified using conventional radiography or micro-x-ray tomography. In both cases the typical characteristics — a central complex cavity 'moustache' and undulating dark lines — can be detected. The price comparison of these CFCP beads and conventional shell beads will probably determine whether this new bead material will be more widely used in the trade. The drilling properties of this new material are perfect as all drill hole directions have the same resistance when drilled, due to the concentric structure of the beads.

Natural pearls have also now been used as nuclei for the formation of cultured pearls. The natural pearls so used are non-nacreous, brown or of an unpleasant appearance, and the cultured 'coating' gives them a far finer appearance. This new kind of cultured pearl is difficult to identify because the radiographic structures are those of natural pearls.

The creation of a beaded cultured pearl gives an object of given shape and size a 'nacre' coating to make it appear like a natural pearl. In the case of the classical Japanese Akoya cultured pearl, a *Pinctada martensii* oyster coats and thus enhances the internal bead. The fine nacre coating may be less than a millimetre thick — thin paintwork that poorly disguises the nature of the core. Cultured pearls of better qualities usually display more than a millimetre of coating and thus show increased size and optical attractiveness, as is usual with South Sea cultured pearls. An unattractive core covered with an attractive coating.

The use of natural pearls of low quality (nacreous or non-nacreous) as beads in cultured pearls is pushing the gemmological laboratories to develop new testing methods, and to consider terminology where the authenticity of a pearl cannot conclusively be decided. A layered, onion-like structure alone is no longer proof of authenticity.

Non-nacreous pebbles of columnar calcite, called 'unripe pearls' by one author (HAH), are harvested just before a nacreous layer is deposited on them by the pearl sac, the latter still being in the juvenile pre-aragonite-forming state (Hänni, 2002). Now it seems that the lack of a nacreous layer on these pearls can be remedied by a quick holiday in a domestic oyster — but the pearl becomes a cultured one.

#### Reference

Hänni, H.A., 2002. SSEF Tutorial 'Pearls' (CD-ROM), [www.ssef.ch](http://www.ssef.ch)

### The Authors

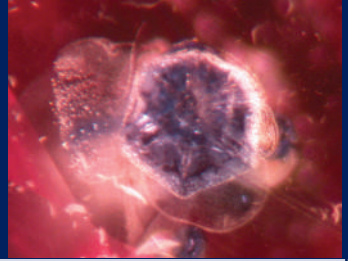
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# An update on the heat treatment of ruby and sapphire



## A ONE-DAY GEM-A SEMINAR WITH TED THEMELIS

Saturday 6 November 2010 from 10:00 to 17:00 at Gem-A's London headquarters



We are extremely fortunate that Ted Themelis, who has had first-hand experience in the treatment of ruby and sapphire, is able to visit the UK to present this important seminar. The day is to be divided into eight sessions where you will learn not only about the treatments used to enhance these gems, but also about their pricing structure. In addition, between each session you will have the opportunity to examine the treated stones for yourself, so please be sure to bring along a penlight and your 10x lens.

Full details of the programme for the day can be found in the Gem-A Conference 2010 leaflet and on our website at [www.gem-a.com](http://www.gem-a.com)

### SEMINAR FEE:

£125.00. Gem-A members and registered Gem-A students: £98.50

### TO BOOK:

For a detailed programme and to download a booking form, go to [www.gem-a.com/news-events/events/update-on-heat-treatment.aspx](http://www.gem-a.com/news-events/events/update-on-heat-treatment.aspx).



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For details of our full range of instruments and books at the Gem-A shop go to [www.gem-a.com/shop.aspx](http://www.gem-a.com/shop.aspx) or contact Alan Clark on +44 (0)20 7404 3334 email [shop@gem-a.com](mailto:shop@gem-a.com).

# Trick or treat?

Whether you are buying, selling or repairing, be sure to identify what you are handling to avoid expensive mistakes.

## Fake crystal group

Gem and crystal dealer Federico Barlocher was delighted with the unusual quartz and topaz group he purchased in 2009 in Myanmar from a Mogok miner. It wasn't until he was cleaning the specimen that he discovered that one of the larger topaz crystals had been fixed in the centre of the group with a mixture of glue and powdered rock. The original group was of high quality and the topaz had been skillfully added, making the deception difficult to detect.

Federico saw a similar fake at Tucson this year, where a tourmaline crystal had been inserted into an albite specimen.

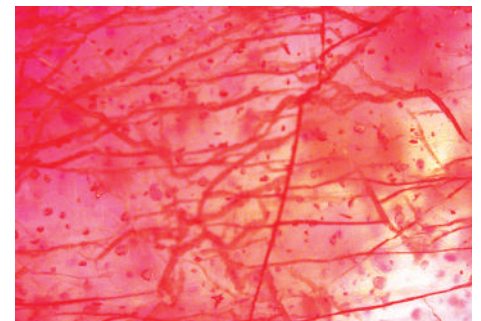


The fake crystal group with the added topaz crystal (arrowed) and (inset) the natural group with the topaz crystal removed. Photo courtesy of Federico Barlocher.

## Damage to a composite lead-glass-filled ruby

There has been much talk in the trade recently about the amount of glass-filled rubies currently on the market. This tale from AGA Board member Craig Lynch emphasizes the need for everyone in the trade not only to be able to identify the treatment, but also to check each stone in a piece of jewellery before undertaking any work on it.

A cabochon ruby and diamond ring was taken into a jewellery store in Arizona, USA, for sizing. The client was in a great rush and asked for it to be done the same day. The jeweller agreed and the customer was to return later that day to pick up the ring. Without first examining the stone, the jeweller carried out the sizing and put the ring into 'pickle', the acid solution that is used to clean up jewellery after it has been subjected to heat. He was horrified to see the damage to the stone when it was removed from the pickle and realized too late that the stone had been glass filled. The ring



(Left) The damaged composite cabochon ruby after it had been pickled. (Right) lead-glass-filled ruby, as typically seen with a very good light and a 10x lens. Photos courtesy of Craig Lynch.

was subsequently sent to Craig Lynch of Ouellet & Lynch, a certified AGA laboratory in Phoenix, Arizona.

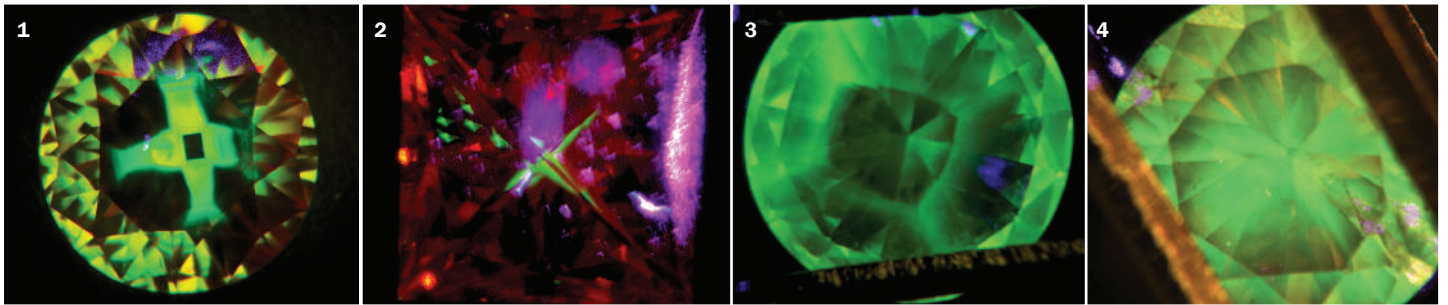
When the customer returned to the store and saw the damage he advised that the

ring had been 'custom made' and that he had paid US\$7000 for it.

A potentially costly mistake for the jeweller that could easily have been avoided.

# Pointers for identification

The potential for using violet-blue laser pointers in gemmology was discussed on Gem-A's Maitalk in late 2009. Here Michael Seubert FGG, Munich, Germany, notes an interesting and specific use: identifying synthetic yellow, yellow-brown and reddish-brown diamonds.



Synthetic and natural diamonds showing luminescence under laser-beam: 1. Synthetic HPHT diamond, origin Belarus; 2. Synthetic HPHT diamond, origin USA; 3. Synthetic HPHT diamond, origin Belarus; 4. Natural diamond. Photos copyright Michael Seubert.

A simple blue-violet laser pointer can be used to reveal the growth structure of some HPHT synthetic diamonds. This is not a sure identification method, but is a useful first step, and one using an easily portable and relatively inexpensive piece of equipment.

The stone to be examined should be observed under magnification, ideally using a microscope, illuminated with a low power blue-violet laser pointer of wavelength 405 nm and ideally 1 mW. Laser light is dangerous to the eyes, especially in shorter wavelengths such as the blue-violet range, and the use of inexpensive laser protection goggles or equivalent eye protection is essential. The stone should be examined when illuminated from several sides and from different angles. A black background — such as black paper — should be used which does not reflect the laser beam.

Of 16 HPHT synthetic diamonds examined (in shades of yellow, brownish-yellow and brownish-red and from German, American and Belarusian production) all showed a more or less strong growth structure. Yellow, brownish-yellow and reddish-brown HPHT diamonds can show either a cross-like luminescence (**1** and **2**), or an overall luminescence that is strong with roughly square zones that are less strongly fluorescent (**3**). The appearance is similar to that of the cathodoluminescence used in the DiamondView™ from De Beers.

Such growth structures were not visible in natural stones observed under similar conditions (**4**), nor were they observed in synthetic colourless diamond or synthetic blue diamond. This suggests that the fluorescence of the growth structure with a laser pointer works only with synthetic type I diamonds which have a higher nitrogen content (yellowish tones). Synthetic type II diamonds seem not to show such typical growth structures, possibly due to their low to non-existent content of nitrogen (N).

Synthetic diamonds grown by the chemical vapour deposition (CVD) process also do not show such growth structures. CVD synthetic diamonds are built up layer by layer, in contrast to diamonds

*Blue-violet laser pointers similar to that illustrated are available on the internet at widely varying prices.*



grown by the HPHT procedure which grow in cubo-octahedral habits.

The presence of a cross-like or square growth structure should be a relatively sure and easy clue that the stone is an HPHT synthetic diamond. Such stones should be subjected to additional investigations, including a study of their inclusions, presence of magnetism and more detailed investigation in a laboratory. But the benefits of using the blue-violet laser pointer as an initial test are that it is non destructive and can be used on mounted stones.

## Warning

The violet-blue laser point may become a useful tool in gemmology, but sufficient protection for the eyes is crucial.

# BSc (Hons) Gemmology and Applied Mineralogy

**The ONE-YEAR BSc course in Gemmology and Applied Mineralogy is open to all those with an appropriate scientific background or qualification such as the FGA, which provides the approved prior learning needed to take on this one year 'top-up' degree course.**

The course aims to enhance students' understanding of the origin of gems and the analytical techniques involved in their study. Key modules taken during the degree programme include:

- Geology and Mineralogy of Gems
- Mineralogical Methods and Techniques
- Recent Developments in Gemmology and Applied Mineralogy
- Research Methods and Data Analysis
- Research Dissertation (double module)

The degree programme includes visits to laboratories and museums and a lecture programme that includes invited keynote speakers who will address key topics. It will culminate in a student-led conference at which the students present some of their work to an invited audience. The degree programme is preceded by a bridging course, involving a field trip to SW England, designed partly to embed knowledge that will underpin later modules, but also to allow the course team to discover what the incoming students individually want out of their studies.

The course team are aware that the student group will include mature students who have been out of education for many years and have designed the course structure accordingly, particularly with respect to developing an understanding of basic scientific principles and the scientific method as applied to gemmology. Students will complete the course not only with an enhanced understanding of the science of gemmology but with an enhanced range of skills. Preparing and delivering oral presentations and researching and writing a dissertation will, in themselves, provide a robust intellectual challenge, which will be fully supported by the course team.

The BSc course in Gemmology and Applied Mineralogy is available in both full time (one year) and part time (two years) mode. Sadly we cannot deliver the course in distance learning mode. Kingston University is located in SW London and is easily accessible from both Heathrow and Central London.

Course details are available at <http://www.kingston.ac.uk/gemmologymineralogy/>. Prospective students are encouraged to contact the course director (Professor Peter J. Treloar) on [p.treloar@kingston.ac.uk](mailto:p.treloar@kingston.ac.uk) or by phone on +44 20 8417 2525.

**Kingston University London**

# The beauty of gems

Gem dealer, Harry Levy, reveals that his favourite gemstone is opal and shares his knowledge of this unique stone.

In the years that I have been writing this column I have tried to give you an insight and overview into how the gem trade acts in selling its products. I attend many congresses where decisions are made and I have reported on these, usually well before you see them elsewhere, and often I have worked on the maxim of giving information which will not be found elsewhere in a compact form.

I was asked several times to give or include in this column the state of the market, what is available and prices. I have not done so because by the time I gather the information, write about it, have it published in this magazine and it gets to you to read, it would probably be out of date. This type of information is available in trade journals that come out monthly or weekly, but even then they reflect on what has happened and not what will happen to prices.

Those involved with the buying and selling of gemstones would need a heart of stone not to be moved by many of the beautiful stones that exist. I remember, many years ago, my father telling me never to fall in love with a stone. This was practical advice in trading in stones, but there are gems I have bought which I cannot bring myself to sell. I am sometimes asked by those who work in the office for a certain type of stone for which they have an order. Sometimes I tell them we

*Opal necklace layout. Matching opals is extremely difficult and usually the sets are made up of stones that do not match perfectly. Photo courtesy of Andrew Cody of Cody Opals (Australia) Pty Ltd.*



do not have such a stone, but they rummage through the safe and find just what they are looking for, and I have to say "It's not for sale."

I asked myself sometime back which would be my favourite stone. Of course the usual three, ruby, sapphire and emerald came to mind. A top-range stone of a significant size in any of these will take one's breath away. Again a fine amethyst, golden quartz, a peridot, a rhodolite garnet and many such stones could rank to be favourites. But to my own surprise I finally came to settle the question by opting for the opal.

I am sure not many would agree with this choice, but most of us get to see the lower range of stones in our working career, and very rarely do we get to see the top range. I am lucky in that the top range of opals are found in Australia, and the Australian dealers make a stop at our office on their way to the States, Japan or the Far East, now that they know my passion for the stone and show me the best in their collections.

Strangely I have found that many jewellers personally really do like opal above other gems. Many don't handle it because it is complex. Some of the world's most famous jewellers love it, including Dior's Vittoire de Castellane who wrote in a book she gave to me: "Opal is my favourite of all gemstones."

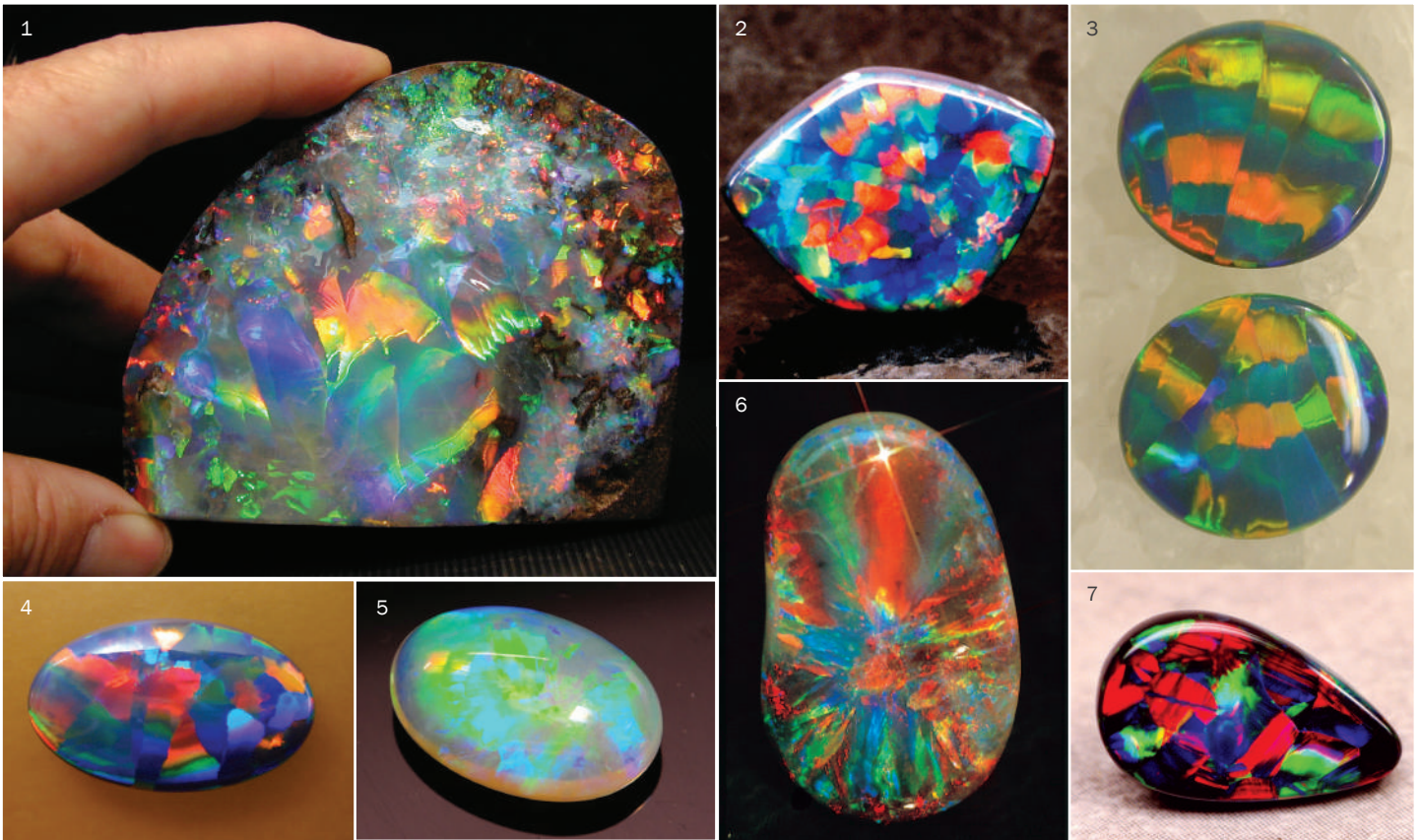
Most opals come from Australia, and we see the white, milky variety – from stones with no speckles in them to ones with plenty of life and fire. We see the crystal varieties – again those with a single sheen of colour, usually blue or green, to those displaying a lot of fire and colours. We see and use stones ranging in price from a few cents a carat to, perhaps, the low hundreds of dollars. Fine-quality crystal light opal can sell for as much as US\$2,500 per carat and gem quality blacks for \$20,000 per carat.

