

# Gems & Jewellery

Summer 2011 / Volume 20 / No. 2

Great Scot: The 2011  
Scottish Conference

Testing amber

Mughal spinels





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## Gem-A's record growth in 2010

It is a great pleasure to be able to report that Gem-A met the challenging economic environment of the past year by achieving record growth in 2010. The year saw our income from worldwide gem education grow 21% over 2009, and the resulting increase our reserves will allow further investment in both updated and new courses. The results prove that the Gem-A educational brand is increasingly being recognized internationally. The relevance, excellence and high status of our courses and qualifications are needed in a global industry where gem identification, imitations and treatments are a constant challenge.

In 2010 income from membership was up 4.5% compared with 2009 – a result equally pleasing because membership organizations in general are finding it hard to encourage long-term engagement of members, particularly when shared-interest communities and targeted sources of information are available in so many new ways. Incoming subscriptions thus continue to cover the costs of our publications and membership administration, but are not subsidizing other activities to any significant extent – only 2% of membership subscription income goes towards our global marketing, PR, trade show and travel budgets.

Gem-A's wholly owned subsidiary trading company Gemmological Instruments Limited also reported a 7% sales growth in 2010 compared with 2009, with a small overall profit for the year; an excellent result in what has been a challenging trading year.

Our 2010 results follow on from Gem-A's growth and surplus in 2009, and the Association's strong balance sheet now puts us in good stead to achieve our educational and charitable aims, and to widen the benefits for members. In particular we are in a strong position to consider the options we have when our lease of the four floors at 27 Greville Street comes to an end in mid-2012.

I would like to take this opportunity to send our sincerest thanks to all of you for your continued support of Gem-A; our members and students are what make us an association of like-minded friends, peers and colleagues.

**Jack Ogden**  
Chief Executive Officer

### Cover Picture

Red spinel engraved with the names of two seventeenth-century Mughal rulers. The stone is one of 11 spinels mounted on a gold link chain sold recently at Christie's Geneva. Photo courtesy of Denis Hayoun, Diode SA, courtesy of Christie's. See Mughal treasure, page 37.



**Published by**  
The Gemmological Association  
of Great Britain  
27 Greville Street  
London EC1N 8TN  
**t:** +44 (0)20 7404 3334  
**f:** +44 (0)20 7404 8843  
**e:** editor@gem-a.com  
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Registered charity no. 1109555  
Copyright 2011 ISSN 1746-8043

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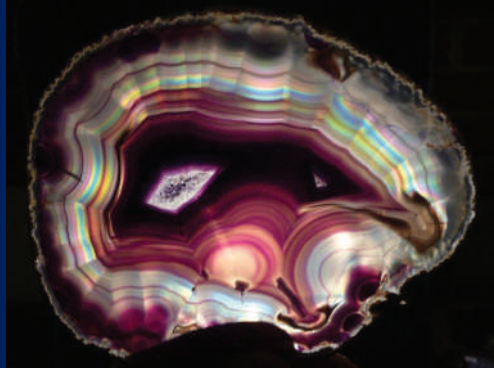
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# Gem-A Conference 2011

Sunday 6 November 2011  
The Hotel Russell, Bloomsbury



The 2011 Gem-A Conference will be looking at a variety of exciting topics, from gems and new media to the recutting of the ancient Koh-i-Noor. With a range of events on the days surrounding the Conference, be sure to book early to guarantee your place.

The Conference will be held at the Hotel Russell, 1–8 Russell Square, Bloomsbury, London WC1B 5BE, from 9:30 am to 6:00 pm and will be followed at 7:30 pm by a dinner/disco.

The programme will include talks from:

**STEVE BENNETT, UK**

GemsTV: The market and the media

**BRIAN COOK, USA**

Original 'Paraíba' tourmaline: legendary gem, unique occurrence

**BRANKO DELJANIN, CANADA**

Screening and identification of enhanced and synthetic diamonds on the market today

**ALAN HART, UK**

Re-creating the 'Mountain of Light':  
A modern evaluation of the original Koh-i-Noor diamond before re-cutting

**BRIAN JACKSON, UK**

Optical phenomena in gemstones

**ADOLF PERETTI, SWITZERLAND**

Distinguishing natural Tibetan copper-bearing andesine from its diffusion-treated counterparts using advanced analytical methods

**GARY ROSKIN, USA**

The blues brothers, or not: comparing the Hope and Wittelsbach diamonds

## WORKSHOPS AND EVENTS

### SATURDAY 5 NOVEMBER

2:00 – 5:00 pm

**The identification of synthetic diamonds and diamond types using UV, microscopy and the polariscope with BRANKO DELJANIN**

Branko's presentation will be followed by a two-hour practical session during which participants will be able to examine samples of type Ia, IIa, IIb and Ib diamonds (of natural, treated or synthetic origin), using the techniques described under expert tuition.

### MONDAY 7 NOVEMBER

10:00 am – 1:30 pm

**Optical phenomena with BRIAN JACKSON**  
With a range of gemstones available, this hands-on workshop will allow attendees to explore and test for optical phenomena in gemstones.

2:30 – 5:30 pm

**Snap decisions: photographing gems under less than ideal conditions with GARY ROSKIN**

In this seminar Gary will pass on his tips and tricks and explain some of the gems and gemmology that made him make that snap decision.

6:30 – 9:00 pm

**Graduation Ceremony**

Graduates will be presented with diplomas and prizes gained in the 2011 Gem-A examinations.

### TUESDAY 8 NOVEMBER

10:00 am – 12:00 midday

**Natural History Museum with ALAN HART**  
Alan will take delegates on a tour of the Mineral Gallery, giving an exclusive look behind the scenes at the museum's new acquisitions, as well as discussing plans for the future development of the collections.

3:45 – 6:00 pm

**The Crown Jewels with DAVID THOMAS MVO**

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

6:45 – 8:00 pm

**Gem Discovery Club Evening**

Details of the Club evening will be published on our website nearer the date.

Photo: Dyed iris agate © Trustees of the National Museums of Scotland.

For further information on the Conference and Events please visit  
[www.gem-a.com/news-events/events/gem-a-conference-2011.aspx](http://www.gem-a.com/news-events/events/gem-a-conference-2011.aspx),  
email [information@gem-a.com](mailto:information@gem-a.com) or call +44 (0)207 404 3334.

# Death of a salesman?

Harry Levy discusses the future of both the salesman and the Kimberley Process in the gem trade.



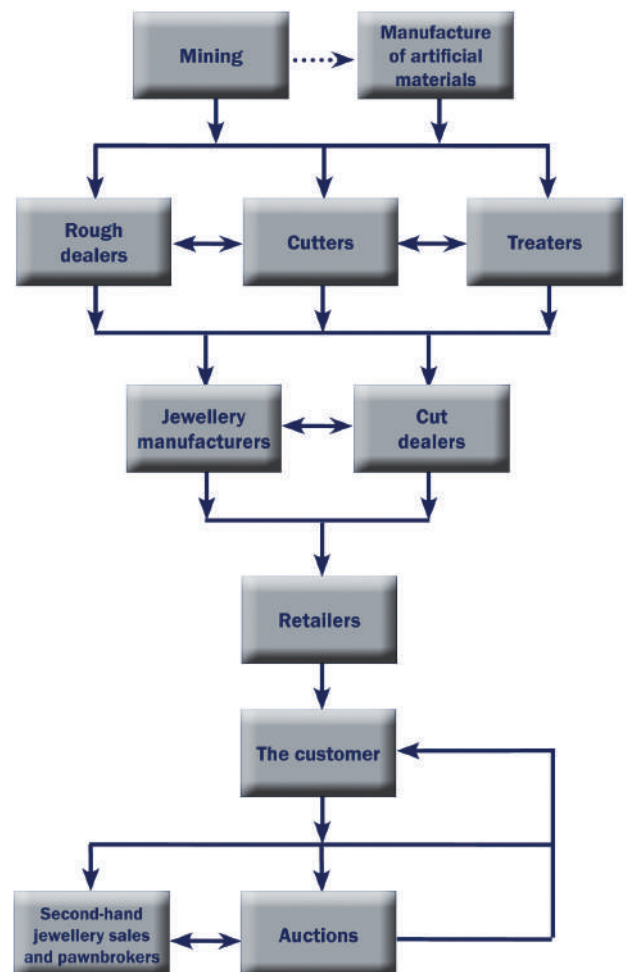
If you ask a UK diamond or gemstone dealer how he or she is doing in business, they will most likely answer that their figures are down. If you ask why this is so, they will say that the downturn is due to the drop in demand for jewellery from the consumer. If you talk to a retailer he or she will probably agree with all of these sentiments.

What most traditional retailers do not see is the sales being conducted through TV channels and the internet. Figures are hard to verify, but the overall sales of jewellery in the consuming countries have not diminished, and sales in the producing countries – particularly in the Far East in China, Hong Kong and India – are increasing almost exponentially.

So why is the dealer in Europe and America losing out? The answer is that he is being cut out of the production chain. Traditionally the jewellery production chain consisted of miners, rough stone dealers, cutters, polished stone dealers, manufacturers of jewellery, wholesalers and retailers. In past years people did not just 'jump' into this chain – if one did one would find themselves ostracized by their fellow jewellers. Trade shows, gemstone fairs and the internet have encouraged people to try and cut out the middle man. Retailers would bypass the wholesaler and manufacturer and go direct to a stone dealer, whilst cutters would go to the manufacturer or even retailer. In doing this they are reducing their costs as they are able to sell cheaper material, and can thus undercut their competitors.

This all sounds very well and good – miners may think that if they could cut out some of those in the production chain that the amount of profit made all the way up the supply chain will reduce; the end-user will pay less and thus money would be released to buy more jewellery. Unfortunately we do not live in such an ideal world. If a retailer buys a stone from a dealer, the article produced will cost the dealer less had that piece been bought from a wholesaler. However, the retailer rarely passes all his savings onto the consumer, just merely increasing his or her profit.

Such an attempt was apparently made by De Beers, or the Diamond Trading Company (DTC), the seller of rough diamonds in the De Beers group. They argued that if they could bring together jewellery makers, large manufacturing companies and new designers to deal directly with their sightholders, then the price of diamonds sold to the end supplier would reduce. This would be pushed to the end user; more diamond jewellery would be sold and De Beers would therefore sell more rough diamonds. What actually happened was that sightholders and end producers were invited to a function so that they could meet each other. Sightholders, who were used to cutting and polishing stones and selling large parcels of often ►



Right: The route a gemstone may take from the mine to the customer.

## Around the Trade

### Death of a salesman (cont.)

#### Is the KP dying?

The pundits in our trade are all talking about the end of the KP: the Kimberley Process.

As most readers will know, the KP started over ten years ago, to counter rebels in a few of the African countries who were selling diamonds and using the money to purchase arms. The international community, Non-Governmental Organizations (NGOs) and the diamond trade got together and brought in a system of controls on the movement of rough diamonds from areas where there were wars, thinking that if the funding was stopped then the wars would stop. A total ban was thus advocated on Angola and Sierra Leone, where the problems originally began. However, this failed because the diamonds were then smuggled to neighbouring countries. As a result the system was applied to all African countries, but since the governments of these countries wanted the income from the export of diamonds, the system of Certification came in to separate those conflict diamonds from the legitimate stones. It was the governments and not the rebels that were involved in the negotiations, and so no questions were asked as to why there were civil wars, and the politics of the conditions in these countries were never discussed.

To tighten the process, the movement of rough diamonds between all countries came into the scheme and eventually even diamond producers in places such as Brazil and Venezuela had to adhere to the system to allow them to export their diamonds. The KP has limped along with minor blips until diamonds were found in Marange in Zimbabwe a couple of years ago. These were alluvial diamonds found on or near the surface and were first collected by the local population. The government became aware of these finds and sent in the army, resulting in many of these 'miners' being imprisoned, tortured and killed. The NGOs were again at the forefront of exposing these human rights violations, and so the KP put a ban on the export of diamonds from Marange. The



Zimbabwean government, who are in the KP already, has been fighting this ban. The ban was temporarily lifted last year, but was re-imposed when Zimbabwe did not adhere to the conditions laid down by the KP. The issue is still not resolved, despite KP Chairman Mathieu Yamba demanding that the ban on Marange exports be lifted during the Kimberley Process talks in June. Members failed to reach a general consensus on the issue, and so the export of Marange diamonds is still opposed by the European Union, United States, Canada and Australia, with India recently deciding to ban imports of these diamonds.

A new phenomenon has now occurred; normally African countries would help enforce any bans on offending countries, but have not done so on this occasion. The problem with the KP is that it was never designed to counter human rights violations, and thus Zimbabwe claims that there is nothing illegal in them exporting all their diamonds, including those from Marange. A solution was proposed to bring in a KP-Plus system, whose rules would rectify the omissions of the original KP, and countries such as Australia and Canada were in favour of this. This was seen as an attempt by these countries to separate their stones from those coming out of Africa, and so African countries

have been united in their stance of supporting Zimbabwe, thus declaring that the Marange diamonds are legitimate. To complicate matters, Israel was the Chair of the KP during 2010 and had tried to obtain an agreed compromise to allow Zimbabwe to sell their goods. Israel then passed the Chair onto the Democratic Republic of the Congo (DRC), who immediately and unilaterally declared all Zimbabwe goods to be legitimate and thus 'solved' the problem. The immediate reaction from the non-African KP countries was to declare that this decision is null and void and anyone importing diamonds from Zimbabwe would be blacklisted and possibly prosecuted.

This is the sad situation at present, with a widening schism between African and American and European countries. Is this the end of the KP? It should be, but then do we need a new version?

## Death of a salesman (cont.)

I think not. The KP was originally set up to prevent harm to native Africans. There have been no provable demonstrations that the KP has saved any lives. There have been wars in Africa and in the rest of the world for generations, without any need for diamonds. To prevent wars one needs political solutions, rather than cutting off means for fighting these wars. There will always be atrocities committed; diamonds are not the only method of gaining income. However, as recent exposures show, the money from conflict diamonds has gone into the pockets of dictators and war lords to enrich themselves.

Is there a solution? Again the answer is yes. We have looked at the harm diamonds can bring, but not at the benefits. De Beers brought in the notion of 'beneficiation'. This is a system whereby a greater portion of money that is given towards diamonds should be left in Africa to benefit the native population. This has been seen for many years. In Botswana, they use a portion of the profits from diamonds to improve the infrastructure of the country by building roads, schools and hospitals. Other African countries such as South

Africa now wish to have greater control of their diamond exports, to see that cutting industries are set up within the country, to increase the revenue from diamonds.

People like Martin Rapaport now pursue a system where a greater portion of profits from diamond sales is given to the miners and their families; he is calling for the introduction of 'fair' diamonds. Although Martin does support beneficiation, he believes that rather than taking more money out of the existing system, he is advocating adding a small premium when diamonds are sold, and that this money should go back to the native miners. He is trying to say that an end user would be happy to pay a slightly higher price if they are told that a part of the money goes back to the African communities involved. He is having problems in persuading the trade to adopt such a system, but it is worth mentioning that this too will be hard to monitor.

However, I think the KPCS will continue for a while yet, not because it works but because of a fear of admitting failure on the part of its creators.

unsorted diamonds, were suddenly confronted by a large number of new clients who wanted small quantities of very well-selected goods. To take an extreme example: the new client wants 24 diamonds of 1.50 mm, and a set of eight baguettes measuring 3.5 x 2.1 mm. The sightholder has never been confronted with such orders and does not have the skills or time to do this, but would nevertheless have to try to produce these sets. The story does not finish here; the client would come back saying that six of the 1.50 mm were not of the right size, that two others did not match in colour, and that four of the baguettes were not accurately measured. The sightholder soon realizes that he has to divert staff to deal with this and, at a later junction, hire new staff to cope with the diversion — very soon he or she has found that they have had to set up a separate department. The money for this has to come from somewhere, and so goods have to be sold internally to this new department because they in turn have to show a profit, and very soon the price charged to a manufacturer is no different than that charged by a dealer. The dealer has been brought in-house, so there was little or no saving made inside the chain.

In the coloured stone industry, retailers and manufacturers go to the cutting centres and gem fairs and report back that they can often buy those same goods from the dealers back home at similar, or even lower, prices than they are being asked for abroad. When one looks more closely at this it appears that stone cutters now differentiate between selling wholesale and retail. A stone dealer buys wholesale because he tends to buy larger quantities and a greater range of goods. The manufacturer is much more specific in his demands; he is often unaware of prices and is thus charged more. Having been to the Tucson gem show over the years I have found a steady increase in prices. I knew that the show was for the trade for the first week or so, but that it would then open to the public for a few more days, where much higher prices would be charged. Part of this was due to

American taxation. I asked one of my suppliers for prices, and found that the list prices he showed me were much higher. He said that if I wanted the trade prices I should go to the Hong Kong or Bangkok shows, where he sells his stones cheaper.

The largest international coloured stone grouping is the International Colored Gemstone Association (ICA, see pages 18–19 for a report on the latest ICA Congress). This was set up to be open to miners, stone cutters and dealers, and like all associations it needs to increase its income to survive. The obvious way to do this is to increase the membership coming through manufacturers and retailers. However, the dealers have been fighting this move as it will put their suppliers and customers into contact with each other. So far they have succeeded; I understand that in the Congress held in Brazil earlier this year they managed to out-vote those who wanted to open up the Association.

I wonder how much longer stone dealers will survive. They are an essential part of the production chain; they hold a wide range of stones which they can offer their customers, as well as taking a huge slack out of the cutters' production because they buy those stones which the cutter would be left with if he sold his stones more selectively. Most cutters, after flirting with retailers and designers, now turn them away and suggest they use their dealers back home.

However, we still have the retailer who goes to Tucson to buy a piece of rough, has it cut and polished, casts his or her own mount to set it, and then finds that the rough did not produce the stone that the retailer hoped to get and is left with it as 'stock'.

