

# Gems & Jewellery

Summer 2012 / Volume 21 / No. 2



Golden coral

Australian sapphires

Fossils in amber



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# Summer 12

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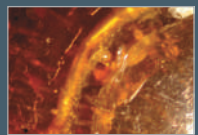
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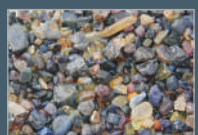
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## Holding the reins

I am writing this as Editor, but no longer Gem-A CEO. The time was right for the change and it feels good.

Back at the beginning of April James Riley was appointed to work alongside me as Chief Operating Officer. James is well-known to the UK gem and jewellery trade – he was Manager at Backes & Strauss, Diamond Manager at Boodles, and a past member of both our and the National Association of Goldsmiths' Boards. Over the last three months James has been taking increasing responsibility for the day-to-day running of Gem-A and the development of the UK market for Gem-A education and services. As was the plan, this has now allowed me to reduce the hours I work for Gem-A.

James, appointed CEO at the beginning of July, is now at the helm of the organization while I, with my reduced hours, will focus on Gem-A's worldwide interests – a sort of ambassadorial role if you like – and also remain Editor of *Gems & Jewellery*. This really is a perfect progression for me, and one that I have been chivvyng the Board to agree to for some time. It will allow me to pursue other opportunities alongside my commitment to Gem-A. I was Gem-A CEO for seven and a half years, through some interesting times and, once we got past the slump years of 2007–8, a period of good growth, both financially and in terms of the international profile of the Association. So now it is time for a change. I have brain cells itching to get their teeth (or whatever it is brains cells have) into some new areas of research, and Gem-A, like every proactive organization, needs a change in helmsman every few years to keep the creative juices flowing.

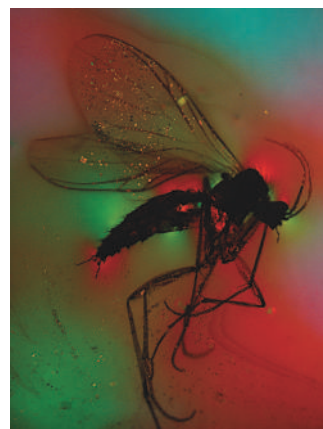
What does this mean for *Gems & Jewellery*? The idea is that with many of the day-to-day responsibilities at Gem-A off my shoulders, I can concentrate more on this publication and continue its development. My involvement with the magazine long predates my working for Gem-A and so I have both an interest and a pride in its success.

**Jack Ogden**

Editor, *Gems & Jewellery*

### Cover Picture

Strain fields in amber, caused by this included midge, give rise to beautiful interference colours due to anomalous birefringence around the silhouette of the insect. The wings are covered by tiny, brightly shining birefringent particles. Their nature and origin still have to be identified – the particles could possibly be million-year-old dust sitting on the insect's wing. Magnification 25×, bright field illumination with crossed polarizers and quarter-wave plate. Photo Michael Hügi. See pages 39–43 for more beautiful images of amber inclusions.



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# Gem-A Conference 2012

## Sunday 4 November Programme

Small rough emerald from Fazenda Bonfim, Brazil, measuring 5 mm. Photo by Hanco Zwaan.  
© Netherlands Gemmological Laboratory.



The 2012 Conference will be held at the magnificent Hotel Russell, Bloomsbury, London. With a host of international speakers, be sure to book early to guarantee your place.

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**The challenge of identifying recent generations of melee-sized synthetic diamonds**

**RICHARD HUGHES FGA**  
**Jade: between Heaven and Hell**

**JERRY SISK GG**  
**Expanding the market for coloured gems: the JTV experience**

**JOANNA WHALLEY FGA DGA**  
**Smoke and mirrors: the art of gem setting in Renaissance Europe**

**RON RINGSRUD GG**  
**Emeralds of Colombia: passion and profits**

**Conference fees:** (to include lunch and refreshments)

- £145 for Gem-A members
- £185 for non-members
- £95 for Gem-A registered students
- Dinner/dance tickets are £50, to include a three-course meal and drinks reception.

For more information or to book for any event please see the enclosed Conference leaflet, email [events@gem-a.com](mailto:events@gem-a.com) or call on +44 (0)207 404 3334.

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# Gem-A Conference 2012

## Seminars and Visits

Diamond tiara. Photo Jack Ogden.



### SATURDAY 3 NOVEMBER

**Richard Drucker GG**

**Colour assessment of gemstones (A half-day seminar)**

Tickets: £25

**10:30 – 12:30**

(Morning session) or

**14:30 – 16:30**

(Afternoon session)

### MONDAY 5 NOVEMBER

**Maggie Campbell Pedersen FGA**

**Is it real? Identifying amber (A half-day seminar)**

Tickets: £25

**10:00 – 12:00**

**Dr Jack Ogden FGA**

**All things bright and beautiful: a history of gems and gem setting (A half-day seminar)**

Tickets: £25

**13:30 – 16:00**

**Graduation Ceremony**

Tickets: £25, to include drinks and nibbles. 2012 Gem-A Diploma Graduates plus two guests may attend free of charge.

**18:30 – 21:00**

### TUESDAY 6 NOVEMBER

**Visit to the Natural History Museum**

A guided tour with **Alan Hart FGA**

Tickets: £20

**09:45 – 12:00**

**Private viewing of the Crown Jewels**

A guided tour with **David Thomas MVO**

Tickets: £40

**15:45 – 18:00**

**Gem Central**

**Gem dealing: challenge yourself**

With **Jason Williams FGA DGA** of G.F. Williams & Co. Ltd.

Tickets: £5

**19:00 – 20:00**



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# Gem news from Gary Roskin

Gary Roskin FGA visits Interweave's BeadFest and reports on some interesting specimens.

Whether it's Baselworld, JCK Las Vegas, Tucson's AGTA GemFair, Idar's Intergem, or any other major well-known gem show, we always end up talking about the transparent gems. Rubies, emeralds, sapphires, diamonds, tourmalines, aquamarines, you name it, the transparent gemstone list goes on and on. Seldom do we consider the ornamental gems, the translucent to opaque stones. This is where shows like Interweave's BeadFest come in.

Interweave is an arts and crafts media company specializing in publishing magazines and books – the most notable of their magazines being *Lapidary Journal* and *Jewelry Artist*. Although not as large as any of the 'big' shows, BeadFest is very impressive nonetheless.

Twice a year at The Oaks – about 30 minutes north of Philadelphia – bead and bead jewellery consumers from all over North America gather to see hundreds of exhibitors promoting the art of beading. Whether you are there to gather supplies for making your own jewellery, attending 'How To' classes, or to behold (or buy) someone else's creations, this is the bead lover's paradise.

I must admit though, walking around this type of show puts me a bit out of my comfort zone. I am by no means an expert on ornamental gems, so I use BeadFest as an added learning experience. Of course, it is a bead show, and that means that there are handmade glass beads, plastic beads and metal beads, as well as organic gem material beads and hard stone ornamental beads. This show also features ornamental gemstone cabochons. I recognize most of the gem materials on display, and could probably name them by sight, but I do rely heavily on the expertise of those who exhibit and those who seek out the unique chalcedonies and gem materials labelled with only descriptive names like 'Sonoran Sunset'.

I would highly recommend attending the smaller local gem and mineral shows, and if you have a chance to attend a bead show I can assure you that it will be a learning experience like no other.

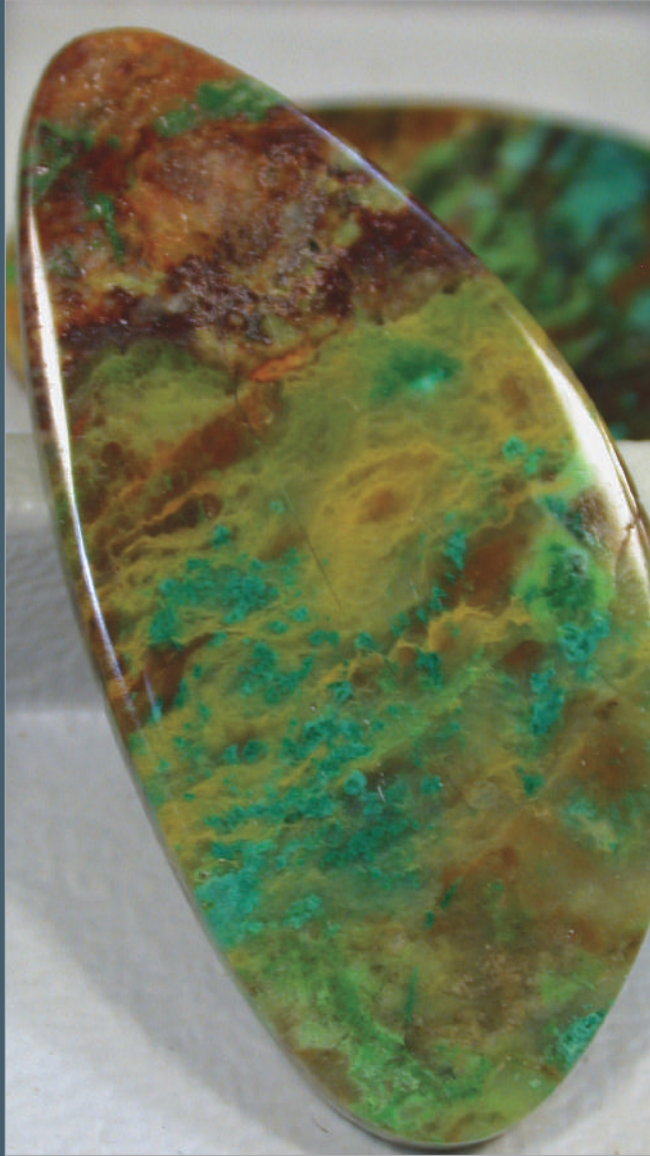
Here are some of my favourite ornamental gem materials seen at this year's Spring BeadFest. I am sure that you will recognize many of them.



*Mookaite is an ironstone jasper from Western Australia. Usually appearing in pinks and browns, one has to be extremely familiar with this variety of jasper to know that the burgundy colour (deep purplish-red) seen here is apparently quite rare.*

## Gems and Minerals

### Gem news from Gary Roskin (cont.)



You have to love the names that are given to ornamental gem materials — particularly this 'parrot wing chrysocolla'. Anything goes, but the best are the ones that not only relate to the material, but also make it sound worthy of ownership. Case in point: parrot wing chrysocolla. What is it exactly? There is no strict definition that we have found, but it is usually a combination of chrysocolla with possibly cuprite and/or azurite.



*Rhodochrosite, featuring classic ornamental colour and bacon-strip design.*



Who knows how long the volcanic eruptions on Java, Indonesia, have created a seemingly singular deposit of this beautiful and unusual natural 'bead' called fossil 'bambu' agate. Formed around the stems of old and very tough marsh reeds, although this botryoidal chalcedony certainly gives the appearance of a possible replacement for bamboo (or 'bambu' in Indonesian), it is not. It certainly stood out though as one of the finest natural bead materials I have come across in a long time.



## Gem news from Gary Roskin (cont.)



*Amazonite microcline feldspar is not new to most gemmologists, but is too often ignored by the traditional jeweller. This is just a reminder that the gem material is still available and in good quality and quantity. Look for evenness of colour and texture.*



*Regency rose agate (far left) and crazy-lace agate (left).*

## Gems and Minerals

### Gem news from Gary Roskin (cont.)



*This is what black onyx is supposed to look like. Give me a good white stripe or series of white stripes in black chalcedony any day. Better examples of black onyx are found here at BeadFest than in the dyed black chalcedony with no character found in most traditional men's jewellery.*



*Tagua nut, or vegetable ivory, is very popular amongst beaders. Easily worked and relatively inexpensive, it gives the jewellery maker a great deal of flexibility. On the left we see beads of natural colour, while on the right is dyed tagua nut, carved and pierced into smiley face beads and dyed into fun and bold statements. This is just one simple example of how tagua nut has made its way into affordable fun fashion jewellery.*



*Dearborn agate (or 'fordite') is similar in appearance to dyed agates or even manufactured stone called 'rainbow calsilica'. Dearborn is not a mine, it is a city in Michigan, close to Detroit, and home of the US automobile manufacturing centre. During the heydays of Detroit, in the 1950s and 1960s, auto manufacturing was at a peak, and auto painting was very colourful. The paint that ended up on the paint room walls was subsequently removed and tossed away, left for enterprising lapidaries to rediscover and cab into fun jewellery-worthy jewels. Its very light heft is a good identifier.*

## Gem news from Gary Roskin (cont.)



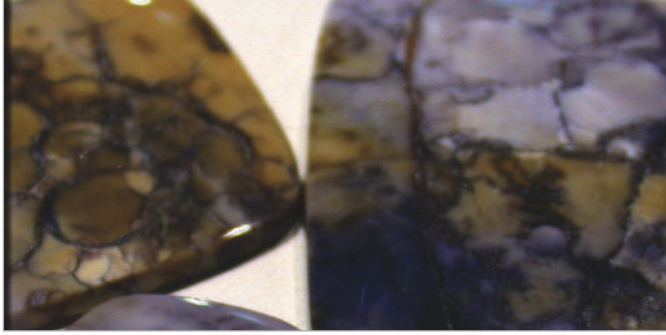
*Above: Fibrous amphiboles inside chalcedony – what a combination! Of all of the ornamental gem materials in larger carved objects, I just love the variety of colours and the texture that is found in this Namibian pietersite. Beaders like it too.*

*Right: Dyed tiger's-eye (left) and natural tiger's-eye (far right). The natural colours on the right are also given a trade term of 'honey-blues' or 'blue-blondes'. Surprisingly, amongst beaders the natural colours do as well, if not better, than the more colourful dyed colours.*



## Gems and Minerals

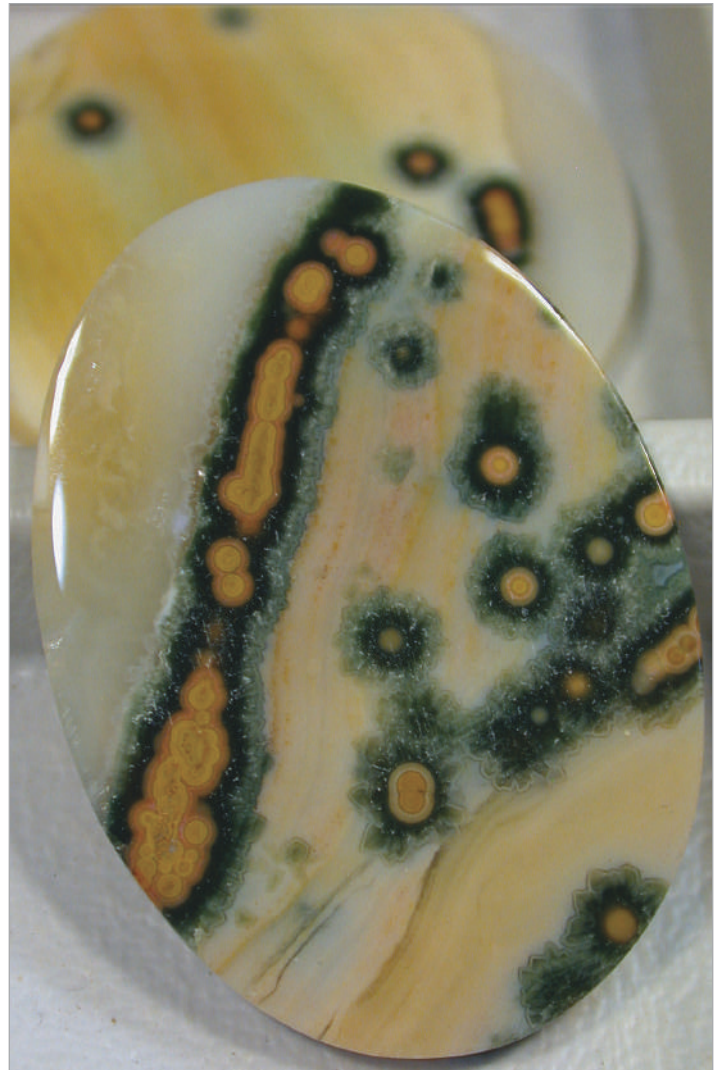
### Gem news from Gary Roskin (cont.)



One of the challenges of buying ornamental gem materials is if you want to classify it as a particular mineral. In many cases, such as with the very popular Utah 'Tiffany Stone', it's a variation of combinations of minerals, including opalized fluorite and bertrandite, so it doesn't fit neatly into a gemmological or mineralogical classification. Called 'Tiffany Stone' for its colour palette as well as its 'stained glass-like' divisions, 'Tiffany Stone' is mined more for its beryllium content than for its polished gem-worthy potential.



Traditional appearance of rhodonite — saturated colour with distinctive black markings.



Orbicular 'ocean' jasper, from Madagascar, has been a favourite amongst beaders and wire wrap jewellery artists for several years. Because of the obvious varieties of shapes and colours, it's always been one of my favourites as well. Although we see a lot of it in the market, 'ocean' jasper is said to be difficult to export from Madagascar. Government regulations against exporting rough gem materials, countered by export smuggling, will continue to confuse the market.