Virtually all the black opal, boulder opal and non-calibrated light opal is cut in Australia, while they send the lower end material to the Chinese in Hong Kong to be cut.

I often looked for a classification of opals (I thought of creating one when I could not find such a list) but the main ones are:

- **Precious opal** which exhibits play-of-colour, which is produced by the diffraction of white light through a micro-structure of orderly arrayed spheres of silica.
- **Common opal and potch**, neither of which exhibit a play-of-colour. The Potch is structurally similar to precious opal but has a disorderly arrangement of its silica spheres, while common opal shows some degree of micro-crystallinity.

## Around the Trade



**Opals of Australia.** 1. *Galaxy 15*, one of the finest boulder opals, now housed in the Houston Museum collection. 2. *Millennium*: A 24.90 ct magnificent gem quality harlequin opal. 3. A pair of harlequin black opals. 4. *The Borealis*, another rare black opal with a flagstone/harlequin pattern. Wholesale value would be around US\$15,000 per carat. 5. *Lightning Ridge* crystal opal with brilliant green flash, valued around US\$600 per carat. 6. *Star Opal*, an exceptional pattern resembling the Union Jack. 7. An extremely rare black opal harlequin, wholesale value around US\$20,000 per carat. Photos courtesy of Andrew Cody of Cody Opals (Australia) Pty Ltd. Don't miss Andrew's presentation on opals at the Gem-A Conference in November (see pages 26 and 27 for full details).

There are magical and mystical names for the sources of opal such as Lightning Ridge, Coober Pedy (an Aboriginal name meaning 'white man in a hole', describing the miners who lived underground to avoid the intense heat of the Australian outback), Andamooka, home of the best crystal opals, and Mintabie.

Descriptive terms are harlequin, pinfire, flash, hydrophane, patch, white, black, and fossilized opals. I would ask the dealers to show me a typical, say, harlequin opal, but each time I would see a different type; small squares, large squares, monochrome, multi-coloured and the nicer and more expensive they got they became more individual.

With most gemstones it is possible to get together a collection of similar looking — matching — larger stones to form a suite comprising, say, necklace, ring, brooch and earrings. It may have taken several years to do it, but it could be done. Nowadays this is much easier since we can heat and otherwise treat stones to improve and change their appearance. This is not possible with opals, as most beautiful large black opals are literally matchless. This makes such opals almost priceless, and when I see them with the dealers the asking

prices are anything from a quarter of a million dollars upwards — always a price for the stone, not by weight. What they eventually sell for I do not know, but to add to the mystique the dealers have a habit of giving such opals an individual name, depending on the shape of the patterns. Thus there is *Sitting Bull's* headgear, the *Flag*, *The Fiery Comet*, the *Fire of Gidgea* and many more.

Australia is not the only producer of opals — they are also found in Mexico. The crystalline material is known as water-opal, and these can come with various qualities of colour flashes in them. The red and orange varieties show no play-of-colour and are known as 'fire opal'. These are cut as faceted stones, which is unusual for opal which is usually cabochon or cut to follow the shape of the opal layer.

The Natural History Museum in London, the Smithsonian, Houston Museum and the Australian Museum all have opal collections, but they are not extensive. I have some fine booklets and leaflets with fine colour pictures to fire the imagination, but they tend to come in very limited editions.

## Shows and Exhibitions

# Amberif 2010

Maggie Campbell Pedersen reports on the 2010 Amber International Fair held in Gdansk, Poland

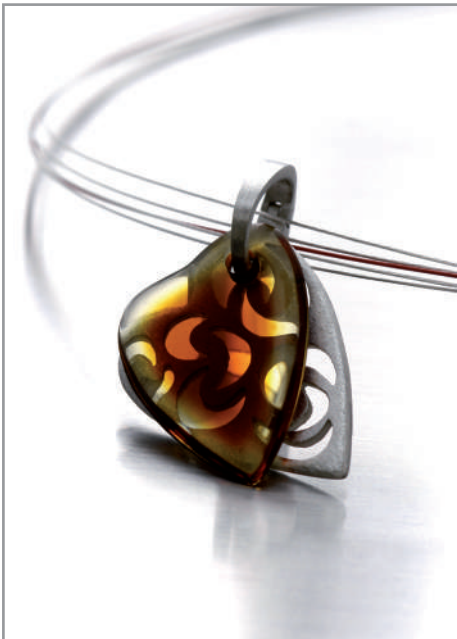
The seventeenth 'Amberif' — the Amber International Fair — was held this year in Gdansk, Poland, from 10 to 13 March. For only the second time it was a trade-only event, but well over 6000 people from 38 countries visited the fair, which had 454 exhibitors from 15 countries.

As usual there were various gems and some packaging and equipment on display, but the emphasis was firmly on Baltic amber. And there was lots of it.

Amberif is a good place to view the seemingly limitless possibilities that amber presents. From the usual little bead necklaces to the one-off designer pieces, sculptures and pictures, Amberif has Baltic amber in all its various incarnations.

Amber can be used on its own, or it can successfully be combined with other

*An example of the modern use of Baltic amber in jewellery. Photo by M. Rozenberg, courtesy of Art7.*



*Above (from left): Prof Kosmowska-Ceranowicz, Ryszard Ulinski (amber expert working with the Amber Commission) and Dr Ewa Wagner-Wysiecka (Gdansk University of Technology), examining amber on the Amber Laboratory's stand. Below: Display panels on the Amber Laboratory's stand, each showing different amber treatments or imitations. Photos by Maggie Campbell Pedersen.*





## Shows and Exhibitions

materials. In times past it was sometimes trimmed with ivory, but today it can be seen combined with other gems, various metals (not only silver and gold), as well as wood, shell, leather – indeed with anything that takes the designer's fancy.

By far the bulk of the material on display was Baltic amber in its beautiful, natural colours; from creamy white through honeys and golds to dark browns, but examples of amber which had been treated in some way – for example clarification in an autoclave, darkening by heat-treatment and pressed amber – were also available. So, too, was 'green amber', but it was noticeable that the material being sold was less garish in colour than some of the material for sale in Tucson this year, and was probably treated Baltic amber rather than copal.

The rules laid down by the organizers of the fair are very stringent. I quote: "There is a complete ban on the exhibiting of surrogates (products made of plastics mixed with

amber), Colombian copal, and Baltic amber forgeries at the Amberif Fair."

All treatments have to be disclosed, though not necessarily the exact process involved. Failure to do so, or the misleading of visitors, ends in a stand being closed down. This is enough of a deterrent to stop some companies selling the more dubious varieties of 'green amber' at Amberif, even though the same company may have been selling them in Tucson.

There were one or two stands selling ambers of slightly strange colours, such as peachy pink, clear cherry red and even turquoise. These were said to be the result of a process in an autoclave, similar to that used to produce 'green amber'. Initial tests left some questions, so more tests are being undertaken on material collected during the fair. Although the experts try to keep abreast of all the treatments, they admit that they are occasionally baffled themselves.

The fairs are supervised by the Joint

Commission for Amber and Gemstone Inspection, led by Professor Barbara Kosmowska-Ceranowicz (Museum of the Earth, Polish Academy of Sciences), Dr Elena Belichenko (State Gemmological Centre of Ukraine), Wiesław Gierłowski (International Amber Association expert) and others. During the fairs they regularly test anything that appears not to be as advertised, as well as items brought to them by visitors to the fair.

On the Amber Laboratory stand Gabriella Gierłowski – who runs the laboratory and is the author of many publications – presented all the various types of amber, its forgeries and treatments. For this display alone it is worth visiting Amberif. It is there every year, but each year it grows a little with the new treatments being discovered.

On the last day of the fair it is customary to hold seminars on amber, given by an international panel of amber experts. This year the theme was 'Amber in Collections and Archaeology'.

# LOUGHBOROUGH 2010

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- Main presentations on fake silver with Alastair Dickenson, mark-ups, dialogue with customers/ insurers etc, post-loss assessment, Visual Optics with Alan Hodgkinson, new ideas and techniques with Don Palmieri ("The Market Monitor")
- Book and instrument sales with Alan Clark of Gem-A Instruments

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Sandra Page on 029 2081 3615 or email [irv@jewellers-online.org](mailto:irv@jewellers-online.org).

## Shows and Exhibitions

An exhibition of paste and other jewellery dating from the eighteenth and nineteenth centuries staged by S.J. Phillips Ltd, London, dealers in antique jewellery.

# Brilliant Impressions

The exhibition Brilliant Impressions was held from 15 to 29 June at S.J. Phillips Ltd. It comprised over 140 pieces most of which had come from a private collection and provided a comprehensive overview of paste between 1750 and 1900.

Paste jewellery is part of a tradition dating back to antiquity when craftsmen discovered that glass could provide a fine substitute for the colour, brilliance and splendour of expensive gemstones. Roman writers, describing the passion of rich men and women for gold jewellery set with emeralds and pearls imported from the East, remarked that those who could not afford genuine gems sought the same effect. Similarly in the Middle Ages, when wealth was also expressed by the possession of valuable gold and jewellery, there was a demand for substitutes met by the glass makers of Bohemia, Venice and Paris. Glass even appears in the collections of Elizabeth

I, Mary Queen of Scots, Anne of Denmark (wife of James I), the first Duchess of Marlborough and, among others in France, Henri IV.

During the seventeenth century the demand for glass imitations increased as jewellery design focused on the display of stones, especially diamonds. English travellers to both Venice and Paris

1. Butterfly. White and coloured paste, close set in silver. French, eighteenth century.
  2. Girandole earrings. Pink and white pastes, close set in silver. Probably French, early eighteenth century.
  3. Blue parure. Blue paste, close set in gold. English, early nineteenth century.
- Images courtesy of S.J. Phillips Ltd.
4. Bib necklace. French jet (black glass) mounted in silver. Possibly English, nineteenth century.



## Shows and Exhibitions

remarked on the quality of imitation stones and the translation by Christopher Merrett, a London physician, of A. Neri's *L'Arte Vetraria* (Florence, 1612) stimulated English makers to follow suit. George Ravenscroft perfected a formula for colourless glass with greatly improved optical properties, creating copies that were so good that speculation on whether jewels were genuine or not was one of the amusements of society.

There followed in the eighteenth century the great flowering of paste jewellery, coinciding with what was called 'the age of the diamond'. Improvements in lighting with wax candles meant that diamonds could be seen to their best advantage especially since not only had the brilliant cut been introduced but setting and foiling techniques had also greatly improved. Paste gems were made by equally skilled craftsmen who produced excellent bright imitations, which were similarly set in well-designed jewellery.

Among the best examples of eighteenth century pieces to be exhibited was a French butterfly in white and coloured paste set in silver, the wings pavé set with white pastes and the head, thorax and abdomen set with coloured pastes (1). The design of the pair of early eighteenth century girandole white and pink paste earrings (2), is of seventeenth century origin. They are named 'girandole' as the design resembles the branches of a candlestick.

All the leading jewellers sold paste which appealed not only to those of modest means but also to the rich as it could be worn without having to worry about thieves and was a sensible substitute when travelling – attributes which continue to attract buyers today.

Demand for paste continued to increase in the early nineteenth century and, between 1810 and 1830, a fashion for bright colours in dress as well as jewellery eclipsed white paste 'diamonds'. Parures or matching sets of imitation amethyst, topaz, emerald and sapphires survive to illustrate this taste, which is exemplified by an early nineteenth-century English parure in blue paste close set in gold (3). The pair of bracelets, necklace with Greek cross pendant, top and

drop earrings and open brooch/buckle are all still in the original fitted case. Over the years, much old jewellery has been broken up for the stones, particularly parures, so paste survivals are of great interest.

The ritual of mourning was strictly observed in the nineteenth century which led to the manufacture of suitably sombre jewellery. The jewellery could be made of black enamel or onyx with seed pearl but was principally of jet, both the genuine article from Whitby and the 'French', or black glass version, which was not only less expensive but could also be moulded into a greater variety of patterns. A particularly striking example is a bib necklace of French jet mounted in silver (4).

In the second half of the nineteenth century designs became more naturalistic as the moneyed classes looked for something new and different. Flowers, leaves, bees, butterflies, a variety of insects, lizards, frogs, birds and tortoises were all popular. The Vauxhall Glass Manufactory produced mirrored glass that was much used in the production of inexpensive jewellery particularly by makers in Birmingham.

In 1869, *Queen* magazine stated the case for 'sham' jewellery: "If the profession or career of the husband requires that his wife should go much into society on a small income, she would be perfectly justified in wearing imitations to save money. ....it cannot be wrong for a lady who cannot afford and has not inherited them to wear a moderate amount of paste." The article added that she should not give the impression that her 'jewels' were of any value.

The exhibition was accompanied by a fully-illustrated catalogue *Brilliant Impressions* written by Diana Scarisbrick with a foreword by Anna Wintour, Editor-in-Chief of American *Vogue* since 1988. As the first publication on the subject for over 30 years, it throws new light on an area of jewellery that has been rather neglected. Copies are available at £28.00 (softcover) and £38.00 (hardcover) from S.J. Phillips Ltd. [www.sjphillips.com](http://www.sjphillips.com).

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New to the workshop programme is 'Gem Empathy – Gemstones for Jewellery Designers', a perfect introduction to the wonderful variety

of gemstones available on the market today. The focus will be on the factors that are essential for all those working with gems in jewellery – susceptibility to damage in manufacture, repair and cleaning, and durability in wear. You will gain the insights to enable you to best take advantage of the beauty of gemstones in your designs while minimizing the potential for problems.

### Latest books and instruments

A wide selection of gem testing instruments and books will be featured. Our team at stand J50 will include a gemmologist to advise on the best equipment to suit your needs.

## Gem-A Annual General Meeting

The Gem-A AGM is to be held during IJL on Sunday 5 September at 4:30 pm in the Whitehall Room, Earls Court 2. Visit our website at [www.gem-a.com](http://www.gem-a.com) from 1 August for further information and to download the AGM agenda, annual report and accounts. Hard copies can be mailed to members on request.

## Show Special

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Show price: £292.50 + VAT



## Gem-Empathy Award

Gem-A is delighted to announce its annual Gem-Empathy Award to recognize the exhibitor at IJL whose gem-set jewellery best combines innovation and design flair with a knowledgeable and sympathetic understanding of the materials. The judges will base their decision on a single piece or collection of jewellery that makes captivating use of one or more gemstones. The criteria for the award will include accurate gem descriptions as well as creativity, imagination and attractiveness.

The winner of this year's award will receive publicity in *Gems & Jewellery* as well as a free full-page advertisement. The winner will also be offered a free place on a one-day Gem-A workshop of their choice or free attendance at the 2010 Gem-A Conference, plus free Corporate Membership of Gem-A for 2011.

Our Gem-Empathy Award judges visit all IJL stands anonymously, but if you have a particular piece or range that you would like to bring to our attention in advance, let us know – contact Mary Burland at Gem-A giving your name and stand number: [mary.burland@gem-a.com](mailto:mary.burland@gem-a.com).

The 2009 Gem-Empathy Award winners were, for the second time, the Derbyshire-based family business C W Sellors. The judges were particularly impressed with their unique and creative use of British gemstones Whitby jet and Derbyshire Blue John. Said Chris



The 2009 Gem-Empathy Award winners C W Sellors. From left, Rebecca Sellors, Jason Sellors, Diane Sellors, Gem-A CEO Jack Ogden, Sarah Hicks (Marketing Manager, IJL) and Chris Sellors. Photo by Alex Beaton Photography Ltd.