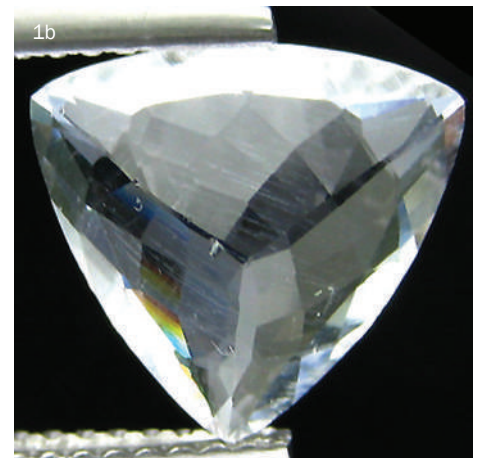
And, speaking of survival, there are now those who talk of the death of the Kimberley Process and Kimberley Process Certification Scheme (KPCS).

Harry Levy



# Mythbusting mineral

Kerry Gregory employs hands-on gemmology to investigate a mystery gemstone.



1: Images showing the top view (a) and back facets (b) of pollucite, highlighting the colour, transparency, low dispersion, slightly greasy lustre, polishing lines and chip.

After hearing Dominic Mok's talk at the Scottish Conference about the rare gem material tested in the AGIL laboratory named pollucite (a singly refractive material in the range of 1.5 to 1.7 which is not glass; see pages 12–13), I knew I had to possess one. I emailed a dealer I often use in Thailand for rare and unusual stones and enquired if he had any – I also needed a few other stones to test out Darko Sturman's new technique for the refractometer (see *The Journal of Gemmology*, **32**(1–4), 74–89).

The moment I received the parcel I inspected my pollucite: a 3.43 ct, transparent, colourless, trillion-cut gemstone, that looked just like a piece of faceted glass (1). Never having seen pollucite before (and in fact not knowing it existed until the Scottish Conference), how did I know that I had what it said on the invoice? By now I am fairly confident of knowing what glass is, but what is pollucite?

While waiting for the stones I had conducted some research and compiled a spreadsheet, using my favourite data sources (My bible – *Gems* by Webster – and [www.mindat.org](http://www.mindat.org), amongst others). Mindat, run

by Jolyon Ralph, is particularly useful when dealing with both unusual minerals and common gemstones, as it has the benefit of having things like 2V angle listed as well as standard gem data.

Pollucite was discovered in 1846, in Elba, Italy, and named after Pollux (the twin brother of Castor, both figures from Greek mythology and now immortalized as the constellation Gemini), due to its common association with castorite. It is an extremely rare mineral – a silicate of aluminium and caesium – and contains the rare alkali metal caesium as an essential constituent. As with many minerals containing rare elements it is often mined for the purpose of extracting the caesium content. It is a mineral that crystallizes in the cubic system – not rare in nature, but is rare as single crystals. In 2008 it was also found occurring as a monoclinic variety. Pollucite is almost always colourless, it has a hardness of 6.5 on the Mohs' scale and has a vitreous lustre (although not quite as high as quartz) which may be slightly greasy or waxy. It does not display any cleavage, has sub-conchoidal fracture and is fairly brittle. The RI data of the stone



## Hands-on Gemmology

varies depending on the source and, as mentioned, ranges from 1.508 – 1.528, it is singly refractive with a low dispersion of 0.012. The specific gravity ranges from 2.85 – 2.94. Mineral inclusions found in pollucite are apatite, elbaite and quartz, and can also include chalcedony with a snowflake appearance under magnification. Pollucite is found in Elba, Brazil, Afghanistan, Zimbabwe, Namibia, USA and, fairly recently, Pakistan, which may explain why it did not appear too difficult to obtain.

Looking at the supposed pollucite with the naked eye, it was very transparent with little light being reflected back to the eye by the stone, and little or no fire, so my first assumptions were a stone with low RI and low dispersion. Two non-optical properties I noticed were that the stone felt warmer than I would expect of a gemstone, and seemed to get greasy quickly when handled. With a 10x lens the first thing noticeable is how many polishing lines there are all over the stone (2), and that it has quite a soft appearance, which may contribute to the slightly greasy-looking lustre. There was a small chip on the keel of the stone, which displays a conchoidal fracture. The good news was that I could see no bubbles or the usual swirly interior expected of glass. However, a small included area at the back of the stone contained a few minute inclusions that appeared to be crystalline, as well as a fine liquid-filled fissure, although difficult to say with any degree of certainty at this magnification. Under crossed polars on the polariscope the stone showed a singly refractive reaction with a very small amount of strain present, nothing like the 'writhing snakes' often seen in glass. When tested with the refractometer, there was a single constant shadow edge at 1.518. I found no discernible spectrum.

Under both long wave ultraviolet light and shortwave ultraviolet light the stone remained inert, and although a lot of older data states that pollucite fluoresces orange/pink, a lot more recent research has shown the material to be usually inert with the occasional pale yellow fluorescence in shortwave ultraviolet light. The most exciting find however was a two phase inclusion,



seen under 70x magnification on the microscope, proving that the stone was of natural origin (3).

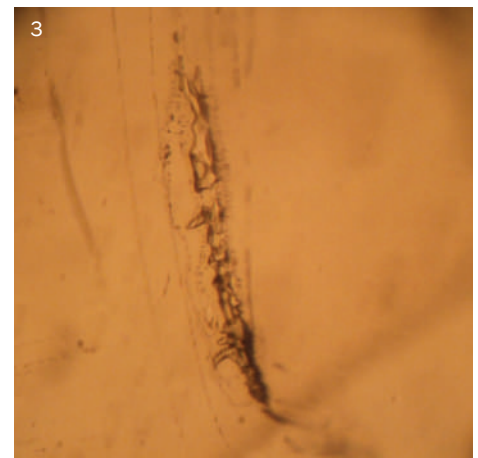
I also tested the SG of the stone using a carat balance, bent paperclip, bridge and plastic pot of boiled water with a drop of washing up liquid in it. Weighing the stone in air it was 3.44 ct and in water it was 2.26 ct, giving me an SG of 2.915.

Having fully tested the stone to the best of my capabilities (and without having access to any laboratory equipment), the appearance, inclusions, RI and SG all add up to pollucite. I could double check by boiling it in hydrochloric acid, or I could carry out a flame test. However, as I would rather not destroy the stone, I think I will leave my testing there! While researching the material I asked if Gem-A had one I could look at, but they did not, and so I will donate this one to them. If anyone reading this has a look at the stone and disagrees with me please let me know so we can all continue to learn.

### Acknowledgements

Thanks to John Sawyer of Studley's in Wells for letting me use his microscope and UV equipment, and also to Peter Cheer for help with the images.

All photos © Kerry Gregory.



2: The conchoidal fracture, polishing lines and several small inclusions in the pollucite sample, viewed using 10x lens.

3: Close up of two-phase inclusion, seen at 70x magnification.

### About the author

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

## Recent Events

# Imperial purple

An evening of Zambian amethysts and specimen emeralds with Cyrille Djankoff.



Cyrille Djankoff, a French national, has over 20 years' experience in gemstone mining and marketing in Mozambique, Brazil, Tajikistan and Zambia. He is on the Board of Directors of Zambia-based Kariba Minerals, who provide over 90% of Zambian amethyst, as well as running the collectors' emerald specimen side of Gemfields PLC, a partnership between UK based Gemfields and Collector's Edge Minerals Inc. — a specimen mineral dealer based in Colorado, USA. Cyrille holds a BA in computer science and is a gemmology graduate of L'Institut National de Gemmologie in Paris.

Cyrille Djankoff opened his talk by explaining his background in the gem world. Aged 18, he travelled to Mozambique on holiday and ended up staying for many years. He began dealing in gems there, initially swapping stones for other basic commodities, as well as visiting extremely remote regions where he would get involved in the local mining. Cyrille experimented with colourless Mozambique beryl, finding that a combination of heating and irradiation could provide a brown colour at first, eventually changing to a good 'morganite' pink. His gem interests also took him to Tajikistan where he was one of the first Europeans to visit the high-altitude Kuh-i-Lal mines in 1998; the source of the famous Badakhshan 'balas rubies' — red spinel. These mines are best known to many for having produced the large red spinel known as the 'Black Prince's Ruby', set in the Imperial State Crown in the British Crown Jewels. He also reported seeing particoloured red/blue corundum in Tajikistan — crystals that were half ruby and half blue sapphire, with a clean boundary

between the two, from Snejnaya ruby mine in the Pamir mountain range.

Having spent some time in Brazil (where he noted that regulations and relatively high salaries made gem mining uneconomic), Cyrille eventually decided to take a break from gems to "refresh his mind", and so returned to Paris to complete his education, graduating with a degree in computer science. After a brief period working in computer security, he moved to London and started work with Gemfields Plc and Kariba Minerals.

Cyrille's explanation of the ethically produced mineral specimen side of Gemfield's mines provided an interesting insight into a segment of the trade alien to most gem dealers and gemmologists. There was great skill in recognizing the 'specimen' potential of an initially unprepossessing lump of matrix with, perhaps, minimally exposed crystal. There was even greater skill in cleaning and preparation. This is an area in which Collector's Edge Minerals Inc. is the world leader. The work of removing



1: A selection of cut and polished Zambian amethysts.



## Recent Events

unwanted matrix and other inclusions and associated minerals is painstaking, involving mainly mechanical techniques, including ultrasonic tools and techniques developed by Collector's Edge. The exposed crystals are only valuable if they are essentially perfect; at least one original termination is needed and any breakages or chips caused during cleaning and preparation detract hugely from the specimen's value. Such preparation also involves experienced aesthetic judgement, with the final shape, the amount of any retained matrix, the crystal orientation and the overall proportions all contributing to the specimen's desirability and thus price. Cyrille also warned of the fakes, repairs and other modifications that blight the mineral specimen trade just as they do the gem trade.

Cyrille then focused on the topic of the evening: **Zambian amethysts (1, 2 and 3)**. Zambia is the largest source of amethyst in the world, whilst Kariba Minerals is now the largest single amethyst producer in the world. The amethyst, first discovered by an Englishman in the 1950s, is formed hydrothermally and found in a huge network of large, surface-reaching veins and cavities (3). The amethyst has high iron and manganese levels, but it is unclear where this originates from in geochemical terms. The Kariba amethyst is not found in geodes as in Brazil. A conservative estimate is that there are reserves of some 1.5 million tons of amethyst in the area. Nevertheless, when Cyrille took over the running of Kariba in 2009, amethyst prices had been flat for a decade and the mine hadn't been making money. This soon changed. Currently, 95% of the amethyst Kariba produces (some 100 – 120 tons per month) is exported to a Chinese distributor who then passes it on to other Chinese companies. The other main market for Kariba is India, which takes mostly higher grade material, but some is also exported to Europe and America. Some fine-quality amethyst is imported by China, but 90% of the Kariba amethyst entering China is destined for the bead market where the crystals, simply trimmed or 'cobbed' in Zambia, are mostly cut into cubes and machined to spheres before being drilled ultrasonically and polished or (increasingly)



2: Rough amethyst crystals.

faceted. The beads are then exported internationally. The best markets for the finest qualities are Japan and Korea, USA and Europe, the lower grade beads being distributed in Eastern Europe and Russia, with some even being sold back into Africa. The lower quality rough used in the bead industry usually sells for some \$1.20 – \$2 per kilo, but there are even poorer qualities at half this price; the finest amethyst rough can often sell for \$2000 a kilo. The cheapest Zambian amethyst is as cheap as synthetic material; Russia is no longer producing synthetic amethyst, but some is produced in China. Cyrille estimated that about 10% of the amethyst currently on the market is probably synthetic.

During the evening Cyrille provided samples of Kariba amethyst rough, emerald specimens and Mozambique morganite for participants to examine.



3: Amethyst veins in gneiss.

J.O.

All photos © Dr Rossitsa Vassileva and Cyrille Djankoff.

### Further information

For more information and photographs see [www.collectorsedge.com](http://www.collectorsedge.com), [www.karibaminerals.com](http://www.karibaminerals.com), [www.gemfields.co.uk](http://www.gemfields.co.uk) and [www.emeraldspecimen.net](http://www.emeraldspecimen.net).



## Recent Events

# Great Scot!

Kerry Gregory reports on the 2011 Scottish Gemmological Conference held in Perth, from 29 April to 2 May.



Delegates listening attentively to David Callaghan's talk at the 2011 Scottish Conference.

**The Annual Conference of the Scottish Gemmological Association (formerly the Scottish Branch of Gem-A) was held this year in the Queen's Hotel, Perth. As always, the conference was a mixture of fun, friendly, informative, relaxing and tiring. Having grown from its much smaller beginnings when it was attended by a handful of like-minded Scots, this is now a very highly regarded international conference, with delegates attending from all around the world, including USA, Canada, China, Norway, Hong Kong and even England.**

The Friday evening kicked off with an official welcome reception for old and new friends to get acquainted, although an official welcome was not needed – the welcome starts as soon as you arrive, whether you are met at the reception or at the bar, the welcome is always warm.

## The love of stones

We were eased into the conference programme with a talk discussing the link between art and mineralogy. Professor Marcia Pointon, author of *Brilliant Effects: A Cultural History of Gemstones and Jewellery*, gave a talk entitled 'The love of stones: mineralogy, art and education in nineteenth-century Britain'. Professor Pointon showed us how, in the nineteenth century, the developing study of earth sciences had a great effect on people's understanding of the world, and in turn affected how artists depicted geology and mineralogy in their work.

We see earlier artists such as Claude Lorrain attempting to 'improve' on nature, using exaggerated rock formations as a backdrop for compositions. Lorrain was convinced that "taking nature as he found it

seldom produced beauty", whilst later artists such as John Ruskin (who had a greater understanding of the world and indeed a passion for nature), tried to reveal nature through accurate observations of it. Indeed, a contemporary of Ruskin, John Brett, painted with such attention to detail that rocks can be rudimentarily identified by the cleavage and fracture features depicted.

The talk ended with 'Pegwell Bay' by William Dyce, in which Professor Pointon drew attention to the ways in which human time, geological time and astronomical time are all present in a scene showing the artist and his relatives collecting shells and stones beneath a sky in which Donati's comet is visible.

## A gem of a birthday present?

After an informal dinner on the Friday night and a hearty full Scottish breakfast on the Saturday morning, Dr Karl Schmetzer had no problem in waking everyone up with his first talk on alexandrite. Both of Dr Schmetzer's talks were a result of more than three years of intensive research, studying alexandrite samples from the Urals. The vast amount of research that went into the project has now been published in a book (Schmetzer, K., *Russian Alexandrites*, Schweizerbart Science Publishers, 2010).

The research covered historical production, studying data and stone samples from eight museums, including those in St Petersburg and Moscow, along with stone samples from recent production, where the mine had been worked by a Canadian company (Tsar Emerald Corporation) until 2008, when the licence was revoked (this was after significant investment on Tsar Emerald's part, which provoked a dispute that is still ongoing.)

## Recent Events

In his first talk, 'A gem of a birthday present? – The history of the discovery of alexandrite', Dr Schmetzer told us an intriguing story involving politics, princes and possible theft, as well as propaganda and marketing that some modern retailers and stone dealers would be proud of. It is as close to the true story of the discovery and subsequent naming of alexandrite as we are likely to get – a story worthy of Agatha Christie, but backed up with solid research, factual data and documentary evidence. For many years it has been believed that alexandrite was first discovered on the coming of age of Tsarevich Alexander on 17 April 1834, and that this fine stone that changed from purplish red to green (the colours of the Russian military) was named for him. The truth, however, is that alexandrite was discovered at least six months before this.

The first published crystallographic description of 'alexandrite' by Gustav Rose in 1839, described a cyclic twin, depicted as a chrysoberyl showing a colour change. The chromium content of the stone was noted as was its potential as a gemstone. The first published mention of the name 'alexandrite' was in 1842 by Franz von Wörth *et al.*, in the *25th Anniversary Volume of the Zapiski RMO (Proceedings of the Russian Mineralogical Society)*, a volume produced to coincide with the twenty-fifth wedding anniversary of Tsar Nicholas (an ego boost in exchange for much-needed funding). The description was mostly concerned with the colour change, but did mention that the name was suggested (by Gustav von Nordenskiöld) in honour of the Crown Prince of Russia, the future Tsar Alexander II.

It appears that the source of the first research samples of alexandrite (the samples that were studied and written about by both Rose and Wörth, as well as other scientists such as Brewster, Berzelius and Nordenskiöld), were provided by Count L. A. Perovski (a wealthy and avid collector of minerals, after whom the mineral perovskite was named in 1839). Perovski, Vice-President of the Imperial Appanage department, did not reveal his source but simply referred to "stones from the Urals" or "from my collection".

However, from looking at correspondence written at the time between Yakov Kokovin – head of the Ekaterinburg lapidary works and in charge of emerald prospecting and mining in the Urals – and Prince Gagarin, it can be proven that he sent samples of this new material to Perovski. In Kokovin's letter he detailed the relative high hardness – close to that of corundum – and also the colour change in daylight and incandescent light, and so it cannot be mistaken that these are the alexandrites in question. This letter was sent in late 1833, six months before the birthday of Tsarevich Alexander. Although this unfortunately disproves the legend of the naming of alexandrite, Russians (and others) however still say "It is a great story, and we love it."

## Update on Gem-A

Lorne Stather, Gem-A's Director of Education, gave us an enthusiastic and positive update on the recent and planned developments at Gem-A which the past strong financial year has enabled. Lorne began by stating that the primary purpose of Gem-A is, as always, education; specifically keeping the passion and interest in gemstones going, with the particular objectives of encouraging the gemmologists of the future and moving the Association firmly into the twenty-first century.