## Gems and Minerals

## Gem news from Gary Roskin (cont.)



I've never been to Sonora (Mexico, just south of Arizona), but I imagine that the sunrise could certainly look like the colours in this 'Sonoran sunrise' material. This is jasper with chrysocolla and cuprite. Not surprisingly, this material comes from the same area in Mexico where 'parrot wing chrysocolla' is unearthed.



Natural obsidian (glass) can take on the appearance of many different recognizable objects (for example, rainbow obsidian, snowflake obsidian) and this variety is no different; it takes on the look of mahogany hardwood, and is therefore called 'mahogany obsidian'. The colour and texture of this obsidian variety makes it such a terrific material to design around.



Scenic polychrome jasper from Madagascar.



Any fossil can be made into jewellery, but some are simply prettier than others. Here is a great example of fossilized palmwood, found all over the world, including right here in the southern states — most specifically, a state fossil of Louisiana, and state stone of Texas! The high quartz content gives this 'black-heart' palmwood that opal-like appearance.

## About the author

Gary Roskin is the author of *Photo Masters for Diamond Grading* and hosts the online gem news magazine *The Roskin Gem News Report*. For more information visit [www.roskingemnews.com](http://www.roskingemnews.com).

## Organics

# Golden coral

Golden coral has recently become quite popular in the trade and amongst consumers, especially as beads and fashion jewellery. Gagan Choudhary FGA of the Gem Testing Laboratory of Jaipur, India, recently received a bead of golden coral which was not only impregnated but also coated with a thick layer of polymer/plastic.



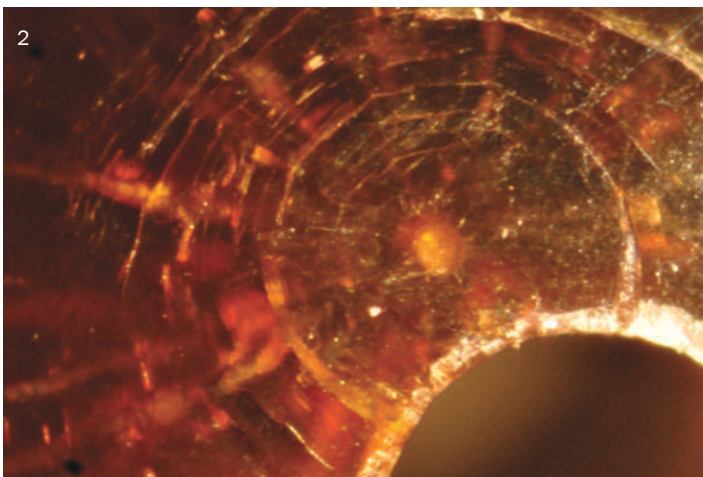
Broadly, coral is classified into 'carbonate' and 'horny' types; carbonate types contain calcium carbonate in their composition and are usually red, orange, pink or white, while the horny types contain protein substance and are usually black or golden. Classified as horny type, golden coral habitually belongs to the Antipatharian order, *Stichopathes*, *Cirripathes*, *Leiopathes* (Campbell Pedersen, 2004) but some may also belong to order Zoanthinaria, species *Gerardia* (Campbell Pedersen, 2004) and

order Alcyonacea (formerly known as Gorgonacea). Although structural studies help to determine the species in some cases, the exact species of golden coral may not be determined in every case as large numbers of black coral are bleached to produce golden coral.

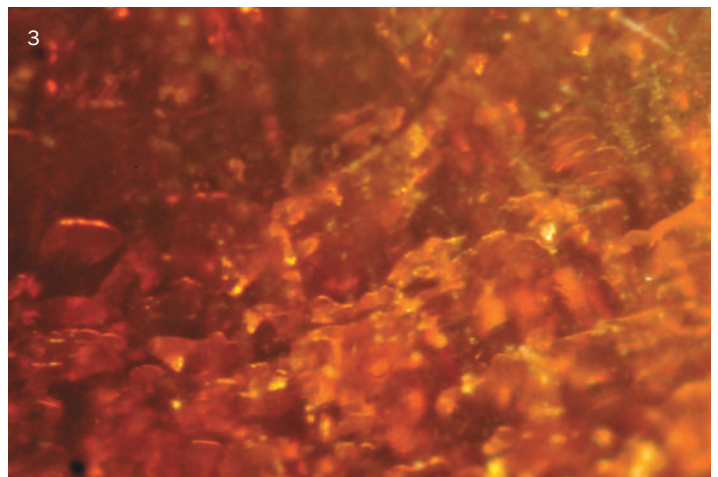
### Visual characteristics

The spherical bead submitted for identification weighed 3.44 ct and measured 10.10 mm in diameter (1). At first glance the

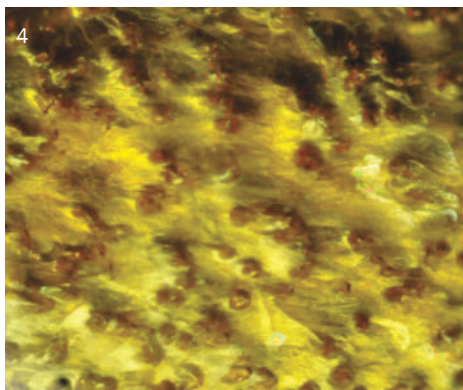
sample displayed a bright metallic lustre, but careful examination revealed that the metallic reflections were not from the top surface but from the layers beneath. The top surface displayed a dull lustre, similar to resins. The colour of the bead was not even throughout but golden in the centre, changing to brown towards the outer areas. In addition, some uneven/wavy texture of the underlying layer was visible. Such colour distribution and textural patterns are common for golden corals and although



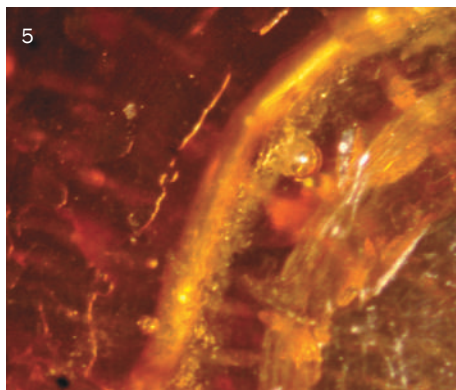
2: The encountered bead displayed features typically associated with horny corals which include curved growth layers, surrounding a central canal that was oriented along the length of the branches. Also note the growth lines emanating from the central canal intersecting the circular growth layers. These growth lines appeared to be responsible for the pimply surface shown in 4. Magnified 32 $\times$ .



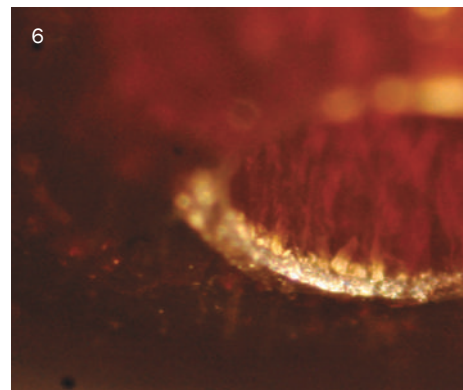
3: The concentric layers shown here consisted of an array of cracks appearing as flakes, which is typically associated with horny corals. Magnified 64 $\times$ .



4: The central front portion of the bead displayed a characteristic and distinctive pimply to wavy surface with strong reflections/sheen effect. Magnification 64 $\times$ .



5: Presence of gas bubbles deep inside the cavities and spaces within the circular growth layers indicated the presence of a polymer. Magnification 48 $\times$ .



6: A demarcation line seen near the drill hole, separating the coral from the thick layer of polymer-like substance, confirming the presence of coating. Magnification 48 $\times$ .

these suggested the identity, the structure was studied in detail under the microscope.

#### Microscopic examination

The bead displayed features typically associated with horny corals which include curved growth layers (2), concentric array of cracks appearing as flakes (3) surrounding a central canal (2) that was oriented along the length of the branch. In this bead the central canal was oriented along the drill hole. These circular growth layers were also intersected by growth lines emanating from the central canal towards the surface (2). When viewed from the side (i.e. the central front portion of the bead), it displayed a characteristic 'pimply' to 'wavy' surface with strong reflections/sheen effect (4). On careful observation the growth lines emanating from the central canal appeared to cause the pimply or wavy surface in cross-sectional view. Overall structural features suggested that this bead of golden coral belonged to Antipatharian order (Campbell Pedersen, 2004).

In addition gas bubbles of various sizes were sporadically present; some of these were present very close to the surface while some were deep inside the cavities and spaces within the circular growth layers (5). These gas bubbles suggested the presence of some artificial material such as polymer or resin. Gas bubbles at a significant depth in the sample indicated that a polymer-like substance filled the cavities, but the presence of coating could not be ruled out.

On observing the bead around the drill hole, a demarcation line (6) was seen separating the coral part from a thick layer of polymer-like substance, confirming the presence of coating. The presence of polymer-based coating was also indicated by the resinous surface lustre and numerous scratches on the surface (see 2 and 6). Although microscopic examination identified the bead as impregnated and coated coral, gemmological and spectroscopic properties were measured for records and further confirmations of polymer.

#### Gemmological properties

The RI was measured at around 1.55 and specific gravity (determined hydrostatically) at 1.27. Although these values are consistent with those expected for golden coral, they might have been influenced by the thick layer of polymer and the drill hole. Under ultraviolet lamp (both longwave and shortwave), the bead displayed a weak green glow. EDXRF analysis revealed the presence of bromine and iodine, as expected for a horny type coral (Hanni, 2004). Presence of chlorine could not be confirmed as the peak overlapped with the peak of backscattered X-rays. FTIR spectra showed peaks at around 2875 and 2970  $\text{cm}^{-1}$ , which are associated with polymers.

#### Conclusions

Although the golden colour of coral is commonly produced by bleaching black coral, its presence cannot be determined

with absolute confidence, as was the case here. Corals are also commonly impregnated with colourless wax, resin and polymer to improve surface lustre and durability. However in this case the coral bead was not only impregnated but was also coated with a thick layer of artificial resin or polymer.

*All photographs and photomicrographs by Gagan Choudhary.*

#### Further reading

Hanni, H.A., 2004. Black horn coral with artificial resin. *Gems & Gemology*, **40**(1), 78-79

Campbell Pedersen, M., 2004. *Gem and Ornamental Materials of Organic Origin*. Elsevier Butterworth Heinemann, Oxford

<http://en.wikipedia.org/wiki/Gorgonian>; last accessed 22 June 2012.

#### About the author

Gagan Choudhary is the Deputy Director of the Gem Testing Laboratory, Jaipur, India, and is involved in certification and research.

## Field Trips

# The sapphires of Australia

Jack Ogden FGA visits the sapphire mines of Queensland and New South Wales.

During May and June 2012 I had the opportunity to visit several of the sapphire and opal fields in New South Wales and Queensland, Australia, along with Terry Coldham who arranged the trip, and Vincent Pardieu. Terry was, until recently, the President of the Gemmological Association of Australia and is a veteran of the Australian sapphire mining world. Vincent Pardieu is the GIA's Supervisor of Field Gemology, well known for his intrepid expeditions to remote gem mining areas.

It was a wonderful and interesting trip that followed the Gemmological Association of Australia's 2012 Federal Conference in Sydney, at which both Vincent and I were speakers. Vincent spoke on the gemstones of Afghanistan — speaking in full Afghani dress — and I on a history of gem imitations. Both talks were later repeated at the Lightning Ridge Bowling Club, an unlikely-sounding but huge and very hospitable venue in Lightning Ridge, the centre of New South Wales' opal mining.

The eight-day trip encompassed sapphire and opal mines, some amazing scenery, near-endless miles of mud roads garnished with kangaroos and emus, and a wonderful selection of watering holes, motels, miners and generous hosts, although here just the sapphires will be considered.

## Australian sapphires

The sapphires in New South Wales and Queensland are associated with basalt, but the majority are actually found in what has often been assumed to be river gravel, but is actually a pyroclastic deposit — the sapphires had been brought to the surface and spread by explosive volcanic eruption. Such pyroclastic flows can reach extremely high speeds and often spread rocks and ash over huge areas with devastating effect — as the destruction of Pompeii demonstrated. The sapphires in both the basalt and pyroclastic material may in turn be washed into alluvial deposits.

The variety of forms in which the sapphires are found is remarkable. They range from fairly typical bi-pyramidal crystal forms to a variety of fractured and etched shapes. Basal parting is very common. Many have almost a melted look to their surfaces, others are smooth and sometimes of even shape — a result of etching, not water-born abrasion. Those that do seem to be water-worn have more of a chipped and fractured surface. Parti-coloured stones are common, most typically yellow and blue or yellow and green, as well as stars. The most famous star is the 'Black Star of Queensland', a



Bill Dawson (left) with Vincent Pardieu (right) at Fraser's Creek.

1165 ct black sapphire originally found by Mrs Roy McKinney when she stubbed her toe on it during a picnic.

## The sapphire fields of New South Wales

Sapphires were first discovered in New South Wales in 1851 during gold mining operations, but commercial mining didn't really commence until immediately after World War I. The main deposits are the river systems and valleys (creeks) in the Glen Innes–Glencoe–Inverell area, some 600 km (380 miles) north of Sydney. Overall the sapphires in this area are typically basaltic ones, with some 98% being blue and the remainder being yellow, green and



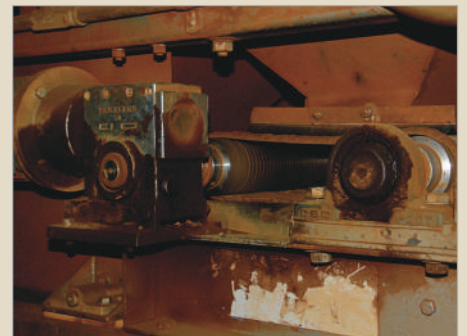
Rough sapphires and other gems from the Kings Plain Mine, New South Wales. McLachlan Collection.



## Field Trips



Series of images showing the processing plant at Jack Wilson's mine, Kings Plain. The sapphire-containing 'wash' is broken up by rotating steel teeth, and is then passed through a series of rotating trommels to separate the different sizes of gravel. The sapphire-containing wash passes over vibrating jigs where the sapphires sink to the bottom. At the end of the day, the top layer of gravel is shovelled out and the sapphires that are on the bottom of the jig are extracted with a vacuum, and are then fed into large iron boxes and taken to a magnetic separator which is used to remove the magnetically-susceptible spinel.



'partis' (particoloured). Pinks are very rare, although miners say that the typical production of these varies between areas. Thus Wellingrove Creek (where Terry mined in the 1970s) and Fraser's Creek are said to produce darker stones, and here pinks are more usual. On the other hand Swanbrook, which was heavily mined in the 1960s-1980s, tends to produce smaller stones, but prettier blues and occasional pinks. Bill Dawson, who has mined the area for 40

years and who now mines in Fraser's Creek, says that Swanbrook produces the best sapphires in terms of colour, size and lightness. The further down Swanbrook you go the better the sapphires get. Some praise Reddestone Creek for the good sapphires found there after mining began in the mid-1980s, including miner Jack Wilson who agrees that on average there are better blue and higher quality gems than at the extensive Kings Plain area, which now produces

## Field Trips

### The sapphires of Australia (cont.)



Above left: Rough sapphires from Jack Wilson's mine, and rough sapphires from Reddestone Creek (above right).  
Bottom right: Drums of sapphires in Jack Wilson's office ready for shipping to Thailand for cutting.

some 80% of the sapphires currently mined in Australia. Most former sapphire mining areas, such as Reddestone Creek, are fully returned to prime grazing land, a laudatory reclaiming of the land for agricultural purposes that is typical of the area.

A visit to Jack Wilson's mine at Kings Plain Eastern Feed allowed us to see the largest mechanical mining operation left in Australia. Here, some 600 tons of the sapphire-bearing material — called 'wash' by the miners and essentially a material that looks like clay — is mined per day. The wash is transported up a ramp where it is tipped into a hopper. With the urging of a high-power water hose, the wash feeds down to a channel with rotating teeth that break it up. This



The sapphire processing plant at Reddestone Creek.

material then passes down through the trommel, a series of rotating sieves which divides the wash on the basis of size. The trommel is typically powered by friction against a large, rotating wheel with a rubber tyre. The highest section of the trommel, which has the finest mesh size, separates out the smallest material which is too small to provide any useable sapphires and is discarded. The following sections (at some processing plants only a single section) of the trommel have increasing mesh sizes that separate out gravel which potentially contains the sapphires. At Jack Wilson's processing plant, gravel over about three-quarters of an inch in size passes through to the final section of the trommel where it is discarded, as it is unlikely to provide sufficient sapphires to warrant the extra processing costs involved.

The selected gravel washes over vibrating collecting jigs where the heavy sapphires sink to the bottom. At the end of the day the top layer of gravel in each of the washing tables is removed and then the lower layers, the concentrate containing the sapphires, is extracted — in this case using a 'blower', a powerful form of vacuum extractor. The concentrate is fed into iron boxes which are then transported to a large shed where magnetic separation is employed to remove the magnetically-susceptible black spinel, an associate of the sapphires.

At Jack Wilson's mine about 600 tons of 'wash' is mined each day. This reduces down to some four tons of concentrate with a final yield of 10 grams (50 ct) of sapphire per ton of wash. The sapphire is mostly low grade and only about 15% is usable. Gem sapphire production is about 15,000–20,000 ct per month after cutting, which is carried out in Thailand. That might sound like a good yield, but, as Jack Wilson explains, the mine running costs are extremely

## The sapphires of Australia (cont.)



Strip mining for sapphires at Reddestone Creek.