Sellors: "The Gem-A Award adds prestige to us not only as a company but also in the promotion of our products to customers in-store."

## Free Two-Hour Seminars by Gem-A

Doug Garrod (pictured) has become a highly anticipated 'Show regular' in the programme of excellent seminars held each year during IJL. Following the success of last year's seminars, Doug will be presenting two-hour hands-on sessions giving essential information for those involved in the jewellery trade.

Please note that each session is *limited to 16 delegates* and so it is recommended that you book your place in advance. You can do this by emailing Claire Mitchell at [claire@gem-a.com](mailto:claire@gem-a.com) or Doug Garrod at [doug@gem-a.com](mailto:doug@gem-a.com).

Both of Doug's presentations will be held in the Windsor Room on the first floor at Earls Court 2.

Sunday 5 September: 10:00 am to 12:00 midday

### **Ruby and its treatments**

During this seminar Doug will introduce the various treatments that have been used to improve the colour and/or clarity of ruby. Rubies filled with lead glass are very prevalent at the moment. Recognition of these treatments is extremely important for anyone selling, valuing or buying rubies.

Tuesday 8 September: 10:0 am to 12:00 midday

### **Diamond treatments and imitations**

Diamond is the gemstone that is most often encountered in the jewellery trade. During this session Doug will explore the treatments that are used to alter the appearance of diamond clarity. Diamond imitations will also be considered and the means of separating these from diamond will be discussed.



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## The Journal of Gemmology

Summaries of articles published in *The Journal of Gemmology*.

The full articles may be viewed by Gem-A members only at [www.gem-a.com/publications/journal-of-gemmology/the-journal-online.aspx](http://www.gem-a.com/publications/journal-of-gemmology/the-journal-online.aspx)

# Thai dickite: a gem material for carving\*

Ornamental gem materials are popular for decorative carvings where, unlike gems for jewellery, softness is less of a constraint. Even very soft materials such as steatite, gypsum, marble, calcite and fluorite can be used for carvings and such materials are easy to carve, with lower production costs and shorter working times than harder and tougher ones. Dickite is one such soft material. It is a fine-grained clay mineral ( $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$ ) with a Mohs' hardness of just  $1\frac{1}{2}$ –2 which occurs in fine-grained masses in a wide range of colours, most typically cream, greyish green, pale greyish blue, white, pale green, yellow or dark blue, but red, pink and yellowish-cream varieties are also known.

Dickite is a raw material for the ceramics industry, but the material from Saraburi, Thailand, also has a long history of being used for carvings such as Buddha statuettes (1), tables, jars and animal figurines. For a time the Thai dickite was mistakenly thought to be pyrophyllite, a commoner mineral of similar appearance and some similar physical properties.

The dickite from the Thai deposits has been categorized in three broad grades: i.e. grade A (high purity) grade B (less pure) and grade C (low quality, unsuitable for carvings). Grade-A blocks of dickite specifically for carving currently sell for 10,000 Baht (about US\$300) per ton. There are two known dickite deposits in Thailand; the larger is near the border of Nakhon Nayok and Saraburi provinces and the other is in the Muang district of Nakhon Nayok province. Thai reserves of dickite have been estimated at approximately 20,000 tons.

The origins, structure and geochemistry of dickite have been the subject of several studies. Dickite is formed by the replacement of volcanic rocks and fracture-filling and so distribution is dependent on the structure

1. A Chinese Buddha (laughing Buddha) carved from red and cream dickite.





2. Three carvings of a horse in dickite (a), marble (b) and dolomite (c) carried out as part of the study. Carvers found the dickite horse easier to carve than that of marble due to higher toughness, but in all materials it was necessary to include the tree trunk to support the horse.

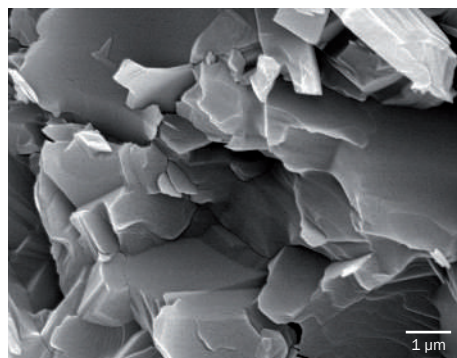
(cavities or fractures) of the host rocks. Some domains in the host rocks are completely converted to dickite while others have only been partially replaced.

For the study, samples of Grade A and Grade B dickite were used from Suthakit Mining Co. Ltd in Saraburi province. The study also included the working of the material and a full examination of its composition, microstructure and other physical and chemical properties. As standard gemmological instruments may not be sufficient to identify dickite, advanced techniques, especially Raman spectroscopy, may be required. Nine carvers who had been carving rocks and minerals for more than five years were surveyed regarding their opinions on carving dickite compared to marble from Na Phra Laan, Saraburi province, and dolomite from P&S Pand's Group Co. Ltd., Kanchanaburi province.

The equipment used to carve dickite includes a rock saw, table, hose, flexible shaft and mounted abrasive point, sanding paper, goggles, mask, etc. The dickite, trimmed to the required size, is carved with the following procedures: drawing an outline on the rough (designing); pre-forming with a saw; grinding the outline; grinding the features; sanding; and polishing.

Dickite, marble and dolomite have their own unique blend of colour and texture as well as different hardnesses and strengths. It was found that although marble and dolomite are harder than dickite, they are

more brittle and have a higher tendency to break if the carved object has a sharp corner or a long thin component. The carvers found dickite to be easier to carve than marble and dolomite, with a distinctive range of colours and textures (2). It was also recommended that grade A dickite should be extracted from the mine by sawing without use of explosives as these can cause severe strain and fractures in the mineral.



3. SEM image of cream and red dickite. The crystals are tightly packed and the porosity is low. The bright crystals in the top right-hand corner are probably hematite.

The crystal habit of dickite was not easily observed in polished section because of its intergranular texture, but under the scanning electron microscope the granular texture of grade A and grade B dickite could be resolved as pseudo-hexagonal plates 1–10 µm across, stacked together like books (3). Grade C dickite showed a different, very fine grained texture with tiny holes, some of

which contain tabular crystals. The grade A (cream and red) samples were found to have a higher  $Al_2O_3$  content and lower  $SiO_2$  than the grade B samples.

\* A summary of 'Dickite: a material for gem carving from Thailand' by Seriwat Saminpanya, Chaichart Dharmgrongartama and Namrawee Susawee. *The Journal of Gemmology*, 2009, **31**(5-8), 211-225.

*Editor's Note: Out of interest it might be worth noting that in the late 1970s – early 1980s a number of supposed ancient greyish dickite carvings in human and animal form appeared on the antiquities market. These were said to originate in the Lake Van region of eastern Turkey and to date back to several thousand years BC. These carvings surfaced in various galleries and collections, and included among the latter was the collection of the late Leo Mildenberg. The catalogue of the exhibition of part of Mildenberg's collection at the Cleveland Museum of Art included a note about the material – X-ray diffraction and other tests identified it as dickite (see A. Kozloff, *Animals in Ancient Art from the Leo Mildenberg Collection, Cleveland Museum of Art, 1981*). Questions about the authenticity of these carvings were raised when they first appeared on the market.*

# ROCK 'n' GEM SHOWS

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14 and 15 August 2010

**FARNHAM MALTINGS**  
Bridge Square, Farnham, Surrey  
11 and 12 September 2010

**NEWTON ABBOT RACECOURSE**  
Newton Abbot, Devon  
18 and 19 September 2010

**NEWARK SHOWGROUND**  
Winthorpe, Newark, Notts  
25 and 26 September 2010

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Great North Road, Hatfield, Herts  
2 and 3 October 2010

**BATH & WEST SHOWGROUND**  
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diamond merchants



# Corundum: natural or synthetic?\*

Gemmologists traditionally distinguish natural from synthetic corundum on the basis of such characteristics as inclusions and growth lines. However, such tell-tale signs are not always easy to see or interpret. The authors have considered how advanced techniques may be used to provide more certain criteria for separating natural corundum from hydrothermal and flux synthetics.

Large and relatively inexpensive corundum crystals in many colours can be grown today using Verneuil flame fusion, Czochralski pulling, or flux or hydrothermal growth. The key diagnostic feature of Verneuil synthetic corundum are curved growth lines, reflecting changes in growth rate and minute variations in the distribution of colouring agents and strain. However, these are not always easy to see, especially with pale-coloured specimens. Czochralski-grown synthetic stones appear similar to Verneuil ones, but the internal characteristics tend to be more difficult to recognize due to the generally better controlled growth process. Flux and hydrothermal synthetics are more expensive than Verneuil and Czochralski ones; they are thus less widespread in the jewellery market and their features less familiar to gemmologists.

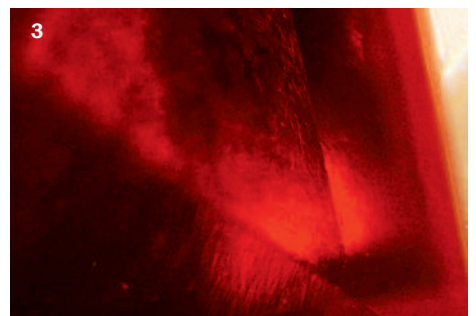
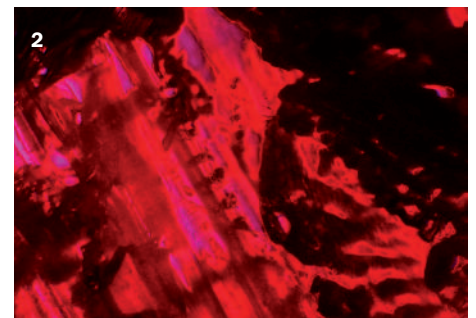
For their study the authors obtained 35 rough and cut samples of natural corundum from deposits in Russia, Madagascar, Tanzania and Vietnam; synthetic corundum grown by the flux method in the laboratories of Ramaura, Kashan, Balitsky and Lomonosov Moscow University (Moscow, Russia), and synthetics grown by the hydrothermal method in the laboratory of Balitsky (IEM, RAS, Chernogolovka, Russia).

Samples of these were studied using optical microscopy, spectroscopic techniques (Infrared, UV-absorption and photoluminescence analysis) and oxygen isotope analysis.

There are three main impurity elements in corundums: chromium, iron and gallium. Their relative proportions can be used to indicate a locality or growth laboratory. In this study the hydrothermal synthetic showed no distinctive compositional features, but the low proportions of iron in flux specimens was notable. With infrared spectroscopy (FTIR), the 'water' bands were much less evident in the spectra of the natural stones than the synthetics. With PL an excitation band centred at 290 nm was seen in spectra of synthetic rubies only, with both high and low contents of iron. This is considered to be a discriminator between natural and synthetic stones. With UV absorption, flux-grown rubies reveal a characteristic narrow band in their spectra with a maximum at 342 nm. The reason for this line is not known and further studies should be undertaken.

Oxygen isotopic composition of flux corundum is similar to that for natural corundum, but varies from that found with the hydrothermal synthetic corundums studied. Unfortunately, this is a destructive technique.

**J.O.**



*Inclusions in corundum: (1) mineral inclusion (possibly rutile) in natural corundum; (2) flux inclusions in a flux-grown corundum; and (3) parallel undulating growth features in hydrothermal synthetic-grown corundum.*

\* A summary of 'New data for distinguishing between hydrothermal synthetic, flux synthetic and natural corundum' by Alexei S. Bidny, Olga S. Dolgova, Ivan A. Baksheev and Irina A. Ekimenkova. *The Journal of Gemmology* (in press).

Login as a member on the Gem-A website and go to [www.gem-a.com/publications/journal-of-gemmology/the-journal-online.aspx](http://www.gem-a.com/publications/journal-of-gemmology/the-journal-online.aspx) to view the full articles.

## Gem-A Calendar

### July

20

#### IDENTIFYING BLUE STONES

##### London Trade Evening

Gem-A's London headquarters

6:00 to 8:00 pm

Find out more about blue stones and practice testing techniques.

For further details contact

Carlos Witkowski on 020 7404 3334

email [carlos.witkowski@gem-a.com](mailto:carlos.witkowski@gem-a.com)



26 to 30

#### VISIT THE LAND OF THE MIDNIGHT SUN: ARCTIC SWEDEN

- Visit mineral and gemstone localities
- Experience gold panning
- Try your hand at lapidary

For further information contact Doug

Garrod at [doug.garrod@gem-a.com](mailto:doug.garrod@gem-a.com) or call

Doug on 020 7404 3334.

### August

8

#### SOUTH WEST BRANCH SUMMER SOCIAL

An afternoon of gems, BBQ, cocktails, quizzes and boule. To be held in Bath.

For further information contact Kerry

Gregory at [kerry@gemmologyrocks.com](mailto:kerry@gemmologyrocks.com)

### September

5

#### ANNUAL GENERAL MEETING

##### Change of date and venue

The Gem-A AGM is now to be held at 4:30 pm on Sunday 5 September in the Whitehall Room at Earls Court 2 during IJL. Visit our website at [www.gem-a.com](http://www.gem-a.com) from 1 August for further information and to download the AGM agenda, annual report and accounts. Hard copies can be mailed to members on request.

5 to 8

#### INTERNATIONAL JEWELLERY LONDON

Meet the Gem-A team at Stand J50. Don't miss Doug Garrod's two-hour seminars at the show on the Sunday and Tuesday. See pages 18 and 19 for more information.

9

#### FAKING LUXURY IN MEDIEVAL AND RENAISSANCE EUROPE

##### A presentation by Joanna Whalley

Scottish Gemmological Association

To be held at the British Geological Survey, Edinburgh.

Further information at [www.scotgem.co.uk](http://www.scotgem.co.uk).

14 to 18

#### HONG KONG JEWELLERY & GEM FAIR 2010

##### Asia World Expo

Meet the Gem-A team at Booth No. 7P33.

28

#### ALLURE OF GEMS\*

##### Gem-A one-day workshop

Gem-A's London headquarters

10:00 am to 4:30 pm

An informative and informal workshop, ideal for those new to gemmology. No previous experience is required.

### October

5

#### TASSIES

##### A presentation by John Smith

Scottish Gemmological Association

To be held at the British Geological Survey, Edinburgh.

Further information at [www.scotgem.co.uk](http://www.scotgem.co.uk).

19

#### DIAMOND BUYING GUIDE\*

##### Gem-A one-day workshop

Gem-A's London headquarters

An introduction to the four Cs (carat weight, clarity, colour and cut).

20

#### GEM EMPATHY – GEMSTONES FOR JEWELLERY DESIGNERS\*

##### Gem-A one-day workshop

Gem-A's London headquarters

A perfect introduction to the wonderful variety of gemstones available on the market today, with a special focus on the factors that are essential for all those working with gems in jewellery.

26

#### INTRODUCTION TO PRACTICAL GEMMOLOGY\*

##### Gem-A one-day workshop

Gem-A's London headquarters

This practical day will help you understand the principles required for effective gemstone identification.

29

#### PEARLS – NATURE'S GIFT\*

##### Gem-A one-day Workshop

Gem-A's London headquarters

A day for those with a passion for pearls.

## November

### 4

#### THE WORLD OF JADE\*

##### Gem-A one-day workshop

Gem-A's London headquarters

Discover how jade is defined, the countries that are producing jade and the mining methods used.

### 6

#### AN UPDATE ON THE HEAT TREATMENT OF RUBY AND SAPPHIRE\*\*

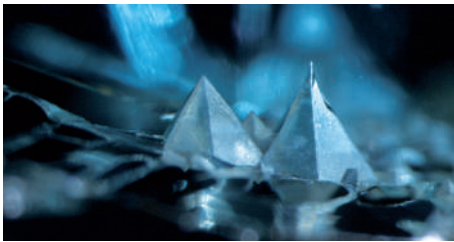
##### A one-day Gem-A seminar with Ted Themelis

Gem-A London headquarters. Further details given on page 8.

### 7

#### GEM-A ANNUAL CONFERENCE

##### Gemmology and the Gem Market: Micro and Macro\*\*



Hilton London Kensington

9:30 am to 6:00 pm

Dinner/disco: 7:30 pm to midnight

The 2010 Gem-A conference will be looking at gems from both gemmological and marketing perspectives, and in detail as well as giving the wider picture. The day will conclude with a dinner/disco.

### 8

#### FROM MEDIEVAL TO MODERNISM:

##### A thousand-year tour of international jewellery design\*\*

##### A one-day Gem-A Seminar with John Benjamin.

Goldsmiths' Hall, London

Further details given on page 34.

### 8

#### GEM-A GRADUATION CEREMONY AND PRESENTATION OF AWARDS\*\*

6:30 to 9:00 pm



Goldsmiths' Hall, London

The ceremony will be followed by a reception for graduates and their guests.

### 9

#### PHOTOMICROGRAPHY\*\*

##### A Gem-A half-day workshop with Michael Hügi

Gem-A's London headquarters

10:00 am to 12:30 pm

The principles of photomicrography and the subsequent digital processing will be demonstrated.