With regard to education, the focus is on producing new Diamond Diploma course notes – provisionally scheduled for next March. Gem-A is also concentrating on translating existing Gemmology course notes into French, Japanese and Chinese, to encourage the growth of overseas students. Also scheduled is the creation of new online courses to improve accessibility to gemmological education, and to encourage new people into the gemmological community. Moving Gem-A into the twenty-first century involves updating computer systems so that the website can be improved with a view to creating a more user-friendly interface, including blogs, online discussions, additional online resources and member services. Work is also in progress to make available online every back issue of *The*

*Journal of Gemmology* to further aid online research.

Lorne also took the opportunity to thank the staff and the many others who continue to solidly support Gem-A, such as tutors, examiners, ATCs and regional branches. She reiterated the importance of affiliate organizations such as the SGA, and how sharing information and resources between organizations is absolutely key to the future of gemmology.

## Specific gravity

No Scottish conference would be complete without Alan Hodgkinson bringing us back to basics by reminding us of the importance of using our testing equipment to its full potential. This year specific gravity testing was the subject of his talk.

Specific gravity or density determination is very much on the wane nowadays; Alan believes that the safety rules over the use of heavy liquids are a contributing factor to this; they are increasingly difficult to obtain due to issues with shipping and taught far less in gemmology because of problems of handling and storing. This means that many modern students have never had the opportunity to use these liquids. Even the 'harmless' ways of testing specific gravity have been pushed to the back burner of practical gemmology due to a number of factors – mainly time constraints. The affordability and accuracy of modern day refractometers (as well as other equipment) has overtaken the use of SG testing.

Nowadays it is frequently the case that there are quicker and more logical tests that can be carried out rather than SG tests; for example, a large quartz crystal can be identified quickly and simply by its morphology or by a bull's-eye interference figure on a polariscope, rather than by the long-winded process of obtaining its SG.

However, Alan showed us that there are many times when SG determination can be of great use, and demonstrated to us how it can be used for great practical benefit, rather than concentrating on the drawbacks of this avenue of testing.

An example of the benefit is through the use of a glass pycnometer. To use, fill

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### Great Scot! (cont.)

the pycnometer with distilled water, insert the stopper and weigh (a), weigh the stone separately (b), then simply insert the stone, place a stopper in the bottle and dry off any escaped water, then weigh again (c). Use the formula  $SG = b / ((a+b)-c)$  to give a very simple way of calculating SG without the need for calculating volumes of stones. Please note that this is a simplified version of how to use the equipment and that care must be taken to fully dry all parts between steps.

Lastly, Alan went through the observations and further benefits that can be gained by those of us willing to use heavy liquids, despite the hurdles of Health and Safety. Not only can we ascertain the approximate SG of a test substance, but by using glass control markers with known SGs and diluting liquids to produce a greater range of SG liquids, we can narrow it down even further. Other observations such as how quickly a stone stops moving when the liquid is stirred, or how slowly it sinks or bobs to the surface, can give a very accurate idea of a stone's SG. This process can be used to help identify treatments in jadeite — type A jadeite has an SG of around 3.30, but polymer

impregnated jadeite (type B) may have a lower SG. Using methylene iodide (SG 3.33), we can see that type A and type C sink, and that type B floats. If glass control stones of SG 3.36 and 3.27 are added and the solution is stirred we are able to see which stops rotating the quickest, thus being able to compare the jadeite to the control stones to further analyse the SG.

Another example uses a synthetic moissanite (SG 3.22), a diamond (SG 3.52) and a CZ (SG 5.52) in methylene iodide (SG 3.32). If stirred, the stones move round in the liquid. Upon cessation of stirring, the CZ with the highest SG of 5.52 stops almost immediately, whilst the diamond stops much more slowly. In contrast the synthetic moissanite floats. A secondary use of this test is to look at the relative optical relief of stones in such liquids.

Lastly the presentation showed the workings of the Hanneman beam balance, otherwise known as a SG instant determination balance. This was also the subject of two workshops which allowed the participants to yield the SG of a quartz, followed by an unknown gem.

### Red tape

In an impromptu yet impassioned speech, Adrian Smith, founder of the Association of Independent Valuers and a Scottish Conference sponsor, explained the Government's recent proposal to scrap hallmarking legislation in an attempt to cut down on red tape. The audience were implored to visit the Red Tape Challenge website and register our disapproval at the proposal; one which Adrian felt would have a seriously detrimental effect on the UK jewellery industry. His sentiments were certainly echoed throughout the audience, with much nodding of heads.

### Testing precious gemstones in Hong Kong

Dominic Mok, self-confessed "workaholic gemmologist" and founder and principal gemmologist of the Asian Gemmological Institute and Laboratory, gave us an interesting insight into the everyday workings of a busy and well-respected laboratory in Hong Kong — one of at least 20 laboratories in the territory. The work is varied in terms of the type of stones they see (contrary to popular belief, it is not all jadeite) and also to what is being asked of them. Often clients ask for reports to be verified — there aren't only 'fake' stones around but also fake documents. Often the jobs you turn down are more important to the survival of your business than the ones you accept — the laboratory will not give a report on anything they cannot prove, and if there is the possibility of disagreement about the result on a stone it is often better to let the business go elsewhere than to risk producing a report.

It is an expensive business equipping a laboratory — it is not enough to use only standard gemmological equipment; customers need to feel that they are getting value for money and so complex laboratory equipment has to be used. To be a major competitor you have to have equipment such as energy dispersive X-ray fluorescence (EXDRF) spectrometers, UV-Visible spectra, Raman spectra, cathodoluminescence testing tools and more. Frequently the



Alan Hodgkinson (left) and Dominic Mok (right) addressing the audience. Photo Andrew Fellows.



## Great Scot! (cont.)



Intense apple green Fei Cui jadeite pendant.  
Photo Dominic Mok, AGIL.

equipment is used for more than its primary purpose; e.g. the DiamondSure machine can be used to test jadeite – the 437 nm line in jadeite can be broad and can be picked up by the machine looking for the 415 nm line in diamond, thus the jadeite ‘passes’. As well as multiplying the uses for specialized machines it is also increasingly important to look to other industries and sciences to see if we can utilize alternative equipment; for example, an electron microprobe that was originally used to detect the SARS virus is used in the laboratory to test gemstones. Time is also a factor – often stones that come to the laboratory for testing have to be completed on the same day, not just because the clients don’t have time to leave them, but because the insurance on such stones is too expensive to keep them in the laboratory.

Dominic stated he feels lucky to see the stones he does on a daily basis, and enjoys passing on details of interesting and unusual stones to those who may not have the opportunity to see them. Recent stones that have been through the laboratory include a 10 ct untreated Burmese ruby valued at £150,000, a 50 ct Santa Maria aquamarine, a 27 ct clean blue apatite, a

94 ct yellow orthoclase feldspar and a 10 ct sugarloaf Sri Lankan sapphire. In terms of diamonds Dominic has seen a natural type IIA, D colour, flawless diamond of 13.10 ct, valued at £2 million, and a 2.12 ct fancy intense blue diamond, valued at £440,000 (interestingly the stone was a marquise cut and a semi-conductor across the width of the stone only; no conduction was seen across the length).

During Dominic’s talk he taught the audience two very important pieces of information; firstly, that there is at least one naturally occurring singly refractive mineral used as a gemstone in the RI range of 1.5 to 1.7; the laboratory tested a transparent (almost colourless) singly refractive material with a RI reading of 1.52 and an SG of 2.65 – a material which was not glass but actually pollucite (see ‘Mythbusting mineral’, pages 6 – 7), proving that there are always exceptions to our gemmological rules of thumb. Secondly, much of the material classed as jadeite is a rock mix of jadeite, omphacite or kosmochlor. Laboratory equipment such as a Fourier transform infrared spectrometer (FTIR), X-ray Fluorescence Analyzer (XRF) and Raman spectrometer can now positively separate those minerals which have very similar properties. In Hong Kong this high-quality ornamental material is often called Fei Cui (pronounced ‘fey choy’) and subdivided into type, i.e. Fei Cui – jadeite (pictured left), Fei Cui – omphacite. Dominic ended by saying that we always have new things to learn, and highlighting the importance of continuing our education so that we are not out of date.

## Market trends and other illusions from the trade

One of the greatest things about the Scottish Conference from my point of view is how well the subject matter is balanced; science and practical demonstrations mixed with beauty and, dare I say it, trade, is just right. The final speaker on Saturday, Stuart Robertson, Research Director for Gemworld and *The Guide*, gave us an insight into how new deposits, treatments, economy and market trends influence the value of gemstones.

Stuart began with the economy – the state of which we are all too familiar with. One of the major economic factors currently affecting the gem industry is the recent weakening of the American dollar, contributing to perceived higher prices in all stones. In addition to this, a reduced supply of stones (due to mining operations closing or scaling down to cut costs) keeps prices firm, as dealers know that their inventory cannot be replaced. Both the US and European economies are still in recovery whilst the Far East is stronger – the Chinese market is influencing prices even more so than in the past. However, it seems that things have started to improve in the West – mining operations are starting to open again and trade is gradually picking up. Those retailers who have spent the last two years selling inventory without replacing it may get a shock when they come to buy again at increased prices.

Specifically, Stuart commented on the many dealers and retailers putting their money into ‘safe’ stones. Blue sapphire is still the number one seller, with very strong prices for fine ruby, whilst prices are also increasing for fine emeralds, particularly Colombian and Zambian material. The ‘untraditional’ gemstone market has been slowed somewhat, although the number of people seeking cheaper alternatives to ‘expensive’ gems has increased the prices of certain stones: for example, red tourmaline and spinel as substitutes for ruby, whilst others are sourcing apatite and zircon instead of Paraiba tourmaline. Fancy sapphires (except very fine pink and yellow stones) have shown a decrease in price and demand, whilst tanzanite (after a weak two years) has started to pick up again. Spinel in colours other than red are in good supply with a stable price.

The increase in scope and quantity of treated goods has served to push up the price of fine untreated goods – demand is far outpacing supply of these materials. In addition to this, the lack of disclosure across the board increases demand for natural stones. The biggest challenge we face at the moment appears to be coatings; GIA are seeing more coated stones than ever before and the technology for this treatment is

## Recent Events

### Great Scot! (cont.)



Treatments add value to a gemstone. Seen here are beryllium treated sapphires averaging 0.50 ct. Photo Stuart Robertson.

improving all the time. For example, Serenity Technologies are doing many treatments with diamond-like carbon coatings. Coatings are now used to improve colour and also lustre. Frequently it is the lower-priced stones that are coated. These stones do not get sent to the labs and so such treatments can slip through the net, particularly as many of the newer coatings do not show the tell-tale iridescence.

It is worth checking any small pink diamonds you come across, as there appear to be lots of pavilion-coated pink melee diamonds on the market. Oiling is now common in ruby, Paraíba tourmaline, alexandrite and amethyst – in fact any gemstone with surface-reaching fractures.

The common illusions about gemstone treatments are (a) that treated stones are worth less than untreated stones, and (b) that treated stones are therefore a problem. Stuart is of the opinion that this is not the case; why would anyone bother to carry out a treatment to devalue a stone? Treating is carried out to add value to material. For example, corundum accounts for the largest proportion of the coloured gemstone trade. Fine-quality ruby and sapphires are rare whilst corundum is not – if we can treat corundum to look like fine ruby and sapphire we can therefore increase the value of the corundum product. However, this in turn can alter perception of how rare these stones

are, as well as alter perception of what to expect from the stones, and so in the end natural stones often cannot compete with treated goods. Therefore it is not the treatment of goods that is the problem, but the non-disclosure of treatments (pictured left).

Stuart concluded with the sentiment that now, more than ever, it is up to us all to educate ourselves and to keep up-to-date with treatments on the market. Also to ensure that wherever we are in the supply chain we guarantee that we are offering full and transparent disclosure for the protection of ourselves and our industry.

### Alexandrite: a special stone for experts, enthusiasts and connoisseurs

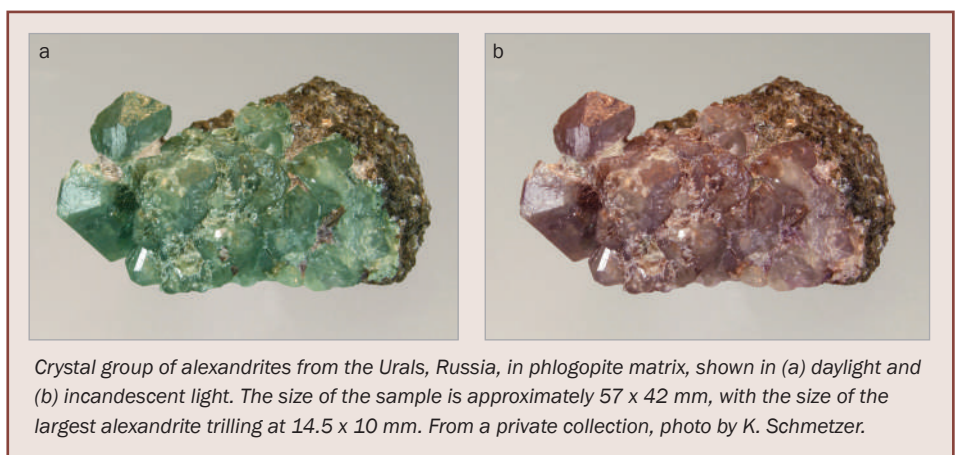
With the Saturday evening's festivities still fresh in everyone's minds, it was up bright and early for the continuing programme on Sunday. In the second of his talks outlining his research into alexandrite, Dr Karl Schmetzer concentrated on the gemmological and mineralogical properties of alexandrite from the Urals, and how these properties compare to stones of different origins found in a phlogopite matrix.

Dr Schmetzer explained that in the Urals (and in other phlogopite mica deposits) alexandrite generally occurs in locations with emeralds, and has in the past always been a by-product of emerald mining, with a ratio of approximately 200:1 (in favour of emeralds) in production. In the nineteenth century,

miners in the Urals were not happy to find alexandrite, because it meant that they did not then find emeralds – although they come from the same mica schist, they are not often found together.

Alexandrite from the Urals most commonly occurs as cyclic twins with a dipyramidal or even columnar habit, looking very much like our text book examples of chrysoberyl trillings. It is very rare to find simple single crystals. Typical inclusions are mica crystals, with the occasional small fluorite, whilst other inclusions are rare. The stone displays pleochroic colours; in daylight, green to greenish-blue colours are seen (see (a) below), whilst in incandescent light a bluish-grey to purple coloration is observed with the naked eye (see (b) below), creating a colour change from green or bluish-green in daylight to purple, purplish-red or reddish-purple in incandescent light respectively.

With a knowledge of the crystallography of alexandrite you can understand how best to cut it. Alexandrite is a very difficult stone to cut, not necessarily in terms of the physical aspect of cutting but the actual planning. The lapidary has to carefully consider the best orientation of the material that will produce the perfect balance of the biggest yield, the cleanest stone, the optimum amount of colour change and the most pleasing face-up colour(s), whilst taking into account the strong pleochroism, in order to get the best return from the rough. Often, one property will have to be sacrificed for another – e.g. choosing the orientation that gives the best green colour yet produces a poorer colour change, or choosing the



Crystal group of alexandrites from the Urals, Russia, in phlogopite matrix, shown in (a) daylight and (b) incandescent light. The size of the sample is approximately 57 x 42 mm, with the size of the largest alexandrite trilling at 14.5 x 10 mm. From a private collection, photo by K. Schmetzer.

## Recent Events

### Great Scot! (cont.)

#### Ceilidh

The Scottish Conference wouldn't be complete without the evening dinner and traditional Ceilidh to round up Saturday's talks. Guests enjoyed a delicious three-course meal, providing ample opportunity to catch up with old friends and to make new acquaintances. After dinner a raffle was hosted by the SGA, with prizes generously donated by several supporters. Once the tables and chairs had been pushed back guests were invited to join in the lively Scottish dancing, where Dr Karl Schmetzer proved himself to be a keynote dancer as well as the keynote speaker.



orientation that maximizes colour change, thus giving a poorer green. As with many things in life, with alexandrite you simply cannot have it all.

With regard to the colour of alexandrite, one of the main difficulties is that there is no standard colour wheel or nomenclature for describing colour. As with many other stones what constitutes an alexandrite is a matter of opinion; there is no set standard. In Karl's opinion, in order to be classified as an alexandrite the stone must have a pronounced colour change, must be chromium-bearing and the colour change has to show a red component; without these properties the stone is actually a colour change chrysoberyl (e.g. showing a colour change from green to yellowish-green). Sri Lankan material has a different colour change to that from the Urals, but since its discovery in the late nineteenth-century, has been accepted as alexandrite.

Alexandrites from other localities such as Novello Claims, Zimbabwe (discovered around 1960) have a similar morphology, displaying colour zoning and growth structures under a microscope, as well as containing mica platelets as inclusions. The colour change is from dark green (not bluish) to purplish-red, and has higher levels of chromium and iron. The colour zoning in crystals from this locality can help to determine origin. Crystals from Lake Manyara, Tanzania (discovered around 1970) occur as trillings, contact twins, interpenetrant twins and rarely also as single crystals. Occurring with emeralds, they commonly contain inclusions of mica, apatite and needles of unknown nature and have a colour change from green to purplish-red.

Production from Carnaiba, Brazil (discovered in the 1970s) is generally not of gem-quality, producing mainly only cabochon-quality gems or very small facetable crystals, yielding faceted clean stones below 0.5 ct.

In summary it is possible in many cases to prove the origin of alexandrite by looking at a combination of the properties; from the morphology of crystals, typical growth patterns and colour zoning to colour change, inclusions and trace elements. However, it is something that can only be done with a vast amount of both experience and research, and it is better to leave it to the experts — which Dr Karl Schmetzer has proven he most certainly is.