Washing and sieving sapphire-containing gravel at the Reddestone Creek fossicking area.

high — a carbon tax is about to be introduced which will add another AUS\$50,000 per year to his costs.

Jack Wilson's mine is the largest mechanical sapphire mine currently in operation, but other sapphire mines, although usually smaller in scale, use similar basic processes. At Reddestone Creek, where strip mining is used, geologist Robert Coenraads showed us the mining area and the processing plant — slightly smaller than Jack Wilson's plant — although this appeared not to have been used for some time. An even smaller-scale version could be seen being used by Bill Dawson at Fraser's Creek.

There are several fossicking areas where visitors, in return for a fee, can try their luck sieving, washing and sorting the 'wash'. It is easy enough to find a few sapphires, and some lucky people can do quite well. However, do be aware that it is not unknown for wash from one area to be transported to fossicking areas further afield to provide a sufficient quantity of wash for fossickers. I even heard it said that some reject material from Thailand ends up in Australian fossicking areas, so if you are doing origin studies, don't rely on materials you've obtained by fossicking in tourist areas. You can even buy sacks of 'wash' to take home with you.

I obtained a good idea of the range of rough sapphire found in the area during a visit to the McLachlan Collection, an outstanding family collection of rough sapphires, rutilated quartz, cassiterite crystals and gold nuggets. The sapphire collection, proudly shown to us by Lance 'Mac' McLachlan, includes some 250



A nugget of sponge gold from Clermont, Queensland. McLachlan Collection.

sapphires mined in the Kings Plain area, and which exhibit a wide range of colours, including blue, purple, brown, yellow, pink, green and particoloured. I must admit that I was also drawn to the gold, especially a large and very beautiful 'sponge' gold nugget from Clermont in Queensland.

## Queensland sapphires

Further north, there is sapphire mining around the towns of Rubyvale and Sapphire in Queensland, an area which has a long sapphire mining history. Sapphires were first reported here in the 1870s and a decade or so later commercial mining had begun. The area produces green, blue, yellow and particoloured sapphires, zircons, and very occasionally diamonds. Both opencast and underground mining are employed and, as in New South Wales, different creeks produce slightly different runs of mine. For example, some provide good yellows, while others provide better greens. The heyday of the area was during 1960s–1970s when mechanized mining took over, but this soon flooded the market and the large quantity of poor quality and often very dark sapphires gave Australian sapphires something of a bad name. Heat treatment alone won't lighten the colour of the over-dark sapphires, but beryllium treatment will, often producing fine yellow to gold-orange shades. During the 1980s and 1990s there was a tail-off in local mining due to competition from mines in Africa and Asia, but the market now shows some sign of recovery. Richland, TanzaniteOne's parent company, has taken an option on one mining area and Thai buyers are now coming to the area again in greater force. The latter might be partly because of the ability to beryllium-treat large and very dark sapphires to a fine golden-yellow colour. The greenish colour in blue sapphires is due to iron. The amount of iron present can be roughly estimated by the degree of pleochroism present — the more green in one direction, the more iron.

In Sapphire, Peter Brown's Desperado underground sapphire mine is worked using a smaller-scale version of the machinery at Jack Wilson's mine. A hoist raises the 'wash' from the mine and tips it

## Field Trips

### The sapphires of Australia (cont.)



The processing plant at the Desperado sapphire mine (left) and (right, from left to right), Terry Coldham with Peter Brown underground in the Desperado mine. The mined gravel is hoisted from the ground straight up to the hopper where it feeds down through a simple trommel system.



directly into a hopper that feeds a simple trommel. The underground mine, a spider's web of passages, often intersects older workings, the remains of which include wooden props which show that some of the hundred-year-old tunnels were barely high enough to crawl in. I asked Peter if he had found any human remains down there and he replied that he had found no skeletons, but that he had once found a gold tooth.

Peter Brown cuts and retails as well as mines — a vertically integrated business model that he sees as essential if the whole enterprise is to be viable. He also cuts and sells for other miners. In his shop he showed us a variety of fine sapphires, including a very fine yellow 20 ct sapphire found by miner Dick Hawkins. The rough was 70 ct, cut to provide two stones, the one on display plus another of 2 ct. Another large piece of particoloured rough of 135 ct that had been found on the surface in an area not previously dug in Wash Pool, west of Reward, was cut to give a 12.91 ct green, a 37.72 ct yellow and two smaller yellows at 0.54 and 1.16 ct each.

The final visit was to Yorkshireman Andrew Chafer, sales manager for Coolamon Mining Pty Ltd, based in Sapphire. Coolamon handles a large quantity of sapphires from Queensland, as well as many from further north in Lava Plain. Sapphire mining began in Lava Plain in the 1970s, but mining ceased in the early 1990s until Coolamon started mining in the area in 2002. The output is all cut in Thailand and routinely heat-treated. Despite some statements to the contrary heating alone will not lighten dark blue Australian sapphires, but it can remove some of the silk, thus improving their clarity. Heating will also remove a slight star if the stone is required for faceting.

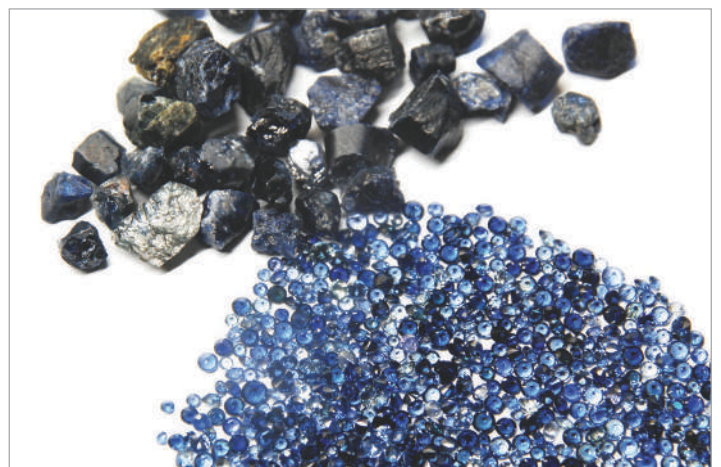
There are also fossicking areas here, a popular tourist activity and one which can sometimes pay off. Locally they tell of 14-year-old Serli Nelson who found a 2,020 ct sapphire in 1979, later named the Centenary sapphire. In 1983 it was stolen from an exhibition in Sydney and only turned up again in 1986. Terry Coldham was largely responsible for its recovery.

Following the farewells and thanks to Andrew Chafer, it was a short drive from Sapphire and Rubyvale to the (by then)

conspicuously anarchic-sounding town of Emerald, where I boarded a flight to Sydney via a brief stopover in Brisbane. I left Terry and Vincent at Emerald — they still had other mines to visit and the long drive back to Sydney. I had to take the quicker route to catch my flight to Los Angeles and, eventually, Las Vegas, for the JCK Jewellery Show. One can hardly compare the quasi-opulent splendour and vastness of the glittering buzz of the Luxor Hotel in Vegas with the simple rural facilities of some of the outback accommodation, or the friendly and hospitable welcome of the miners I met along the way, but I know which I prefer and which has made the most lasting impression.

My thanks go to Terry Coldham for his knowledge and insights, for arranging and hosting such an incredible trip, and for driving many hundreds of kilometres along mud roads which were clearly designed for cattle. My thanks also go to Vincent for being a great travel companion. It was truly a trip to remember and cherish.

All photos by Jack Ogden.



Rough and cut sapphire from Lava Plain. These stones are cut and routinely heat treated in Thailand.

# CIBJO

## James Riley reports on the 2012 CIBJO Congress, held in Vicenza, Italy

Although this was my first visit to a CIBJO Congress, I am by no means in ignorance of what the Congress tries to do. I have grown up hearing about the political to-ing and fro-ing of the gem world, and it has left me with no illusions. That is not to say, however, that the objectives of CIBJO are not laudable.

Vicenza is one of the less glamorous Congress locations in recent years, but in some ways is more relevant as it coincided with Fiera di Vicenza and the World Diamond Congress (WDC). The itinerary looked long and it was. For those of you that think these trips are some kind of jolly, I think most delegates would happily swap their time to be at home with their families. True, there were the usual Gala dinners (which turned out to be buffets), but two hours each way on a coach from the hotel to the conference venue was a bit much.

### Kimberley Process

So what happens at these events? The WDC decided to broaden its stance on the Kimberley Process (KP), stating that the KP needed to evolve and that conflict diamonds should cover “diamond-related violence in rough diamond producing and trading areas”. This would enable the KP to take a tougher stance on countries such as Zimbabwe, whose diamond exports are legal in spite of the shocking history of its government activities. The KP was initially designed to deal with the financing of arms in civil or tribal wars and it was not envisaged that the profits from diamonds might prop up and enable a government to repress its people. (For further information on the KP situation, see ‘A problem shared’ on pages 22 and 23.)

The crossover between the WDC and CIBJO meant that the great and the good from all over the world were able to meet and talk face to face about issues concerning our trade. Often it may be argued that very little gets decided but it provides a platform for discussion which is not really available anywhere else in the world. CIBJO’s numerous commissions on pearls, labs, coloured stones and diamonds work tirelessly to come up with universal nomenclature and descriptions which are acceptable to all. Inevitably this means that some people are not happy. The hot potato this year was whether to abandon the notion that the description ‘pearl’ automatically means ‘natural pearl’ unless otherwise qualified by the fact it is cultured or whatever. The Pearl Blue Book contains a massive wealth of information enabling distinctions between natural and cultured to be made but the argument goes that as the general public think of cultured pearls as being simply ‘pearls’, one must qualify all pearls to avoid confusion. The contra argument is that if one applies this to pearls, why not diamonds, rubies, etc.

CIBJO doesn’t just talk about gems. One interesting diversion was how the rest of the world buys in its second hand gold, showing how lax we are here in the UK. The new ‘Gold Standard’ will help this but only

if it is supported. If it fails then Government regulation may do the job for the industry. The issue of 5 ct gold was raised, as South Africa has started to produce items in this quality. There was an update on the Dodd Frank Act in the USA which affects over 6000 companies in the USA using tin, tantalum, tungsten and gold who have to prove that the raw material did not originate from the Democratic Republic of Congo. UK businesses: be thankful!

The Congress also coincided with an excellent afternoon talk on tourmaline which saw a number of presentations given, including one by Karl Schmetzer, who talked about trapiche tourmalines — as published in *The Journal of Gemmology* (2011, (32)5–8, 151–173). The thorny issue of tourmaline nomenclature was covered by Pornsawat Wathanakul from The Gem and Jewelry Institute of Thailand (GIT), who outlined the policy of the Laboratory Manual Harmonisation Committee.

The CIBJO board voted to expand their membership and in particular to set up an ethics commission focusing on Fair Trade. This may well cross over with the Responsible Jewellery Council (RJC) but CIBJO does at least have international recognition with representation at the United Nations. This last point is one of the key reasons why we choose to remain part of the CIBJO family. Membership at the top table is not cheap and it is in part where some of your membership fee goes. However, it is an opportunity for your voice to be heard and represented internationally. Gem-A is unique in being the only member with an international membership and remains fully committed to furthering gemmological knowledge together with organizations such as CIBJO.

### Vicenza jewellery fair

On a lighter note there was the opportunity to see around the Fiera di Vicenza, something I had not done before, though it paled in comparison to Basel and Hong Kong. Where it does succeed is having the best of the rest. There are many exhibitors who would not be at the big shows and thus it is an opportunity to see what is happening at a lower level of the market.

The Chairman of the Fair, Dr Roberto Ditre, is to be congratulated on his team and the event they put on. My discontent at being away from home disappeared when, in CIBJO’s honour, they organized for the Mille Miglia to pass through and stop in the square in Vicenza. Apart from an Italian commentator who seemed to know someone called ‘Sibby Joe’, this was a delight. Surrounded by some of Antonia Palladio’s finest work we were treated to a chorus of V12 exhausts from Maranello (Ferraris), the whine of supercharged straight 8s from Molsheim (Bugatti) and the thunder of Cricklewood’s finest: a trio of the iconic Blower Bentleys — my idea of heaven, at least, not far off!

## Gem-A News and Views

# In the news

## Gem-A to provide JTV course

Gem-A has entered into an agreement with Jewelry Television® (JTV), a USA broadcast retailer of jewellery and loose gemstones, to develop a proprietary course for JTV customers called 'Gem Basics'. JTV is the only broadcast shopping network in the USA that focuses exclusively on the sale of jewellery and gemstones. It is a privately-held company founded in 1993 which now broadcasts to more than 80 million households in the US.

The online course will introduce consumers to a wide variety of gems and explain the basics of gemmology and gem identification. The course also covers gem origins and lore, and will include a basic kit of gem identification tools and a selection of gems. The development of the course follows two years of negotiation between Gem-A's Jack Ogden and members of the JTV management team, including Jerry Sisk, a graduate gemmologist and co-founder of JTV, who will be speaking at the Gem-A Conference in November (see page 2).

Jerry commented: "As the largest retailer of loose gemstones in the world, we felt a strong obligation to take a leadership role in the education of our viewers as well as the general consumer. To that end, we developed an extensive Learning Library and made the decision to partner with one of the world's most respected gemmological institutions. A better-educated consumer will make more well-informed decisions, and will purchase with greater confidence."

Gem-A is pleased to help JTV open the world of gem knowledge to a wider audience. There has been criticism of some online and TV gem retailers over the years, largely due to varied approaches to disclosure and nomenclature issues. However there is no doubt that such retailers have increased the appetite for loose gemstones and coloured gemstone jewellery among consumers, and a course of this type can only help. JTV has a particularly committed approach to disclosure and nomenclature, and its online Learning Library is already a model for the industry. The JTV 'Gem Basics' course will provide an entry-level course for JTV customers and provide a stepping stone for those who wish to pursue more advanced studies through other Gem-A courses.



Jack Ogden and Jerry Sisk. Photos copyright JTV.

## New Journal articles available online



New articles appearing in the current issue of *The Journal of Gemmology* (Vol. 33, Issues 1-4, 2012) are now available for members to view online. Login to the membership area of the Gem-A website and go to 'The Journal online' to view 'Determining the geographical origins of natural emeralds through nondestructive chemical fingerprinting' by D.P. Cronin and A.M. Rendle, and 'Morphological and gemmological features of gem-quality spinel from the Goron deposit, southwestern Pamirs, Tajikistan' by S.A. Ananyev and S.I. Konovalenko.

Spinel from the Goron deposit, southwestern Pamirs, Tajikistan. Photo by S.A. Ananyev.

For regular updates on Gem-A events, news and developments, please see our monthly e-newsletter or visit our Facebook page at [www.facebook.com/GemAofGB](http://www.facebook.com/GemAofGB)

## Gem-A News and Views

### Gem-A AGM

Gem-A's new Chairman Cally Oldershaw chaired the AGM held at the Imperial Hotel, Bloomsbury. Gem-A's annual report for 2011, issued by Gem-A in June and tabled and adopted at the AGM on 11 July 2012, recorded another year of good results – on a par with 2009 and 2010. As with the past three years, the growth was primarily in education, but Gem-A's wholly-owned trading subsidiary Gemmological Instruments Ltd also showed a rise in sales (the full extent of which is not obvious in the annual report because of a change in its accounting procedures). In round figures, Education contributes 70% of Gem-A's income, Gemmological Instruments 17% and Membership (from subscriptions, events and publication sales) 13%.

Harry Levy was elected President and David Callaghan and Alan Collins were made Vice Presidents for life. Mary Burland, Andy Rankin, Jason Williams and Miranda Wells were all elected to the board with Richard Slater and Steve Collins being re-elected. The Membership Liaison Committee was dissolved and relevant amendments to the Association's Memorandum and Articles of Association were agreed.

Following the AGM was a Pimms session for delegates, followed by a well-received talk from Dr Emmanuel Fritsch on Ethiopian opals. Dr Fritsch discussed opals from the Wollo province of Ethiopia, commenting on their behaviour in relation to treatment and durability, highlighting the poorly documented question of the destabilization of opals.



Emmanuel Fritsch.

MEMBER



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diamond merchants

## Around the Trade

# A problem shared



Diamonds continue to intrigue and dominate the gem industry. Gem-A's new President Harry Levy FGA discusses the current hot topics within the trade: the continuing problems with the Kimberley Process (KP), suppliers being forced out of the rough diamond market, and the rise of synthetic colourless (white) diamonds in the market.

### The Kimberley Process (KP)

The KP is almost ten years old. It came about to prevent rebels from using diamonds to purchase arms and continue civil wars in various African countries. The links of some diamonds to wars in Africa were pointed out by various NGOs who initially referred to them as 'blood diamonds'. Their campaign followed a highly successful one against the fur trade. Here every pelt needed in that trade had to be obtained by killing an animal. One motto used was "the last owner of the fur coat died wearing it". With demonstrations outside fashion stores selling furs and attacks with red paint on people who wore such coats, governments were soon involved and the adverse publicity caused a huge decrease in the sales of furs.