#### PRIVATE VIEWING OF THE CROWN JEWELS\*\*

##### Guided tour by David Thomas MVO

The Tower of London

4:00 to 6:00 pm

#### Gem Discovery Club\*\*

Gem-A's London headquarters

6:45 to 8:00 pm

Specialist evening.

#### IT SHOULDN'T HAPPEN TO A RUBY

##### Practical Session

Scottish Gemmological Association

To be held at the British Geological Survey, Edinburgh.

Further information at [www.scotgem.co.uk](http://www.scotgem.co.uk).

## December

### 12

#### NATURE'S TREASURES 3

A one-day seminar at the Flett Theatre, Natural History Museum, South Kensington  
10:00 am to 4:00 pm

An event for anyone with an interest in minerals and gemstones. Students from schools and universities are particularly encouraged to attend. The day will include a programme of short talks as well as a number of displays and demonstrations.

The day will commence with registration and coffee at 10:00 and finish at approximately 4:00 pm.

The event is organized jointly by Gem-A, The Mineralogical Society, The Russell Society and Rockwatch, in association with the Natural History Museum.

Further information on this event is given on page 2.

#### \* GEM-A WORKSHOPS

Further information on our popular one-day workshops is given on page 34.

#### \*\* GEM-A CONFERENCE AND EVENTS

Further details are given on pages 26 and 27.

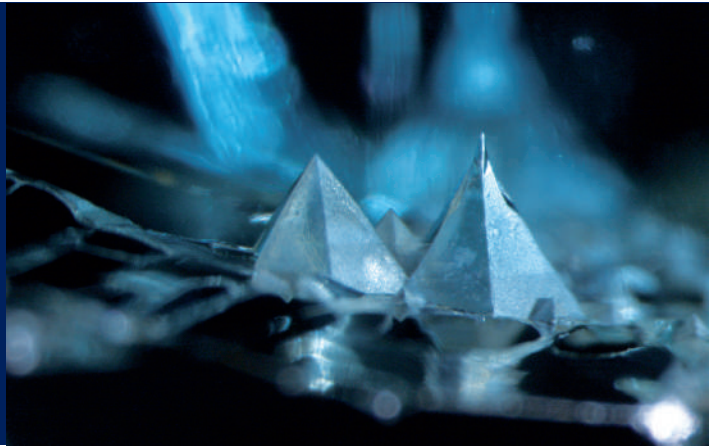
For the latest information  
on Gem-A events and  
workshops go to  
[www.gem-a.com](http://www.gem-a.com)

# Gem-A Conference 2010

## Gemmology and the Gem Market: Micro and Macro

Sunday 7 November 2010

The Hilton London Kensington



The 2010 Gem-A conference will be looking at gems from both gemmological and marketing perspectives, and in detail as well as giving the wider picture. The programme will cover some of the latest treated, synthetic and simulated gems and how you may differentiate between them, gemstones from their origins to the present day, pricing structures and photomicrographic techniques.

The programme will include:

RICHARD DRUCKER, USA	Historical and gemmological influences on pricing
DR MICHAEL KRZEMNICKI, Switzerland	Gem Lab notes
CHRISTOPHER P. SMITH, USA	Rubies – untreated and treated: An update of rubies currently in the market
GIOIA DE SIMONE, Italy	Red coral: when tradition meets a modern management
MAGGIE CAMPBELL PEDERSEN, UK	Amber, copal and the green stuff
ANDREW CODY, Australia	Opal and the dinosaur – discover the link
MICHAEL HÜGI, Switzerland	Digital photomicrography: Revealing the hidden beauty of inclusions in gemstones

The programme will allow you ample time for networking and to view displays by the speakers and to browse through the latest books and instruments available from Gem-A. The conference will open at 9:30 am for registration and coffee, finishing at approximately 6:00 pm. A dinner/disco will follow on the Sunday evening. The fee for the Conference, to include lunch and refreshments, is £130.00 for Gem-A members, £150.00 for non-members and £55.00 for Gem-A registered students. Tickets for the dinner/disco are £46.00.

### CONFERENCE VENUE

The Conference and Dinner/Disco are to be held at the:

Hilton London Kensington, 179–199 Holland Park Avenue, London W11 4UL. Tel: +44 (0)20 7603 3355 Fax: +44 (0)20 7602 9397

#### Accommodation at the Hilton London Kensington

A limited number of rooms have been reserved at the Hilton London Kensington for delegates during the conference. Please book directly through the Hilton (Tel: +44 (0)20 7603 3355 Fax: +44 (0)20 7602 9397), or on our Hilton conference booking webpage at [http://www.hilton.com/en/hi/groups/personalized/LHRHITW-AGEMB-20101106/index.jhtml?WT.mc\\_id=POG](http://www.hilton.com/en/hi/groups/personalized/LHRHITW-AGEMB-20101106/index.jhtml?WT.mc_id=POG)

### TO BOOK FOR THE CONFERENCE AND EVENTS

To book online for the Conference and Events, go to [www.gem-a.com/news-events/events/conference-2010.aspx](http://www.gem-a.com/news-events/events/conference-2010.aspx) or contact **Carlos Witkowski** on +44 (0)20 7404 3334 email [carlos.witkowski@gem-a.com](mailto:carlos.witkowski@gem-a.com)

#### PHOTOGRAPHS

*(This page)* Growth structures (negative crystals) in aquamarine (variety of beryl), found in Tanzania. Photo courtesy of Michael Hügi. *(Facing page)* A complex water sapphire, polychrome enamel and emerald pendant by Henry George Murphy circa 1928. Photo courtesy of John Benjamin.

# Gem-A Conference 2010

## Events

Saturday 6 to Tuesday 9 November 2010



### SATURDAY 6 NOVEMBER

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10:00–17:00

**An update on the heat treatment of ruby and sapphire.** A one-day seminar with TED THEMELIS

Divided into eight sessions, this seminar will not only cover diffusion and heat treatment, but will also discuss pricing structures for the treated stones. There will be the chance to examine samples of each treatment, so be sure to bring along a penlight and your 10x lens. Further information on the seminar is given on page 8.

Price: £125.00. £98.50 for Gem-A Members and Students.

19:00 for 19:30

**Informal dinner**

Enjoy an informal meal at a Singapore Chinese restaurant a short walk from the Hilton London Kensington.

Price: £32.00 to include wine and soft drinks.

### MONDAY 8 NOVEMBER

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10:15–16:30

**From Medieval to Modernism: a thousand-year tour of international jewellery design**

A one-day seminar with JOHN BENJAMIN at Goldsmiths' Hall in the City of London.

This intensive four-part seminar offers a unique opportunity to study the evolution of international jewellery design from Medieval times to the end of the twentieth century. We are extremely fortunate that John has offered to give his presentation free of charge, to ensure that the attendance fee may be kept to a level affordable to anyone in the trade. Further information on the seminar is given on page 34.

Price: £15.00 to include morning and afternoon tea and coffee.

18:30–21:00

**Graduation Ceremony and Presentation of Awards**

The graduation ceremony will be held at the prestigious Goldsmiths' Hall in the City of London, where graduates will be presented with diplomas and prizes gained in the 2010 Gem-A examinations. The ceremony will be followed by a reception.

Price: £14.00.

### TUESDAY 9 NOVEMBER

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10:00–12:30

**Photomicrography.** A half-day workshop with Michael Hügi

The principles of photomicrography and the subsequent digital processing (HDRI and focal depth enhancement) will be demonstrated. To be held at the Gem-A headquarters in Greville Street.

Price: £30.00.

16:00–18:00

**Private viewing of the Crown Jewels.** Guided tour by David Thomas MVO

David Thomas, Crown Jeweller from 1991 to July 2007, will be providing a unique opportunity to view the Crown Jewels in the Jewel House at the Tower of London.

Price: £40.00.

18:45–20:00

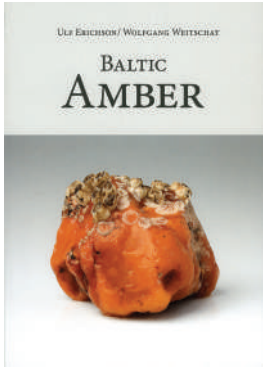
**Gem Discovery Club**

The Gem Discovery Club is a weekly practical gemmology evening for Gem-A members. Once a month, club members have the opportunity to examine items from the collections of gem and mineral specialists. Details of the November specialist evening will be published on our website by early September.

Price: £5.00 (No additional fee is charged for current Gem Discovery Club members, but those wishing to attend should notify Gem-A in advance.)

## Book Shelf

### Baltic Amber



Ulf Erichson and Wolfgang Weitschat, 2008  
German Amber Museum,  
Ribnitz-Damgarten  
192 pp. Fully illustrated  
in colour.  
Price on application.

This book is published as an exhibition catalogue for the German Amber Museum in Ribnitz-Damgarten, but it can easily stand alone as an excellent introduction to Baltic amber, from its origins and history to the present-day trends.

The text is written in clear and simple language as the book is written for the general public rather than for specialists. As well as colour photos of excellent quality, there are many diagrams, maps, old photos and old etchings to accompany and enhance the text.

The authors know their amber! Ulf Erichson is Director of the museum, and Dr Wolfgang Weitschat (of the Geology and Palaeontology Institute and Museum at the University of Hamburg) is a well-known expert in amber circles and author of many papers and books.

The book covers two areas: 'Origins, Deposits, Inclusions' which also includes identification and extraction, and 'Amber in Art and Culture' covering the

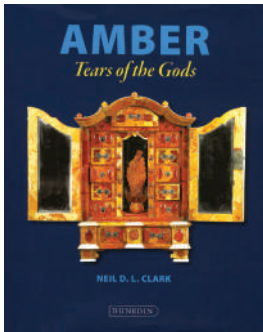
various uses of amber since the Stone Age and giving examples both old and new. It is all divided into small bite-sized sections. There is a table of contents but no index, as it is not intended as a reference book.

As it is not a scientific treatise there is a slight tendency to over-simplification, for example in the very first sentence: "The term 'amber' is the general designation for fossil resins more than a million years old." However this simplification does not detract from the work as a whole.

The book gives a straightforward and comprehensive insight into the world of Baltic amber. Those that find the text too simple will nonetheless be fascinated by all the reproductions of old photographs. It is a quality production and a pleasure either to browse through or to read from cover to cover.

**Maggie Campbell Pedersen**

### Amber, Tears of the Gods



Neil D.L. Clark, 2010.  
Dunedin Academic Press  
Ltd., Edinburgh  
128 pp. Fully illustrated  
in colour.  
ISBN 978-1-906716-16-5  
(Hardback)  
Price £25.00

*Amber: Tears of the Gods* was published to coincide with the exhibition 'Amber – Treasures from Poland' at the University of Glasgow's Hunterian Museum which ran from January till April 2010. On display in the exhibition were items from the Malbork Castle Museum and the Amber Museum in Gdansk. The book is written by Dr. Neil Clark, Curator of Palaeontology at the Museum. It is clearly written and very informative, and also well presented with many coloured photographs and diagrams, maps, or charts where needed.

The book is divided into thirteen chapters. The first tells where, how and when amber formed and describes its colours. Slightly misleadingly, the author writes about rare green amber without making it clear that amber only occurs in this colour as the result of fluorescence or treatment, and that green, natural amber is as good as non-existent. Apart from this omission, and a few of the usual small errors that creep into any book, I had no argument with anything that the author wrote.

Further chapters cover myths and legends surrounding amber, including the story of the Heliades, from which the book gets its title. Medicinal uses from ancient to the present day, on-going research, the inclusions of plant and animal matter that may be found in amber, the question of extracting DNA

from amber, some amber fakes and imitations, and tests (both those that are done in the laboratory and those that can be carried out by the layman), are also covered by the author.

More than half the book is devoted to the history of Baltic amber: the ancient trade routes, the strict licensing of amber collection imposed by the Teutonic Knights, the introduction of amber guilds, examples of the use of Baltic amber (including the Amber Room at the Catherine Palace near St. Petersburg), and the importance of amber in Poland today.

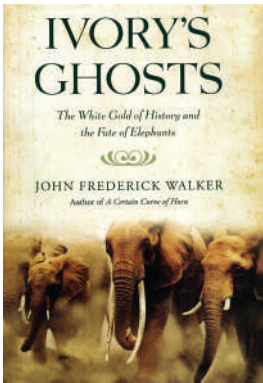
One chapter concentrates entirely on the collection at Malbork Castle Museum. This castle is situated 60 km from Gdansk, and was once the headquarters of the Teutonic Knights, though the magnificent amber collection – which includes many of the items lent to the Hunterian Museum for the exhibition – has been built up relatively recently.

The book is not, however, an exhibition guide and it is not necessary to have visited the exhibition to enjoy the book. The historic detail is fascinating and the whole book is an enjoyable read.

This is not the definitive book on Baltic amber, but it is comprehensive and the author has obviously done a large amount of research. 'Amber, Tears of the Gods' would be a good addition to anyone's bookshelf.

**Maggie Campbell Pedersen**

## Ivory's Ghosts



John Frederick Walker,  
2009  
Atlantic Monthly Press  
(an imprint of Grove/  
Atlantic, Inc.)  
ISBN-10: 0-87113-995-2  
312pp. \$25.00

If you are looking for a book that will tell you about ivory as a material, or how to identify it, this is not the book for you.

If, however, you would like to know more about the past trade in elephant ivory, the uses to which it was put, and the impact that it has had on elephant populations, do read this book!

The author, John Frederick Walker, is a journalist, so the book 'reads well' and is more factual story than science. It is predominantly about the trade in elephant ivory though the millennia, though it also touches briefly on other ivories too. It is factual, sometimes controversial, often alarming and sad, but always imparting information in an unbiased way.

The book is divided into sections with sub-headings. The first section deals with ivory, 'Shapes in Tusks': what it is and how it is worked. Next comes the uses of ivory: 'Ivory under the saw'. The last section deals with 'The Elephant Dilemma' and gives some

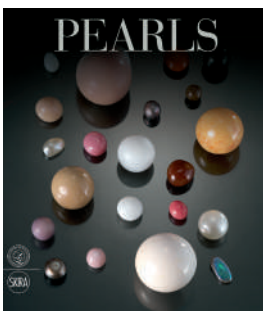
very sane and logical suggestions to the highly emotive subject.

The book is illustrated with a few black and white photographs – reproductions of old photos – but even without these the text is enough to keep the reader fascinated.

Not a gemmological book as such, and indeed there are a few inaccuracies concerning the material itself, but it is a really good read that touches on a gemmological subject, and it is difficult to put down. I recommend it!

**Maggie Cambell Pedersen**

## Pearls



Hubert Bari and David  
Lam, 2009  
Skira Editore SpA, Milan,  
Italy  
ISBN:  
978-99921-61-15-9  
335 pp. £55.00

This exquisitely illustrated book presents the subject of pearls in a clear and very readable fashion. From their formation to the varieties of molluscs in which they occur, the book offers simple facts along with logical explanations and recent theories. The culmination of a great deal of historical and biological research, *Pearls* covers both natural history and art. It has been written by Hubert Bari who has a doctorate in mineralogy and David Lam, both of whom have recently been heavily involved in the organization of major pearl exhibitions.

The first two chapters deal with the natural history of the pearl and pearl molluscs. The first begins with the numerous theories on the formation and growth of the pearl, from early history and mythology to the advanced research of today. The second chapter is a detailed account of pearl molluscs, from the more common to the rare, giving not only biological information but also historical notes and fishing methods.

Chapter 3 looks at the use of the pearl through history. Arranged geographically, the section is illustrated with art reproductions and photographs of pearl-encrusted jewellery and fabrics.

Chapter 4 describes the fisheries from 1850–1940, from the boats and their crews and

divers, to the merchants and dealers.

Chapters 5 and 6, 'The Culture of Pearls' and 'Gentlemen-Farmers', deal with the growth of the cultured pearls industry, the various techniques employed, challenges faced and portraits of some of the pearl farms.

The final chapter pays homage to Gabrielle (Coco) Chanel and her great love of pearls.

The book also includes two sections dealing with pearl-set jewellery, each with fold-out pages extensively illustrated with photographs of antique jewellery. The first is entitled '2500 years of natural pearls' and the second 'Head ornaments'. These are not included in the contents list and are inserted, a little confusingly, in the middle of two of the listed chapters.

Illustrated with over 350 photographs, many of which have never previously been published, *Pearls* has a place in the library of anyone with an interest in jewellery, shellfish or history.

**Mary Burland**

## Gem-A News and Views

# In the news

## New York New York

Olga Gonzalez FGA, formerly heading Gem-A's marketing and events in London, is now Gem-A's Ambassador in New York. She recently organized the second Gem-A New York Dinner (see below) and is helping to promote awareness of Gem-A and its activities in the USA via her extensive trade and contacts. Olga is Sales and Marketing Manager at GeoArt, New York.