#### What a wonderful world?

The organizers of the conference are aware that after nearly two days of lectures, the last talk on the Sunday can often turn into a time when people sneak in a nap. In order to avoid this, the final speaker is traditionally one that talks on subjects that are not too scientifically taxing. There was no fear of people sleeping during David Callaghan's talk; as always he spoke effortlessly in a charming, humorous and captivating manner, and assured us that we could "switch our brains off and just look at pictures". We were treated to the "world exclusive" of his talk — 'What a wonderful world?', a marvellously narrated slide show of some truly exquisite pieces of jewellery that David has had in his possession over the years, chosen to showcase how jewellers imitate and represent nature in jewellery.

Many pieces used precious stones and pearls that needed little or no fashioning in

order to be used in jewellery, lending a very natural feel to the pieces created from these irregular-shaped stones. For example, David showed a red admiral butterfly made from a 45 ct Lightning Ridge polished opal with a natural baroque pearl set as the thorax of the butterfly. Using such unique stones can cause problems for a jeweller at a later date — what does one do if a customer loses one half of a pair of beautiful natural opals?

Lalique is a perfect example of a jeweller who used gemstones, not because they are expensive or to add value to the piece, but simply because they are beautiful and describe the natural subject that is chosen. Many stones that are classed as 'semi-precious' (a term I strongly object to) are used with stunning results in beautifully made pieces of jewellery — something that is often missing in later twentieth-century jewellery that is frequently mass-produced and where the goal is to cut cost, rather than create something of lasting beauty. A bee brooch made from citrine and enamel captures the colour of the insect perfectly without the use of expensive materials; it is the quality of the craftsmanship and Lalique's vision and use of gemstones that make it perfect.

Further illustration that fine quality workmanship and clever use of materials lead to things of beauty, was shown in examples of subjects that, traditionally, people are frightened off. Georges Fouquet frequently depicted terrifying subjects in his work, such as dragons. Other examples shown were a snarling wolf with red eyes — pavé set with diamonds in platinum with enamel. This had been made with such attention to detail that there was a little bolt



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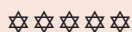
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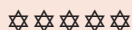
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inside to remove parts if they ever needed re-enamelling. In addition to this was a snake that had been made with a thicker middle, constructed in such a way that the necklace could be worn on the side of the neck and the piece balanced. We were also shown a “ghastly brooch”, which we were reliably informed was worn by an “even ghastlier woman”.

David also gave us a quick (and somewhat tongue in cheek) lesson in how to prosper as a dealer in fine jewellery. When buying, one must always start with a deep intake of breath when the price is mentioned, even if it is much lower than you were prepared to pay, and you must always pretend not to want something. When selling to a customer who comes in not knowing

what they want, a process of elimination must be used in order to help them find what they want, as long as it is the piece you want them to have. The human touch, the story that is brought to the jewellery, is what makes these talks so fascinating. For customers the story of the jewellery also makes it more fascinating, so it always helps to have a tale in order to sell a piece, being advised that even “if you don’t know one, think of one. The odds are they don’t know either!”

In addition to the two days of varied and relevant lectures, the Sunday afternoon gave guests the opportunity to attend two hands-on workshops each, where practical skills could be learnt in a more focused environment. Guests had the choice of the

following workshops: optical phenomena with Brian Jackson – an opportunity to study a range of gem materials at first hand and to examine and understand optical phenomena; diamond grading with Lorne Stather – a chance to be taught the fundamentals of diamond grading by Gem-A’s Director of Education; valuing coloured gemstones with Barbara Leal – using hands-on study to learn practical coloured stone assessment for valuing and buying coloured stones; specific gravity with Alan Hodgkinson – the use and benefits of the direct read SG balance as discussed in his lecture; and practical jadeite testing with Dominic Mok – viewing numerous jadeite samples to illustrate differing qualities and treatments.

### Field trip – Visit to view the collections of the National Museum of Scotland, Edinburgh

Brian Jackson, chairman of the SGA and curator of Mineralogy at the National Museum of Scotland, took a group out to view the collection of minerals and gemstones not currently on display in the museum. Usually, when the field trip is climbing a mountain or sitting on a rainy beach Brian has around ten people, so he was somewhat overwhelmed by the 40 or so he had to squeeze into the collection rooms.

There were many things in the collection that amazed me, the first being the range of Scottish minerals and gemstones. I was surprised at the size and quality of some of the gemmy crystals there – I know there are sapphires and aquamarines in Scotland, but I assumed before seeing the large and impressive examples on show that they would be small samples. The cut stones were equally impressive, making me want to go and find out what is on my doorstep in Wiltshire, although I think I am unlikely to find a large aquamarine, a deep blue sapphire or even a nice citrine.

It was strangely quiet in the collection rooms; an excited quiet punctuated by the occasional gasp or expression of surprise or wonder. I had to laugh however when a member of our group, ever the dealer,

raised the question “I wonder what they scrap at?” on spying a group of Scottish gold nuggets.

The area around the cut stones was busy, so I concentrated mainly on viewing the minerals. However, I did get a brief chance to have a look at some of them before I went. The stones were laid out in alphabetical order, and many of them untreated. There were stunning examples of most gemstones there – it always surprises me that no one has made them into jewellery and that there are incredible examples of gemstones worth thousands of pounds lying in a drawer. However, at least this way they are available for everyone to appreciate.

Looking at the minerals I am astounded by what nature produces; the crystalline forms and habits, the differences in colour, and even differences in SG. A great contrast was a piece of albertite (SG 1.097) next to a piece of hematite (SG 5.26), the difference in SG was immense – the albertite felt like a piece of polystyrene when lifted, in contrast to the very dense hematite. When looking at many of the minerals, it is hard to imagine how they could possibly be improved by man, and yet we still try.

Near the end of my visit I noticed a large vivid orange piece of Baltic amber found in St. Andrews, proving that both gemstones and gemmologists instinctively migrate to Scotland. I would certainly advise any gemmologists to do so for this conference, not only for the wealth of knowledge and gemstones available, but for the wealth of friends one can meet and catch up with.



*Agate with wall and horizontal banding and flakes of micaceous clay-like minerals. Photo Mary Burland.*



## Recent Events

# ICA Brazil Congress 2011



Jack Ogden reports on the 14th Biennial Congress for the International Colored Gemstone Association (ICA) held in Rio de Janeiro, Brazil.

Gem-A instructors and graduates from more than a dozen countries were participants in the 14th Biennial Congress for the International Colored Gemstone Association (ICA). Much has changed in Brazil since the ICA Congress was last held there in 1997 — Brazil now ranks as the eighth largest economy in the world, with sales for all gem and jewellery sectors totalling US\$6.5 billion in 2010 (\$2.8 billion of that was retail sales).

The first day of the Congress was devoted to discussing Brazil and its role in the coloured gem industry.

Brazil produces 100 different gem types; some 80% of this production is exported, but the remaining 20% is for the rapidly growing home market. It was explained that the Ministry of Mines and Energy had developed a 20-year plan focusing on 11 strategic goals, including strengthening the position of small and medium mining companies, adding value to mined gems (for example by developing the Brazilian cutting industry), and putting in place policies and programmes to support ethical and environmentally-friendly gem mining. The latter is of special importance as the industry is starting to look to the Amazon area for new sources.

The ethical and environmental issues were at the forefront of the rest of the discussions at the Congress. It was agreed that there were no easy fixes, but there were insights and success stories that highlighted how the coloured stone industry can better benefit all of the supply chain. Eli Izhakoff, president of the World Diamond Council, explained something of how the diamond industry had addressed the challenges of

'conflict diamonds', and that although the Kimberley process had not been the answer to all the problems, the aim for the gem industry should be to help "make a better life for the people who need it most dearly".

The challenges faced by the coloured gem industry are not that different to those of the diamond industry in theory, but diamonds are a single commodity with a largely mature supply chain. With coloured gems there are far greater challenges. As ICA Vice-President Jean Claude Michelou said, there is a large variety of coloured gems which come from a large variety of countries, each with differing cultures and standards. Of the world's coloured gem production, some 80% is undertaken by artisanal miners in third-world countries.

A responsible mining company is not a treasure hunter but an investor managing risks, but, as Marcelo Ribeiro (director of the Belmont Group emerald mine in Brazil) amusingly noted, in gem mining today more money sometimes goes into the ground than ever comes out of it. Sustainable and profitable mining requires proper geological surveys and feasibility studies, and a commitment to environmental preservation. These are obviously more viable for large mining companies, but small-scale mining operations can (and increasingly do) form co-operatives. Ribeiro's views were echoed by UK-based Gemfields plc, (who mine Zambian emeralds and amethysts) and whose CEO Ian Harebottle said that successful mining today was about being properly managed, with a focus on social and environmental issues. Gemfields sees a huge benefit in being transparent — "When you keep secrets,

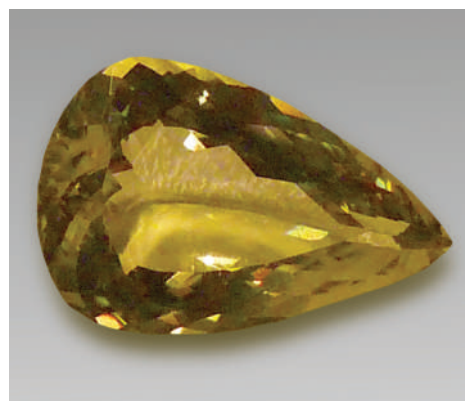
## Recent Events

the only person you're fooling is yourself." From a retailer's perspective, Steve Bennett (president of Color Rocks Limited and GemsTV, who have a strict disclosure policy and a commitment to ethical production) said: "The more you tell the more you sell." Bennett buys gems directly from miners whenever possible and has found that stories covering such aspects as safety improvements at the mine, mine certification issues, local mining community projects and information on miners, all resonate with consumers.

The wisdom of this approach is indicated by GemsTV's 2010 sales – 7.5 million gems, representing 287 different kinds from 31 countries. Bennett also echoed Jean Claude Michelou when he stressed that the improvement of ethical and environmental aspects of the industry must not regulate small miners out of business. He, like Gemfields, is working to create cooperatives to help small to medium mining operations bring goods to market via organized auctions at major trade fairs, to ensure fair trade and better exposure to potential buyers.

Speakers also noted the value of local education and training in gem identification and cutting, citing Madagascar as an example, with the establishment and successful growth of a gemmology and lapidary school which has been spearheaded by the country's ICA ambassador, Tom Cushman, using Gem-A's educational input.

However, there would of course be huge challenges in establishing systems to



Among the fine gems being shown by Ben Sabbagh Brothers was, appropriately enough, this 23 ct Brazilianite. Photo © Jack Ogden.



*How to do the right thing? At the ICA Congress in Brazil, gem dealers from around the world discussed solutions to the myriad challenges raised by ethical and environmental issues. © Jack Ogden.*

document the origin of a coloured gem and to establish a 'chain of custody' record for it up through the supply chain. Such things as acute corruption, tangled bureaucracies and varied literacy levels are the obvious challenges, but as GIA's Vincent Pardieu pointed out, by his reckoning only one or two percent of the gems on the retail market at any one time had actually been mined within the previous three years.

Rio is, of course, the ideal venue for a Congress of this type – Brazil is a major gem-producing country, the scenery is magnificent and the hospitality legendary. The local sponsors, including IBGM, assisted with the incredible evening events. Whilst there I was able to combine business with pleasure; I spent one day with a representative of IBGM discussing the potential for Gem-A education in Brazil, whilst kindly being shown something of the city. The final day before my flight home was spent in the company of Michael Rae and Toby Brooke. Michael is CEO of the Council for Responsible Jewellery (CRJ). I have known Michael for several years and am on a CRJ advisory panel, but had never had the opportunity to discuss CRJ and its aims in depth. The way CRJ (an

international and increasingly significant organization) is run is of interest, following an increasingly common model for international organizations. CRJ has its headquarters in London, but Michael is based in Melbourne, Australia, whilst other senior staff are spread out in other cities in Australia and Canada. Modern technology allows constant contact while the geographical spread best serves its international presence. Thailand-based Tony Brooke is a gem dealer who is currently director for liaison with the Thai Gem and Jewelry Traders Association. Gem-A has long had an Accredited Teaching centre in Thailand at The Gem & Jewelry Institute of Thailand, but has so far had little direct presence there. Following discussions with Tony, it is hoped that this might be remedied.

**Jack Ogden**

### Further info

For more information about the ICA, please visit <http://www.gemstone.org/index.php>



# Copal vs. amber

Maggie Campbell Pedersen and Bear Williams investigate the infrared and optical characteristics of treated and natural ambers and copals.

## Part I: Observation and simple gemmological tests

The correct identification of ambers and copals can be extremely difficult. Not only are we expected to be able to differentiate between them, but we are also expected to be able to recognize and identify all of the treatments given to them. Unfortunately these are constantly increasing in number and complexity. One treatment that is appearing more and more is autoclave-treated copal (including the greened variety), yet still many misunderstandings remain about this material.

When identifying ambers by sight we have a few basic rules from which to start. Fortunately, we know that green is not a natural amber colour (unless it is the result of fluorescence) and so when we come across green resin we know that it is either plastic or a natural resin that has been treated in some way.

Baltic amber is probably the most visually recognizable of all the well-known ambers in its natural form, but it is also the most versatile when it comes to treatments. With heat and pressure it can be clarified or totally re-constituted from powder or chips. Simple heat-treatment can darken the surface or produce discoidal stress fractures (the so-called 'sun spangles') inside the material. Like many other resins it can be turned green through a series of treatments in an autoclave. Greened Baltic amber may retain the amber's characteristic swirls of opaque and clear material, making it easy to recognize.

Discoidal stress fractures rarely occur naturally and so their presence suggests heat-treated Baltic amber — other ambers

are seldom, if ever, treated this way. This is because they are too rare and expensive, and, secondly, the younger ambers such as those from Mexico or the Dominican Republic have a lower melting point than Baltic amber and would melt if heated to the high temperatures necessary to produce the fractures. However, nowadays we are seeing copals treated in an autoclave to produce sun spangles.

It is becoming more and more necessary to carry out tests on the resins we come across, and not just to rely on recognition by sight. The question of whether a resin is natural or treated, and whether it is amber or copal, can have a big influence on the value of the finished item. For example; greened, 40 million year old Baltic amber is

more valuable than greened, 300 year old Colombian copal (1), and clarified and heat-treated Baltic amber would be more valuable than heat-treated copal used in imitation of Baltic amber.

The normal gemmological tests are not very useful for resins. We know that all ambers float in saturated salt water, but so do natural or treated copals, as well as pressed amber. In general, specific gravity tests can therefore only differentiate between natural resins and their simulants, but not identify them.

Gemmological tests that are reserved more for organics can give us some clues, although they too are only rough guides. For example, the hot point test may give us some idea of the nature of the resin,



1: Treated Colombian copal. Photo © Maggie Campbell Pedersen.



2: Pendant with greened Baltic amber.  
3: Typical Baltic amber rough (left), and Colombian copal rough (right).  
Photos © Maggie Campbell Pedersen.

but it is vague at best. As a rule the older and more 'mature' the resin (i.e. the more stable it becomes through the evaporation of the volatiles, and the cross-linking and polymerizing of the chemical components), the lower its melting point and the more rapidly a hot point will melt the surface of the resin. In addition, the more fragrant the smell emitted by melting, the younger the resin is likely to be. However, when copal is treated and 'artificially aged' in an autoclave, the hot point test gives an incorrect result as the surface has been 'matured'.

The same principle applies to testing with solvents. While Baltic amber is almost inert to solvents, some of the younger ones such as Dominican amber will soften slightly. Untreated copals will soften very quickly, but autoclave-treated ones will again give misleading results due to the artificial ageing of the material.

Natural resins from various localities will react very similarly under crossed polars, although there is evidence that treated ones may react differently (see Part II).

Under UV light, ambers from different localities may fluoresce different colours; for example, Baltic amber fluoresces a paler, chalkier colour than many others. Treated materials tend to fluoresce less strongly. However, fluorescence is always strongest in freshly cut material and often tends to fade or change colour with time, so the results are not clear enough to draw anything but vague conclusions.

However, we still need to know what the materials are, as well as which treatments they may have undergone, both for academic purposes and to ensure that the general public are not being cheated. It used to be simple; Baltic amber could be identified by sight – the treatments used on it were

well-known and easily recognized – whilst other ambers were rare, looked different and were never treated. Copals were pale yellow and never treated. Today, while we may be able to recognize some of the resins by sight and have a 'gut feeling' about others, we often need the help of more sophisticated equipment found in specialist laboratories.

Over the past couple of years I have constantly come up against resins that need verification; most recently these include examples of greened materials that were thought to be Colombian copal and Baltic amber. To confirm my identifications, they, along with other samples, have been tested with great patience by Bear and Cara Williams at Stone Group Laboratories in Missouri, USA.

**Maggie Campbell Pedersen**

## Part II: Use of FTIR, Raman and crossed polars

### Introduction

Careful observation is necessary with natural resins, due to both the delicate nature of these materials as well as the fact that they are commonly cabochon cut or are in the form of beads, thus limiting certain testing methods. Whenever possible, visual observations should be confirmed with non-destructive advanced testing methods. For this research project, three testing methods – Fourier transform infrared spectroscopy (FTIR), Raman analysis and crossed

polarizers – were employed to gain insight into the nature of autoclave-treated greened copal and its natural copal counterparts, in order to better identify and confirm treatments. The copals were then compared against treated Baltic amber and its natural counterpart. A total of 63 treated and natural ambers and copals were used in this investigation. For the purposes of clarity, any references to 'amber' in this article are those of Baltic origin. As is the case with copal, amber treatments can include pressing,

heating or autoclave (heat with pressure). The copals in this test came from various origins, primarily Colombia and Madagascar.