After their success, the NGOs turned to the diamond trade. The initial countries involved in the contentious issues of the diamond trade were Angola and Sierra Leone. The press and media were filled with reports of amputations, torture and death in these countries and the NGOs soon had enough publicity to get members of governments involved. The diamond trade took fright, worrying that they could suffer the same fate as the fur trade, when prominent people, such as Hollywood actors, replaced diamonds in their jewellery with lipstick marks, and demonstrations outside major jewellery shops were organized by NGOs. The trade formed a committee, the World Diamond Council (WDC) and the first thing they did was to try to replace the highly emotive term 'blood diamonds', used by the media, with 'conflict diamonds'. In this they succeeded. With the help of the UN and governments 'The Kimberley Process Certification Scheme' was set up to monitor the movements of mined diamonds and prevent any 'conflict diamonds' entering the distribution chain.

The problem was that the KP was put into place with such haste that little thought was given to the causes of the wars. African governments were all in favour, the trade wanted anything put in place to remove the scourge of 'conflict diamonds', and the NGOs were content to see curbs on the sale of diamonds. What no one put into the KP were any restrictions on governments, the assumption being that the governments were the goodies and rebels the baddies; the reasons why there were rebellions in Sierra Leone or Angola were not addressed.

This problem has become worse in the last few years with the trading of diamonds from Marange, Zimbabwe. Locals first found and recovered these diamonds. Then the Zimbabwean government realized the economic potential and sent in troops; soon natives were being arrested and killed. (I often wonder what reaction there would have been from authorities, had diamonds been found in Hyde Park or Central Park.) Again there was a strong reaction from NGOs and action was demanded against the Zimbabwean government. There is a reluctance from all governments to be seen to meddle in other countries' internal affairs, so it was decided that the KP should be the body to interfere. The Zimbabwean government responded to KP officials' concerns by pointing out that they were not rebels and there was nothing in the KP to prevent them from exporting their diamonds. So the NGOs argued that the KP needed changes to bring in human rights protections. Initial attempts, such as having a KP Plus system which contained such changes, only succeeded in alienating all the African countries when they saw that the non-African producers such as Australia, Canada and Russia had declared themselves to be conflict-free.

The problem has now been debated for about two years, and the best suggestion seems to be to change the definition of 'conflict diamonds'. This is something the Africans oppose because they believe any change will be detrimental to them. At present the KP is chaired by the USA, but next year, the KP's 10th anniversary, the chair will move to South Africa, so there is now a stalling game by African countries. There are also suggestions that there should be a permanent seat for the Secretariat, instead of moving it every time the chairmanship changes — the Africans want this to be in Africa. (See also 'CIBJO', page 19.)

### The distribution of rough diamonds

In the 1900s most rough diamonds came from De Beers (an offshoot of Consolidated Mines) and reached the market through their sightholders. This meant that they not only mined diamonds but bought as many diamonds as they could which had been produced from other mines. This enabled them to control the quantities and



prices of diamonds distributed every year. They kept supply slightly below demand and this strategy enabled an annual increment in the price of diamonds.

In recent years diamonds reaching the market through De Beers' companies have declined from 95% to below 40%. The other main producers in the market are Rio Tinto (Australian mines such as Argyle), BHP Billiton (Canadian fields) and Alrosa (the giant Russian producers). Due to pressure from its share holders and the South African government, De Beers has now sold its business, and the other main producers are also trying to sell their diamond mines because, they say, diamond mining is becoming more and more difficult and more expensive.

By selling diamonds through its sightholders, De Beers set the selling price. But the other main producers sell through tender, meaning that it is the buyer who determines the selling price. This latter process destroys the stability of rough diamond prices and is a highly significant change in the trade. Those selling by tender cannot be seen to gang together to determine (fix) selling prices, as such action would be against all free market regulations. So diamond cutters can find themselves buying goods at different prices and this will lead to much more variation in the prices for polished goods. It will be interesting to see how the widely used cut diamond price lists such as Rapaport will adjust to this situation.

One might speculate that if all these producers do sell their diamond producing interests, it could mean that there will be a shortage of rough and hence price increases. This leads us to a third active aspect of the diamond trade, namely the impact of white synthetic diamonds.

## Synthetic diamonds

There have been stories circulating that quantities of small white synthetic diamonds have been sent to some laboratories for identification. This could mean that someone is trying to test the possibilities of detection of synthetic diamonds. The laboratories assure us that they have equipment to detect synthetic stones. This may be so, but in all probability the initial phase will be to introduce synthetic diamonds as small stones under 10 points (<0.10 ct), already set in jewellery — ones that are destined for the mass market. These stones will have nearly all the characteristics and properties of natural diamonds, and I as a dealer would either find myself totally dependent on my supplier, or I would have to test every diamond I bought to know its origin. An unsuspecting trade and public will not know the nature of the diamonds they have unless they are reliably informed, and this is a scenario that is almost upon us. Things are changing and we must adapt.

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## Gem-A Calendar

### September

2-5

#### **INTERNATIONAL JEWELLERY LONDON (IJL)**

Earls Court 2, London.

Come and visit Gem-A at **Stand J60**.

Members of staff will be on hand to answer your queries, assist with shop purchases, and to discuss our education and membership services. See pages 26-27 for further information.

7

#### **UNDERSTANDING GEMSTONES\***

##### **A one-day gem workshop**

Gem-A Headquarters, London

A workshop giving you the perfect introduction to the fascinating world of gemstones. Covering all aspects of the most popular gems, you will learn about origin and lore, as well as the more practical aspects of their physical properties.

10

#### **GEM CENTRAL: GEMSTONE COMPETITION**

Gem-A Headquarters, London

Participants will test their knowledge of gems in a competition. A prize will be awarded to the winner. Participants may bring their own unusual gemstones!

14

#### **UNDERSTANDING PRACTICAL GEMMOLOGY\***

##### **A one-day gem workshop**

Gem-A Headquarters, London

A workshop focusing on the practical aspects of gemmology, covering the effective use of all the readily available instruments and testers that you are likely to need.

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#### **WORKING IN THE AUCTION WORLD WITH KEITH PENTON**

##### **Gem-A Career Service**

Gem-A Headquarters, London

Keith Penton of Christie's, London, will give an insight into the auction world, how it operates and the evolution of the auction market.

21-25

#### **HONG KONG JEWELLERY & GEM FAIR**

Hong Kong Convention & Exhibition Centre

Come and visit us at **Booth CEC3M046**.

One of the world's biggest gem fairs, the Hong Kong Jewellery & Gem Fair is the place to be.

22-24

#### **NAG'S INSTITUTE OF REGISTERED VALUERS CONFERENCE 2012**

Loughborough University of Technology, Leicestershire.

Join the Institute in celebrating its Silver Jubilee at the NAG's annual IRV conference. The usual line up of renowned guest speakers will be in attendance, offering presentations and workshops over two and a half days. For full details contact Sandra Page on 029 2081 3615 or email [irv@jewellers-online.org](mailto:irv@jewellers-online.org).

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#### **UNDERSTANDING DIAMOND GRADING\***

##### **A one-day gem workshop**

Gem-A Headquarters, London

This specialist workshop focuses on the key aspects of diamond grading, giving a unique insight into the 4 Cs of cut, colour, clarity and carat weight, as well as diamond certification.

### October

1

#### **SPECIALIST GEM CENTRAL: HOW EXOTIC GEMS ARE REVOLUTIONIZING THE JEWELLERY MARKET WITH RENÉE NEWMAN**

Gem-A Headquarters, London

Gems that were once only bought by collectors are becoming increasingly popular in jewellery stores and designer boutiques. New finds have made these non-traditional gems more available, and retailers are using the stones to set themselves apart from their competition by creating unusual items to wear and give as gifts.

2

#### **DIAMONDS: A JUBILEE CELEBRATION**

##### **A viewing of the Royal Collection of Jewellery at Buckingham Palace**

*Fully booked*

5

#### **INVESTIGATING GEMSTONE TREATMENTS\***

##### **A one-day gem workshop**

Gem-A headquarters, London



*Lead glass-filled ruby displaying blue colour flash and gas bubbles.*

A workshop focusing on the common treatments currently present within the gemstone industry and their detection, using readily available instruments and techniques. Treatments covered will

**For the latest information on Gem-A events**

include glass filling and heat treatment of corundum (ruby and sapphire), laser drilling and fracture filling of diamonds, and diffusion treatments.

19

**UNDERSTANDING DIAMOND SIMULANTS\*****A one-day gem workshop**

Gem-A headquarters, London

An important practical workshop for those already working in or considering entering the diamond market. You will look at the key differences between diamond and its simulants, and how to recognize them as loose stones or in mounted jewellery. Using basic observation techniques and readily available instruments such as diamond and combination testers, participants will be taught to separate diamonds from all other imitations quickly and effectively, thus preventing costly purchase errors, and allowing informed purchases to be made.

26-28

**THE MUNICH SHOW**

World of Minerals, Gems, Jewellery and Fossils. Visit Gem-A at **Booth E0.06** — more details to follow.

## November

4

**GEM-A CONFERENCE 2012**

Hotel Russell, Bloomsbury, London

This year's Conference promises to be better than ever. With a range of exciting and exclusive events on the days surrounding the Conference, be sure to book early to guarantee your place. See pages 2-3 for further information.



To book, please see the Conference leaflet enclosed with this issue of *Gems & Jewellery*, email [events@gem-a.com](mailto:events@gem-a.com), or call on +44 (0)207 404 3334.

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

The Gem-A Graduation Ceremony and Presentation of Awards will be held at the prestigious Goldsmiths' Hall, London. Graduates and their guests will be invited to attend. For more information contact [education@gem-a.com](mailto:education@gem-a.com).

### Gem-A member and student services

**Career service**

Open to all graduates, Gem-A students and members and free for Gem-A members and current students, the Gem-A Career Service encourages networking amongst peers through a range of informative talks and discussions.

**Gem Central**

Gem Central is a regular practical gemmology evening for Gem-A members and students, giving participants the opportunity to investigate and explore a variety of gem materials. Gem Central attendees can make use of our educational resources, work individually or in group projects, and at their chosen level. There are no examinations.

**Visit our website for more details.**

\*For more information on our workshops visit

**[www.gem-a.com](http://www.gem-a.com).**

To book email **[events@gem-a.com](mailto:events@gem-a.com)**

or call **+44 (0)207 404 3334**

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# Visit Gem-A at IJL 2012

- **TWO FREE SEMINARS**
- **SHOW SPECIALS**
- **2012 GEM EMPATHY AWARD**

## Gem-A at stand J60

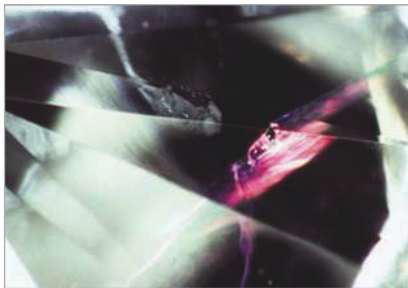
### Gem-A Education

Take the opportunity to learn about the latest developments in gem and diamond education and to view course materials at the Gem-A stand. Choose to study our on-site classes, enjoy the flexibility of a home study course, or study at one of our worldwide teaching centres.

You can also find out about our **NEW** one-day hands-on workshops, ranging from an introduction to the fascinating world of gems, to updates on specific stones, their treatments, synthetics and simulants.

### Latest books and instruments

A wide selection of gem testing instruments and books will be featured. Our team at stand J60 will be able to advise on the best equipment to suit your needs.



## Seminars by Gem-A at IJL

Gem-A is delighted to be presenting two free seminars at IJL this year, featuring Claire Mitchell FGA DGA, Andrew Fellows FGA DGA, and Dr Jack Ogden FGA.

Please note that places are limited and are allocated on a first come, first seated basis only.

*Pink flash seen in fracture-filled diamond.*  
© DTC Research.

### Clarifying treatments (practical session)

**Claire Mitchell FGA DGA and Andrew Fellows FGA DGA**

**Sunday 2 September, 15:30 – 17:30**

Hampton Room, Earl's Court 2

This 'hands-on' practical seminar will address some of the latest gemstone treatments and enhancements that gemmologists, designers, retailers, and valuers and appraisers may encounter in the trade. The seminar will also provide guidance on the correct disclosure of treatments, and the advantages and disadvantages of treatment. Samples will be available for participants to learn how such treatments may be detected.

*No previous experience is required. All instruments will be provided. This seminar is strictly limited to 12 places so first come first seated.*

### Riding the colour wave: profiting from gems

**Dr Jack Ogden FGA**

**Monday 3 September, 16:00 – 17:30**

Hampton Room, Earl's Court 2

Coloured gemstones have never been so popular. They now provide huge potential for increased jewellery sales and good margins at all price levels. Taking advantage of coloured gems in your business requires an awareness of the challenges associated with them, as well as a knowledge of some of the stories and traditions related to them – it is these stories that make the gems alluring talking points, as well as just extraordinarily beautiful jewels. Jack will cover the rising popularity of coloured gems, the huge variety of stones available, the issues they raise and the strategies you can use to make coloured gemstones a focal and profitable part of your business.

# GI Show Special

## Diamond Tester

This useful instrument is capable of testing all diamond simulants, including synthetic moissanite.

- Metal detection facility
- Built-in longwave UV and LED
- Tester flashes the following colours upon detection:
  - Blue (diamond)
  - Green (moissanite)
  - Red (other stone)
  - Yellow (metal)

Usual price: £125 + VAT

**Show price: £99 + VAT**

Plus postage and packing. Offer available during IJL 2012 only.  
No further discounts apply.



## Gem Empathy Award

Does your company produce gem-set jewellery designed to show gems to their best advantage? If so, why not enter for Gem-A's annual Gem Empathy Award, held exclusively at IJL. The Gem Empathy Award for 2012 will be presented to the IJL exhibitor who displays, in the opinion of the judges, a single piece or collection of jewellery that makes captivating use of one or more gemstones. The criteria for the award will include accurate ethical descriptions as well as creativity and design flair, innovation, knowledgeable and sympathetic understanding of the materials 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 2012 Gem-A Conference.

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 Amandine Rongy at Gem-A ([amandine@gem-a.com](mailto:amandine@gem-a.com)) giving your name and stand number.

The 2011 Gem-Empathy Award winner was Susanne Asbeck of Nomades, whose enthusiasm for gems outshone the rest of the competition.



**IJL**<sup>®</sup>  
INTERNATIONAL  
JEWELLERY  
LONDON 2012

**Sunday 2 to Wednesday 5 September 2012**

Opening times: 10:00 to 18:00, Sunday  
9:00 to 18:00, Monday and Tuesday  
9:00 to 16:00, Wednesday

To attend, register FREE online at: [www.jewellerylondon.com/gema](http://www.jewellerylondon.com/gema)

## Shows and Exhibitions

# Masterpiece

Jack Ogden FGA reports on the London Summer Art and Antique Show for well-heeled collectors and keen loupe wielders.

Summer in London and the neighbouring counties — usually called the Home Counties — is a time of sporting spectacle. There is tennis in Wimbledon, racing in Ascot and rowing in Henley for starters. But for the jeweller, jewellery historian, gem lover and gemmologist, there is a new spectator sport to savour: Masterpiece, an art and antique show located in Chelsea, and recently over for its third year. I call it a spectator sport because probably only a handful of those reading this are likely customers, but it is an exhibition worth the effort to visit. Where else in the UK, or indeed in most other parts of the world, can you see — even handle and examine — such a range of gems and jewellery? There is a seemingly endless cascade of the big names of the last century and a half; Fabergé, Castellani, Cartier, Boucheron and Giuliano are all present. There is older jewellery, dating from the Bronze Age to Baroque, plus some wonderful gems. There are also some novel — if not quirky — ideas, from jungle and rusty nails to setting diamonds with a gun.



Pair of diamond and emerald ear pendants by Siegelson, New York. Photo Siegelson.

The huge 'building' that houses the show is not a building at all, rather a fanciful triumph of trompe l'oeil whose painted canvas walls mimic, and thus blend in among, the buildings of the Chelsea Barracks against which it nestles. Considering the artistic licence with scale, it is entertaining to watch perplexed visitors having to prod the external wall to check that they are indeed imitation. Inside however, reality is never in doubt; the architecture, arrangement and quality is on a par with that in any permanent exhibition venue.

The nearest jeweller to the entrance is Wartski of London ([www.wartski.com](http://www.wartski.com)) with, of course, the kind of selection of Fabergé we have come to expect from them. I've never actually been a great fan of Fabergé — it's great workmanship, but a little too kitschy for me. However, I was rather taken with a rock crystal shell box with a gold enamel lid, in the form of delicate gold tracery over black enamel with a diamond border, harking back to eighteenth-century styles — a beautiful but non-typical Fabergé object. Also among Wartski's classical revival jewellery were a pair of small gold and enamel dove earrings in the Hellenistic style which caught my eye. The scale and delicate filigree of the earrings indicates that the maker was Melillo, one of Castellani's craftsmen for whom I have huge respect. There was more fine Fabergé on display at Wartski's New York equivalent, À La Vieille Russie ([www.alvr.com](http://www.alvr.com)), alongside some fine antique and revivalist pieces, and a very pretty multi-row natural pearl necklet featuring grey-black pearls. My favourite revivalist piece at the show, however, was at Hancocks of London ([www.hancocks-london.com](http://www.hancocks-london.com)), where, among a parade of fine jewels from the great houses, was a Giuliano necklace set with rubies and various coloured sapphires.