### FIT Gemmology



Michael Coan (left), Chair — Jewelry Design Department at FIT and Gary Roskin, outside FIT, New York. Photo: Jack Ogden.

In mid-May Gem-A took its Gemmology Foundation Lab Class to New York to the celebrated Fashion Institute of Technology (FIT) where it was presented by renowned gemmologist and frequent MailTalk contributor Gary Roskin FGA. Gary has had over 30 years of professional laboratory diamond grading and gem identification experience and is currently an adjunct instructor of gemmology at FIT in New York City and host of the Roskin Gem News Report. Gary has also taught the gemmology programme at GIA and was previously an assistant director in the GIA's Gem Trade Laboratory.

Said attendee Janice Torretta: "I found the Practical to be invaluable in so many different ways. I have a renewed enthusiasm for lab work and an appreciation for the Chelsea colour filter and the spectroscope, two instruments I never really grasped. Gary Roskin, our tutor, was phenomenal; he was extremely patient and took as much time as was required to answer all of my questions."

FIT, established by the Educational Foundation for the Fashion Industries, opened in New York in 1944 and now occupies an entire city block in mid-town Manhattan. Here 10,000 students may study a large array of design and fashion-related subjects, including one or two year jewellery design degree programmes which include gemmology. FIT has been a Gem-A exam centre since 2005 and has recently greatly expanded its practical gemmology facilities.

## Gem-A's Downtown Dinner

### Olga Gonzalez reports on the Gem-A New York dinner

Like a true familia, Gem-A gathered alumni, members, current students and 'gemmy' friends for our second NYC gathering this year at the renowned Luzzo's pizzeria. A cozy East Village treasure, I thought it would make a nice contrast to our last dinner at a French bistro. The goal was great pizza and great company, an expectation that was certainly met! Keeping our tradition of playing musical chairs in between courses, we caught up on the latest gem and diamond news and got to learn a lot more about the lives of those in attendance. Members and friends from the ICA and Tiffany & Company were in attendance, as well as students who took the Foundation Practical over the weekend with Gary Roskin at the Fashion Institute of Technology.

I received delightful emails and calls after the event from attendees and it is apparent that now that I'll be an Ambassador to the Gemmological Association in the US more dinner parties must be had! We must keep a good thing going and maybe we'll throw in a few field trips too. If you would like to suggest a location for the next soiree, be sure to contact me directly at [olga.gonzalez@gem-a.com](mailto:olga.gonzalez@gem-a.com).

Hope to see you in NYC!



## Gem-A in Las Vegas

On 10 and 11 June Gem-A Senior Instructor Doug Garrod FGA DGA presented a two-day Gem Lab Class at the headquarters of the American Gem Society (AGS) in Las Vegas, Nevada. This intensive gemmology practical lab class was primarily designed to help Gem-A students prepare for the Gemmology Diploma practical examination, but it also gave Gem-A members and GIA Graduate Gemmologists an opportunity to hone their skills, and Gem-A Gemmology Foundation students a taster of serious hands-on practical work.

Just prior to the Gem-A Lab Class in Vegas Doug led a morning hands-on update on corundum and beryl treatments at the American Society of Appraisers (ASA) Gems and Jewelry Discipline 'Gems and Jewelry Appraisal Techniques and Standards', course, also held at the AGS.

## Rubies – see them for yourself

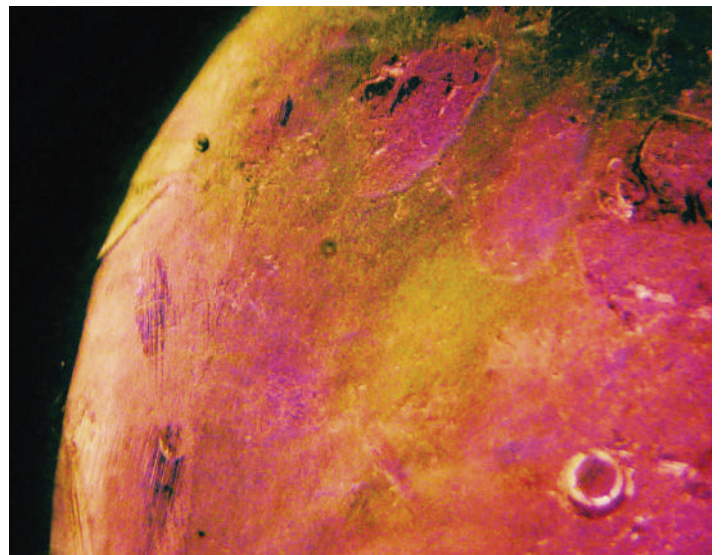
Those glass-filled/composite rubies are now being seen in increasing numbers by jewellers, repairers and valuers in the UK. Most agree that once you have seen a few, most are not too tricky to spot (although 'better' ones are on the way).

The problem is how do jewellers, repairers, valuers, etc, get to 'see a few' and have the chance to study them with a loupe?

Gem-A to the rescue. Members of Gem-A can have a free 15–20 minute hands-on mentored familiarization session with these stones in Gem-A's headquarters just off Hatton Garden (by appointment only; call us on 020 7404 3334).

Gem-A will be providing a similar opportunity for attendees at the NAG Valuers Conference at Loughborough from Saturday 18 to Monday 20 September – just visit the Gem-A table in the Holywell Park Building on the University Campus.

*Detail of a glass-filled ruby cabochon showing ruby fragments in a yellow glass matrix. Digitally enhanced to exaggerate the colour contrasts. Photo Jack Ogden.*



## GIA Diamond Grading Reports via Gem-A, GIA LabDirect Consolidator

Gem-A has signed an agreement with the Gemological Institute of America (GIA) to act as a London take-in service for GIA Laboratory services. The consolidator service (being offered in the UK for the first time) will give Gem-A members easy access to GIA Diamond Grading Reports when it is formally launched at IJL in September 2010. Members will be charged the advertised GIA report charges plus a consolidated shipping and insurance charge, thus providing a considerable saving over the cost of shipping stones to GIA individually. Consolidation for a full range of GIA diamond grading and identification services will be offered.

## Hatton Garden Festival

Gem-A took an active part in the Hatton Garden Festival in London on Saturday 12 June, part of the London Jewellery Week events. For a full fine and sunny day Hatton Garden was barred to traffic and the scene was of jewellery-related activities, food stalls, live music and a row of tented stalls providing demonstrations and information. Among the latter was Gem-A, chatting to the crowds about gems and gem education, handing out information about Gem-A courses and presenting the passers by with free tourmaline crystals. Our booth proved so popular that we were very grateful for the help of Lizzie Gleave (the 2008 winner of the Anderson Bank Diploma prize) and Peter Kumarasinha (a jewellery designer who holds the Gem-A Diamond Practical certificate).

Two things stood out; the awareness of Gem-A and Gem-A courses by those attending, and a huge appetite for gem information in general. Many other London-based gem and jewellery organizations were represented at the Festival and a specially printed booklet outlined the wonderful variety of gem and jewellery education available in the city, including, of course, Gem-A's. The demonstrations in Hatton Garden ranged from hallmarking to laser welding and the event was overseen – literally – by two 'policemen' on stilts.

# New teaching equipment

Funds from the recent auction enable Gem-A to update inhouse teaching equipment. Director of Education, Lorne Stather, reviews her day at the sale.

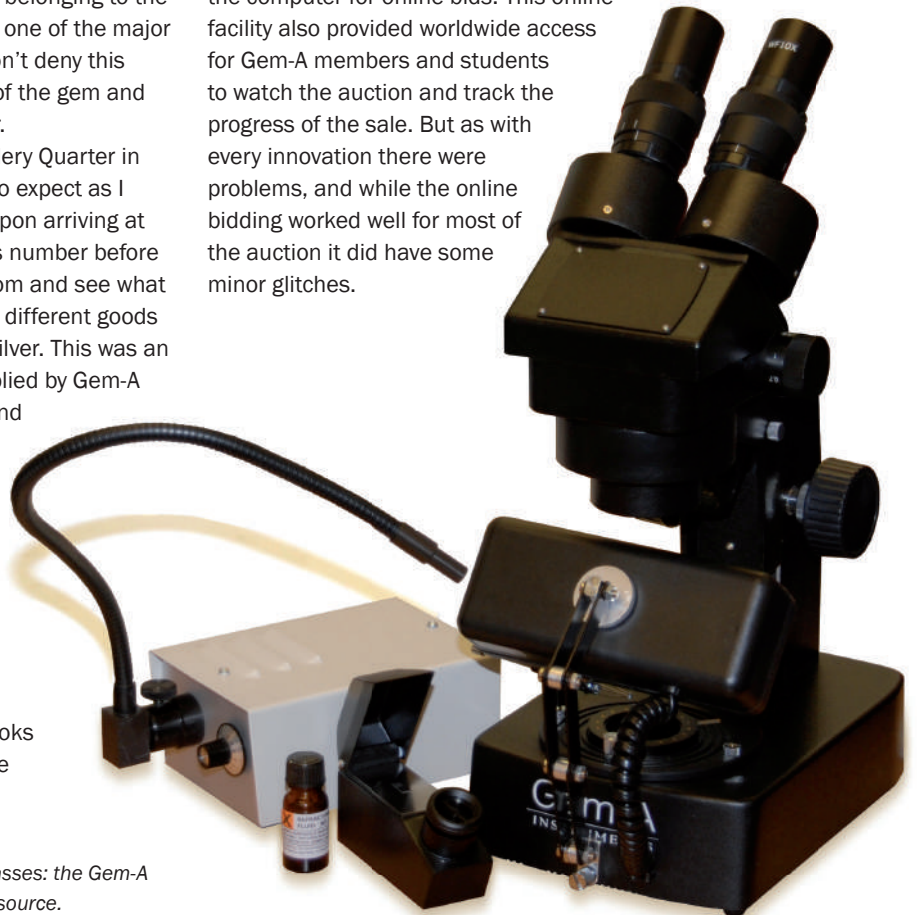
I am delighted to report that the auction of Gem-A duplicate archive instruments and older teaching equipment announced in the Spring 2010 issue of *Gems & Jewellery* (Collection news, pages 32 and 33) realized far more than anticipated, attracting the attention of buyers worldwide. We are most grateful to auctioneers Fellows & Sons of Birmingham for arranging the auction and waiving their vendor commission on the items sold.

It was essential for a Gem-A representative to attend the auction, not only to get feedback from members, students and other prospective buyers, but also on behalf of the Association which, as a registered UK education charity, has specific obligations. As a charity it is important for us to ensure we get the best return for our members and students on the disposal of any items belonging to the association. As the education department had been one of the major suppliers of the instruments I volunteered to go. I don't deny this also gave me an opportunity to see another aspect of the gem and jewellery business; namely, the art of the auctioneer.

The big day arrived and as I drove into the Jewellery Quarter in Birmingham I can honestly say I did not know what to expect as I had not been to a live auction for a very long time. Upon arriving at Fellows I registered and received my unique bidder's number before taking the opportunity to root around the auction room and see what was on offer. Fellows & Sons handle a wide range of different goods from gems and jewellery to furniture, crockery and silver. This was an unusual sale as the gemmological instruments supplied by Gem-A and David Callaghan's collection of gem, jewellery and watch books were not their usual fare, so they had been included in one of their regular 'Antique and Later Furniture' sales. On looking around the room, I discovered some familiar faces from the Midlands area as well as further afield browsing through the instruments and books. Of particular interest to many of the viewers were the microscopes, refractometers and diamond lights, all of which required careful examination as they ranged in condition from good to 'in need of attention'. The books were also receiving a good deal of interest with some tempting titles included in the large collection.

As the morning went on the narrow aisles in which the instruments and books were displayed started to become crowded so it was time to run my various errands around the Jewellery Quarter before returning later in the day for the main attraction. The all-important microscopes generated a great deal of interest from both bidders in the room and external bids.

Watching the auctioneers during the sale you can appreciate the complexity of the work required. They need to keep an eye on the main auction floor for bids, to watch the other auction staff on the phone lines, as well as tracking the pre-auction commissions for the various items. In addition, Fellows had introduced internet bidding earlier in the month and so they also had to keep an eye on the computer for online bids. This online facility also provided worldwide access for Gem-A members and students to watch the auction and track the progress of the sale. But as with every innovation there were problems, and while the online bidding worked well for most of the auction it did have some minor glitches.



*Some of the instruments purchased for Gem-A inhouse classes: the Gem-A stereo zoom microscope, refractometer and fibre optic light source.*

## Gem-A News and Views

Meanwhile, the audience in the room had their own concerns, such as which item was being bid for – an important factor as the speed at which an auction is carried out requires the bidder to pay a great deal of attention to make sure they are bidding on the right lot. At the same time they have to be thinking about who else is bidding and what their top bid should be. Auction newcomers, such as I, were also very conscious that they must not make any sudden moves that could be misconstrued as a bid. Questions such as “Could scratching my nose be considered a bid?” came to mind. I really hoped not, as I had an urge to scratch it just when the auctioneer looked my way. Fortunately for me the auctioneer at Fellows had a great deal of experience and seemed able to tell an innocent nose scratch from an intentional bid. So I relaxed and started to enjoy the atmosphere of the room. An auction seems to generate a unique tension as bidders concentrated on the business at hand and tried not to get carried away in the moment and over spend, an easy mistake to make when a bidding war gets started.

By the end of the auction I can honestly say I was really pleased with the support the instruments sales had received and that I would definitely be interested in attending future auctions and maybe even try my hand at buying some items for myself. In total the auction generated a little over £7,500 towards the purchase of new equipment for Gem-A and I lost no time upon my return to London in

### Post auction notice from Fellows & Sons

Fellows & Sons and Gem-A are aware that there were some glitches and time delays with the online bidding service provided by a third party. These were not apparent to the auctioneer at the time of the sale and outside the control of Fellows & Sons. Nevertheless, Fellows apologize for any inconvenience or disappointment caused. Fellows have expressed their pleasure that the Gem-A lots in the auction raised a sum in excess of expectations, the full proceeds of which will go towards the furtherance of Gem-A's charitable aims.

ordering a range of new equipment for our teaching floors including new microscopes, polariscopes, refractometers and fibre optic lights.

Gem-A would again like to thank all the members and students who put in bids as well as Fellows & Sons for all their generous help with the sale of these instruments. The support of Gem-A members and companies such as Fellows & Sons is of vital importance in generating funds to enable Gem-A to maintain and develop its educational and membership services worldwide, and we both appreciate and welcome this support.

## Gem-A Shop



Don't miss the monthly **SPECIAL OFFERS**  
on books and instruments from the  
**Gem-A Shop**

Log on to the Gem-A website at [www.gem-a.com](http://www.gem-a.com) to discover what is on offer each month.

# From Medieval to Modernism

## A thousand-year tour of international jewellery design



A One-Day Gem-A Seminar with JOHN BENJAMIN FGA DGA

Monday 8 November 2010 from 10:00 to 16:30 – Goldsmiths' Hall, Foster Lane, London EC2



**Gem-A**

THE GEMMOLOGICAL ASSOCIATION  
OF GREAT BRITAIN

This intensive four-part seminar offers a unique opportunity to study the evolution of international jewellery design from Medieval times to the end of the twentieth century. The presentation will cover many of the key elements of manufacture, including Neo-classicism and Romanticism, nineteenth-century Archaeological and Renaissance Revivalism, the impact of diamond mining in South Africa, Art Nouveau, Arts and Crafts and Art Deco, and Post War Modernism.

### SEMINAR FEE

The fee to attend this unique seminar is **£15.00**, to include morning and afternoon tea and coffee.

### TO BOOK

For a detailed programme and to download a booking form, go to [www.gem-a.com/news-events/events/from-medieval-to-modernism.aspx](http://www.gem-a.com/news-events/events/from-medieval-to-modernism.aspx).



We are extremely fortunate that John has offered to give his presentation free of charge, to ensure that the attendance fee may be kept to a level affordable to anyone in the trade.

We are also grateful to the Goldsmiths' Company for allowing us to stage the event in the magnificent Goldsmiths' Hall, a fitting venue for this important seminar.

## Gem-A WORKSHOPS — Autumn 2010

### Tues 28 Sept **ALLURE OF GEMS**

Ideal for those wanting to delve into the beautiful and intriguing world of gemstones with the opportunity to handle a wide range of stones.

**£97.00. Gem-A members and students £79.00**

### Tues 19 Oct **DIAMOND BUYING GUIDE**

An introduction to the 4Cs; carat weight, colour, clarity and cut.

**£97.00. Gem-A members and students £79.00**

### Tues 26 Oct **INTRODUCTION TO PRACTICAL GEMMOLOGY**

If you are considering an in-depth study of gemmology and would like a taster of the practical skills involved or would like to brush up on existing skills, this would be an excellent choice.

**£97.00. Gem-A members and students £79.00**

### Thurs 29 Oct **PEARLS — NATURE'S GIFT**

Update your knowledge of pearls, natural and cultured, and the treatments and simulants on the market today.

**£140.00. Gem-A members and students £120.00**

### Thurs 4 Nov **THE WORLD OF JADE**

Discover how jade is defined, the sources and the mining methods used. You will learn about the colours and qualities, and techniques for the identification of jade's imitations and treatments.