### FTIR

Tests were performed using a Perkin Elmer Spectrum 100 with a Pike Technologies Upward Looking Diffuse Reflectance attachment. As previous studies have shown, due to the organic nature of these materials, FTIR spectroscopy is one of the clearest methods of making distinctions between

# Organics

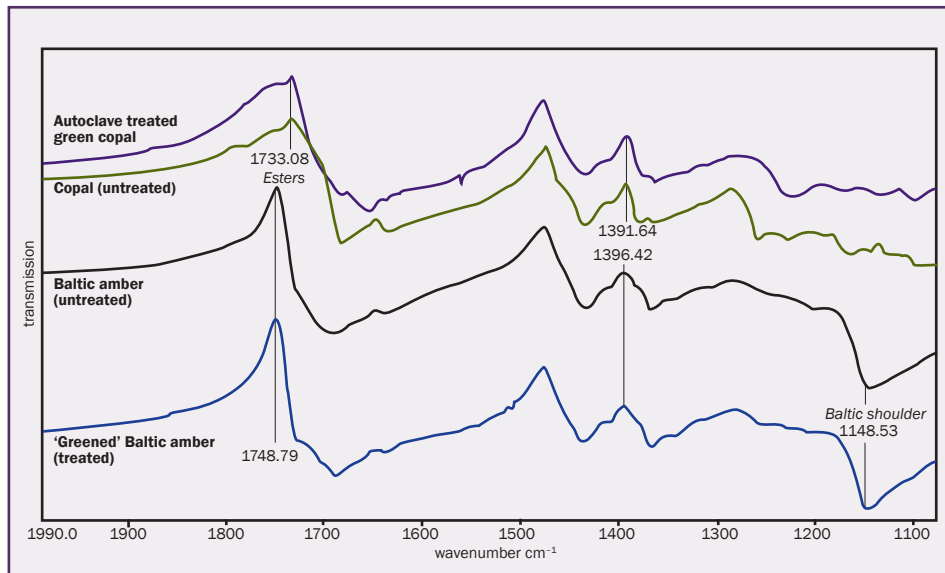
## Copal vs. amber (cont.)

amber and copal. The FTIR observations here may introduce new information for those freshly discovering infrared techniques in testing. Four representative resins were tested to determine the similarities and differences in the labelled spectral ranges (4).

### FTIR discussion

In the two upper lines (green and red) in 4, significant similarities are seen between the natural copal and the greened copal treated in the autoclave (heat with pressure). These copals, whether treated or natural, showed ester level absorptions at  $1733\text{ cm}^{-1}$ . It should be noted that esters are 'organic compounds which form when natural acids and alcohols interact. Interestingly, esters containing simple hydrocarbon groups are volatile fragrant substances.<sup>1</sup> The differing (copal vs. amber) esters ( $1733$  vs  $1748\text{ cm}^{-1}$  respectively) in the infrared, may well be indicative of our olfactory-sensed variations

As an organic gemstone, fine amber is highly prized. As we study these resins in gemmology, we want to remember we are not dealing with crystalline materials, but a complex group of organic molecules. Terminology and testing methods must look to organic chemistry in order to understand the complex variations due to natural and artificial ageing, as well as the impact of various treatments.



4: FTIR (absorption mode) shows differences between treated and natural Baltic amber and copal.

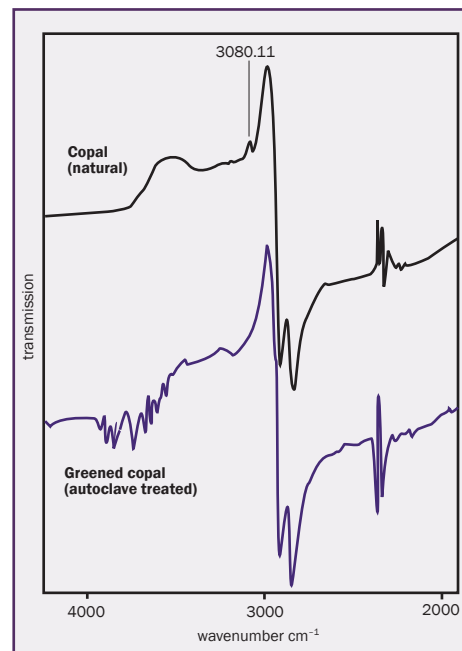
in odour between the two, that are produced during hot point tests.

In the lower two lines, the spectrum of the greened Baltic amber does not vary from the near-precise match to the spectra seen in those of the natural ambers. An ester peak is seen at  $1748\text{ cm}^{-1}$ , indicating a clear distinction from the copals or younger resins. This peak remains consistent even if the amber is treated, melted and/or pressed.

Within the infrared region, observations are broken into two sections: the fingerprint and the functional group bands. The fingerprint group is the unique character area and covers the range from  $400$  to  $1000\text{ cm}^{-1}$ . The functional group sees chemical reactions that operate outside the far infrared, and these bands cover the range of  $1000$  to  $4000\text{ cm}^{-1}$  and beyond (4 and 5).

Differences between copal and Baltic amber are clearly evident in other areas seen in (4) as well. The 'Baltic shoulder' recorded in the range between  $1185$  –  $1148\text{ cm}^{-1}$  is seen clearly in both the conventionally heated Baltic amber, as well as the non-treated material. According to these results, the treatment does not change the basic structure in a way that would make treated Baltic recognizable from its natural counterpart. This must be done by the traditional observation techniques discussed in Part I, or as we will cover later. The region

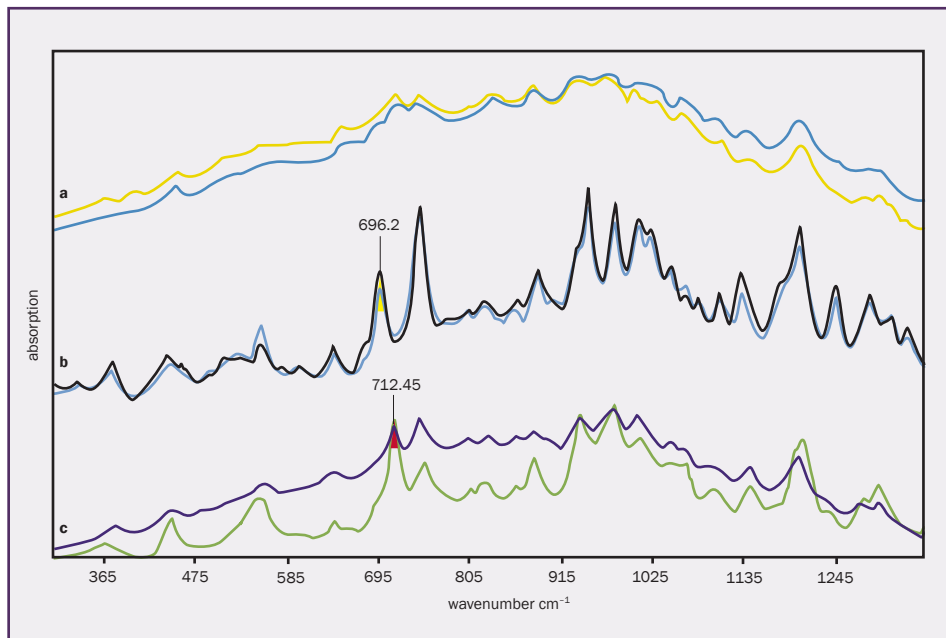
between  $1245$  –  $1010\text{ cm}^{-1}$  is that of C-O molecular bonds<sup>2</sup> and the amber peaks shown in (4) are characteristic of Baltic succinate resins. It is within these functional group bands that the Baltic peak is seen,



5: In this FTIR (mid-infrared) reading, the area above  $3000\text{ cm}^{-1}$  is known to be related to the molecular bonding of hydrogen to carbons. In this case it is a higher than normal C-H stretch and is peculiar to aromatic hydrocarbons<sup>3</sup>. After treatments the  $3080\text{ cm}^{-1}$  alkene peak disappears.



## Copal vs. amber (cont.)



6: Raman spectroscopy of study group representatives.  
 Spectra a: Autoclave treated and natural Baltic amber.  
 Spectra b: Madagascan and Colombian copals – both untreated.  
 Spectra c: Colombian and reportedly Madagascan greened copals, autoclave treated.  
 Spectra displaced on absorption axis for clarity.

particularly in the slope that goes from 1181 to 1147  $\text{cm}^{-1}$ , which remains diagnostic of Baltic amber. This is consistent, even in the case of heat treatments or pressing.

None of the copals tested to date exhibit the 'Baltic shoulder', and their ester level absorption peak will consistently appear at 1733  $\text{cm}^{-1}$ , rather than at 1748  $\text{cm}^{-1}$  as seen in ambers. Based on these markers, we can separate amber from copal, whether treated or not.

We were further able to separate natural and treated copals by studying where changes occur within the functional groups in the infrared and by making comparisons before and after treatment. Natural copals show what can be described as exocyclic methylene groups<sup>4</sup> that were destroyed during treatments. There is evidence of this (5), seen at 3080  $\text{cm}^{-1}$  in the natural copal. After autoclave treatments this absorption peak disappears.

The aromatic hydrocarbon peak is almost always present in the more resinous types of copal, and the advent of heat/pressure treatments will initiate the devolatilization

or artificial ageing process. Most resins and copals contain higher levels of the volatile organic compounds (VOCs) than those of naturally aged and fossilized ambers.

By this method, we can conclude that a treated copal (whether greened or golden) cannot be artificially transformed into amber as it will leave evidence of its more recent past. It is also apparent that FTIR testing can show clear evidence of the differences between copal and amber, and without the need for destructive tests.

#### Raman spectroscopy

Raman spectroscopy can indicate these chemical changes in a different manner. The equipment used is an Enwave Optronics Raman with a 785 nm laser. The Raman data (6) show three groups of two readings each. These graphs are overlaid for comparison references and are representative of six different readings grouped by the following three spectra:

**Spectra a:** the heated vs. natural Baltic ambers show near identical results. Of note is the softened peaks of their readout, suggesting that the volatile

organic compounds have effectively leached out through millions of years.

**Spectra b:** show untreated copals from two countries. These also show a very close match, in this case suggesting possible similarities in tree resin type. Also note the higher levels of volatile compounds indicated by the sharper and higher peaks. However, the main import here is the frequency peak marked in yellow on the graph, centred at 696.2  $\text{cm}^{-1}$ .

**Spectra c:** After autoclave treatments these copals showed peak shift changes. Indicated in red, this shift shows evidence of the artificial ageing process, and it now manifests itself at 712.45  $\text{cm}^{-1}$ . The 696  $\text{cm}^{-1}$  peak has not only experienced a slight shift, but the treatment has also somewhat softened the height of the peaks and caused the spectra to more closely emulate amber readings. This smoothing effect on the peaks might also be considered a function of the extent or number of treatments, as volatile compounds are driven out during the autoclave process.

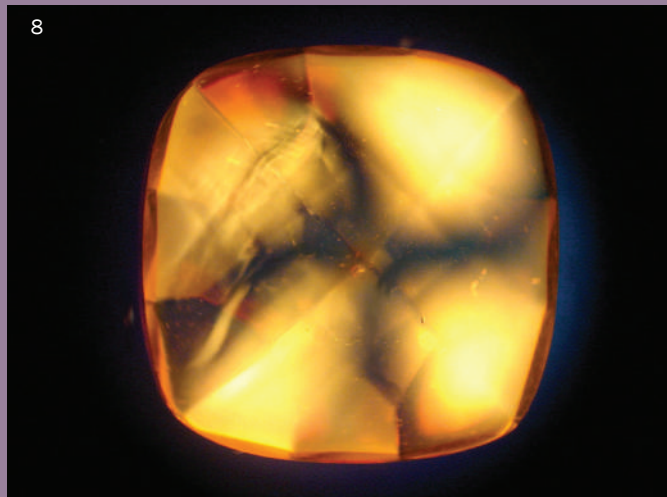
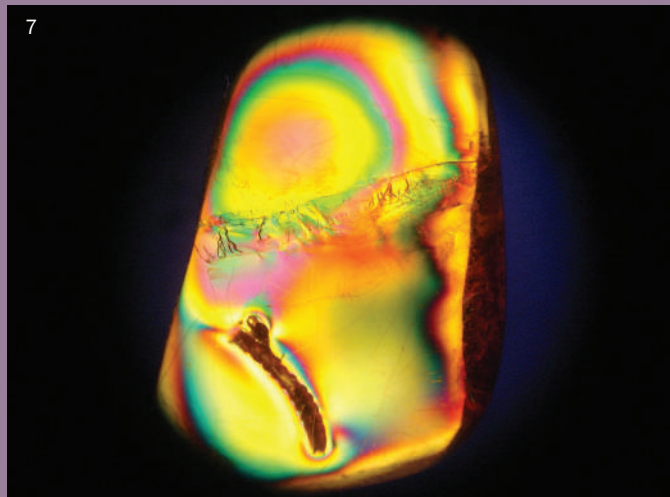
Non-destructive tests through the use of Raman spectroscopy can give evidence that greened copals have undergone autoclave enhancement. Coupled with FTIR readings, it is possible to determine whether a resin is amber or copal and better establish the nature of the material.

#### Immersion under crossed polarizing filters

While FTIR and Raman testing are currently limited to advanced testing labs, all gemmological labs have a polariscope. For resins; clean, room-temperature water makes a good immersion fluid. As with all young resins or amber, outer surfaces harden more quickly while the inner parts cure more slowly. This can create enduring areas of strain and internal pressures in ambers and copals as they fully cure. This strain mechanism exhibits itself as multicolour interference patterns under polarizing filters (7). Foreign particles trapped within can also create strain and colour effects can be seen surrounding the inclusion. Most natural ambers and copals

# Organics

## Copal vs. amber (cont.)



7: Concentric rings of colour interference around insect inclusions caused by internal pressures and strain, shown in this natural Baltic amber.

8: A heated and pressed golden Baltic amber relieved of its tensional strain, shows the wavy dark pattern of anomalous double-refraction. Photos © Bear Williams.

will show these multi-hued patterns under crossed filters.

In our observations using this technique, none of the pressed or autoclave treated materials, whether amber or copal, exhibited any colour interference patterns. Amber transitions into a plastic state when heated to 170 °C<sup>5</sup>. It can then be formed, or pressed into one larger piece from various smaller components. Similar results are produced in autoclave treatments where clarity enhancement or the greening effect is induced. We can theorize that when the material is brought to a softened plastic phase, that it would release the inner pressures and strains while allowing the cooling amber/copal to re-form into a more evenly distributed structure of tensile cohesion.

This strain relief and the re-organizing to a more consistent internal structure is seen repeatedly in treated resins viewed under polarized lenses. It appears as a dark, wavy, pseudo-birefringent (false optic figure) cross effect as the sample is rotated (8). The observed phenomenon is similar to the strain patterns seen in many artificial glasses and plastics and can sometimes also be seen as dark web-like patterns. The treatment also eliminates any of the interference colours in tested samples.

### Conclusion

Analysis with FTIR and Raman spectroscopy can give consistent indicators of whether a resin is amber or a much younger copal; and if copal, whether it has been treated. The Baltic shoulder as well as 1748 cm<sup>-1</sup> FTIR absorption peak can identify a material as being a Baltic succinate, either treated or natural; while the 1733 cm<sup>-1</sup> FTIR peak is consistent with copals, either treated or natural. The Raman shift from 696 cm<sup>-1</sup> to 712 cm<sup>-1</sup> is indicative of autoclave treatment, while the greater height and sharper angles of all peaks throughout the spectrum can indicate a higher concentration of volatile compounds, typical of younger, untreated copals. A final look through crossed polars can aid observation techniques and give gemmologists a good clue as to whether a natural resin is treated or not. The process of first classifying the material, then determining treatment will produce good diagnostic results.

**Bear Williams**

Stone Group Labs extends gratitude to all of our advisers for their feedback. I would especially like to acknowledge Maggie Campbell Pedersen's dedication to finding the truth, educating the industry, and always being careful to state those things we do not know, avoiding misinformation or advocating false testing. She has generously provided amber samples of known provenance from her collections that have been authenticated and dated.

### References

- 1: *Concise Oxford Dictionary*, Oxford University Press, 1991
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- 3: Michigan State University. <http://www2.chemistry.msu.edu/faculty/reusch/VirtTxUml/Spectrpy/InfraRed/infrared.htm>
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- 5: GemWorld International, 2011. *Gem Market News*, Mar/Apr 11, p.7

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**Bear Williams** [bear@stonegrouplabs.com](mailto:bear@stonegrouplabs.com)

# Coral

In May Dr Gioia De Simone visited London, dropping in to the Gem-A office to bring us up-to-date on the situation regarding Mediterranean red coral (*Corallium rubrum*). Gioia is director of Antonino De Simone, a two hundred year old coral company located in Torre del Greco near Naples – the centre of the Italian coral trade – and spokeswoman for Assocoral, an association dedicated to ensuring the correct management of this precious resource.

Coral has been the centre of environmental concerns for some time. In 1994 Europe banned drag-nets and from that time the Mediterranean red coral has been harvested only by scuba divers. The more serious problem lay further east however, where extensive and highly intrusive fishing (as much for the aquarium industry as for jewellery use) was destroying the reefs and marine habitats of Pacific Ocean corals and having a huge environmental impact.

In 2008 four species of Pacific Ocean Corals were listed in Appendix III of the Convention on International Trade in Endangered Species (CITES): an Appendix III listing meant that a CITES certificate was required for its international trade. Mediterranean red coral fishing was less problematic from the environmental point of view as a result of the 1994 legislation and also because, importantly, the coral grows in isolated branches on the sea floor, not as reefs. However, distinguishing it from the Pacific red corals was impossible in practice for Customs purposes and so in 2010 there was a proposal to include all species of *Corallium* in CITES Appendix II, effectively banning its trade. This proposal was rejected.

There are currently no restrictions on the international trade in red coral from the Mediterranean Sea. Nevertheless, the difficulty in distinguishing it from the

'illegal' Pacific red coral and worries about the environmental issues remain. In May, just a week before Gioia's visit to London, the General Fisheries Commission for the Mediterranean (GFCM) met in Rome to discuss the management of Mediterranean fisheries. Delegates from 22 member states, as well as observers from non-GFCM member nations and representatives from intergovernmental and non-governmental organizations took part and considered the report of the GFCM Scientific Advisory Committee (SAC), completed earlier this year, which included consideration of coral.