More Giuliano, Cartier, Boucheron, Van Cleef, Wiese and others, could be found at London's Symbolic and Chase ([www.symbolicchase.com](http://www.symbolicchase.com)). Here small square and rectangular showcases set into black walls provided a more startling display. One such display had a jungle-like background with lush green foliage, dead leaves, water, a rotten tree stump and swirling mist, all to set off a single nineteenth-century gold and enamel snake necklace. Visitors with snake phobias noticeably paled. To add an educational touch, a Cartier diamond offered by Symbolic and Chase for \$6,000,000 was displayed next to an invoice from 1937, when the same necklace was sold by Cartier in New York — the price then was \$65,000.

For a wide range of twentieth-century jewellery, one had to visit the booth of Didier Ltd of London ([www.didierltd.com](http://www.didierltd.com)), who had a comprehensive display of the great designers since World War II. Even for the non-design-savvy gemmologists there were exhibits of interest, such as a huge 18 ct yellow gold carnelian, lapis, ebony and bone abacus pendant on a gold wire necklet by Lucio del Pezzo from

## Shows and Exhibitions



Left: Nineteenth-century gold and enamel snake necklace by Symbolic and Chase. Photo Jack Ogden.



Right: Pair of elephant earrings circa seventeenth- or eighteenth-century, set with turquoise, ruby, sapphire, emerald and pearls, © Ollemans.

1961, and a Sah Oved gold flame brooch set with topaz, morganite, garnet and diamond from 1951.

More nineteenth- and twentieth-century and modern jewellery was to be seen with the likes of S.J. Phillips (London, [www.sjphillips.com](http://www.sjphillips.com)), Theo Fennell Plc, (London, [www.theofennell.com](http://www.theofennell.com)) and Fred Leighton (New York and Las Vegas, [www.fredleighton.com](http://www.fredleighton.com)). The most novel display was that of 21st Century Jewels Ltd (London, [www.21stcenturyjewels.com](http://www.21stcenturyjewels.com)), with its workshop/tool theme where jewellery was displayed on a pegboard with mallets, saws, sledge hammers and nails as props. The floor of the booth and the display cases were in plain, unfinished chipboard. Weird perhaps, but it worked.

A very different aesthetic was shown by the larger-than-life hologram of the Queen; 'the Diamond Queen' by Asprey and Chris Levine was surmounted by a real tiara with 1,100 brilliant cut diamonds totalling 50 ct in weight, with a 3.74 ct natural fancy intense yellow diamond centre. This was for a closed auction with all the proceeds going to The Woodland Trust and Quest, and had a reserve price of £800,000. The exhibit was part of a section of Masterpiece called 'Brilliant', essentially a tribute to diamonds sponsored by the States of Jersey and curated by Carol Woolton, jewellery editor of *British Vogue*. Also here, among 38 significant and thought-provoking diamond-set pieces, was what was described as 'the new way to wear diamonds', a brilliant black diamond, leather and 22.23 ct hydrothermal synthetic emerald collar by Karl Lagerfeld. Another surprise was a new way to set diamonds; 'Diamond Shot', by David Roux-Fouillet and Patrick Brillet Fine Art Ltd, allows you to use a rifle to shoot a diamond into a gold setting, all for a mere £4,500. Talk about more bangs for your buck...

There were some spectacular gems on show, with Siegelson (New York, [www.siegelson.com](http://www.siegelson.com)) having perhaps the best selection, including a matching pair of cushion-cut Colombian emeralds weighing 22.73 and 21.90 ct set as earrings, a fine untreated Ceylon sapphire of magnificent blue colour weighing 29.96 ct and, of course, some large diamonds, including the 33.03 ct 'Ice of Golconda', and a 10.67 ct fancy grey as well as a 61.51 ct oval of golden colour, which I was told was a type Ila.

If you wanted to go back in history you were spoiled for choice. One could travel back through Spanish jewellery of the seventeenth and eighteenth centuries at Deborah Elvira (Oropesa, Spain, [www.deborahelvira.com](http://www.deborahelvira.com)) with such pieces as eighteenth-century jewels set with emeralds and diamonds, evidence of the influx of gems from the New World, and a gold and rose-cut rock crystal ring, with a red backing to the rock crystal providing an attractive pink shade — evidence of the long history of gem treatments and manipulations. For a selection of Medieval and Renaissance rings, as well as some seventeenth-century posy rings, there was Les Enlumineurs (Paris and New York, [www.lesenlumineurs.com](http://www.lesenlumineurs.com)). Earlier jewellery included some Hellenistic Greek gold pieces at Cahn International AG (Münchenstein, Switzerland, [www.cahn.ch](http://www.cahn.ch)) and a very fine Scythian gold plaque in the form of a recumbent stag from Sycomore Ancient Art (Geneva, Switzerland, [www.sycomore-ancient-art.com](http://www.sycomore-ancient-art.com)).

For a more unusual example of jewellery, Susan Ollemans Oriental Art (London, [www.ollemans.com](http://www.ollemans.com)) was exhibiting a pair of elephant earrings (yes, earrings to be worn by an elephant), from Kathmandu. These dated from the seventeenth or eighteenth century and were set with turquoise, ruby, sapphire, emerald and pearls.

I could go on — there was so much to see that I almost wore out the hinge pin on my loupe. I haven't mentioned all the exhibitors with jewellery or given more than a glimpse at the range on offer, for it is a large show, featuring 165 exhibitors. The exhibitors I talked to were largely enthusiastic and knowledgeable about the pieces they were offering. Feedback seems to suggest that it was an OK show for exhibitors, but perhaps not as remunerative as some might have hoped. However, it is a show to meet new customers, and at the high end purchasing decisions are not always made quickly. I gather that at least some of the interest expressed at the show translated into sales in the following weeks.

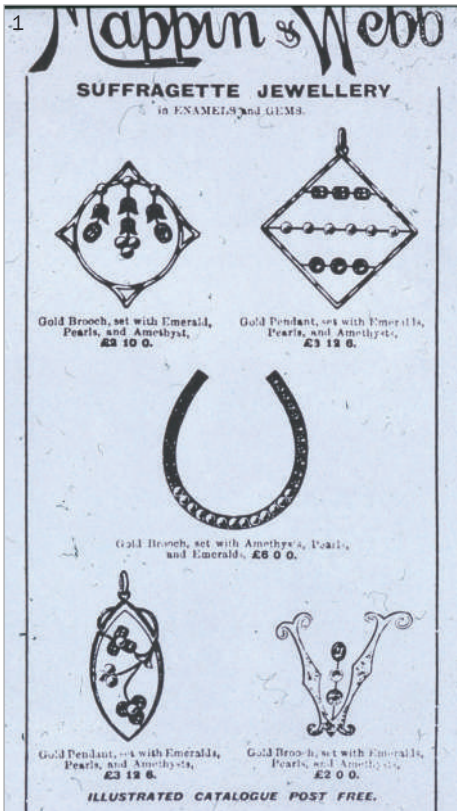
### Masterpiece 2013

2013 dates for Masterpiece are 27 June – 3 July, with a preview on 26 June. See [www.masterpiecefair.com](http://www.masterpiecefair.com) for more details.

## Recent Events

Kerry Gregory FGA DGA reports on the annual Scottish Gemmological Association's conference.

# Bonny Scotland



May saw the return of one of my favourite gemmological events, the annual SGA Conference, held in Perth, Scotland. The conference is now so popular that delegates (who come from all over the world) have spilled over from its familiar location at the Queens Hotel to Station Hotel over the road.

### Suffragette

It is a tradition of the Conference that the speaker on the first night talks about gem-set jewellery. As gemmologists we can sometimes forget that these lists of constants and clusters of atoms are beautiful and meaningful things to others. In the first talk entitled 'Wearing the colours – jewellery and the women's suffrage movement', Dr Elizabeth Goring reminded us that gemstones and jewellery often have a deeper meaning than their RI or auction reserve. Dr Goring is an independent writer and curator, and is well researched and published on the subject of jewellery as a

medium of communication. She started her talk with examples of modern strong female politicians who use jewellery to communicate their message, such as Hazel Blears and her 'Rocking the boat' brooch, and Madeleine Albright, who has written a book called *Read My Pins*, about how she uses her brooches to (not so subtly) put across a message, like the dove brooch she wore during the Middle East peace talks. Dr Goring commented on how amazed she is that so few people do this when it can be such a powerful tool. The focus of the talk, however, was how, over 100 years before these women, other strong females used jewellery to deliver their message: that women should be given the vote. We are all aware of the suffrage movement, but until recently, little was known about this jewellery. Consequently much of it has been lost, broken up, or worse, sent to the scrap pot. Nowadays we are much more familiar with the purple, white and green colours that were adopted by the suffrage movement in 1908 – not, as commonly believed, as a secret code, but as an overt and powerful way of communicating support for the cause. The colours were chosen specifically to represent purity (white), hope (green) and dignity (purple), not the acronymous green, white and violet (as some think) to denote Give Women Votes – this is apparently just a coincidence. We



1: Mappin & Webb advert for suffragette jewellery.  
2: The 'Holloway' brooch, awarded to women who had spent time in Holloway prison. This item is presented with its original casing.



## Recent Events

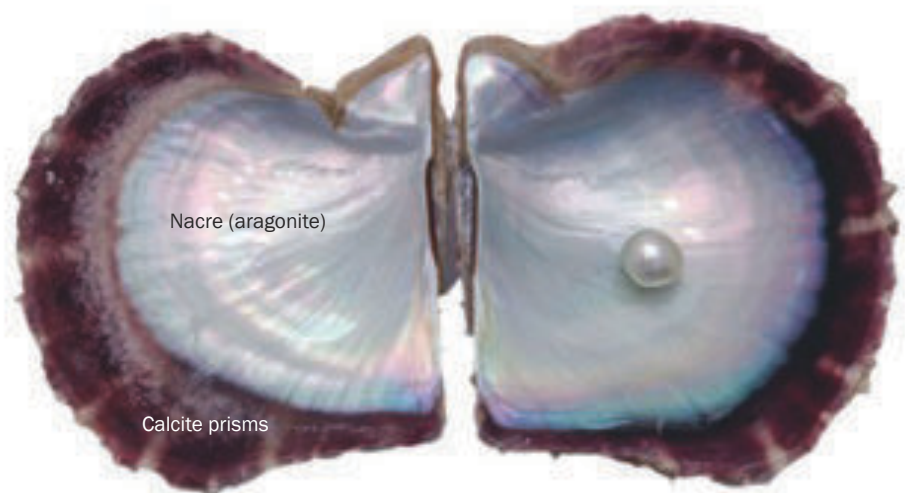
were also informed that it takes more than just these colours to make a suffrage piece. Many items have been described incorrectly, simply because they are set with amethyst, peridot and pearl, but the style and date is wrong for the period. An example given was a Carlo Giuliano piece from 1895 which had been described as 'suffragette' because of the colours used, but was dated 13 years before the colours had been adopted. The importance of provenance was stressed when identifying these pieces – rather than just relying on date and style, one should consider the availability of other media to confirm their identity as suffrage pieces, such as a Mappin & Webb advert (1) showing jewellery for sale with the slogan 'Votes for Women', or original drawings, orders or some other evidence linking the piece to the suffragette movement. There were many types of jewellery and accessories produced for this purpose, with buttonholes, ribbons, trimmings and scarves being used to great effect by women of lower income. Much of the jewellery was made by the women themselves, woven out of inexpensive glass beads and mass produced. The jewellery included glass and gilt necklaces, and pieces embellished with enamel, as well as precious metal and stones. It is interesting to note that white was never represented by diamonds but by pearls, moonstone and enamel, while green was often represented by dyed chalcedony, emerald or peridot, and purple mostly by amethyst. However, some of the most important pieces of jewellery of this time are undoubtedly the honours bestowed on women, like medals are to soldiers, to reward them for their work in the fight. Women who had served prison sentences were given prison medals in the shape of an arrow to symbolize the arrow on prison dress, while women accused of window smashing were given toffee hammer brooches, and those accused of stone throwing were rewarded with gold brooches set with flint. Sylvia Pankhurst, one of the most famous women of the cause, was in charge of design and personally designed the 'Holloway' brooch, awarded to women who had spent time in Holloway prison, and which resembled a prison gate with an overlaid arrow (2). After the barbaric practice

of force feeding was brought in for women who went on hunger strike in prisons, those who had endured this practice received hunger strike medals with extra bars for each period of feeding. Dr Goring's fascinating talk ended with questions, with Pauline Jamieson asking why there were so few suffrage pieces around today. Dr Goring explained that this was due to a number of reasons; firstly, there was a very narrow time frame between 1908 and 1914 in which the jewellery was produced, and that the significance of much of the jewellery was probably lost after votes were awarded to women in 1928. Also the suffragettes did not always pass down their memories and stories to their children and grandchildren. It is sad that the proof and memories of the huge sacrifices of these amazing women have been lost over time.

### A review of pearls

The first speaker of Saturday morning was Professor Henry Hänni, the now-retired director of the Swiss Gemmological Institute (SSEF), with his talk entitled 'A review of

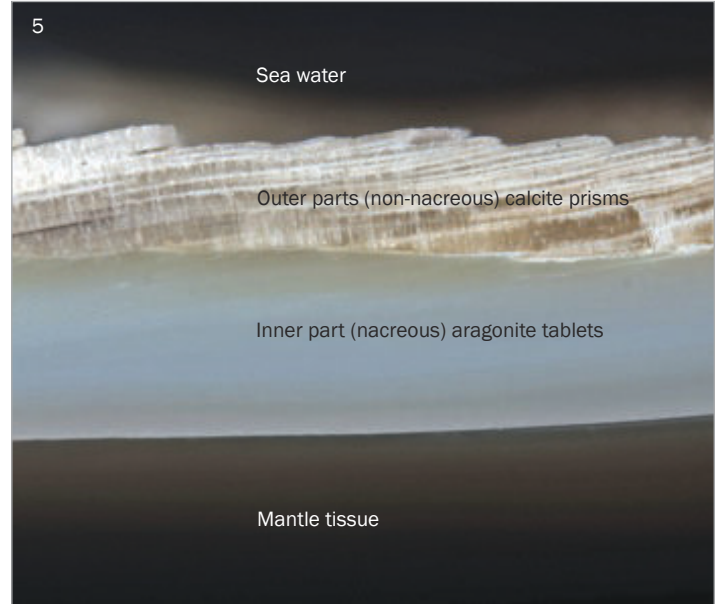
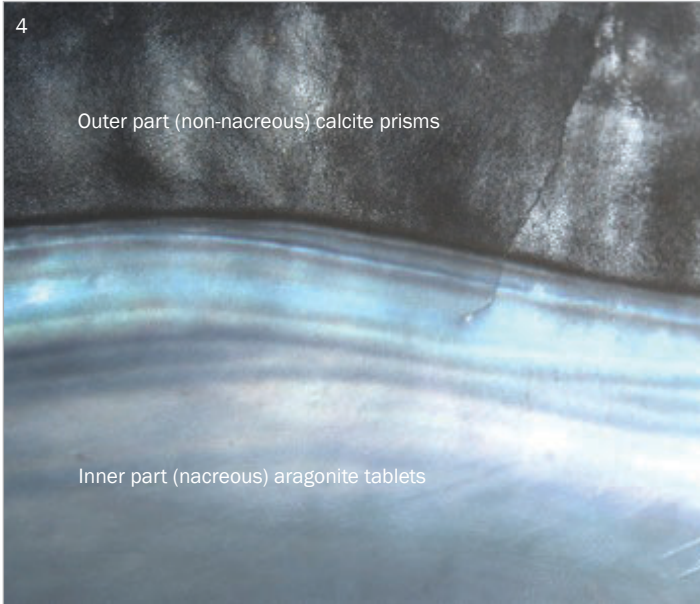
pearls'. The latter was used to deliver his talk titled 'A review of pearls'. Professor Hänni needs almost no introduction, having received a long line of accolades and awards over the years. Leading us through some recent developments and common misconceptions in pearls, Professor Hänni remarked at the beginning that: "Pearls are not easy – I am a mineralogist, when you are not a marine biologist and you have to sign pearl reports it is hard!" Professor Hänni discussed the first common misconception about pearls (which I think most of us are now aware of) – the idea that pearls are formed by grains of sand. He explained how this theory always confused him; how could an oyster who lives in the sand have a problem with a grain of sand? As Professor Hänni explained: "If I swallow a fly, I cough it out – it's the same with the oyster and the sand!" He remarked that if you don't believe the theory about the sand then you have to find a new explanation, which is exactly what he did. He began by examining how shells of pearl-producing molluscs are formed; he noted that they frequently have a dark



3: A *Pinctada radiata* shell (9 cm across) from Bahrain with a nacreous pearl. The rim is brown and corresponds to the more recent production of young mantle epithelium. After approx. 2 cm (6 months) of growth the epithelium cells step over to produce nacre (tabular aragonite). In this time the shell has grown and additional brown rim is formed by mantle cells that were 'born' since. The mantle cells we have looked at before are now contained within the shell and are producing nacre.