**£110.00. Gem-A members and students £90.00**



From its London headquarters Gem-A provides a varied programme of workshops, from an introduction to the fascinating world of gemstones to information on the latest synthetic and treated gemstones.

For information on the latest workshops or to book go to [www.gem-a.com](http://www.gem-a.com) or call Paveet Amrit on +44 (0)20 7404 3334 email [paveet.amrit@gem-a.com](mailto:paveet.amrit@gem-a.com)



**Gem-A**

THE GEMMOLOGICAL ASSOCIATION  
OF GREAT BRITAIN



# Gem sculpture

Gem Club members discover where the inspiration behind the work of gem artist Helen Serras-Herman comes from and the skills needed for this art form.

On Tuesday 25 May we were delighted to welcome the acclaimed Gem Sculptor Helen Serras-Herman from Arizona as our Gem Discovery Club Specialist Speaker. Helen should have been with us in April but unfortunately had to postpone her visit at the very last minute when her flight was cancelled due to the volcanic ash cloud.

Helen began her presentation by explaining how she became interested in the art of gem carving. She studied sculpture in Berlin, Germany, for six years, graduating with a masters degree (MFA). Having practised her art as a sculptor for several years, she came across a course on glyptography (gem carving) and gemmology and decided that these went together very well. She was awarded the Diploma in Gemmology in 1988 and became an FGA. For the past 26 years she has combined her knowledge and skills of sculpture, gemmology and lapidary with her interest in jewellery, creating one-of-a-kind gem sculptures and jewellery art.

Helen takes her inspiration from many diverse sources, from nature to mythology to the symbolic shape of gods, nymphs or fantastical creatures, portraying them with grace and elegance, but often with exaggeration, pushing the visual limits. Said Helen: "I am influenced by travels, landscapes, gem materials, history of the ancient worlds, the great masters and the world around me. My art usually tells a story."

The art of gem carving requires a great deal of patience as well as skill, as the cutting and polishing is very time consuming, with many materials posing numerous lapidary challenges. Helen went on to explain the techniques involved and the necessary tools required to achieve the results she desires.

In addition to the gem carving Helen produces faces and creatures in silver, first by carving in wax and then by casting. These pieces are inspired directly from her sculptural work.

The gem materials used for the sculptures are many and varied, including the gems of Arizona, Helen's home for the past five years.

A selection of Helen's work was available for Club members to examine, including art works in rutiled quartz, sugarcane emerald, turquoise and chrysoprase, as well as the larimar necklace pictured on the front cover.

Go to [www.gemartcenter.com](http://www.gemartcenter.com) for more information about Helen and her work.



*Venus. A 256 ct rutiled quartz from Brazil, carved in relief by Helen Serras-Herman, mounted as a pendant in 18ct yellow gold. Photo by M.J. Colella. © Helen Serras-Herman.*

## Recent Events

Olga Gonzalez reviews the ASJRA Conference

# Let's talk about forgeries



When I discovered via Facebook that Jack would be giving a talk on fakes and forgeries in New York, I had to sign up. After having a grand time at last year's Association for the Study of Jewelry & Related Arts (ASJRA) Annual Conference, I was looking forward to what was in store. Held at the stunning University Club on 54th and Fifth Ave, my initial reaction upon entering the posh doorway was that I must be at the wrong place. The marble lobby was pristine and everything was silent. Where were the loud gemmologists gathering around the registration desk/coffee/breakfast table? I was informed by the doorman to proceed towards the elevator and was whisked to a beautiful hallway with oak panelled walls and decorative stucco ceilings. I was immediately impressed by the choice of venue. Art books were being sold in a private room by Charon Kransen, who had a lovely selection on display, and there was a healthy selection of fruit and yoghurt for breakfast. Very good.

On the down side I was disappointed to hear Yvonne Markowitz would not make it for the conference, but I was very excited to see Elyse Karlin, who did a spectacular job putting the event together and making sure all ran smoothly at the venue. Her son phenomenally handled the sound and each and every speaker captivated the audience. The schedule proceeded as follows:

Dr Jack Ogden started the day off on an exciting note with his talk Fool's Gold: Adventures of a Forgery Hunter. He outlined the 'three legs of forgery detection', which he identified as style, technology of manufacture and composition. He illustrated brilliant and not-so-brilliant forgery examples throughout history, such as ancient Greek hairnets and Scythian gold bracelets. Important things I took away from his talk were the sexier the depiction of a woman in an ancient work of art, the more likely the work is to be a fake (literally, it distracts you from the truth), and modern wire was used after the tenth-century and the strip twist technique was used on most wire before that and certainly on ancient gold. If you see parallel striations on the wire of an ancient piece of jewellery, beware.

Next on the schedule was Janet Zapata, who immediately grabbed my attention when I heard she graduated from Rutgers



1. Plate glass, iron and gold ring by Anna Maria Zanella, 1996. Collection of the artist.

2. Lucy in the Sky with Diamonds, 2010, by Robert Ebendorf. Crushed aluminium soda can and rhinestones. Collection of the artist.

## Recent Events

University and worked for the Doris Duke Charitable Foundation (two things we have in common – small world!). Her talk, entitled Nineteenth-Century Architectural Revival Jewellery, discussed the revivals, which she credits to the wealth of the time as well as the general interest in art. Elegantly organized, she discussed the Classical, Egyptian, Gothic and Renaissance revivals, and had examples of relatively unknown artists as well as big players like Tiffany and Castellani.

The following two lectures particularly captured my interest because they were about the topic you never hear about in school: when the goods are stolen. Emily Banis gave Yvonne Markowitz's talk in her place, The Great Diamond Hoax, which in short was a true story about a 23-year-old man who stole the Greek Nike earring from the Museum of Fine Arts, Boston, turned himself in and managed to forget where he left it. Apparently, all he could remember was that he put it in a beer can under a tree near the museum. Somehow they actually recovered it!

Even more amusing was Elyse Karlin's talk, Murf the Smurf and the Star of India Caper. If you love gems and you've never heard of this character, look him up. Murf (Jack Murphy) become a Miami playboy, jetsetter and jewellery heist operations manager. Inspired by a heist in Topkapi Palace (from the 1964 film Topkapi), Murf and his friends become robbers. They robbed the American Museum of Natural History in New York by going through an open building and scaling the building with a rope. (At the time, the alarm system was broken. You can be sure that is no longer the case.) Many of the gems in the museum's collections were purchased by Kunz, then JP Morgan, and were later donated back to the museum. Famous stones that were stolen included: the Star of India, the DeLong Ruby, Midnight Star, the Patricia Emerald and the Eagle Diamond (the latter of which was never recovered; it was probably recut). Throughout his life Murph had great heists, a jet setting life, was in and out of jail, later found God and is now a public speaker. Needless to say, that was a lot of good gem action before lunchtime.

After the break Ursula Ilse-Neuman followed with Nine Lives: Jewellery from Recycled Materials throughout History. The images were fascinating, from Anna Maria Zanella's Ring, 1996 (1) made of plate glass, iron and gold, to Lucy in the Sky with Diamonds, made of a crushed aluminium soda can, found tin, scrap metal, scratched away pigment and rhinestones by Robert Ebendorf (2). I felt inspired to dig through my garage and find items I could create beautifully eclectic jewellery from!

John Nels Hatleberg followed with Notes From The Diamond Counterfeiter, an inside look on the coolest job I have ever heard of – making replicas of the world's most famous diamonds. His current projects? The Hope Diamond and the Wittlesbach-Graff. Captivating all, jaws were dropping as he explained his meticulous methods of making moulds and cutting. What a skill to have! He then made one final last impression on the audience showing sculptural pieces he created with gems. My favourite? A beautiful pearl corn cob made with freshwater pearls, 18 ct gold and 24 ct gold leaf (3).

Next on the line-up was Harrice Simons Miller with Kenny and Coco, Historical Influences on the Jewellery of Kenneth J. Lane and



Corn cob by John Nels Hatleberg. Freshwater pearls, 18ct gold and 24 ct gold leaf. Photo courtesy of John Hatleberg.

Coco Chanel. Representing her talk beautifully by wearing a massive turquoise necklace and earring combo, Harrice took the stage and went through the history of Kenny's Egyptian, Pre-Columbian, Greco-Roman, and Byzantine Inspired pieces as well as the beautiful costume jewellery classics by the infamous Coco Chanel. Geza von Habsburg with Fabergé or Fauxbergé, then followed with delightful examples of Fabergé throughout history and juxtaposed them with fakes, and then confused the audience by ultimately showing a gorgeous one on which the jury is still out. The conclusion is that there are a lot of fakes ... and some of them are very good. Not good news for art connoisseurs.

For the last presentation of the day Gary Roskin graciously stepped in for another speaker who was unable to attend and delivered Recycling the Big Ones: The Hope and Wittlesbach-Graff Diamonds. Describing the ultimate night at the museum, Roskin lived the gemmologist dream by pulling a late night at the Smithsonian testing the Hope and Wittlesbach-Graff diamonds to see if they came from the same crystal (ultimately, the tests pointed to 'no' due to strain). What could be more fun than handling both in one evening?

Leaving the conference with a renewed passion for gem studies and a craving for 'a night at the museum' experience someday, I would like to congratulate Elyse and Yvonne for all the hard work they put into planning this truly enlightening event. The speakers, venue and ambience were all fantastic. Be back same time next year ...

## Recent Events

# Highland Bling

Jack Ogden reports on the 2010 Scottish Gemmological Conference held in Perth from 30 April to 3 May.

## Unscrambled Egg

The Conference got off to a fine and informative start on the Friday evening when Dr Maria Alferova of the Fersman Mineralogical Museum, Moscow, gave a talk about 'Fabergé: The Lost and Last Egg'. This was a history of determination, detective work and charlatans.

Peter Carl Fabergé's work first came to Czar Alexander III's attention at the 1882 Pan-Russian Exhibition in Moscow and just three years later, in 1885, he was appointed court supplier. That same year he produced the first Imperial egg, an Easter gift from the Czar to the Czarina Maria Fedorovna, a form of gift that would be continued annually by Czar Alexander until 1894, after which his successor Czar Nicholas II continued the tradition, but giving two eggs each Easter, one to his mother Maria, the other to his wife. The final eggs were given as gifts at Easter 1917; those for 1918 remained unfinished due to the problems of the war years and the Revolution. In total 54 of these large eggs are known to have been made, of which 46 remain scattered in museum and private collections around the world.

In the wake of the Russian Revolution, some of the confiscated eggs were sold off to raise funds to support communist regimes around the world — some for minimal sums — one joined Maria Fedorovna in exile and some entered Russian Museums. The unsympathetic view of luxury officially held by the communists meant that those preserved in Russian museums were catalogued in ways to disguise their true nature. Thus the ten Fabergé eggs that entered the Kremlin Armoury Museum were



*Fabergé's Constellation Egg. Photo by Maria Alferova. © Fersman Mineralogical Museum.*

described as 'models'. The fate of one of the 1917 unfinished eggs was unknown, publicly at least, until 2002 when three pieces of it were discovered in the Fersman Mineralogical Museum in Moscow, modestly described as a 'blue glass sphere on quartz pedestal' in a 1920s catalogue. The seemingly unrecognized parts were even on a list of glass objects to be thrown out of the Museum in the 1960s.

The pedestal, in milky quartz, is in the form of clouds, while the two hemispheres form an egg of dark blue glass engraved and diamond-studded to form a celestial globe with the constellation consistent with that at the time of Tsarevich Alexey's birth on 12 August 1904. The missing parts are some

form of band or hinge originally necessary to join the upper and lower parts of the egg, the clock or clock mechanism originally within the egg, and the supporting silver cupids. Although now seemingly lost, the cupids appear to have been completed as a surviving letter to Eugene Fabergé notes that the cupids were ready.

Perhaps it is not surprising that with original drawings surviving, but the egg itself seemingly lost, a complete egg surfaced in the late 1990s. This, and the supposed other lost 1918 egg, a birch wood one, were exhibited in Switzerland and Russia as the long-lost 1918 Imperial Eggs miraculously rediscovered. These eggs, like the documentation accompanying them, were skilful fakes — the true nature of which was confirmed by the discovery of the Fersman Museum pieces.

## Colour

Saturday morning opened with a talk by Dr Dietmar Schwarz, Head of Research at the Gübelin Gem Lab, titled 'Coloured Gemstones: Mines and Market', a survey of the more important gemstones on the market today and their sources, based on his quarter century of trips to coloured stone deposits around the world. The more highly regarded gems in the past had been ruby, sapphire, emerald and alexandrite, but more recently these had been joined by spinel, Paraiba tourmaline, imperial topaz, tanzanite and some types of garnet. These stones were covered in the talk, except for emerald, which would be the subject of a separate presentation the following day.



## Recent Events



Coloured Gemstones: Mines and Market. Sapphire mining in a secondary deposit near Bogawantalawa, Sri Lanka. Photos © Dietmar Schwartz.

A consideration of the mining of these gemstones today involved a holistic look at the geological and mineralogical aspects, local or regional infrastructure, technical know-how, financial resources, the political or military situation, and, of course, national and international supply and demand.

Corundum deposits are to be found in many countries, including Afghanistan, Burma, Cambodia, Kashmir, Kenya, Madagascar, Malawi, Mozambique, Pakistan, Tajikistan, Tanzania, Thailand and Vietnam. Those of the 'South East Asian Ruby Belt' — stretching from NW Afghanistan across to Burma — are all hosted in marble rocks, and the mines at its western end are hard to access due to their altitude and remoteness, let alone their current political situations. The rubies of Thailand, Cambodia and Vietnam are of basaltic origin and, in practice, most

so-called Thai rubies on the market are actually from the Cambodian side of the border. In Vietnam sapphires occur in the South, thus contrasting with rubies which are found in the north. Basalt-related deposits typically yield blue, green and yellow corundum, less often ruby.

Rubies from Africa have become prominent in recent years, with the discovery of the Uмба deposits in Tanzania in the 1960s and, more recently, those of Winza in the same country. The discovery of this Winza deposit came to the international gem-trade's notice in 2008 when extremely fine rubies from this area first appeared in Thailand and at the Basel Show in Switzerland. By the end of 2008 more than 5000 people had moved to Winza. Although some of the Winza rubies are extraordinarily fine — some initially thought them too good

to be real — most are of far poorer quality and, despite earlier reports, are susceptible to heat treatment. In Songea, Tanzania, there is a huge mining area which produces sapphires and rubies in gem-bearing gravels similar to those of Sri Lanka. In M'sawize region in northern Mozambique, some of the other problems associated with mining are in evidence — the mining area is within a game reserve which makes official access and exploitation difficult. The Mozambique rubies are generally of poor quality, but are good for heat treatment and glass filling, providing better results with the latter treatment than Madagascan stones. Malawi produces some ruby and sapphire, but there is currently no regular production. Madagascar, with its many different deposits and geological environments, produces a wide range of corundum colours, including the vast amount

## Recent Events

### Scottish Conference (cont.)



(Left) Sorting Imperial topaz from the Boa Vista mine near Ouro Preto, Minas Gerais, Brazil and (above) three topaz crystals from the Boa Vista mine. Photo © Dietmar Schwartz.

of poor-quality rubies which are glass-filled. The long term availability of significant quantities of good-quality rubies from the region is open to doubt.

The best quality blue sapphires have traditionally been associated with Kashmir origin, but new deposits have produced some rivals. For example, some blue sapphires from Madagascar have been sufficiently close to Kashmir ones in appearance, even under a microscope, to have misled some gem labs.

Alexandrite first came to prominence with the discovery of the stone in Russia in the 1830s. Russian stones are rarer today, but other known sources now include Brazil, India, Madagascar, Sri Lanka, Tanzania and Zimbabwe. The Hematita mine in Brazil became a major source following the accidental discovery of some crystals in a small river bed by two boys. More top-quality alexandrite came from this small area in Brazil in a few weeks than had hitherto appeared in the whole world. Generally speaking, Brazil has a long tradition of gem production with a well-established mining infrastructure. Locally-found gems are mostly cut in Brazil, but exceptions are alexandrite and Paraíba tourmaline which are mostly exported to Hong Kong for cutting.

Spinel has seen a huge resurgence in interest in recent years, with mines in Afghanistan, Burma, Kenya, Madagascar, Pakistan, Sri Lanka, Tajikistan, Tanzania and Vietnam. In part this rising appreciation for spinel might be one result of the dearth of fine rubies on the world market.

Imperial topaz has mainly been associated with Brazil where there are many small mines in the Ouro Preto region of Minas Gerais — sometimes on land owned by the Catholic Church, although in Brazil the State not the landowner is the owner of gemstones found under that land. Russia produced very little fine Imperial topaz in the past and Pakistan now has a small deposit near Katlang which is mined sporadically.