The SAC report noted the progress made in the protection of red coral, and formulated the following suggestions for its management:

- Prohibit the harvesting at depths of less than 50 metres.
- Establish a daily and/or seasonal quota system based on licences.
- Prohibit the use of ROV (Remotely Operated Vehicles) as a means of harvesting red coral.

SAC had also considered a proposal of the Subcommittee on Marine Environment and Ecosystems to set a minimum size of 10 mm of basal diameter with 20% tolerance for branches of red coral, but recommended that further research and discussion was needed before deciding on a minimum size.

Clearly the environmental and



*It is reported in Greek mythology that Corallium rubrum formed when Perseus cut off Medusa's head and the blood dripped into the sea.*  
© Antonino de Simone.

commercial issues relating to Mediterranean coral fishing are being taken seriously and the will seems to be there among all stakeholders to establish robust legislation and guidelines to preserve both the coral and the centuries-old Italian based coral industry. However, we will have to wait to see whether this will is sufficient to counter the global anxieties about the coral trade as a whole, which, seemingly driven by the undoubtedly dire problems with Pacific coral fishing, have given rise to the term 'too precious to wear'.

Perhaps the single most valuable contribution the gemmological community could make now is to develop a simple way for customs authorities and others to distinguish between Mediterranean and Pacific red coral.

**Jack Ogden**

## Update

On 8 June 2011, during the 133rd meeting of Unioncamere (the Italian Chamber of Commerce) in Rome, it was announced that Antonino De Simone is one of 150 companies to be listed in the Registro imprese storiche – the first national register of the oldest companies in Italy – to celebrate 150 years of Italian unity. Our congratulations go to everyone at Antonino De Simone.



## Gem-A Calendar

### September

4 – 7

#### **INTERNATIONAL JEWELLERY LONDON EARL'S COURT 2**

Meet the Gem-A team at stand J50. We will have a selection of books and equipment from Gemmological Instruments available to purchase, and staff will be on-hand to answer any of your questions. Don't miss Gem-A tutor Douglas Garrod's seminars starting from 10:00 am on Sunday and Tuesday. See pages 29–32 for more information.

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#### **FLUID AND MELT INCLUSIONS AS INDICATORS OF ORIGIN AND PROVENANCE OF GEMSTONES**

**By Professor Andy Rankin**  
**Scottish Gemmological Association**

To be held at The British Geological Survey, Edinburgh, 7:00 pm. Professor Andy Rankin, Professor of Applied Geology at Kingston University, talks about the use of fluid and melt inclusions in indicating the origin and provenance of gemstones. For further information go to [www.scotgem.com](http://www.scotgem.com).

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#### **RUBY TUESDAY**

**Gem Discovery Club Specialist Evening**  
Gem-A's London Headquarters  
6:00 to 8:00 pm

A glass-filled ruby refresher evening. This is a hands-on opportunity to examine the glass-filled rubies that have flooded the market in recent years. Learn how to detect them and hear more about the controversy and terminology issues surrounding them. Suitable for all those involved in the industry who may encounter these stones when buying, selling, repairing or valuing.

24 – 26

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

See page 48 for more information.

27

#### **A ROUGH NIGHT AT GEM-A Gem Discovery Club**

Gem-A's London Headquarters  
6:00 to 8:00 pm



Another of our popular rough nights. The scenario is Madagascar; you've just been presented with a bag of mixed rough gems, all from this gem-rich country. But what are they? A chance to test your skills and win a small prize if you get the most correct.

30

#### **MINI ANTIQUES ROADSHOW**

**By John Benjamin**  
**Gem-A Midlands Branch**

To be held in the Earth Sciences Dept, Birmingham University, Edgbaston. John will be recounting some anecdotes of his experiences and the exciting jewellery he has seen as a member of the BBC Antiques Roadshow. Please bring along an interesting piece for John to assess. For further information contact Paul Phillips at [gem-a-midlands-branch@hotmail.co.uk](mailto:gem-a-midlands-branch@hotmail.co.uk).

### October

4

#### **ALLURE OF GEMS**

**Gem-A one-day workshop**  
Gem-A's London headquarters



The perfect introduction to the world of gemstones, ideal for those new to gemmology.

10 – 14

#### **DIAMOND GRADING AND IDENTIFICATION COURSE**

Gem-A Headquarters London  
See page 16 for details.

17

#### **V&A**

**By Dorothy Hogg**  
**Scottish Gemmological Association**

To be held at The British Geological Survey, Edinburgh, 7:00 pm. Dorothy Hogg, formerly head of Edinburgh College of Art's Jewellery and Silversmithing Department, talks about her experience as Artist in Residence at the Victoria and Albert Museum. For further information go to [www.scotgem.com](http://www.scotgem.com)

18

#### **INTRODUCTION TO DIAMOND GRADING Gem-A one-day workshop**

Gem-A's London headquarters

An introduction to the 4Cs – carat weight, clarity, colour and cut – this course provides the practical information required to enable you to make informed choices or to give sales advice.

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

25

**INTRODUCTION TO PRACTICAL GEMMOLOGY****Gem-A one-day workshop**

Gem-A's London headquarters

Learn the basic principles required for effective gem testing under the guidance of an experienced Gem-A tutor. This is an ideal workshop for those desiring a 'taster' class of longer-term gemmological study or a perfect refresher course for those with some existing knowledge.

26

**RUBY, SAPPHIRE AND EMERALD****Gem-A one-day workshop**

Gem-A's London headquarters

An informative day looking at natural, treated (including glass-filled ruby), simulated and synthetic gems.

28 – 30

**MUNICH SHOW 2011**

This is the first time Gem-A will have exhibited in Munich. A show which has grown in stature year on year, Munich is very much developing into a prominent international event. Come and visit us at our stand. For full details please visit the show's website: [www.mineralientage.de/?lang=en](http://www.mineralientage.de/?lang=en)

28

**CONCAVE FACETING****By Doug Morgan****Gem-A Midlands Branch**

To be held in the Earth Sciences Dept, Birmingham University, Edgbaston.

A presentation showing the techniques employed to bring out the beauty in gemstones. For further information contact Paul Phillips at [gem-a-midlands-branch@hotmail.co.uk](mailto:gem-a-midlands-branch@hotmail.co.uk).

## November

5

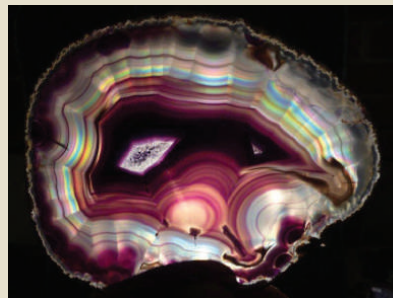
**THE IDENTIFICATION OF SYNTHETIC DIAMONDS AND DIAMOND TYPES USING UV, MICROSCOPY AND THE POLARISCOPE\*****A Gem-A half-day workshop with Branko Deljanin**

Gem-A London Headquarters  
2:00 – 5:00 pm

6

**GEM-A ANNUAL CONFERENCE\***

Hotel Russell, Bloomsbury  
9:00 am to 6:00 pm



Dinner/disco: 7:30 pm to midnight  
The 2011 Gem-A conference will host an exciting day of gemmological lectures from speakers at the forefront of their fields, followed by a dinner/disco in the evening.

7

**OPTICAL PHENOMENA\*****A Gem-A half-day workshop with Brian Jackson**

Gem-A London Headquarters  
10:00 am – 1:30 pm

**SNAP DECISIONS: PHOTOGRAPHING GEMS UNDER LESS THAN IDEAL CONDITIONS\*****A Gem-A half-day workshop with Gary Roskin**

Gem-A London Headquarters  
2:30 – 5:30 pm

7

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

Goldsmiths' Hall, London  
6:30 to 9:00 pm

A celebration for this year's graduates. The ceremony will be followed by a reception for graduates and their guests.

8

**NATURAL HISTORY MUSEUM\* A tour with Alan Hart**

Natural History Museum, London  
10:00 am to 12:00 midday

**THE CROWN JEWELS\*****Guided tour by David Thomas MVO**

Tower of London, London  
3:45 to 6:00 pm

16

**GEM & PEARL LAB UPDATE****By Stephen Kennedy****Scottish Gemmological Association**

To be held at The British Geological Survey, Edinburgh, 7:00 pm. Stephen Kennedy will discuss items of interest which have recently passed through The Gem & Pearl Laboratory. For further information go to [www.scotgem.com](http://www.scotgem.com)

25

**THE REFRACTOMETER****By Gwyn Green****Gem-A Midlands Branch**

To be held in the Earth Sciences Dept, Birmingham University, Edgbaston. A mainly practical evening for everyone to learn and refresh their knowledge and use of the refractometer. For further information contact Paul Phillips at [gem-a-midlands-branch@hotmail.co.uk](mailto:gem-a-midlands-branch@hotmail.co.uk).

\* **GEM-A CONFERENCE AND EVENTS:** Further details are given on page 2

and workshops go to [www.gem-a.com](http://www.gem-a.com)

# Visit Gem-A at IJL 2011

- **FREE TWO-HOUR SEMINARS**
- **SHOW SPECIALS**
- **GEM-EMPATHY AWARD**
- **PHOTOGRAPHIC COMPETITION**

## Gem-A at stand J50

### Gem-A Education

Take the opportunity to learn about the latest developments in gem and diamond education and to see the course material at the Gem-A stand. Choose to study our day or evening classes, or enjoy the flexibility of a home study course.

You can also find out about our 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.

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

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

### Latest books and instruments

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

## Photographic competition

The winners of Gem-A's 2011 Photographic Competition will be announced at this year's IJL. Open exclusively to members, this year's competition had four categories of entry, reflecting the advancement of the digital age in photography: natural (digital photography with minimal post-production work), treated (digital photography with significant post-production work), synthetic (computer-rendered 3D

images) and melange (images of anything that does not fit in the other categories). A prize will be awarded in each category, and all prize winners will receive their image within a frameable mount. In addition there will be one overall winner who will receive a free Gem-A membership for the following year.

## Show Special

### The TravelGem Microscope

Designed for gemmologists, this compact microscope is ideal for students, valuers and gem dealers.

- Fitted aluminium travel case
- Runs on 110 and 220 volts (built in transformer)
- 10x, 20x, 30x and 60x magnification
- Bright field, dark field and top lighting
- Stone holder and darkfield assembly can be removed to examine jewellery

Usual price: £325.00 + VAT

**Show price: £260.00 + VAT**





## 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 2011 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 2011 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 Claire Mitchell at Gem-A giving your name and stand number: [claire.mitchell@gem-a.com](mailto:claire.mitchell@gem-a.com).

The 2010 Gem-Empathy Award winners were, for the third time, the Derbyshire-based family business C W Sellors.



The 2010 Gem-Empathy Award winners C W Sellors. From left, Sarah Kitley of IJL, with Diane, Rebecca, Jason and Chris Sellors in the centre, and Gem-A CEO Jack Ogden on the right.



## Free Two-Hour Seminars by Gem-A

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

Please note that each session is *limited to 20 delegates* and so it is recommended that you book your place in advance. You can do this by emailing Claire Mitchell at [claire@gem-a.com](mailto:claire@gem-a.com) or Doug Garrod at [doug@gem-a.com](mailto:doug@gem-a.com), or visit us at stand J50.

Both of Doug's presentations will be held in the Hampton Room at Earl's Court 2.

**Sunday 4 September: 10:00 am to 12:00 midday**

### Pearls of wisdom

During this seminar Doug will look at natural pearls, marine, nucleated, cultured (both Akoya and South Sea) and freshwater (non-nucleated and nucleated). A short presentation will be given, after which we will look at various materials using the 10x lens.

**Tuesday 6 September: 10:00 am to 12:00 midday**

### Colour sense

This session will look at groups of stones of various colours. For each colour group we will consider natural, treated, synthetic and imitation materials. Observation techniques and other suitable testing methods will be considered.

**IJL**<sup>®</sup>  
INTERNATIONAL  
JEWELLERY  
LONDON 2011

**Sunday 4 to Wednesday 7 September 2011**

Opening times: 9:00 am to 6:00 pm, Sunday to Tuesday;  
9:00 am to 4:00 pm Wednesday

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

# The stars of the show

This year's IJL promises to be even bigger and better than before, with the launch of several new areas including the Runway – a catwalk which runs the entire length of the Boulevard – a purpose-built seminar theatre hosting debates, sessions on jewellery trends and keynote speakers, as well as a 'Loose Diamonds and Precious Gems' area dedicated to companies who deal only in loose diamonds and precious stones. Here we feature several major exhibitors and find out what delights they will be showing us.

## Marcus McCallum

### Stand J31

w: [www.marcusmccallum.com](http://www.marcusmccallum.com)

Famous for supplying rare and unusual stones to the trade, IJL 2011 will see Marcus McCallum concentrating on displaying stones with unusual colour, particularly tourmalines, spessartine garnet, fancy colour sapphires and other brightly coloured stones in accordance with current market trends. In addition to this they will also exhibit their usual display of higher quality pearls and stone beads.

Marcus said: "Despite the difficulties on the high street, we feel optimistic for the September show. The individual designers seem to be doing well and people with money are still seeing precious commodities such as precious metals, diamonds and top-end coloured stones as a good thing to invest in."



*Bi-coloured tourmaline, pink tourmaline cat's-eye and a trapiche emerald.  
Photo © Marcus McCallum.*

## Apsara



*Pink spinel weighing 1.38ct. Photo © Apsara.*

Apsara have been exhibiting at IJL for 14 years, during which time the show has doubled in size and has become one of the most important events in the UK jewellery trade calendar.

At this year's IJL Apsara will be displaying a collection of unheated rubies, available in one and two carat sizes, from a variety of sources, including Winza, Tanzania, and areas in northern Mozambique. Their sapphire collection will include an assortment of colours from Madagascan blues to untreated golden/orange stones

from the Bang Kacha deposits in eastern Thailand, sapphires that are characterized by their clarity and superb lustre and brilliance.

To complement their ruby and sapphire collection they will be exhibiting spinels, Mali garnets, spessartines and demantoids, plus many other coloured gems. Apsara offer an approbation service to their clients and goods may be viewed and ordered online.

### Stand J29

w: [www.apsara.co.uk](http://www.apsara.co.uk)

## Marcia Lanyon



### Stand J51

w: [www.marcialanyon.co.uk](http://www.marcialanyon.co.uk)  
e: [sales@marcialanyon.com](mailto:sales@marcialanyon.com)

With over 33 years of experience dealing in everything from high-end precious and semi precious stones to beads and freshwater pearls, it is no wonder that Marcia Lanyon Ltd is always an essential shopping destination at IJL. But even though they are a long running stalwart of the show, their stock is constantly changing with the times and 2011 will be no exception. Stand J51 is sure to be as busy as ever as they introduce an exciting new range of stones that is sure to delight and inspire jewellers and buyers alike.

This year Marcia Lanyon will be exhibiting a broader range of materials than ever before, giving their customers the chance to not only buy the classic freshwater pearls, beads and calibrated stones that they have

come to expect, but also more unusual pieces including neon Paraíba tourmalines, hot spinels and striking citrus-coloured sphene. Not to mention the sparkling sunstone, brightly dyed howlite and the patterned, autumnal coloured agates that have become regular features of the Marcia Lanyon stock.

This wide spectrum of stones is matched equally by the variety of coloured and natural pearls available in a range of golds, pinks and blues along with an abundance of high-quality white, peacock, grey and natural coloured pearls. As always, a visit to Marcia Lanyon is a must at IJL!

## PJ Watson

### Stand G111

w: [www.pjwatson.co.uk](http://www.pjwatson.co.uk)  
e: [info@pjwatson.co.uk](mailto:info@pjwatson.co.uk)

Over the last few months PJ Watson have been building their stock of rare and unusual gems, and this year's IJL show will see the launch of a number of new designs and one-off pieces. Coloured diamonds will again feature very strongly, and a collection of pink diamonds acquired earlier in the year will be ready for viewing. The stand will also feature the new lighting system from the Swiss company DiaLumen, which last year made a tremendous impact on the presentation of the stones.

Vivian Watson of PJ Watson said: "IJL is an important date in the retailer's calendar as it more or less marks the beginning of the quest to have the right stock for Christmas trade. Keen professional buyers appreciate that distinctive pieces are not easy to come by and will ensure that their time at IJL includes a visit to PJ Watson on stand G111 on the main Boulevard."

*Rare 0.28 ct fancy intense purplish-pink diamond surrounded by 1.10 ct of white pear-shaped diamonds, set in 18 ct rose and white gold. Ring and photo: PJ Watson.*



## C W Sellors – Gem-A Gem-Empathy Award winners 2010



Jewellery from the new bauxite range. Photo © C W Sellors

Having specialized in creating beautiful collections from British gemstones for over three decades, C W Sellors continue to take these jewels to new heights with interesting and unique collections and techniques. At the heart of their award-winning designs is a team of in-house designers and craftsmen whose skill, knowledge and understanding of the individual properties of precious metals and colourful gemstones make their collections so unique and appealing. Each and every stone used is carefully hand selected and crafted to suit its individual properties to ensure the setting and precious metal is entirely complementary to the piece.

Chris Sellors, Director of C W Sellors said: "We are delighted to be exhibiting at IJL again this year, in a challenging market this event is fantastic for stimulating buyers

by showcasing the newest innovations suppliers have to offer. This year C W Sellors will be unveiling new collections of British hand-crafted gem-set jewellery in platinum, 9 ct and 18 ct gold and silver, along with our innovative Gem-Stations. Our British brand has expanded our already vast portfolio of hand selected international gemstones with exciting developments in our most comprehensive range to date including our signature British gemstones; Derbyshire Blue John and Whitby jet."