## Recent Events

### Bonny Scotland (cont.)



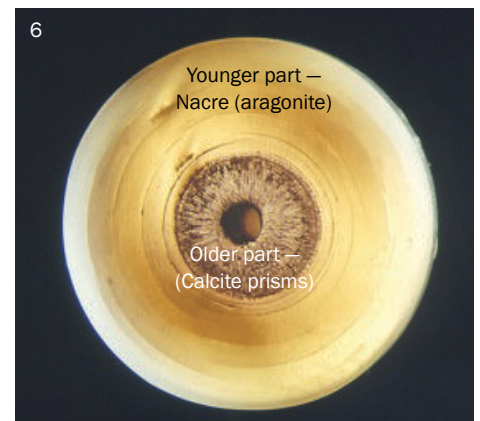
4 and 5: Looking closer at the area of transition from non-nacreous to nacreous calcium carbonate, and (5) at a cross-section of this transition, in a *Pinctada radiata* shell from Bahrain. Magnification approx. 20 $\times$ .

outer rim with an inner iridescent coating of nacre. This he explained is due to different parts of the mantle producing different forms of calcium carbonate during the different stages of development (3 and 4). The outer part of the mantle is the youngest part of the mollusc, which produces dark conchiolin to create a protective outer shell (4). Next is the older, paler part of the creature, which produces columnar calcite. The oldest part of the mollusc produces tabular aragonite crystals, which form the nacre (5). These stages of development are relevant in pearl formation and the identification of natural pearls because we can see at what stage the pearl was formed or which part of the mantle produced the various layers of the pearl. Natural pearls, if cut in a cross section (a horrifically expensive pastime) will often show a dark conchiolin core, with a middle section of columnar calcite and an outer coating of iridescent nacre produced from overlapping platelets of aragonite (6). Interestingly, Professor Hänni pointed out that these platelets are in the region of 300–500 nm thick, in the same region as a wavelength of the visible spectrum, and also the reason nacre produces iridescent colours. He also noted that if a pearl is harvested too soon, often not enough time has elapsed for the beautiful outer layer of

nacre to form and you are left with a dull brown pebble. Professor Hänni believes that pearl production is a result of damage to the mantle of the mollusc and that the type of pearl produced will depend on when and where the damage occurs. The damage to the mollusc produces a cyst, and in this cyst or sac a pearl is produced. If it starts to form at the young outer edge it will start as a brown conchiolin deposit and move through (if left alone) until a beautiful nacreous pearl is produced further inside the mollusc, or if the damage occurs further in it will start to form with either columnar calcite or even just nacre. He also emphasised the importance of correct terminology when

discussing pearls; they can either be natural as described above, cultured when man has a part to play in the farming of pearls, or imitation if they look like pearls but are not of the same process. Professor Hänni stressed that it is essential to use the word 'cultured' when describing any organic pearl that is not of natural origin. Cultured pearls usually fall into two distinct categories: beaded cultured pearls generally grown in the gonad of the mollusc (7), where mantle tissue from a donor mollusc is essential as well as the bead, examples of which are salt water Akoya, South Sea, Tahitian and freshwater 'Ming' pearls (a relatively new Chinese product named after Ming, the wife

6: A cross section through a natural pearl, showing the transition from non-nacreous to nacreous material, starting with calcite prisms and then the sudden change to nacre. This observation highlights that most natural pearls start to form in the juvenile mantle tissue, e.g. as a reaction to an injury where some cells with the 'juvenile programme' are disconnected from its layer and displaced deeper in the mantle (conjunctive tissue) where they initially form a pocket. The product is primarily calcite in columnar array. When the pearl sac ages the cells move to the 'adult programme' and coat the brown centre with nacre. The pearl is now considered 'ripe' as it has now a nacreous appearance.



## Recent Events

### Bonny Scotland (cont.)



7: Opened saltwater shell (*Pinctada martensii*) with pearl lying on pearl sac next to gonad. This beaded cultured pearl is grown near Huidong, Guangdong Province, China. Photo © H.A.Hänni, Basel.

8: Opened freshwater shell (*Hyriopsis cumingii*) showing mantle-grown pearl. The mantle shows 24 pearl sacs still closed. These beadless cultured pearls were grown near Donggou, Hubei Province, China. Photo © H.A.Hänni, Basel.

of the man who started the process) and non-beaded cultured pearls generally grown in the mantle of the mollusc (8), such as salt water non-beaded pearls, or freshwater Biwa, Mississippi or Chinese pearls. Professor Hänni pointed out that term 'Keshi' as frequently used for any non-beaded salt water cultured pearl is not correct, and should only be reserved for pearls grown in the mantle and not in the gonad after harvesting, but it is now too late to change the way the trade describes them. One of the most important pieces of information to come out of the talk was the news that natural pearls that are not, for whatever reason, not as beautiful as they could be, are now being used as the bead for cultured pearls, resulting in a beautiful nacre on the outside of a natural pearl; when X-rayed such pearls appear to be natural. The location where the mantle tissue is placed on the natural core often forms a lump, caused by organic debris. It seems, however, that the pearl needs to be drilled to insert the donor tissue and this produces a shallow offset drill hole after the process is completed, although it is important to note that the beads are not drilled to fix the mantle tissue – this is only a method used with Ming pearls. The problems faced illustrate the importance of keeping up

to date with current knowledge and the need to consult good X-ray or tomography pictures, as well as the need to use a reputable lab to check your natural pearls.

### Update on Gem-A

After a short coffee break it was the turn of Gem-A's CEO Dr Jack Ogden to give an update on what Gem-A had been up to in the last year and its plans for 2012. The year 2011 was another great one for the Association, with growth mostly outside the UK (the home market has been stagnant for a while). This resulted in a surplus at the end of the year, although this was not as big as the year before. There had been more charity and accreditation requirements to meet that had caused challenges, but plans have been put in place to overcome these issues. Moving forward, Jack announced that he would be stepping down as CEO, and would be focusing on Gem-A's international development, while James Riley was to be appointed as the new CEO and would be working towards maximizing surplus revenue and efficiency. The overhaul of the Diamond Diploma is underway, as are ambitious plans for a programme of short courses. Social media is increasingly being

used to keep in touch with current members and students, and the website is being improved to offer more benefits to members and non-members alike. As a charity and a membership body the Association's focus is on balancing the needs of its loyal members with the desires and pressures of the wider world.

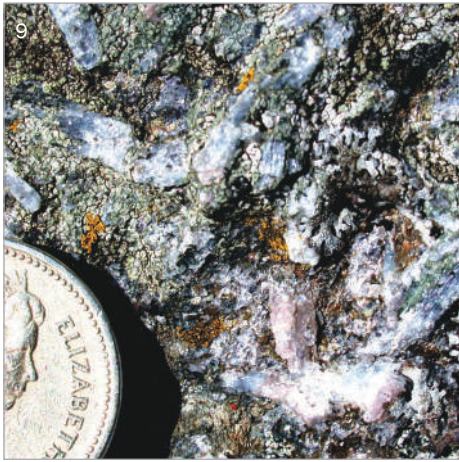
### Why we won't find rubies on Venus

Next, Professor Godfrey Fitton gave his talk entitled 'Geodynamics and gems, or why we won't find rubies on Venus'. Professor Fitton specializes in igneous petrology and geodynamics at the School of GeoSciences, University of Edinburgh. He started by saying how fascinated people are by stories, for example, the Antiques Roadshow is so popular because viewers are drawn to the tales behind the pieces, and that if we are to appreciate and understand the stories behind gems we must appreciate and understand how they are formed and what makes them so unique and rare.

To begin with he explained the timeline of our Earth in a way that made it easy to comprehend; 4.6 billion years is hard for us to get to grips with, but Professor

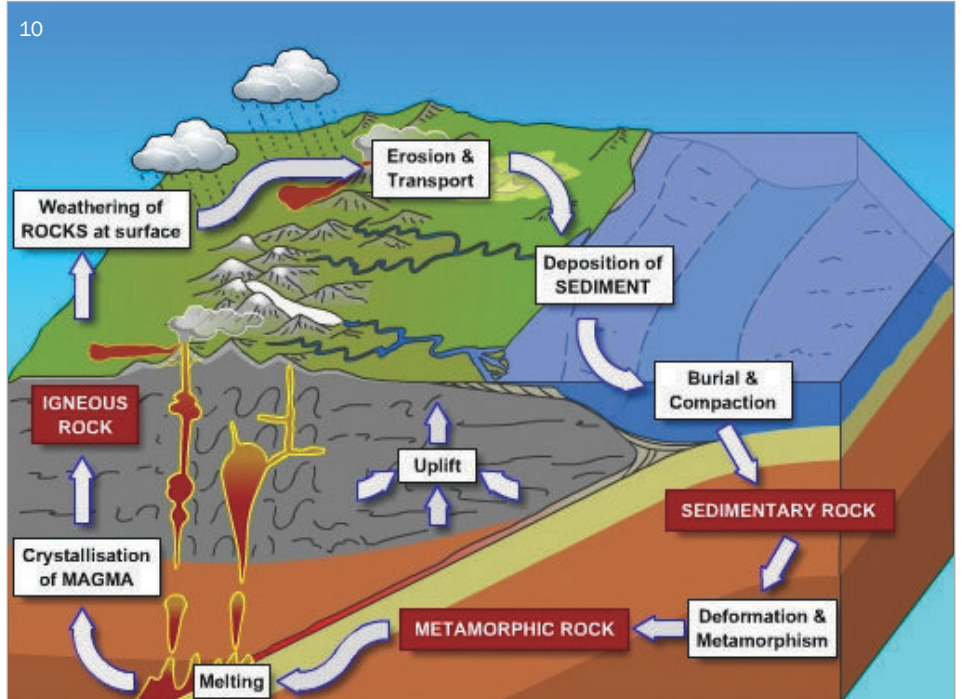
## Recent Events

### Bonny Scotland (cont.)



9: A photograph of a metamorphic rock on Mull showing blue crystals of kyanite being converted to pink andalusite. To get aluminium-rich minerals such as these it is necessary to have a source rock that has an excess of aluminium with respect to calcium and alkalis. Photo Professor Godfrey Fitton.

10: Diagram showing the rock cycle. Copyright The Geological Society.



Fitton boiled it down to a timeline we can understand, making one year equal one second. In this timeline we might expect to live for a minute to a minute and a half, the ice age ended three hours ago, humans have been around for two and half days, dinosaurs became extinct around two years ago, the oldest ocean is six years old and the Earth was formed in 1868, putting it all somewhat into perspective.

So why are gemstones so rare? Professor Fitton explained that it takes a geological accident to form gemstones. Our Earth is made up of three parts; the inner core, containing rare metals such as platinum and gold; the middle section or 'mantle' containing elements such as nickel and chromium that give many gemstones their colour, and the outer layer or 'crust' which contains the elements that make most gemstones. In order for us to have 'rare' gemstones something needs to happen to move these rare elements from the mantle to the crust so that they can combine and create these rare minerals. The outer part of the Earth is made up of a rigid outer layer of 'plates' (named tectonic plates) which move slowly all the time, at about the same speed our fingernails grow. Sometimes this activity pushes plates under one another,

creating what is called a subduction zone, and sometimes they pull apart and hot magma from the mantle flows up to fill the gap, creating new ocean crust. Most of the gemstones we class as 'rare' are rich in aluminium, and this is required in their formation. However, the magma from the mantle is 'metaluminous', meaning that it has a greater proportion of calcium oxide, sodium oxide and potassium oxide than aluminium oxide and will therefore crystallise to form the common feldspars rather than the rarer aluminous gemstones. In order to produce aluminium-rich gemstones such as ruby a 'peraluminous' source is needed, meaning that there is a greater proportion of aluminium oxide than the other oxides (9). This peraluminous source is obtained through the rock cycle. At subduction zones the mantle melts to produce metaluminous volcanic rocks such as andesite and plutonic rocks such as granite. Erosion of these rocks produces aluminous clays and soluble salts of calcium, sodium and potassium. These are carried by rivers to the oceans, where the clays are deposited as sediment. Potassium is absorbed by clay and calcium is precipitated as the skeletons of marine organisms, leaving sodium behind in the oceans. Subduction processes scrape the

aluminous clay-rich sediments off the ocean floor and convert them into metamorphic rocks in mountain belts which are then eroded, completing the rock cycle (10). This process produces peraluminous continental crust because sodium has been removed and transferred to the oceans. It is this peraluminous crust that provides the materials needed for the formation of many gemstones. Thus we only have most of our gemstones because we have salty oceans, and there can be no rubies on Venus because it has no oceans or plate tectonics like we do.

After all the marine biology and complex chemistry there was a long and leisurely lunch, with plenty of time to chat to people – to catch up with old friends and to make new ones.

### Ivories

The afternoon schedule began with Maggie Campbell Pedersen's talk on 'Ivories'. Maggie is, without doubt, one of the world's foremost authorities on organics, bringing warmth, passion and understanding to an often overlooked subject. With a sense of humour Maggie mentioned that the audience were probably thinking "Why bother?" – an

## Recent Events

## Bonny Scotland (cont.)

attitude often encountered when organics of any kind are discussed. I have to admit to neglecting them myself when studying, although Maggie's talk certainly made me more enthusiastic. Maggie began by giving us her definition of ivory: any teeth that are big enough to be carved, and so along with the traditional elephant tusks that we all think of, unusual things like canine teeth can also be classed as ivory, although crocodiles are not included as their teeth are hollow and difficult to carve. Next Maggie discussed the subject of dating the material. This can often be a difficult task to achieve, not only with both old and ancient ivory, but also with more recent pieces. In the UK it is illegal to sell ivory that has been produced since 1947, so if you are transporting, buying or selling ivory you need to be sure it predates that year. With more modern pieces the advice is that provenance is key — paperwork or photos that prove the item was produced before 1947 are the best way to proceed, as without these it can be difficult to prove. With older pieces carbon dating can be used, but this does have many drawbacks, as carbon dating tells you the date the elephant died and not necessarily the date of the piece. Ivory is often stored or stockpiled and used at a later date, and earlier pieces can be re-carved, for example, a ninth-century book cover was carved over the top of a sixth-century carving. In Britain we did not have access to elephant ivory during medieval times and so used alternate forms such as walrus, or simply re-carved older pieces. Sometimes newer pieces of ivory are added to older pieces. The advice here is that the best way to date ivory is with experience and by considering the style of the piece. For example, the angle of a subject's head can tell a lot, as can the style of dress or whether the ivory has been coloured or dyed at all — traits that no doubt take years of learning to identify. Humans have used ivories for thousands of years, with the unfortunate result that we have nearly wiped out elephants. Perhaps the biggest reasons for this were the popularity of pianos and billiard balls. We used to produce 350,000 pianos a year, all with ivory keys, which apparently feel beautiful under the fingers when played —



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some say there has yet to be found a perfect substitute. Billiard balls don't last forever and need to be replaced often, and with a maximum of five balls being produced from one tusk, that's a lot of elephants. Other uses of ivory include pictorial carvings such as scrimshaw, or as decorative objects or useful things such as Japanese Netsuke, the toggles used in traditional dress. Ivory has been used in all walks of life, as a veneer for furniture and walls, in teething rings for babies, in false teeth made from hippo ivory (because it doesn't stain as much),

11: Inside of elephant ivory box lid, stained by make-up. The material which was near the pulp cavity shows more pronounced staining.

12: Celluloid brooch imitating ivory.

13: Cross section of elephant ivory, showing unusual structure due to growth deformity (courtesy of Bobby Mann).

All images © Maggie Campbell Pedersen.



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## Recent Events

### Bonny Scotland (cont.)

and even false hips, the first of which were carved in Burma for use by a German doctor in the 1890s. So how do we identify ivory? For Maggie that is one of its great features – no numbers! It is very difficult to identify ivory using standard gem equipment as we would with inorganic material, and rarely is a refractometer or specific gravity test used as the fluid can damage pieces: ivory is hygroscopic, i.e. it absorbs water. Ivory has to be identified using observation and touch. Characteristics such as the size and curvature of a piece can also give clues to origin. The appearance of Haversian tubes rule out ivory and confirm the item as bone. The make-up of the tooth itself, such as the structure of the dentine in the centre, also gives clues as to its identity, for example walrus ivory has a unique ‘tapioca pudding’ structure. The angle of the intersecting arcs seen in the dentine of the ivory can also aid identification (Maggie discourages the use of the term ‘Schreger’ lines), and these are not to be confused either with ‘lines of Retzius’ that are seen in the enamel of the teeth not the dentine. Elephant ivory shows

intersecting arcs that are never less than 90°, while mammoth ivory shows them never exceeding 90°, however mastodon ivory, just to confuse us all, has arcs similar to those found in elephant ivory. (See *Gems & Jewellery*, Winter 2010, page 22). All in all one had the feeling that the talk just dipped a toe into this interesting and substantial subject and, I am sure, prompted myself and others to try and learn more.