As with all fine-quality gemstones, the prices for the finest garnets are now high. Examples include: tsavorite, mainly from Kenya, but now also Tanzania and Madagascar; demantoid, traditionally from the Urals, but now also from Namibia, Iran and Pakistan; and Malaya garnets (a trade name) from the Umba region of Tanzania and southern Madagascar.

Tanzanite and its source are well known. Much mining is under the control of Tanzanite One, but there are also freelance miners selling to the Masai. Most tanzanite is heat treated, but not all.

Tourmaline is another gemstone that has come into prominence with the discovery of Paraíba tourmaline in Brazil in 1987 – and more recently similar gems from Mozambique and Nigeria.

### Before your very eyes

After coffee and a brief talk on Gem-A's plans for the future, Alan Hodgkinson, President of the Scottish Gemmological Association, took to the podium. In 1858, he explained, not all were convinced by a report from l'Athenée des Arts, Sciences et Belles-Lettres de Paris that an 819 ct cut stone was indeed a diamond. However, proof to the contrary was difficult to provide. Hardness testing was not acceptable and the stone's SG was within the range of SGs encountered with topaz, the most likely stone to be confused with diamond, and diamond itself. The stone was sent to Professor Wilhelm Karl Ritter von Haidinger in Vienna. Haidinger, one of Austria's foremost scientists and a one-time Edinburgh resident, employed an elegantly simple test. He held the stone to his eye and when he saw the doubling of a candle viewed through it he could say with certainty that the stone was doubly refractive and thus was not a diamond. That simple type of visual test, reported in various nineteenth-century publications and even illustrated in Louis Dieulaufait's *Les diamants et les pierres precieuses* (1874), was the forerunner of Alan Hodgkinson's 'Visual Optics' — the title of his presentation this year.

Alan first published his approach to gem testing 'without conventional instruments' in Gem-A's *Journal of Gemmology* in 1978. It was, as he stated, one part of gemmology, not an alternative to conventional gemmology. As with much day-to-day gemmology these days, Haidinger's ability to say that the 819 ct stone was not a diamond was sufficient. This ability to 'eliminate' stones is a widely used and useful part of Visual Optics, but the techniques will also often allow identification and confirmation.

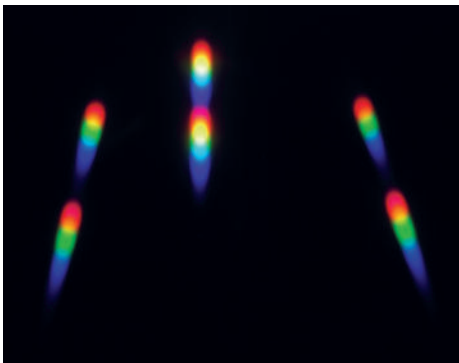
Alan has spoken about Visual Optics several times, but in his presentation at the Scottish Conference he focused on one aspect — the observation of birefringence and dispersion and the usefulness of what he calls the B:D ratio — birefringence divided by dispersion. The concept was described by Hanneman (1980)\*.

The concept can be demonstrated by shining a light down through a faceted

## Scottish Conference (cont.)

round stone placed on its table-facet on a transparent stage; a radiating series of rings of bright spots will be projected on an underlying sheet. These spots will be seen to be small elongated spectral images, each doubled if the stone is doubly refractive. There will be a ring of bright rainbow images, termed 'primaries', which represent rays of light passing straight through the stone, refracted at a facet and projected below. There will also be a wider range of 'secondaries' – tinier images that represent light that has been internally reflected one or more times within the stone prior to escaping. A well-proportioned brilliant-cut diamond will show secondaries, but no primaries. Synthetic moissanite, and indeed any stone with an RI over about 2.3, will similarly reveal secondaries but not primaries. This is in contrast with gems below RI 2.3: CZ, GGG and YAG which show primaries, although with differing radii of primary rings.

The distance between the red and violet bands on each little rainbow-like primary image is indicative of the stone's dispersion. The distance between the reds on doubled images depends on the stone's birefringence. Thus the approximate B:D ratio can be determined by the overlap or separation of a pair of flecks generated by a doubly refracting stone. If the B:D ratio is less than 1, the images overlap. If the B:D ratio is over 1, the images in each pair will be separate. This may sound complex, but it is easy to grasp once seen. With practice



Typical trio of doubled primaries seen from a round zircon. Note the variation in doubling. The left hand doubled images approximate the 1.5 B/D ratio.

the same insights into birefringence, dispersion and B:D ratio can be gauged using visual optics, by holding the stone close to the eye. (Hold a high zircon table facet – loose or open set – to the eye and look at any light source. At the maximum separation of the images, the B:D ratio is approximately 1.5). Observation along these lines will distinguish, for example, coated topaz, Paraiba tourmaline and tanzanite from synthetic forsterite. Some gems have a similar B:D ratio, as with tourmaline, synthetic rutile or benitoite, all of which have B:D ratios of about 1, but their vastly different RI, birefringence and dispersion separates them instantly.

When there is a significant difference in dispersion for the  $\alpha$  and  $\gamma$  rays, the two primaries making up each pair of images will vary in length noticeably – sphene is a good example of this. Absorption features are also revealed. With ruby, the low B:D ratio (0.4) coupled with the wide absorption of the green and yellow regions of the spectrum results in readily recognizable primaries where each overlapped pair of flecks appears as two red and one blue band.

Alan closed by explaining how Visual Optics could be used to gauge RI and showed the equipment that had been developed to facilitate such readings – such as the Hanneman-Hodgkinson, Nelson-Hodgkinson, Michael Willing and Don Hoover refractometers.

In Visual Optics, the eye, as Alan explained, was the ultimate gemmological tool.

\* W.W. Hanneman, 1980. Educating the eyeball – The Hodgkinson Method. *Lapidary Journal*, **34**(7) 1498-1519

### A colourful introduction to colourless stones

Gwyn Green agreed with Alan. The eye was the most sophisticated of optical equipment, as she demonstrated in her talk 'Colourless Stones in Jewellery' eloquently explaining how experience and careful observation can provide the answers a gemmologist seeks.



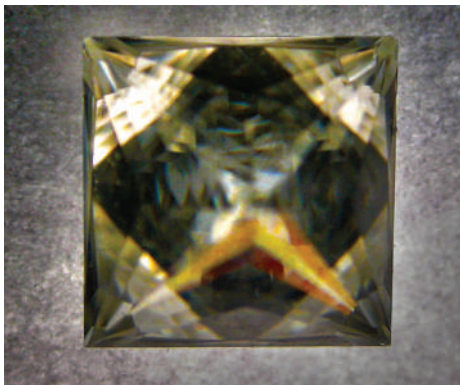
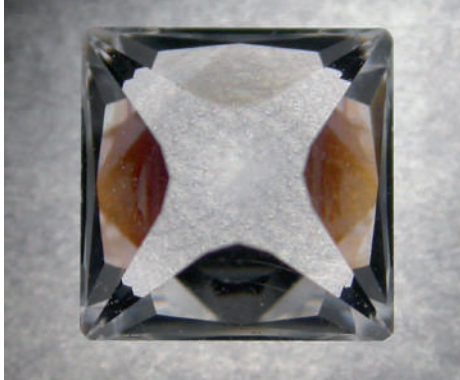
A large CZ showing the orange pavilion flash effect which is achieved by holding the table of the stone against a sheet of white paper placed close to a light source. The light fails to come through the stone completely, as it would with stones of lesser RI value. e.g. zircon or YAG. As the stone is tipped slightly, the whole of it becomes illuminated after a dispersive orange flash is seen. This is characteristic both for standard brilliant cut CZ and princess cut CZ. Photo by Gwyn Green.

Laboratories armed with advanced instruments, or appraisers or dealers with more basic equipment but controlled and familiar lighting conditions, should rarely have a problem distinguishing a diamond from an impostor. The problems – and potentials – arise when colourless stones are encountered in other than optimum lighting conditions and when the 10x loupe is the only equipment to hand. Such stones are often likely to be set and equally likely to be dirty. CZ and moissanite might seldom present problems, similarly with colourless zircon or paste but, she asked, what if the stone is something else?

The first thing Gwyn reminded participants about was that you cannot see through a reasonably well-cut diamond – the whole point of the diamond cutting is to make the light return, not pass through the stone. This approach is well known in the 'line test', where a line drawn or printed on a piece of paper cannot be seen through a diamond placed table-down over it. Gwyn proved that objects and colours worked just as well as lines; two photographs, one showing a red rubber band and the other a ring shank visible through a stone, revealed at a glance that the stones were not

## Recent Events

### Scottish Conference (cont.)



Two princess cut stones. The CZ (top) lets more light pass through showing two indications of the orange pavilion flash. The synthetic moissanite (below) only lets a little light through as it is tilted, so most of the stone remains grey; this light is a small dispersive flash as shown in the photograph. In comparison, diamond is greyer and less colourful. Photos by Gwyn Green.

diamonds. Light will not pass through a stone which has a RI greater than about 2.15. As an adjunct to the line test, she also showed how CZs exhibited an orangey pavilion flash when tilted slightly and observed with the table against white paper over a light source.

White zircon and synthetic moissanite are usually readily distinguished from diamonds by their double refraction and thus the apparent doubling of the facet edges when viewed in appropriate directions. Zircon usually shows doubling of facet edges when viewed through the table but it is sometimes cut with the table at 90° to the optic axis, in which case no doubling will be seen in this direction.

Diamond is celebrated for its fine dispersion, the rainbow flashes of colour.

Compared with this 'tasteful degree' of dispersion, to use Gwyn's expression, the exaggerated dispersion of moissanite was readily recognized, although a 20x loupe may be necessary to spot any apparent doubling of the facet edges in very small stones.

The differences in hardness between diamond and its many imitators can provide a clue as to a stone's identity – the abraded facet edges of zircon being a well-known example. Though hard, diamond can be scratched by other diamonds, but the sharpness of facet edges can be one indicator of a stone being diamond. The diamond's hardness also allows perfect flatness of facets, something rarely present on other stones. Flat facets can be identified by observing reflections of straight lines, such as a window frame, in a facet while the stone is tilted. Any distortion in the reflection is a warning sign, although Gwyn did explain that modern laser cutting of diamond can produce facets of less than perfect flatness. The desire to optimize weight in a cut diamond can manifest itself in girdles which retain some features of the original crystal surfaces, such as trigons, while minute triangular nicks on the girdle, resulting from intersecting cleavage planes, are diagnostic of diamond. As the hardness of diamond varies with different crystallographic directions, polishing direction – and thus any polishing marks – are not always consistently oriented around the crown or pavilion facets. This contrasts with many diamond substitutes where polishing directions are typically consistent around the stone. The internal features of a diamond – such as white or black specks, clouds, needles and so on – are useful indicators that the stone is indeed diamond, while laser drilling is only ever carried out on diamonds (although narrow holes have been mechanically drilled in CZ to replicate laser drilling and mislead the observer; however, there is no inclusion at the termination of the laser hole). White zircon is usually very clean as well as being very white.

If a small long-wave ultraviolet light, now cheaply available, is used to supplement the loupe, further observations can be made.

The variable fluorescence of colourless diamonds under long-wave UV light is well known, although as an aside Gwyn pointed out that on one occasion, no yellowish-brown diamonds in a batch of jewellery showed any fluorescence at all under long-wave UV light. CZs with calcium oxide present fluoresce orangey yellow; those with yttrium oxide fluoresce greenish yellow. Synthetic white spinels do not fluoresce under long-wave UV, only under short-wave. It is not recommended to expose white zircons to lengthy exposure to UV as it imparts a brownish coloration to the stone and a loss in dispersion; the brownish colour subsequently disappears, but the reduced dispersion appears to remain. More research into this latter phenomenon is needed. In later discussion Doug Morgan suggested that heat might help the zircon revert to its earlier dispersion. Gwyn pointed out that in normal gem identification, no one would be likely to expose zircon to UV for any great length of time, but that the cumulative effect of exposing zircon to UV light on numerous occasions, such as in education, was unknown.

Among other colourless stones, white sapphire (natural and synthetic) was hard, but in small stones its birefringence was difficult to observe even with a 20x loupe. White synthetic spinel was very white, but could appear dull and abrasion to the facet edges was not uncommon. White topaz had topaz's characteristically slippery feel and, often, diagnostic two- or three-phase negative crystals parallel to the c axis. Other stones which might appear colourless include iolite (when viewed from one direction), scapolite, tourmaline, morganite and moonstone where the touch of a specific shade of colour would be a useful clue to a gemmologist.

### East

An historical perspective to the coloured gem trade was provided by me in a brief survey entitled 'Eastern promise: a history of the Gem Trade with India and Ceylon'.

Eastern gem materials such as lapis lazuli and, probably, carnelian had been

## Scottish Conference (cont.)



A section of a Roman gold necklace of gold links with small, pierced water-worn sapphire beads – the sapphires almost certainly from India. Photo Jack Ogden

reaching the Near Eastern and Mediterranean world by the third millennium BC, but there is little clear evidence for a direct Mediterranean acquaintance with the gem products of India much before about 500–400 BC. At this period splinters of Indian diamond appear to be being used in Greek gem engraving and a Roman writer quotes what appears to be a fifth century BC mention of the goddess Ariadne as having "a garland of gold and Indian jewels".

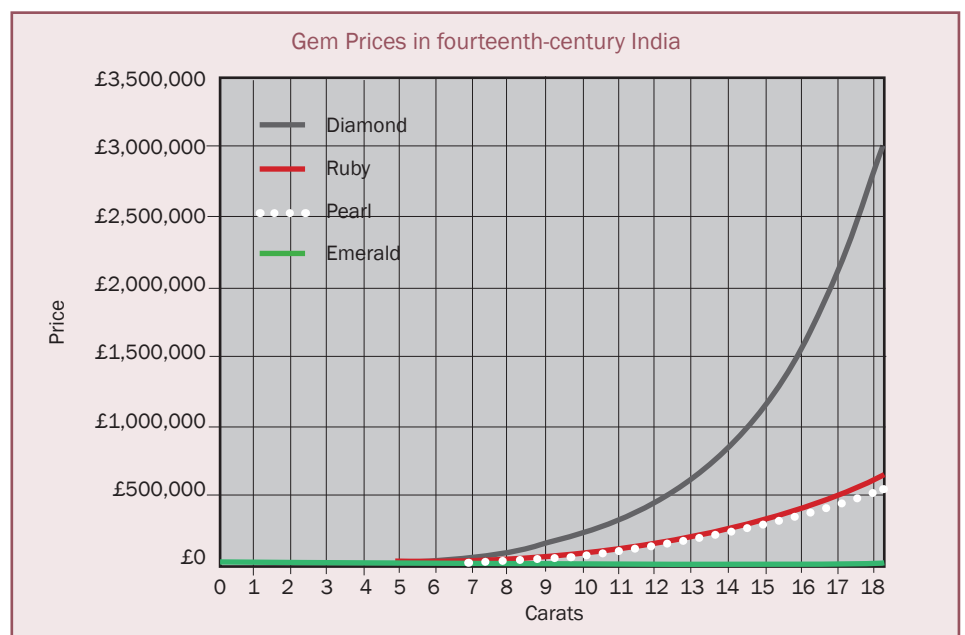
By the time of Alexander the Great, around 330 BC, and due in part to Alexander's conquests as far as the borders of India, we have more evidence. For example, Theophrastus, a friend of one of Alexander's generals, if not of Alexander himself, mentions Indian pearls and from this same period Kautiliya, a minister to the emperor Chandragupta, wrote *The Lesson of Profit* in which various gems are described,

By the early centuries of the Christian era, Indian gems were one of the oriental luxuries draining the Roman Empire of money. The sea trade from India to the Red Sea was booming and from the Red Sea ports gems were traded across to the Nile, up to Alexandria and thence to Rome and the rest of the Roman Empire. Small dark sapphires and simple drilled water-worn pebbles, probably from India, begin to appear in Roman jewellery along with some Indian diamonds and other gems. The expansion of the Persian Empire seems to have slowed the sea trade to India by about the fifth century

AD, but now pale blue sapphires from Sri Lanka (Ceylon) became relatively abundant. This trade then appears to have slowed about the time of the rise of Islam in the seventh century AD and even early Islamic jewellery has few gems other than pearls.

A trade in Indian gems to Europe begins to grow again in later Medieval times, with increasing connections between Europe and the Near East and with the opening up of the Silk Route as a relatively safe trade route. Marco Polo was one of the first to travel that route, and has left us an account of diamonds and other gems from India and Ceylon. Political changes in the fifteenth century made the silk route less accessible, and so European powers sought a direct sea route to India. With this growth in European trade came the foundation of the English East India Company and other similar European trading organizations. Trade in Indian diamonds and pearls increased greatly. Rubies from Burma also came to India and thence to Europe, as well as various stones from Ceylon. The East India Company was selling fine gems and pearls into the Moghul court, including those from the Americas, as well as exporting gems from India to Europe.