### Stand G79

w: [www.cwsellors.com](http://www.cwsellors.com)



## Gem-A News and Views

# Gem news from Gary Roskin

Gary Roskin FGA presents a selection of recent gem news and comments from *The Roskin Gem News Report*. Here he looks at natural untreated gems, from pearls to pink sapphires.

Having spent the past several months at international gem and jewellery shows, one thing seems to be perfectly clear: jewellers are looking for natural untreated gems. How do we know this? Well, for one thing, when the signage in display cases is minimal and pretty much the only signs you do see are the ones that say 'No heat', somebody is trying to tell us something.

Unheated rubies, sapphires, aquamarines, tourmalines,

zircon ... you name it, if they are unheated they're all labelled. And of course, gems that aren't labelled leave you with identification and disclosure issues. Are they natural? If they are, you must then follow up and establish whether or not they are treated in any way. Your gem supplier will offer origin and treatment disclosure, but you may end up sending the gems to one of the professional gem labs for identification. And when you do, there is no guarantee that



1: Natural colour stones.

1: Mozambique tourmalines, from Ekkehard Schneider, Kirschweiler, Germany. The lilac cushion, weighing 57.12 ct, measures 25 x 20 mm. The magenta oval, weighing 31.86 ct, measures 20 x 15 mm.

2: Sapphires, labelled 'No heat', from Madagascar. Gems courtesy of Eli Eliezri from Colgem, Ramat Gan, Israel. Weights range from 2.00 ct to 2.86 ct.

3: Suite of fluorites, courtesy of Coast to Coast Rarestones. Weights range from 19 ct to 37 ct.



they will be able to determine whether or not the gems have been treated. In fact, many of their conclusions state that there is 'no evidence' of treatment. This is not exactly the most comforting determination. And this leads us right back to finding a labelled natural, untreated gem.

If retailers and consumers had the choice (and the budget), they would choose gems that have no identification or treatment disclosure issues. They like what Mother Nature has created — it needs no other explanation. That means you don't have to explain heat treatment, irradiation, diffusion, or high pressure high temperature treatment. Now wouldn't that be nice?

Images **1**, **2**, and **3** are just a few of the gem materials we have come across labelled 'untreated', 'no heat' or 'natural colour'. And if our observation is correct, there will be more.

#### Natural pearls

Along with the rush for natural untreated gemstones and the continued remarkable resurgence of the natural 'oriental' pearl, we now have huge interest in pinkish natural conch pearls from the *Strombus* shell, yellowish natural *Melo melo* pearls, and multispectral coloured natural abalone pearls.



4: Natural oriental pearls — those harvested from the Persian Gulf — were available in good numbers at the 2011 Baselworld watch and jewellery fair. Natural pearl strand courtesy of Horovitz & Totah, Geneva, Switzerland.

5: From the *Tridacna gigas*, the giant clam, here is a large porcelain-like non-nacreous natural pearl.

6: Two *Hippopus hippopus* white pearls showing the classic flame structure. Weighing (from left to right) 20.33 ct and 5.77 ct, from Ambra Greco, Milan, Italy.

7: Natural conch and *Melo melo* pearls. Courtesy of Tish and Wes Rankin, Pacific Coast Pearls, Petaluma, California.

Up until recently, when we would talk about natural pearls, most of us tended to think only of the following: white to dark cream in colour, spherical or near-round 'oriental pearls',

the salt water natural nacreous pearls from the Persian Gulf and other similar waters. But today, with the popularity of the conch, *Melo* and abalone, we must preface the conversation about which natural pearls we are speaking.

Looking at the images, the single strand of 'oriental pearls' (**4**) shows an exceptionally fine lustre, few if any surface blemishes, and a wonderful rose overtone.

The white non-nacreous pearl (**5**) is from the *Tridacna gigas* — the giant clam. Giant clam pearls such as this are

more typically porcelain-like in appearance, and do not show the expected flame structure. Not showing the structure makes the identification of such a pearl somewhat problematic. However, on rare occasions (for example, like the smaller *Tridacna* pearls shown in **6**) they can and will show us that rare and sought-after interior design.

The *Melo* pearls, like the *Tridacna*, are non-nacreous pearls. Above is a grouping of *Melo*, *Tridacna* and conches (**7**), some showing the desired flame structure, as well as a few others showing off their unusual and

**Treatment** — Something that has been done to a gem in an attempt to improve colour, clarity, and/or stability.

**Enhancement** — The results of treatment, e.g. improved colour, improved clarity, and/or improved stability.



## Gem-A News and Views

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



8a: A grouping of Japanese bead nucleated Lake Kasumiga freshwater cultured pearls, courtesy of Perlen Yukie, Merzig, Germany.

8b: These four strands of Chinese freshwater Kasumiga-like bead nucleated cultured pearls look like the real thing. Courtesy of King's Ransom, Sausalito, California.

unique body colours.

We can certainly understand the justified higher price of untreated gems. Who wouldn't pay more for an unheated ruby than one that has been heated to enhance its colour? But for those who may be unfamiliar with natural, untreated, uncultured pearls, the single strand of natural pearls (4), measuring from 4 to 11 mm, was priced in the solid six-figure range. *Melos*, on average, can be priced at \$1,000/ct. Some of these shown here weigh over 10, 20 and 30 ct. The largest we saw at this year's Baselworld weighed well over 100 ct.

#### Chinese imitating the Japanese

They say that imitation is the sincerest form of flattery; if so, then the Chinese are doing a great job of flattering the Japanese, especially when it comes to creating Kasumiga pearls – or, should we say, Kasumiga-like cultured pearls.

The original Japanese Kasumiga pearls are bead nucleated freshwater cultured pearls from Lake Kasumiga. They began culturing pearls there in the twentieth century, with a

first big push in the early 1950s.

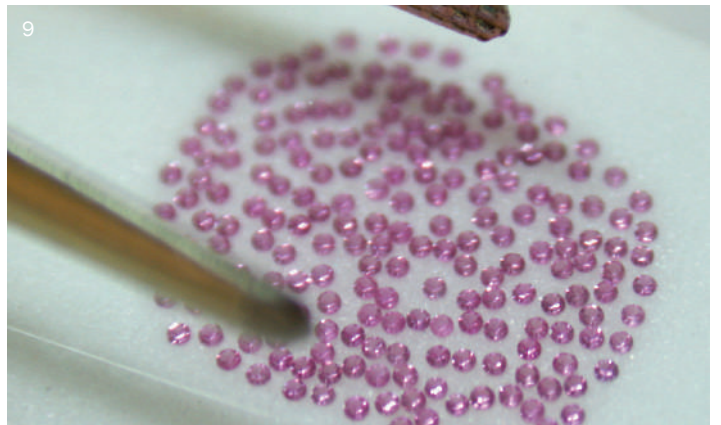
We didn't really see much commercial production until the 1980s or so, but pollution has always seemed to be a problem for maintaining a steady production. While there are still several active farmers at Lake Kasumiga, the product is limited.

In the continual experimentation to create even wider varieties of Chinese freshwater cultured pearls, the latest bead nucleated Chinese freshwater cultured pearls include a variety that many people simply call Kasumiga, after the original Japanese harvests. And we must confess, we think the Chinese have done a pretty good job of creating the copy.

Two images are shown, one showing actual Lake Kasumiga bead nucleated cultured pearls (8a) and the other showing four strands of Kasumiga-like Chinese bead nucleated freshwater cultured pearls (8b). If you ask me, it is almost impossible to tell the difference.

#### Talk about tiny

They say that the pink sapphires are natural in colour, but that



9: 1 mm round brilliant pink sapphires, natural colour, courtesy of China Stone, Bangkok, Thailand. Total weight for the 200 gems seen here is just 0.17 ct. Other colours are available, but you must ask whether or not the colour is natural.

other colours are enhanced, so we've included these in our natural untreated report. However, the real reason for including these gems is to show you the best-matched 1 mm round brilliants we've seen. This parcel of 200 stones (9) has a total weight of just 0.17 ct. Yes, that's right, 17 points total for 200 pink sapphires. Don't sneeze...

**Gary Roskin**

#### About the author

Gary Roskin GG FGA and 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).



# In the news

## New editor for the *The Journal of Gemmology*

Elise Skalwold has been appointed by the Gem-A Board to succeed Roger Harding as Editor of the *The Journal of Gemmology*. A graduate of Cornell University, Elise received her Bachelor of Science in 1982. She has had a lifetime interest in education, science and natural history, which has led to a passion for gems, gemmology and gemmological education. She has been a self-employed jewellery designer and has worked in galleries alongside nationally award-winning designer goldsmiths. Mentorship under a seasoned coloured stone importer and gemmologist has taken her to such places as the gem markets of Chanthaburi, Thailand. These interests led Elise to first obtain her formal accreditation via the GIA GG in-residence program at Carlsbad, California, in 2006, and then to pursue the Gem-A's Diploma in Gemmology course in Thailand in 2007, passing the examination with Merit. She was elected to FGA status in 2008.

Elise is currently employed at Cornell University curating an extensive, world-class gem collection, whilst co-authoring a book and a series of articles on the collection. She is also collaborating with top mineralogists and gemmologists on various gemmological research projects, including a unique investigation involving diamond inclusions. She currently writes abstracts for both *The Journal of Gemmology* and *Gems & Gemology*.

The Editor of *The Journal of Gemmology* is an honorary position appointed by the Gem-A Board. Elise will work with Roger Harding, acting as Deputy Editor for the next few months and then taking over fully during the coming year.

Upon accepting the role, Elise wrote: "It is a great honour to have been appointed to such a position with a publication and organization I hold in the highest regard. Roger and his predecessors have set exacting standards which I will do my utmost to uphold. My library includes a nearly-complete set of *Journals* which I study,



Elise Skalwold, new editor of *The Journal of Gemmology*.

not only for the gemmological content, but also for the historical perspective they paint of the people, places and times. I am so happy to be become part of the continuing tradition of this highly respected publication, the flagship of a Fellowship I am proud to be member of."

*The Journal of Gemmology* was first published in 1947 as the official journal of The Gemmological Association of Great Britain. Since its launch the *Journal* has been edited by Gordon Andrews, John Chisholm, Alan Jobbins and Roger Harding.

## Gem-A's Annual General Meeting

The Annual General Meeting of Gem-A was held on 7 July at the Tudor Rooms in the Imperial Hotel, Russell Square, London. After a brief welcome by Jack Ogden, Gem-A Board Chairman James Riley opened the meeting by noting Gem-A's excellent financial results for the 2010 financial year. Most of the increase over 2009 had been in education, but membership and Gem-A's subsidiary Gemmological Instruments Ltd both performed well. The Directors' Report and Accounts for the 2010 financial year were unanimously approved by those present and eligible to vote.

Appointed to serve on the Board since the 2010 Annual General Meeting, Steven Jordan FGA DGA was duly and unanimously elected to the Board. Steven began his career in 1973 and, after

20 years in managerial and valuer positions in the retail jewellery sector, established his own independent valuation service, forming Hawksworth Associates in 1997. He is also Senior Valuer (Consultant) at the Worshipful Company of Goldsmiths' Assay Office, Goldsmiths' Hall, London.

Board Members Brian Jackson and Cally Oldershaw were due to retire by rotation this year. Both had offered themselves for re-election and were unanimously re-elected. James Riley announced that Professor Alan Collins had retired from the Board. Alan had been both past President of Gem-A and past Board Chairman and James expressed the enormous debt of gratitude that Gem-A owed to Alan.

Two new members were elected to the Membership Liaison

## Gem-A News and Views

Committee: Elizabeth Gleave FGA DGA and Kerry Gregory FGA DGA. Lizzie gained her Gem-A Diploma in Gemmology with Distinction in 2008 and Diamond Diploma with Distinction in 2009. She now uses her gemmology skills at a London-based gem dealing company and also acts as a Gem-A Open Distance Learning (ODL) tutor. Kerry has been involved in jewellery retail and appraisal for several years and has a special interest in exploring and teaching gem identification using basic gemmological instruments. In addition to being a keen and active supporter of Gem-A, Kerry is also a Gem-A ODL tutor, as well as a leading light in Gem-A's South Western Branch and a frequent contributor to *Gems & Jewellery*. Peter Dwyer-Hickey, Chairman of the Membership Liaison Committee, explained that the Committee would take a more proactive role in future, helping with events and graduate and member support.

A Pimms party followed the business part of the AGM, kindly sponsored by Gemmological Instruments Ltd, giving members, students and their guests the opportunity to network prior to a presentation titled 'Zambian Emeralds: Mine to Market' by Ian Harebottle, CEO of Gemfields plc.

During the talk Ian outlined the background of Gemfields and Zambian emeralds, moving from a clear explanation of the geology of Zambia to Gemfields' marketing strategy and their interaction with the Zambian Government. Ian stressed the importance of (and great potential for) coloured gems in the global jewellery market, as well as his belief that Gemfields' championing of Zambian emeralds helped the sale of coloured gemstones in general. Gemfields have a strong code of ethics with regard to both the environment and support for the local communities. When questioned on his views on gemstone enhancement Ian explained that he had no problem with enhancing gems, providing that there was proper disclosure.

Ian also announced that Gemfields was holding an auction of predominantly higher-quality rough emeralds in Singapore the following week (11 – 15 July) where 1.07 million carats were to be offered. It was later reported that this auction produced revenues of US \$31.6 million with a 63% increase in quality-for-quality per carat prices since December 2010.

## rock, gem & bead shows 2011

17/18th	September	Newton Abbot Racecourse, Newton Abbot, Devon. (Rock 'n' Gem)
24/25th	September	Newark Showground, Winthorpe, Newark, Notts. (Rock, Gem 'n' Bead)
1/2nd	October	York Racecourse, York, North Yorkshire. (Rock, Gem 'n' Bead)
22/23rd	October	Newton Abbot Racecourse, Newton Abbot, Devon. (Gem 'n' Bead)
29/30th	October	Kempton Park Racecourse, West London. (Rock 'n' Gem)
5/6th	November	Cheltenham Racecourse, Gloucester. (Rock, Gem 'n' Bead)
19/20th	November	Brighton Racecourse, Freshfield Road, Brighton. (Rock, Gem 'n' Bead)
26/27th	November	Farnham Maltings, Bridge Square, Farnham, Surrey. (Gem 'n' Bead)

### All Shows open

10am - 5pm Saturday • 10am - 4pm Sundays. All Shows are indoors with free parking, disabled access and refreshments

### Admissions

Kempton Park Racecourse. Adults £4.50, Seniors £3.00 • Children £1.00 (8-16 years) under 8s free  
All other Shows: Adults £3.50, Seniors £2.00 • Children £1.00 (8-16 years) • under 8 free

For a list of all shows, directions, maps and exhibitors attending each show, go to  
[www.rockngem.co.uk](http://www.rockngem.co.uk) [info@rockngem.co.uk](mailto:info@rockngem.co.uk)

# A Mughal treasure

**A necklace of 11 red spinels achieved a sale price of just over US\$5 million at the Magnificent Jewels auction at Christie's, Geneva, on 18 May 2011. Three of the beautiful spinels were engraved with the names of seventeenth-century Mughal rulers. Jack Ogden considers the value of these treasures now, compared to their value in the past.**

The necklace comprised 11 spinels weighing a total of 1131.59 ct (with the largest weighing 164.09 ct), which had been mounted on a simple gold link chain, probably in the nineteenth century. Two of the spinels bear the name of the Emperor Jahangir (who ruled Mughal India from 1605 – 1627), whilst another bears his name along with those of Shah Jahan (ruled 1627 – 1658) and Alamgir (also known as Aurangzeb, ruled 1658 – 1707).

## The value now

The value of this necklace lies in its constituent parts, the spinels, and in



*Detail of one of the engraved spinels. Photo Denis Hayoun, Diode SA. Courtesy of Christie's.*

particular the three engraved ones. Spinel (then known as balas rubies) from the remote region of Badakhshan, now in Tajikistan, were highly prized in Mughal India. William Hawkins, a resident in the Mughal court in the early seventeenth century noted that there were two thousand spinels in the treasury "little and great, good and bad". Of these, some would have been engraved, and we even know the name of some of the engravers. The names of successive rulers are not unusual on these spinels and there are others which bear the same three names as the one on the Geneva necklace, including a spinel which is now in the Victoria and Albert Museum, London, and also one reported to have been recut into a square shape by the London jewellers Hunt and Roskell around 1861. The so-called 'Timur Ruby' in the Royal Collection (an engraved spinel with no discernible links to Timur, the founder of the Timurid Empire) is engraved with no less than seven names. With the fall of the Mughal Empire and the English love of treasure, many of these spinels probably reached Europe; some to be recut no doubt (as that just mentioned), others to pass into museum and other collections where they can be seen to this day. Such direct and personal links to the famous Mughal Emperors now rarely come on the market and this scarcity, together with the great interest in Islamic and Mughal art among collectors, make them highly desirable. That said, the price fetched for the present necklace was higher than expected. The pre-sale estimate was between 1,500,000 and 2,500,000 Swiss francs, the price realized 4,579,000 Swiss francs.



*Imperial Mughal spinel necklace. Photo Denis Hayoun, Diode SA. Courtesy of Christie's.*

## The value then

The British East India Company's trade in gemstones during the seventeenth century was not simply that of exporting diamonds and other Indian gems to England; they also sold fine gems, including large rubies and the best pearls to India's Mughal rulers. East India Company documents record various sales such as these, as well as comments about which gems were in demand and which were not. Fine spinels were noted as being greatly admired and we even have an idea of price: in 1618 William Biddulph, who was in charge of the East India Company's business at the Mughal Court in Ahmedabad, India, commented, perhaps with a trace of jealousy, that he knew the Portuguese traders "to sell balas rubies for 7, 8, and 10,000 sterling apeece [sic], present money". That is £7000, £8000 and £10,000 – enormous sums then. As the British currency was gold-based, we can calculate that the equivalent weight of gold at today's prices would make those figures around £2,100,000, £2,400,00 and £3,000,000 respectively in modern terms. If Biddulph wasn't exaggerating too much, the sum fetched in Geneva in May 2011 seems modest in comparison.