### Colour modification of quartz and fire opal

The last speaker of the afternoon was Dr Ulrich Henn, speaking on ‘Colour modification of quartz and fire opal’. Dr Henn, a mineralogist, gemmologist and author of several books and publications covering numerous fields of gemmology, is the General Manager of the German Gemmological Association and head of the German Gemmological Training Centre in Idar-Oberstein. For years Brazil has been a major producer of quartz – we are all familiar with the varieties we have seen

produced there, such as amethyst, citrine, smoky quartz, rock crystal and rose quartz. The Brazilians want to capitalize on their product however, and are offering new and exciting forms of the gemstone. Using treatment methods we now have ‘blueberry’ and ‘lemon’ or ‘greengold’ quartz – even ‘neon’ quartz (**14** and **15**). Not only are these varieties being produced, but more and more of the ‘traditional’ product is being treated, and is often a multi-step process. Dr Henn was fortunate to be able to carry out his studies – in co-operation with Professor Rainer Schultz-Güttler of the University Sao Paulo, Brazil – with a wide range of material, and both the starting material before treatment as well as the end result. For many of us the difficulty with quartz is that the material is relatively low priced – often under £1 per carat – so it rarely gets submitted to laboratories, and even ‘everyday’ gemmologists are loth to spend what can add up to a large amount of time on positively identifying a synthetic or treated quartz, when the cost of the stone is considerably lower than the cost



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14: Set of faceted quartz representing nearly the whole variety of colours of this gemstone group. Photo: R. Schultz-Güttler, Sao Paulo.

15: Set of tumbled yellow-green ‘lemon’ quartz – heat treated smoky quartz. Photo: U. Henn.

## Recent Events

### Bonny Scotland (cont.)

of identifying it. Hopefully, with a greater understanding of the process, we can all use our time and money more effectively. Much of the colour modification is achieved by modifying colour centres within the starting material either by heat or irradiation, or a combination of both, at different temperatures and for different amounts of time to achieve a multitude of effects. Some of these treatments are stable, but many are reversible or can fade over time. It is important to know which has been treated and which is natural when dealing in these goods — despite the product being relatively low value our reputations are not. If we have amethyst as a starting material we can achieve citrine by heating to around 400–500 °C, ‘neon’ or lilac quartz by heating to around 600 °C, and prasiolite using material from Montezuma heated to 400–500 °C. The prasiolite can in turn be irradiated by gamma rays to produce the violet blue ‘blueberry’ quartz which is becoming increasingly common (16). Most of these specimens need to be identified in a laboratory using characteristic absorption spectra, but interestingly the citrine produced in this fashion shows no pleochroism whereas natural citrine does, so this can confirm treated origin. Using morion we can achieve a paler smoky quartz when heated to around 140–280 °C in some material and lemon quartz (a vivid yellow) in other material. The resulting colour will depend on the lithium content of the material. If the starting material is colourless water-bearing quartz, it can be gamma irradiated to produce what is often referred to as ‘green’ or ‘greened amethyst’. This material is relatively unstable and can fade with heat. A good way to tell the difference between this irradiated material and heated amethyst is by using the Chelsea Colour Filter; the irradiated material will appear reddish and the heated amethyst will appear green — it is nice to know that our simple handheld tools are still relevant and useful, even with new treatments. Lastly, Dr Henn touched on another relatively new treatment: the use of combination electron radiation and heat to turn fire opal from Rio Grande to a transparent pale blue colour. Not all material is affected by this treatment;



16: ‘Blueberry quartz’ (left) is produced by gamma irradiation and heat treatment of prasiolite (right). Photo: R. Schultz-Güttler, Sao Paulo.

some remains the original yellowish hue of the starting material. The blue colour is due to absorption, similar to that seen in blue chalcedony. As yet there is no known natural equivalent of this pale, transparent blue stone; there is Andean opal, which is a natural pale blue material, but this is not transparent. Therefore, it seems safe to assume that, at the moment, all material of this appearance is treated. As always, gemmologists are often just one step behind the treaters, but we can at least try to keep up.

### New approach to the refractometer

Lastly there was a chance to listen to Darko Sturman discuss his new approach to teaching the refractometer, as per his article published in *The Journal of Gemmology* (2010, (32)1–4, 74–89). Being a great fan of his work, and having adopted many of the principles myself when teaching, I was eager to go along. Darko explained why he felt that there was a need for change — the fact that many textbooks give misleading or false information about the use of the refractometer made it necessary, as by using those methods incorrect identifications could

be made. Darko’s new method includes the use of patterns and charts rather than lists of constants. He has published all of his work online in conjunction with ISG, see [www.opticalgemmology.com](http://www.opticalgemmology.com).

### Antiques

Despite the late night following the Ceilidh, the conference began on time at 9:30 on Sunday morning. We were eased in gently with a talk by Richard Slater, an independent antique dealer and consultant. Richard started his career when digging for gemstones in Zambia after visiting his brother and, after being encouraged to leave by a government minister, returned to England where he forged an impressive career in the auction world. He now has, in his words, “turned to the dark side”, and is working for himself. His presentation, entitled ‘A lot on offer’, was a whistle stop tour through some of his favourite pieces, and Richard gave the audience the benefit of his years of experience as he explained why each piece was special or valuable. When looking at the value of antiques, questions are often raised concerning broken or damaged jewellery, for example, how easy is it to get a matching stone for a

## Recent Events

### Bonny Scotland (cont.)

#### Ceilidh

On the Saturday evening delegates enjoyed a delicious three-course dinner and Ceilidh — a traditional Gaelic gathering featuring Gaelic music and dancing. If you do not know any Scottish dancing there are plenty of people on hand to reel you in the right direction. It is great fun and it really does bring the whole conference together.



ring that is 150 years old? Will the piece still sell despite the damaged or missing part? Can the item be repaired sympathetically in order to garner a profit? We were shown an example of what Richard called 'Somerset alteration', a particularly attractive guard chain that had been held together with a piece of string! With regard to guard chains it is worth noting that, although they are made purely of gold, the prices they fetch often bear no relation to gold prices and often have considerably higher value, particularly when not held together with pieces of string. Dating antique jewellery can also be difficult if there are no date letters; often styles come in and out of fashion and a piece can only be defined by a period rather than dated more precisely. Also, when dealing in the auction world, prices are affected not only by the piece itself, but by outside factors; for example, whether it's a rainy day and people have braved the rain to come to the sale, or perhaps if more than one person in the room wants the piece and a bidding war ensues, or even by two rival dealers who push the price up out of spite — a situation relished and, no doubt, fuelled by canny auctioneers. Some types of jewellery are becoming increasingly rare — tiaras are frequently broken up rather than sold complete — and Richard was quick to point out that fashion plays a large part in the supply and demand of

jewellery too. Brooches are now very difficult to sell because they are not worn as much. Richard's talk gave a fascinating glimpse into the world of the antique dealer. I particularly liked his description of his favourite diamonds: "transition cuts — because they're cheaper than a comparable modern cut and have far more character."

#### GemExpert

After coffee we had the second presentation from Keynote speaker Professor Henry Hänni, entitled 'Alternative investment in gemstones'. Professor Hänni explained that, after the shock of retirement, he needed something to do, and so set up GemExpert with Professor Johannes Hunziker. GemExpert is a consultancy business which advises clients wishing to invest in gemstones. Amongst his insights and recommendations, Professor Hänni explained that often people wishing to invest in gemstones do not have enough (if any) knowledge of gems, and can often be misled. People look at auction reports and think that their stone will fetch the same price per carat. Unfortunately, a lot of trust is also put into sometimes fraudulent valuations — people tend to trust the paper without looking at the stone. For example, a well-known bank offered \$3.1 billion for a 'ruby doorstep', based on an exaggerated

valuation, thus highlighting the necessity for a reputable laboratory report on any important gemstone. Professor Hänni tipped that spinel is currently the stone to invest in, stating: "Today, red spinel costs a fortune ... In a year it will cost two fortunes!" Tourmalines are also an area of interest — with the sources of 'Paraíba' tourmaline now depleted the price is going up, and is set to go up further still. High demand in China for both red and bi-colour tourmalines has kept prices strong there also. Tsavorite garnet was also mentioned as being a gemstone with price on the increase which looks set to continue. If considering an investment in pearls, Professor Hänni recommends natural, as people are after natural pearls despite them often being not as beautiful as their cultured counterparts. The importance of origin of a stone was discussed, as well as the fact that there is little difference in price between heated and unheated sapphire unless it has a saleable origin. When investing, Professor Hänni recommends getting good advice, getting a decent report, buying natural where possible, buying the best quality you can afford, and looking at trends and putting your money on rising stars. After the talk we were treated to 'Henry's diamond quiz', a lighthearted and humorous quiz on diamonds, with the occasional silly answer to the delight of the audience, who laughed throughout.



## Recent Events

### Bonny Scotland (cont.)

Before breaking for Sunday lunch, prizes were awarded for the SGA's 2012 Gem-Set Jewellery Design Competition, with North Glasgow College cleaning up with both first and second prizes, and third prize going to Carnegie College, Dunfermline. Edinburgh College of Art picked up two certificates for highly commended pieces and North Glasgow College a further four certificates, also for highly commended pieces. The prizes for the best Scottish candidates in gemmology went to SGA secretary Dr Pauline Jamieson, who was awarded the Ness prize for the best candidate in the Diploma paper, while Dr Mairghread Ellis and Kate Bailey jointly won the prize for the Foundation paper.

The afternoon was spent in workshops, with the opportunity to brush up on practical skills. Workshops included 'A lot on offer' with Richard Slater, which took a practical look at some of the pieces in his talk and taught delegates how to recognize a genuine antique from reproduction; 'Extraordinary gems' with Alan Hodgkinson, which took a look at some of his favourite gemstones; 'A refractometer challenge' with Gwyn Green, which gave delegates a chance to test their skills with the refractometer and to put into practice Darko Sturman's new method on a range of cut stones; 'Recognizing and valuing treated sapphire' with Cigdem Lule and Stuart Robertson of GemWorld, a shortened version of their popular one-day practical

workshop; 'Ivories' by Maggie Campbell Pedersen, an opportunity to look at different types of ivory to reinforce the identity techniques discussed in her presentation; and 'Simple instruments are not obsolete' with Antoinette Matlins, who proved how invaluable the darkfield loupe, Chelsea Colour Filter and dichroscope are for the gemmologist on the move.

To end a weekend of superb talks and workshops there was a cosy and delicious supper in local Perth restaurant, 'Let's eat', where the wine and chatter flowed, toasts were made, and friendships sealed. I don't think the SGA could possibly better this year's conference in 2013, but that's what the delegates say every year, and they always do!

### About the author

Kerry Gregory works in jewellery retail and appraisal and is a Gem-A Open Distance Learning tutor. An active member of Gem-A, Kerry is particularly interested in gem identification through the use of basic gemmological instruments. To contact Kerry, email [kerry@gemmologyrocks.com](mailto:kerry@gemmologyrocks.com).

### Roamin' in the gloamin'

This year's field trip was to a remote reservoir known as Lochan na Lairige, situated in the hills around Loch Tay. At a height of almost 600 metres above sea level, the dam and surrounding area are exposed to the elements — rain and snow in particular — even though the reservoir sits between two hills. The location was reached by crossing the dam, and then following a well-trodden path to the reservoir side where smoky quartz, chlorite, calcite, garnets, and various pseudomorphs, notably hematite after pyrite, could be found by the observant collector.

Those attending were rewarded with several finds of gemmy material and numerous mineral samples, including garnet. Some attendees preferred the larger specimens of rock interspaced with quartz, rather than the less easily found and more prized and famed Cairngorm quartz, which had been described by a nineteenth-century Scottish mineralogist, Matthew Heddle, as having a 'claret' colour. Prime samples of this were not easily found, but the variety of sources, which ranged from large rocks and boulders requiring splitting (a technique preferred by some of the more geologically-minded field trippers), to water-worn and weathered pieces released from their host matrix, ensured that

everyone had the opportunity to bag themselves a souvenir from this remote and beautiful location.

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Photo Andrew Fellows.

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| 6th/7th   | October   | York Racecourse, York                 | (Rock Gem 'n' Bead) |
| 13th/14th | October   | Newton Abbot Racecourse, Newton Abbot | (Gem 'n' Bead)      |
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# Fossils in amber

Michael Hügi FGA shares some photomicrographs of fossilized inclusions in amber — beautiful remnants of a forest that disappeared long ago.

In recent years I have examined many pieces of Baltic amber with inclusions of insects or other organic matter. Amber is a fossil tree resin from a forest which covered large swampy areas about 40 to 50 million years ago, in what is now known as the Baltic Sea. Some of the billions of insects or small animals living in this humid region were trapped on the sticky resin exudates of the trees and covered by subsequent resin flows. I was astonished at the high degree of preservation of these million-year-old inclusions, sometimes

looking as if they had been alive only the day before. The following pictures take a closer look at Baltic amber. The application of high magnification and crossed-polarized light often revealed some new aspects of the mechanisms of the inclusion process and the subsequent fossilization.

If not indicated otherwise, the following photomicrographs were taken with a Leica MZ 16 zoom stereomicroscope and a digital photo camera of the Leica DFC Series. All photos are by Michael Hügi.

Donum Serenissim. Principis & Ducis Augusti  
Lunæburgensis & Brunsvicensis.



*Inclusions of insects or other animals in amber have always fascinated scientists throughout the centuries. The German Jesuit Athanasius Kircher wrote his famous work Mundus Subterraneus in the second half of the seventeenth century, in which he covers a broad range of geosciences. One chapter is dedicated to amber, containing many copper engravings of pieces with amber inclusions. Shown is a lizard included in amber, a gift from the Duke of Brunswick. Such inclusions of vertebrates are still very rare today. Copper engraving of Mundus Subterraneus by Athanasius Kircher, 1678.*

## About the author

Michael Hügi MSc FGA of Berne, Switzerland, is the head of the Scientific Committee of the Swiss Gemmological Society (SGS). His specialities involve photomicrography of inclusions in gemstones and the history of gemmology.

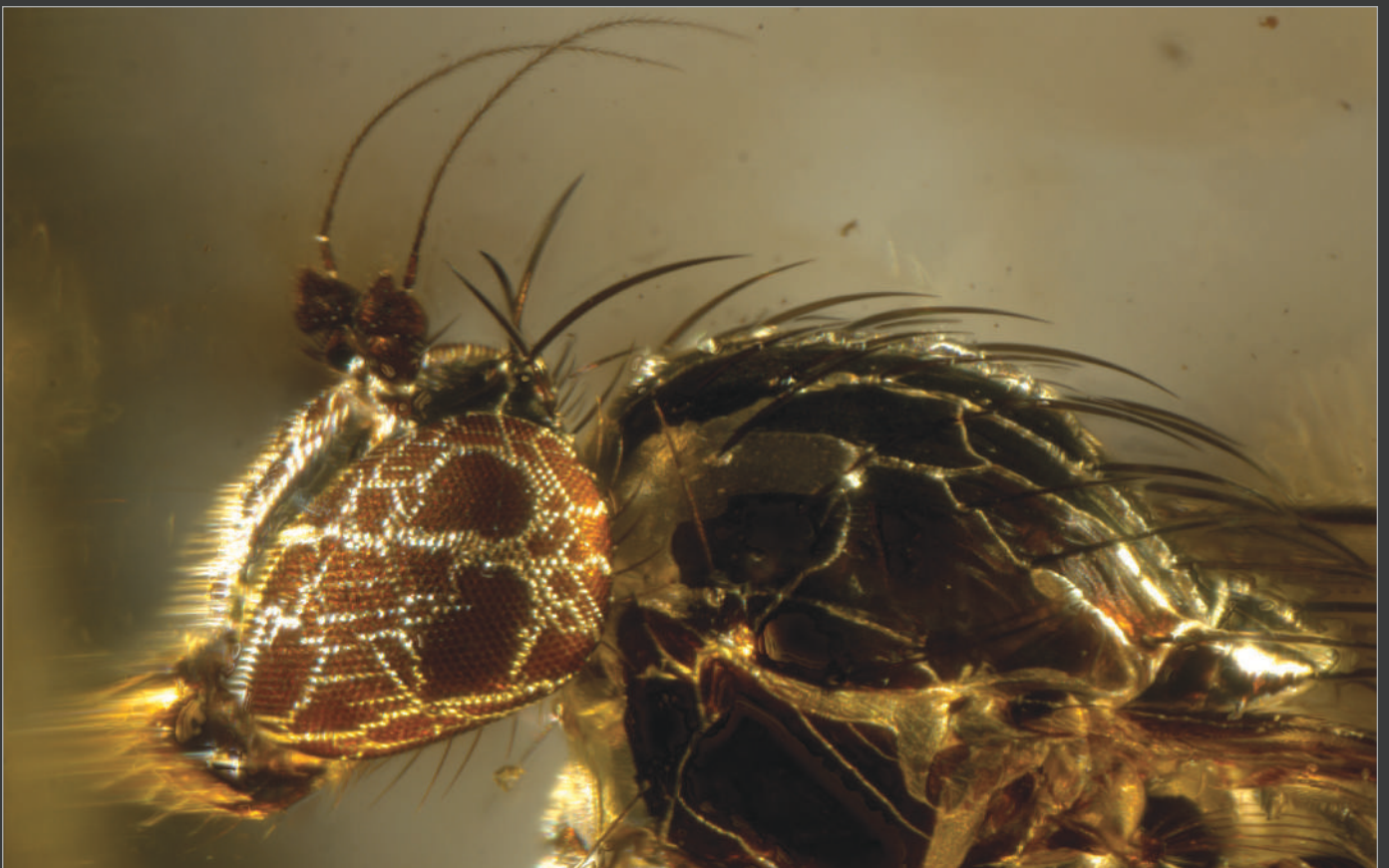
## Through the Microscope

### Fossils in amber (cont.)



*Although at first glance this scuttle fly seems unaffected by the trapping in the resin and by its subsequent fossilization to amber, it is only the chitin exoskeleton of the insect that has survived. All internal organs have dried out or decomposed, leaving a hollow structure. Magnification 28 $\times$ , glass fibre-optic illumination.*

*This image of the head and thorax of a scuttle fly included in Baltic amber demonstrates the excellent preservation of the insect. However, due to shrinking of the resin during fossilization, the exoskeleton of the thorax has broken into multiple segments. The different coloration of the facet eye may also be due to shrinking ruptures and chemical reactions, leading to discoloration of some facets. Magnification 80 $\times$ , glass fibre-optic illumination.*



## Through the Microscope

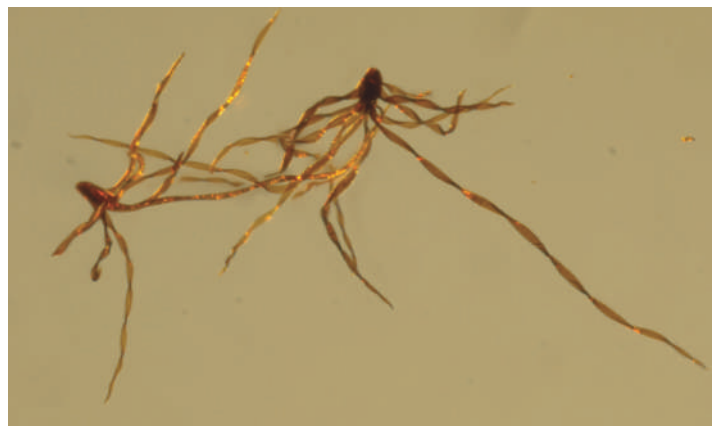
### Fossils in amber (cont.)