Ceylon produced a wide variety of gems, many of which are mentioned by early writers – including rubies which, being of poorer colour than Burmese, had for long been heat treated. Nevertheless, the King of Ceylon was keen to keep the gems for himself and while the Ceylon-Europe trade was in, successively, Portuguese and Dutch hands, the supply of gems from the island was never significant. Even after the British took over in 1796, the gem resources of Ceylon, other than pearls from the Gulf of Manaar, were considered to be uneconomic to work and of minimal importance. It was really only about the time of the visit by the Prince of Wales to Ceylon in 1875 and the subsequent displays of Ceylon gems in the Colonial and Indian Exhibition in London in 1886 that more interest was taken in them – including some ill-fated business ventures. From the nineteenth century there is a huge amount of documentary evidence relating to pearling and the gems found on the island – their nature, mining and value. These documents range from Government reports to popular newspaper articles. One of the latter, from 1888, describes how passengers on liners calling in at Colombo were offered gems by the local dealers; it explains that most



Prices for diamonds, rubies, pearls and emeralds in the fourteenth century based on the prices given by Thakkar Pheru in Delhi. The prices are based on relative gold prices, then and now.

## Recent Events

### Scottish Conference (cont.)

passengers finally returned to their ships “with a dozen bits of coloured glass wrapped up in cotton wool”.

A colourful theme was retained that evening in the clothing and, later, the complexions of those enjoying the traditional Dinner and Céilidh in the Balmoral Suite of the Queens Hotel (continued in the early hours in the hotel bar). A Céilidh, pronounced ‘*kay-lee*’, is defined as a traditional Gaelic social gathering, usually an evening of informal Scottish traditional dancing.

### Emeralds

Sunday morning’s programme started a little later than Saturday, probably more in recognition of the previous night’s exuberance than the Sabbath, and the room was full to hear Dr Dietmar Schwarz, head of Research at the Gübelin Gem Lab, continue his talk on coloured gems, mines and markets with an in-depth survey of emeralds, their origins and nature.

Dietmar began with a recap about the nature of emeralds and how, in chemical terms, they were simply normal beryl — beryllium aluminium silicate — but with chromium and/or vanadium present to act as colouring agent. In nature, beryllium, chromium and vanadium rarely occur in the same geological or geochemical environment, and so emeralds owe their existence to the special geological events that bring rocks containing these elements into close proximity. Aluminium, silicon and oxygen are abundant on earth. However beryllium is typically associated with continental crust minerals, while chromium and vanadium are in the Upper Mantle. These constituents of emerald are thus brought together by large-scale geological processes, often related to plate tectonics — the movement of the continental masses, or during small-scale events, for example when beryllium-containing pegmatites meet chromium- or vanadium-bearing ultramafic rocks. The relative fragility of emeralds which goes back to their perturbed growth history also means that they are restricted to primary deposits, or found in very close proximity to them. There are no secondary emerald deposits of economic interest.

Emeralds have a widespread distribution. They have been found in countries all over the globe, including Afghanistan, Australia, Austria, Brazil, China, Colombia, Egypt, India, Nigeria, Russia, Tanzania, Zambia and Zimbabwe. These different deposits have been exploited and discovered at different times through history. Thus the emerald mines of Colombia had been worked already by local Indians when the Spanish Conquistadores arrived, while those of India were first exploited on a commercial scale in the 1940s and the deposits of China are only just now becoming known.

Dietmar discussed the most important of these various deposits in detail, showing fine photographs of their locations, describing the geological environment and the characteristics of the emeralds that come from them. Thus the host rock for the celebrated Colombian emeralds is typically a black shale, emeralds from Brazil are found in phlogopitized carbonate-talc schists and the recently discovered Dabdar deposit in China seemingly has emeralds in hydrothermal veins in sedimentary rocks. The nature of the host rocks is reflected in the characteristics of the emeralds from them, thus detailed analysis of the composition and properties of emeralds can help determine origins. Gemmological laboratories are now using a whole battery of equipment, including UV-Vis, IR and Raman spectrometry, trace element analysis and isotope analysis in their quest to characterize sources. With the multiplying number of known emerald sources, the difficulties in giving an opinion on source increase. For instance, the three-phase inclusions well known in Colombian emeralds, and for long their principal identifying feature, can now be seen also in emeralds from Afghanistan and from the recently discovered Dabdar deposit in the Xinjiang Province of China, close to the borders with Afghanistan. However, analysis with advanced equipment can differentiate the Chinese from the Colombian material, for example using gallium:iron ratios because the Dabdar emeralds contain similar amounts of gallium to those from Colombia, but more iron.

The degree of exploitation of an emerald mine and its potential yield in the future depends on many things, from local political and security considerations to climate to geology. Thus Colombia, although producing magnificent emeralds, has for a long time had a reputation for being a hazardous environment because of its drug-related crime cartels — a reputation that the country is now trying hard to dispel with the establishment of such things as a monopolistic approach to the Muzo mines, with branding and ‘sightholders’. Nevertheless, a further problem in Colombia is the geology — not all the mineralized veins contain emerald making it very difficult to prospect new mines or project the future yield of existing ones. Many other factors affect mining; within the mountainous regions, remoteness, ice and snow make the Dabdar mines unworkable for many months of the year, and political events have disrupted the workings of the mines in Afghanistan and Pakistan. In Afghanistan emerald mining is controlled by the Tajiks, enemies of the Taliban, while in Pakistan the Taliban seized control of the Swat Valley deposits in 2009 and began to sell emeralds, leading to references to ‘Blood Emeralds’, although these stones are probably not a huge source of revenue to the Taliban, who have other, more lucrative sources of revenue.

### Light Refreshment

Following a coffee break all was light when David Callaghan talked about ‘Upon Reflection: an Excursion into the Phenomenon of Reflection’. This was a light hearted but by no means lightweight consideration of light. The term ‘reflection’, David explained, could refer not merely to the reflection of light, but also to the concept of serious thought and consideration of ideas. The importance of reflection in jewellery — whether gems, metals or enamels — is something he had reflected on frequently during his many years in the trade. After all, the two most extraordinary miracles in the gem world were light phenomena — the flashing polychromy of opal (said David: “In truth, just ‘fossilized water’!”) — and the lustre

## Recent Events

## Scottish Conference (cont.)

of pearls. Unlike the natural lustre of pearls, most jewellery materials required human agency in their finish. Reflection provides the light and shade that give objects form, while contrasts between polished and matt surfaces similarly add to a 3D appearance. On the other hand, a satin finish to gold can also help reveal shape by reducing reflection and glaze. The ability to exploit reflection was not limited to precious metals. One example was polished 'cut steel' – the initial focus of production by jewellery manufacturer Matthew Bolton in the eighteenth century.

Perhaps the best known example of reflection in jewellery is found with the diamond. Diamond was typically dull until cutting and polishing permitted the reflection and refraction of light to work their magic. With rose diamonds reflection rather than refraction was usually paramount, which also

meant that inclusions were less visible within the stone. However, even rose diamonds could be backed by shiny thin metal foils to amplify reflection. Glass has been used in jewellery since antiquity, but it only became a serious substitute for polished gemstones after Ravenscroft's introduction of high lead glass in 1673 followed by Strass's lead in using it in jewellery. Fine paste jewellery was not costume jewellery; it was beautifully made, often by the same craftsmen who worked with genuine gemstones. Indeed, as in many instances through jewellery history, appearance was as important as the consistency or authenticity of stones. Thus even Cartier combined natural and synthetic gemstones in some of their early twentieth-century jewellery as this made it easier to have a perfect match of colours. A generation or so later, in the 1940s, large, but not

necessarily heavy, jewellery used the large reflective surfaces of highly polished gold of differing colours to provide visual appeal.

With a fine range of illustrative materials, from Cartier bracelets to Grima's extraordinary 'axe-cut' yellow beryl, David showed how the history of twentieth century jewellery, its metals and its gemstones, is a history of the exploitation of the reflection of light.

The Sunday afternoon was devoted to demonstrations and displays, and a full programme of workshops.

This year's field trip, held on the Monday, was to 'Ruby Bay' at Elie to hunt for garnets in the sand. The weather held up reasonably well until the afternoon and participants returned with at least one cut garnet, 'prepared earlier' by Brian Jackson.



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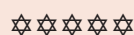
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# Reduce, Reuse and Recycle

Lessons from the past. Cally Oldershaw reports on a visit to the Museum of the Jewellery Quarter, Birmingham.

The modern mantra of 'reduce, reuse and recycle' is the mantra of many a successful organization. It has been incorporated into aspects of modern family life and the school curriculum as we look to the future of our planet Earth. In addition to the present and the future, the mantra would not have been out of place in our social or industrial history. Looking to our past, the jewellery industry can be used as a good example where this approach was not only successful but essential.

The inherent value of gold and gemstones has led to the need to avoid waste. Gold has been melted down and reused and gemstones have been reset in jewellery as fashions change. The jewellery industry uses both gold and gemstones and has developed ways of keeping waste to a minimum. In the UK, the main jewellery centres are in Hatton Garden in London and in the Jewellery Quarter of Birmingham. Although a large percentage of the jewellery sold in the UK is manufactured abroad, more than 40% of the jewellery that is produced in the UK is actually made in Birmingham, examples of which can be seen at the Museum of the Jewellery Quarter, the Museum and Art Gallery of Birmingham and Thinktank, the science centre at Millennium Point.

### **The Museum of the Jewellery Quarter**

The museum is a 15 minute walk from the centre of Birmingham and the Bullring shopping centre and just two stops on the train from Moor Street. I arrived just as a guided tour was starting. Rachel, the guide, led us through the museum to the offices and workshop of the jewellers Smith & Pepper, founded in 1899 at 77-78 Vyse Street. It felt as if we had walked into a time capsule — everything perfectly preserved and left just as it was on Smith & Pepper's last working day, when the family closed the workshop. We were to be given a unique glimpse of working life in Birmingham in the early part of the twentieth century.

The factory had been run as a close family concern for over 80 years where 'Mr Eric' the Managing Director and travelling salesman, his sister 'Miss Olive' who managed the office and their brother, 'Mr Tom', the factory manager, were to run the workshop until 1981.

Smith & Pepper produced large amounts of gold and silver bracelets, earrings and brooches for both wholesalers and agents. What particularly impressed me was the way that every ounce of gold was used and any waste was recycled and reused.

### **The jeweller's work box**

Each jeweller was responsible for his jeweller's work box. At the beginning of the day Mr Tom, the factory manager, weighed out the gold to be used by each jeweller and placed it in his work box which would have been kept in the safe overnight. As each work box was prepared, the amount of gold was entered in a ledger. At the end of the day, each jeweller placed all the finished and partly finished work in their box and returned it to be weighed in. They had to account for any missing gold, with only up to 2% being allowed as natural wastage. In the same way that crumbs are left after a loaf of bread is cut, or sawdust is left after wood is sawed, when jewellers cut and polish gold some gold dust will result which would have to have been accounted for.

Every aspect of the job and of the factory was designed to minimize any loss of gold. This included organizing:

- the jewellers and their work,
- the women and their work, and
- the design of the factory.

### **The jewellers and their work**

The jeweller's bench was designed with a leather apron attached to catch any falling gold or gold dust. A jeweller might also use a hare's foot to wipe down the bench, then flick the foot to release any gold dust back into the jeweller's box.

### **The women and their work**

Women were employed in the Smith & Pepper factory to work on the stamping and polishing machines. They used 'fly press' machines to cut out the shapes needed for the jewellery. The machines were dangerous and if care wasn't taken, they could have potentially lost a finger.



## Gem and Jewellery History

As well as working fast, they were aware of the cost of the gold and tried to use as few sheets of gold as possible. In the same way that a cook or pastry chef will try and cut as many pies or jam tarts from a piece of rolled out pastry, the women became expert at getting the most out of each sheet of gold.

### The design of the factory

At the end of the day, Mr Tom, the factory manager, swept the floors and took the sweepings to the furnace in the basement. As the sweepings and sawdust burned, any gold or waste metal that it contained melted and once cooled and solidified was rolled flat. These blocks of gold and other metal waste, were called 'lemel bars'. They were sold back to the gold dealers, who separated out the gold and either sent them back to the factory for reuse, or paid the factory for the gold content.

To avoid any gold dust leaving the factory on clothing, a jeweller had to take off his apron before going home and leave it to be washed in the factory sinks. All aprons and overalls were washed in the sinks which were also used for hand washing. The sinks

contained grills to collect any small pieces of gold that had become caught in the clothing.

Gold dust that was not caught by the grills wasn't lost either; the water from the sinks was diverted into a large holding tank beneath the floor of the factory, so gold was not washed away directly into the drains. A layer of sawdust was placed in the tank as a filter. At the end of the year, the water was drained out and the sawdust was carefully removed. It was placed in the furnace and in the same way that the gold was retrieved from the sweepings, it was retrieved from the sawdust and reused or recycled.

The factory is an example of how design and technology and methods of working go hand in hand within the jewellery industry in order to reduce waste, and reuse and recycle gold. This whole design system was motivated because of the value of gold. Nowadays, this lesson should be taken forward into all aspects of life.

*Photographs with permission of The Museum of the Jewellery Quarter.*

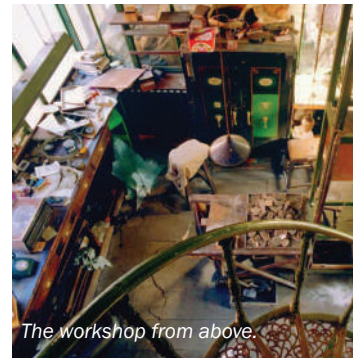
The Museum of the Jewellery Quarter recently won the Small Visitor Attraction of the Year award in the Enjoy England Awards for Excellence 2010.



The office.



Smith & Pepper's workshop.



The workshop from above.



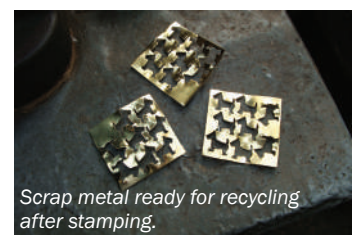
The jeweller's workbox.



The jeweller's bench with leather apron.



Stamping shapes using a fly press.



Scrap metal ready for recycling after stamping.

## Stone Scoop



# Hot diamonds

Robbery is a constant threat in our industry, and one shouldn't make light of the constant anxiety – and worse – it can cause. Nevertheless, press reports of thefts can include interesting or intriguing information. Three reports of diamond thefts provide insights into old diamond treatments, early X-radiography and harsh justice.

## Burnt goods

A curious court case recorded in *The Times* in 1865 revolved around a not-unique question of whether a diamond in a ring had been swapped or not. The evidence that it was not the same diamond lay in part in the presence of a 'flaw' and the question was asked in court whether a flaw in a diamond could be changed in appearance. Mr Martin, a diamond broker, "stated that there was no process known in the trade by which (as the plaintiff had stated) a flaw could be taken out (which could only be done by cutting it out), though there was a process of burning, in borax, by which a yellow flaw could be turned to a black one. Sometimes this improved the stone, because the black tinge (if the flaw was small) would show the whole of the stone better. Sometimes however, a flaw, he said, would extend [i.e. grow larger in heating]; and then the stone would be damaged and deteriorated." This statement was corroborated by three other diamond experts including a diamond cutter, Mr Auerhaan, who explained: "I am used to burning diamonds, which is done thus – take a crucible, fill it a third part full of borax; then put the diamond in, fill up the crucible with another third of its contents of borax, and put the crucible on the fire until the borax boils." After this process the diamond would often need repolishing, although not always.

Turning a yellow flaw black wouldn't do much for the clarity of a stone, but it might well greatly improve apparent colour.

## Gut reactions

Concealing a stolen stone was always a challenge for a thief. *The New York Times* in 1904 reported how a Texan thief had stolen a diamond "worth \$250" and then swallowed it. The stone was located with an X-ray machine and removed by operation which was paid for by the owner, who then, surprisingly, dropped charges. A comment in the publication a few days later noted that "Texans are a hasty and impulsive people" and, perhaps more objectively, that "a jail is not the very best of places for the performance of a surgical operation as serious as this one, and the fee of a competent surgeon for performing it would make a large hole in \$250." That same day a correspondent in the letters page of the same paper made the important observation that "A diamond is transparent to X-rays, and could not, therefore, be detected by these means...".

So the whole thing is rather odd – one wonders if it was an imitation and not a genuine diamond and if so, was it all a put up job?

Reminds me of the 1996 Woody Allen film 'Everyone Says I Love You' where a diamond is swallowed and then in the hospital, when it can be seen in an X-ray, a doctor wants to know its size, what was paid for it and then insists that his brother-in-law could have supplied one cheaper. The transparency of diamond to X-rays has also been pointed out by gemmologically savvy critics of the movie – pedants.

## Headlines

If you think a stomach operation is a drastic response to a diamond theft, think again. In 1798, according to a press report, the Turkish ambassador in Paris had been buying jewellery in a jeweller's shop in that city. It appears that one of the ambassador's entourage stole a diamond ring. This crime, witnessed by the jeweller's son, was later tactfully reported to the Ambassador. A short while afterwards the jeweller was sent a box containing the thief's head with the ring gripped between its teeth.

**Jack Ogden**

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