If a bigger insect or animal is included, the large amount of tissue water contained within the animal is not able to diffuse completely into the surrounding amber during the fossilization process without leaving a trace. In such cases, the water emulsifies in the amber structure, causing white, milky clouds on or near the fossil. This can be seen here near the abdomen of the spider. Magnification 20×, glass fibre-optic illumination.



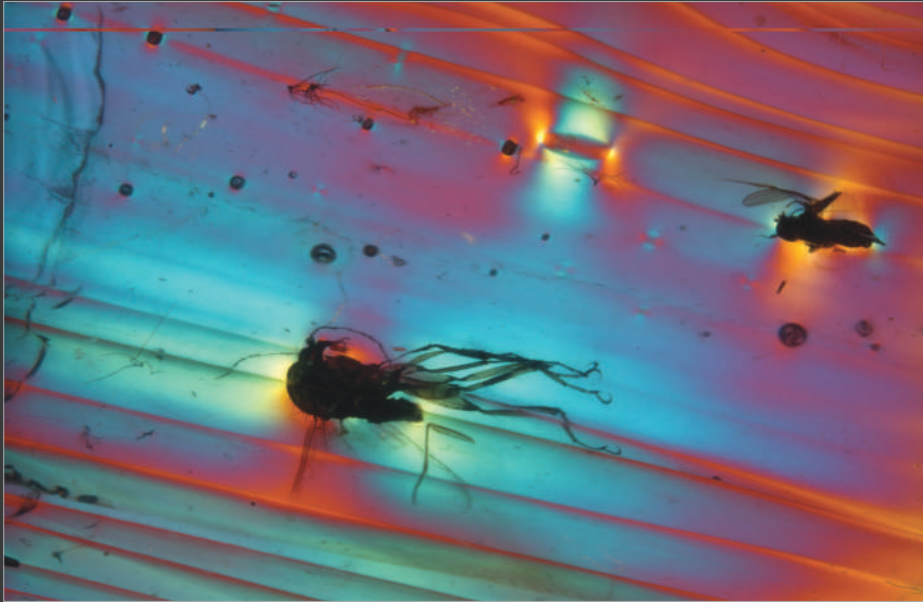
A scavenger beetle, perfectly preserved and unaffected by resin flows or shrinking processes. Magnification 63×, glass fibre-optic illumination.



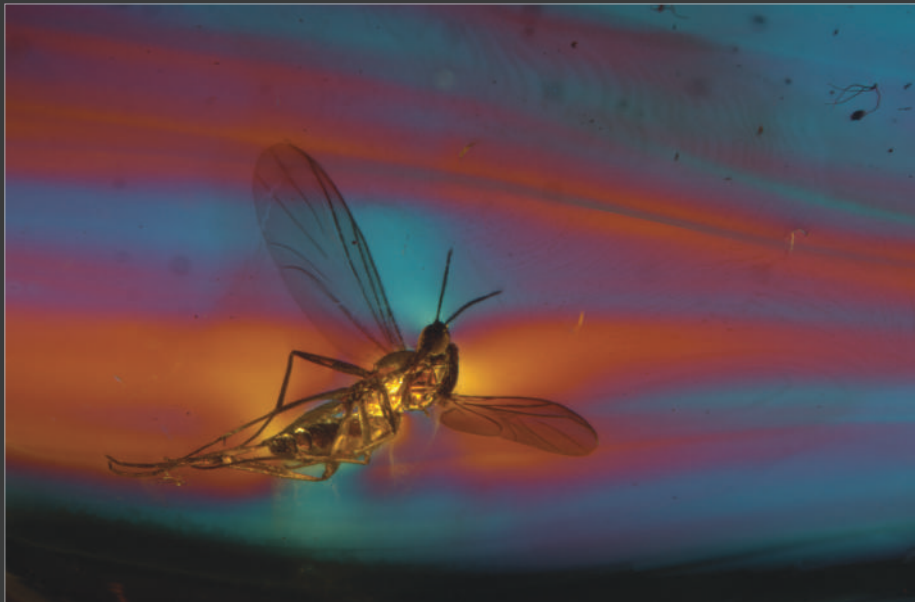
This image shows trichomes of oak blossom inclusions, or so-called stellate hairs. They are typical of Baltic amber and can be frequently observed in specimens. The high magnification of this photo reveals the fine twisting of each hair. Magnification 100×, glass fibre-optic illumination.

# Through the Microscope

## Fossils in amber (cont.)



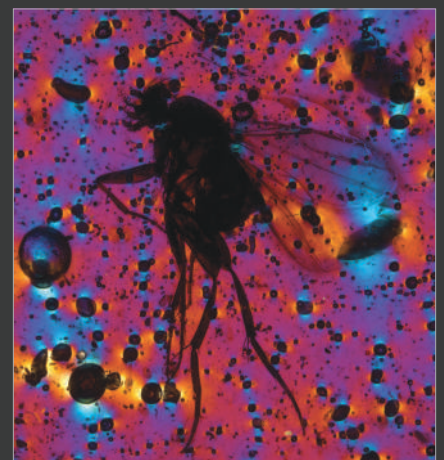
This crossed-polarized illumination reveals the flow structure of the tree resin as blue and orange interference colours. On the different surfaces of the flows insects and stellate hairs (trichomes of oak blossoms) can be seen. The insects are affected by the flow strain of the resin; the legs of the midge in the lower part are elongated in the flow direction and partly severed. Magnification 12.5×, bright field illumination, crossed polarizers, quarter-wave plate.



Many of the inclusions cause strain within the surrounding amber. Under crossed polarized light, this strain field can be seen as a bright halo due to anomalous double refraction around the included biting midge.

Magnification 16×, bright field illumination with crossed polarizers and quarter-wave plate; glass fibre-optic illumination.

Round air and water bubbles are a common characteristic of amber and are seen here with the silhouette of an included fly. Under polarized light they reveal their surrounding strain fields as blue-yellow interference colours. In normal light conditions, this sample shows the golden-yellow colour of amber. Magnification 25×, bright field illumination with crossed polarizers and quarter-wave plate.

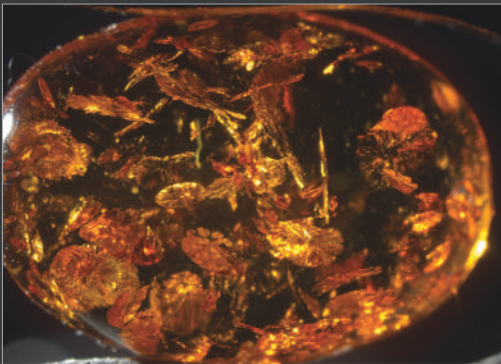


## Through the Microscope

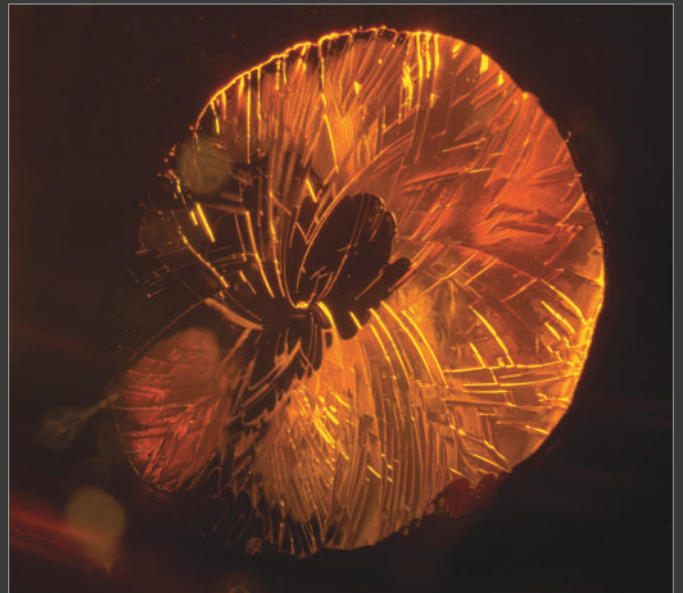
### Fossils in amber (cont.)



*A detailed view of a midge's wing: the chitin structure is preserved with every detail, but the fossilization process of the resin produced shrinking ruptures on the wing. Magnification 63×, bright field illumination with crossed polarizers and quarter-wave plate.*



*Some amber can show a cloudy appearance due to myriads of tiny air bubbles. It is a common practice to clarify such amber by careful heating. This process enhances the permeability of the amber structure and allows the gas or liquid filling of the bubbles to escape by diffusion. However, a homogeneously clear piece of clarified amber is often regarded as a rather unattractive ornamental material, so the cooling process can be modified in order to produce round stress cracks — so-called 'sun spangles' — which are irregularly arranged throughout the amber piece. These sun spangles reflect the light strongly and give the stone a vivid appearance. Although they resemble included plant material at the first glance, their origin is completely artificial and they have nothing to do with fossil inclusions. Magnification 7.1×, glass fibre-optic illumination.*



*This detailed view of a sun spangle reveals its identity as an artificially induced stress crack. The curved structure on the crack's surface are typical of sun spangle. Magnification 25×, glass fibre-optic illumination.*

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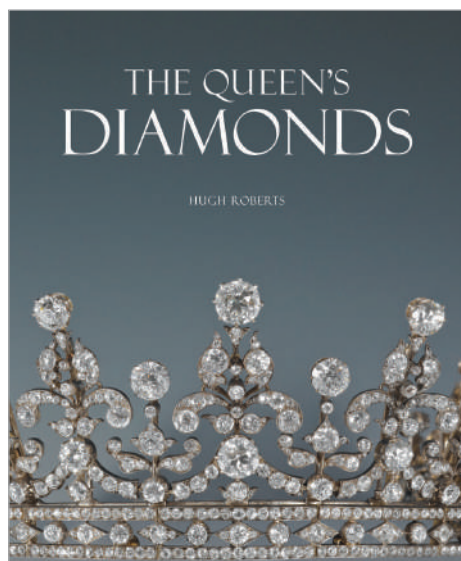


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## The Queen's Diamonds



Hugh Roberts, 2012  
The Royal Collection  
Hardback, 324 pp.  
ISBN: 978-1-905-68638-4  
Price: £60

*The Queen's Diamonds* by Hugh Roberts is one of those coffee table books that is a pleasure to dip in and out of. Bursting with photographs and published by the Royal Collection to coincide with the Jubilee and the exhibition at Buckingham Palace, it is a fine piece of work cataloguing the most important of the pieces belonging to Her Majesty.

Starting with William IV's consort, the long suffering Queen Adelaide, it details the history of each piece, the context in which it was created and how it has been passed down to the present day. In this respect Roberts has done an excellent job of research and has paid attention to the smallest detail, having pursued many lines of enquiry, bringing them together in a seamless manner. The only criticism from a gemmologist's point of view would be the lack of weights of stones and their qualities, but then it is not intended to be that sort of book.

It is interesting to note that most of the really exciting pieces in the collection have been inherited by the Queen. The fact that she was young in a time of post-war austerity and (from a design point of view) the perhaps unexciting 1950s, is reflected in the items acquired by her – particularly her wedding gift from Prince Phillip (a bracelet made from his mother's tiara) and her wedding present from the City of London. These items would, I think, be seen as unremarkable if it were not for their provenance.

Many years ago I was invited to participate in a BBC documentary entitled 'Royal Millions' which aimed to estimate the value of the Royal fortune. Although being totally ill-equipped to do so, I was asked to talk about some pieces of jewellery and in the bravado of youth I did. Despite the many photographs and books which I saw and read at the time in preparation, this book makes me realize the extent of the vast array of diamond delights in the Royal Collection. Let's hope there might be a follow up focusing on the coloured stone pieces.

JR



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## Understanding gems

## Stone Scoop



# That's nothing new

Gemmologists who are also jewellery historians are constantly reminded that there is little that is new, and this is especially true of imitations and treatments. While technique and the degree of sophistication might have changed, the underlying ambitions and intentions seldom have.

## Hot

Robert Bakewell's *An Introduction to Mineralogy* (London, 1819) provides a good glimpse of gemmological knowledge in his day. Back then the majority of imitation gems were still made of glass, but Bakewell also noted that "The colour of some gems may be entirely discharged, and of other gems changed by a greater or less degree of heat." He adds: "When they are cut, polished and set, it is difficult to detect the fraud." The whitening of sapphires by heat so they could imitate diamond was well-known, but this is quite an early European mention of heat affecting the colour of gems in other ways.

Bakewell was one of the earliest teachers of geology, his first book on which was published in 1813. His brief 1829 book specifically aimed at students, titled *An Introduction to the Study of Mineralogy*, includes the wise advice that a powerful lens should be the pocket companion of every mineralogist.

## Heads I win

I was asked the other day whether shell cameos were necessarily 'imitations' because they replicated far more costly stone cameos. I suppose it depends on what the cameo is sold as – if the buyer of a shell cameo thinks that they are getting a stone cameo, then I guess it is misleading. It is tempting to suggest that the word 'cameo' should always be qualified by the descriptor 'shell' or 'stone'. Should it matter that for many in the trade today cameos are always associated with shell and stone cameos are largely unfamiliar? This wasn't always true. Cameos are a frequent and popular component of Victorian jewellery. Sometimes these were of stone, sometimes of shell, but there was a huge difference in cost. According to T. L. Phipson in his 'The Utilisation of Minute Life' (London, 1864): "A good stone cameo the size of half-a-crown, with a simple head as a device" would be worth around £40. On the other hand "a shell cameo of the same description, unless of extraordinary merit" would seldom be worth as much as £2. The half crown, an English coin worth one eighth of a pound and which survived until decimalization in 1971, had a diameter of 32 mm (1.26 inches).

## Stain

Talking about shell in jewellery, you may have encountered imitation conch pearls made of spheres cut from shell. The basic practice is

nothing new; I've seen Roman gold jewellery decorated with what appear to be pearls but which on closer inspection are revealed to be mother-of-pearl beads. Perhaps nearer to the shell imitations of conch pearls is a 'red pearl' emanating from the Philippines, recorded as long ago as 1916, which proved to be a piece of shell cut to a sphere, stained red and polished. A 'black pearl' from the same source similarly proved to be stained shell.

## Original syn

In my article on the early days of cultured pearls in the last issue (*Gems & Jewellery*, Spring 2012, p.28–30), I noted that Charles Dickens had mentioned a cultured pearl necklace in the 1850s. This prolific author also referred to synthetic rubies and other gems in his work: "If you want emeralds and rubies, make a mixture of alumina and magnesia and add from half to one per cent of bichromate of potass to this mixture, add one part fused boracic acid and expose it in platinum resting in porcelain to the heat of the porcelain furnace of Sevres. The product will be rubies. The constituents of emerald treated in the same ways yield emeralds. Sapphires are born of lamp black calcined alum and sulphate of potash reduced to powder." (From Charles Dickens (Editor), *All the Year Round*, Vol 2, p.127, Dec 3, 1859). By the middle of the nineteenth century there had been many experiments producing synthetic corundum, most typically rubies, from ingredients that included the necessary aluminium and chromium, and various recipes published. The results were generally too small for use, but there is some reference to cutting and polishing such stones, such as that found in *A Cyclopaedia of six thousand practical receipts* by Arnold James Cooley (New York 1851, pp. 266–7).

## Taken off the web

Lastly, here is a gem test you won't find in the gemmology pages on the web – but you might find the necessary sacrificial victim on a web. According to Thomas Nichols in his *A Lapidary or The History of Precious Stones* (Cambridge 1652): "If a sapphire is put into a glass with a spider the spider will die." So presumably if the sapphire is fake, the spider will survive? If you try it, let me know the results.

J.O.

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## Understanding gems



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