**Jack Ogden**



## Exhibitions

# Masterpiece and Treasure

Jack Ogden reports on two exhibitions held in London over the summer.

**This summer London has seen two exhibitions intended to put the capital on the map; one for fine art and antiques, and including some jewellery, whilst the other focused wholly on jewellery. They were called 'Masterpiece' and 'Treasure' respectively – names intended to conjure up thoughts of magnificence and riches.**

## Masterpieces

If 'fine' jewellery needs an air of the rare, aspirational and valuable, and oozing with quality, then Masterpiece (London, 30 June – 5 July) fits the bill, with jewellery to match almost anyone's aspirations. This is the second outing for Masterpiece (the first being in 2010), and it outdid the first in size and in scope. It was not just jewellery, of course – does anyone want to own a 1944 Spitfire (guide price £8 million), a Peter Breughel the Younger landscape (I didn't dare ask the price) or a Stradivarius cello? However, the range of jewellery on show must make this one of the premier fine jewellery shows worldwide.

The jewellery exhibited ranged from the ancient, such as the extraordinary ancient Scythian gold stag plaque exhibited by Sycomore Ancient Art of Geneva, to the modern designs of Theo Fennell. Other ancient gold from between these eras was displayed, such as Jean-David Cahn's selection of predominantly Roman jewellery, the medieval rings of Les Enluminures (Paris), and a truly extraordinary range of jewels and *objets d'art* by houses such as Fabergé, Cartier, Tiffany and Van Cleef & Arpels (1), and exhibited by the likes of Wartski (London), S. J. Phillips (London), Marjan Sterk (Amsterdam), Hancocks (London), A La Vielle Russie (New York) and Symbolic and Chase (London).

There were ample fine coloured gemstones to appeal to the gem lover, but it was particularly interesting to see the 125.88 ct Martha Rocha aquamarine set in a Cartier-style gold bangle exhibited by 21st Century Jewels. This stone was cut from part of the 74.5 pound crystal found in 1955 in Teofilo

Otoni, Brazil, and named after the Miss Brazil of that year. This was the largest of several gems cut from the crystal,

1. A flower-head brooch invisibly set with calibre-cut sapphires and baguette, brilliant and marquise diamonds in platinum. By Van Cleef & Arpels, 1964. Exhibited by Symbolic and Chase of London.



2. Carved red jasper head of an Egyptian Pharaoh. © Sycomore Ancient Art, Geneva.

the uncut remainder of which is in the Natural History Museum, New York. Even this gem seemed small in size compared with the pendant set with a 640 ct aquamarine displayed next to it – although the Martha Rocha gem was of far finer quality. Size is not everything.

Choosing a favourite was not easy, but from a purely personal bias (and perhaps stretching the remit of jewellery), I have to pick the carved red jasper head of an Egyptian Pharaoh (2), possibly Hatshepsut, dating from around 1500 BC. This 10 cm high head, originally part of a composite sculpture, is a masterpiece indeed. The price was comparable to the 1944 Spitfire and there is no doubt about which I'd prefer to own.

## Treasure

Exhibitions of jewellery by innovative contemporary designers need equally edgy names and organizers must have been ransacking their thesauri ever since Graham Hughes rattled the foundations of Goldsmiths' Hall, London, with his 'Loot' in 1976. 'Treasure', an exhibition (and increasingly a trade show) which is held annually during London Jewellery Week in June, provided a comprehensive showcase for jewellery designers. But how was the name 'Treasure' being used? There were some true treasures there, but I assume (indeed hope) that the name was also being used more figuratively in the sense of the huge resource of creative talent that we possess in this country. Alas, as with so much innovative British talent, from the technical to the artistic, there is often little potential to follow it up in an economically sustainable manner.

There were, inevitably, designs that hardly met the criteria for 'Treasure' in any sense, jewellery that might have looked more at home in an end-of-term show for silversmithing evening classes, but there was also a wonderful range of fine jewellery. Here I am using my own definition of 'fine' — to be considered fine (by me, anyway), a piece of jewellery should possess at least two of the following: great design, great craftsmanship or great materials. It was particularly rewarding to see so much use of coloured gemstones — far more than among the contemporary design at IJL, for example.



3: Earrings by Leyla Abdollahi in 18 ct white gold set with tanzanites, blue and white sapphires and cultured Tahitian pearls.

4: Cushion-cut tourmalinated quartz, brown diamonds and blue sapphires, mounted as a ring in gold plated silver by Jayce Wong.



5: Tourmaline and diamond set earclips in 18 ct yellow gold, hand engraved and enamelled, by Henn of London.

As with Masterpiece, it was hard to pick out favourites at Treasure, but jewellery which particularly caught the eye included that by Leyla Abdollahi (3) — mostly 18 ct gold creations set with a wide range of gems, including tsavorite garnets, green sapphires and tanzanite (see [www.leyla-abdollahi.com](http://www.leyla-abdollahi.com)). Jayce Wong also had some wonderful designs (4), with faceted quartz with tourmaline inclusions set in gold-plated silver ([www.jaycewong.com](http://www.jaycewong.com)). Of course, an exciting use of coloured gems is greatly enhanced by a knowledge of gemmology coupled with design flair, as one of the exhibitors, Milena Kovanovic FGA, was happy to acknowledge. Treasure is by no means the sole preserve of young, new designers; exhibitors included Henn of London (5), whose trade mark is combinations of wonderful coloured gems and beautifully executed enamels ([www.hennoflondon.co.uk](http://www.hennoflondon.co.uk)). Perhaps not surprisingly, Ingo Henn is an FGA. Also present at Treasure was Shawish of Geneva ([www.shawish-jewellery.com](http://www.shawish-jewellery.com)), a company whose diamond and precious gem jewellery is top end and perhaps visually reminiscent of Joel Arthur Rosenthal (JAR), a contemporary French artist celebrated for his pavé jewellery. However, their much vaunted diamond ring — a whole ring carved from a single 150 ct diamond — is perhaps not the innovation they believe it to be. I seem to remember a Gulf client of mine some 25 or more years ago showing me such a ring made by Cartier before the Second World War. Nevertheless, it is a great concept and they deserve credit for having the conviction to (re)introduce it.

I have no doubt that the wealthy international clients and connoisseurs will make their way by limo, private jet or flower-bordered paths to Masterpiece 2012, which will have reinforced its position as an exceptional international show. But what of Treasure? Treasure this year clearly showed that we have the skills and the enthusiasm to put London on the international jewellery map — now we want the world to pick up that map. That's the real challenge for next year's organizers and marketers; they need to recognize the global potential for UK jewellery design and be as innovative, imaginative and proactive as the designers they serve.



# MailTalk

# MailTalk



1: The fruit of excruciating labour: a handful of fine red spinels from Ipanko, near Mahenge, Tanzania. Photo © Richard W. Hughes.

The production of synthetic diamonds from human ashes (as well as other organic materials' ashes) cropped up again, with various degrees of scepticism regarding the processes and the makers' claims. As an antidote to what he described as this "rather morbid discussion", Dick Hughes posted a link to a wonderful article that he and Vince Pardieu had just completed on the ruby, sapphire and spinel mines of central and southern Tanzania. (See <http://www.ruby-sapphire.com/tanzania-ruby-sapphire-spinel.htm>). This site also gave a link to a thesis on the gemmological features of Tunduru sapphire.

## Star stones

Even more remote than the Tanzanian mines is a star called HOPS-68, located in Orion about 1,350 light years from Earth. *Time Magazine* noted that recent research with the Spitzer Space Telescope revealed that "a sort of perpetual crystalline rainstorm made of a

bright green mineral of a class called olivine [was] pouring down on the infant star." This report was spotted by erstwhile Gem-A Tutor Jerry Root, who asked: "Anyone care to fathom a guess what the cost per carat might be to recover this material?"

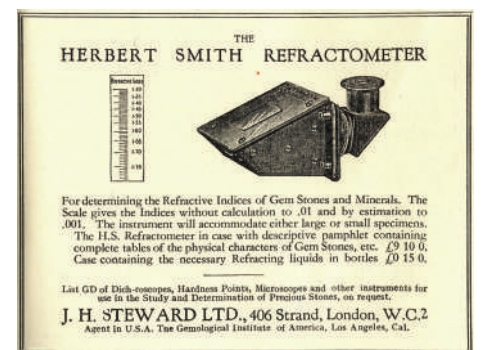
## Have refractometer, will travel

With the GIA Symposium and 80th Anniversary celebrations this year, Gem-A reminded readers that Robert M. Shipley, GIA founder in 1931, had been Gem-A's first ever US gemmology diploma graduate (1929). In a *Journal of Gemmology* article in 1981 Basil Anderson referred to the time fifty years earlier when "Robert M. Shipley with little but a GA Diploma, a Herbert Smith refractometer and unrelenting determination on his side was beginning his conquest of North America with 'Gemmology' as his banner...". Also in 1981, Richard Liddicoat Hon FGA — the then

The usual eclectic mix of gem-related news, views and amusements have travelled through cyberspace over the last few months on Gem-A's popular email forum MailTalk. Here is a round up some of the topics covered recently.

president of the GIA — commented that "Many years ago the late Robert M. Shipley told me that in 1930 to the best of his knowledge only one gem refractometer existed in the United States." Presumably that was the same Herbert Smith instrument which is still a treasured GIA possession.

2: 1930s advertisement for a Herbert Smith refractometer.





## Pearls

Austria-based jeweller and gemmologist Georg Wiesauer reported that the Chinese freshwater cultured pearl producers have now perfected a method of culturing large gonad-grown pearls in mussels using a large mother-of-pearl bead. He had seen large quantities of spherical white pearls — up to 20 mm, even 25 mm in diameter — produced by such a technique, including some black stained specimens. Elisabeth Strack noted that gonad-grown freshwater cultured pearls were not a new phenomenon and that some had been on the market since 2005, but Georg responded by agreeing that it was not an entirely new technology, but that it was only now that the Chinese producers were able to provide large quantities and that the first major harvest was expected to be offered at the Hong Kong Show in June. The large mother-of-pearl spheres used in the process are drilled prior to insertion into the gonad — as x-rays reveal — to help position the mother-of-pearl within the mussel.

Following the discussion on MailTalk, Prof. Dr Henry A. Hänni reported that he had seen this type of pearl in Hong Kong and that they were being called 'Ming Pearls'. This type of gonad-cultured freshwater pearl corresponds to the Japanese 'kasumiga-ura' cultured pearls (see 'Gem News from Gary Roskin', pages 32 – 34).

A more traditional look at cultured pearl production can be seen in a video produced during recent fieldwork in pearl farming areas of French Polynesia by Laurent Cartier. View at <http://www.uvm.edu/ieds/node/523>.

## Precious thoughts

A recent discussion on MailTalk warrants comment here: the use of the term 'semi-precious' — a term which gemmologists dislike and which, according to trade consensus in CIBJO, is banned. The argument against the term is logical enough, confusing at best (3). As Harry Levy has pointed out on MailTalk, so-called 'semi-precious stones' can often be worth far more than precious ones. He comments that it is not good "to tell a customer who has paid several thousand dollars for a stone set in jewellery that his or

her stone is only 'semi-precious'".

Of course, many in the trade (along with journalists and PR people) ignore the ban and, despite some active and passionate advocates for fighting such churlish behaviour, it is a difficult battle to win. As Harry Levy explained, "Unfortunately we live in a larger world than one dominated by gemmologists and jewellers. Governments, through their Customs, still insist on the use of the term 'semi-precious'. If you move goods across borders then you have to fill in forms, and each commodity has to be given a separate code number. If you put the product code used for rubies, sapphires and emeralds for other types of stones then your goods could be confiscated." This doesn't mean that the trade hasn't tried to get things changed; Harry continued, "We have had discussions for several decades now with Customs; they accept our arguments but claim that they would need 'universal' agreement between Customs and Postal Authorities which no one seems able to bring around. That is one Universe we have not been able to penetrate (yet)."

From both public and official governmental perspectives the definitions of precious and semi-precious seem to be that the former are diamond, emerald, ruby and sapphire, whilst anything else is semi-precious. Even so, I haven't yet located an official definition for import tariff purposes, whilst other dictionary definitions are of little help. For example, *The Cambridge Advanced Learner's Dictionary*

states: "A semi-precious stone is one which is used for making jewellery but is not extremely valuable." *The Macmillan Dictionary* is no better with "A semi-precious stone is one that is used in jewellery and is fairly valuable, but not as valuable as a precious stone such as a diamond or emerald." One of the earliest gemmological definitions may surprise many readers. According to Lewis Feuchtwanger's 1838 *A Treatise on Gems*: "Those species of minerals which are generally considered real gems are the diamond, sapphire, chrysoberyl, spinelle [sic], emerald, beryl, topaz, zircon, garnet, tourmaline, rubellite, [h]essonite, cordierite, iolite, quartz, chrysolite. The rest are considered as semi-precious gems."

Although the term 'semi-precious' is not a suitable one, it would actually be useful to have a single word or short phrase which meant 'gems other than diamond, emerald, sapphire and ruby', but without any derogatory or relative value implications. If we could find such a word or phrase I am sure that customs officials, gemmologists and the public would be delighted. In any case, if you think it is hard to define what is a 'semi-precious' stone, what about defining what is not? This was essential in order to comply with Kenyan mineral legislation which defined the class of 'common' minerals as including any stone "not being a precious or semi-precious stone".

J.O.

3: *The problems with the term 'semi precious', as seen here in an advertisement from Weekly World News, 30 January 1990.*

ADVERTISEMENT

**While Supplies Last...**

**New Jersey Jeweler Giving Away  
A Collection Of 8 "Valuable",  
Semi-Precious Stones For Only \$1.**

**"See what stone you like best", refundable offer being  
ordered by tens of thousands of jewelry lovers nationwide.**

(New Jersey) SPECIAL —

The Rothchild Depository, a major jeweler in Hillsdale, New Jersey, is sending people a collection of 8 beautiful semi-precious stones for only \$1 during their get acquainted offer.

According to a company spokesperson, the reason for this great value is simple.

The company feels they will

Their average weight is an impressive .50 carat, with some weighing a full carat.

**Gemstones certified by appraiser as "valuable" being offered for only \$1**

This collection of real, semi-precious stones from around the world has been certified by a licensed appraiser as "valuable".

The company, The Rothchild

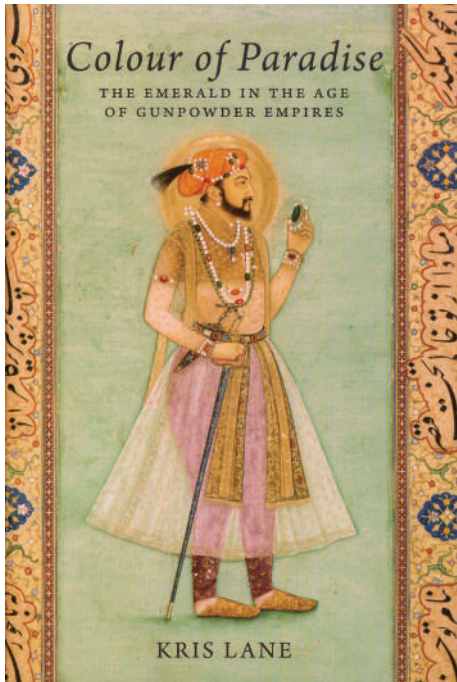
**Supply is running low due to huge demand**

When asked how long the company planned to make this special offer, they said "as long as we have collections left — before they sell out".

The orders are flooding in at a very heavy pace and can only be honored if they are received before the collections are sold out. If

## Book Shelf

# Colour of Paradise: The Emerald in the Age of Gunpowder Empires



Kris Lane, 2010.  
Yale University Press, New Haven and London.  
320 pp, 16 colour illustrations.  
ISBN 978-0-300-16131-1  
Price (approx.) £25.00

*Colour of Paradise* by Kris Lane is a study of the complex network of trade routes that brought South American emeralds to Europe and the Islamic worlds in the sixteenth and seventeenth centuries. Professor of history at the College of William and Mary in Williamsburg, Virginia, Lane has authored a number of books, as well as numerous articles dealing with piracy, slavery, gold mining, headhunting and even witchcraft in colonial Ecuador and Colombia.

Lane's study ranges from the conquests, the forced labour and the slavery occurring predominantly near Muzo in Colombia (the emerald production centre) to the traders, rulers and smugglers in Europe and the East who so greatly valued these "imperfectly shiny but rare, green rocks." Lane notes: "Those who profited most from the early world trade in emeralds were not the owners of the mines but rather a small number of Spanish, Portuguese, Flemish and other mostly European merchants who managed to survive punishing sea voyages and overland treks to carry exotic stones deep into kingdoms and principalities of South Asia and the Middle East."

Lane draws on a huge range of sources, from the relatively well-known items such as the travellers' records of Tavernier and Linschoten, to numerous rare documents such as a 1567 map of emerald diggings, royal tax records and private correspondence. Lane considers the emerald trade in terms of it representing "early modern globalization", and whilst his approach is that of a historian and not a gem specialist, there are some wonderful insights into the trade in earlier times that will fascinate any gem enthusiast. For example, Lane quotes an anonymous late-sixteenth century manuscript from Lisbon: "In the business of emeralds it is essential that whoever buys and sells them is most expert as there are many false ones ...". What modern gemmologist would not echo

those same words? The same four hundred year old source also says of emerald: "To tell by sight if it is good and fine, it must be of brilliant green, without lines, webs, or fractures, and being perfect it would be worth as much as diamond. One would have to wait a long time, however, to see a perfect emerald." Indeed, many observations made several centuries ago have resonance now; a visitor to the Muzo mines in 1766 noted that "the best stones always seemed to disappear, leaving the Crown with only fractured bits of second-class rough ...".

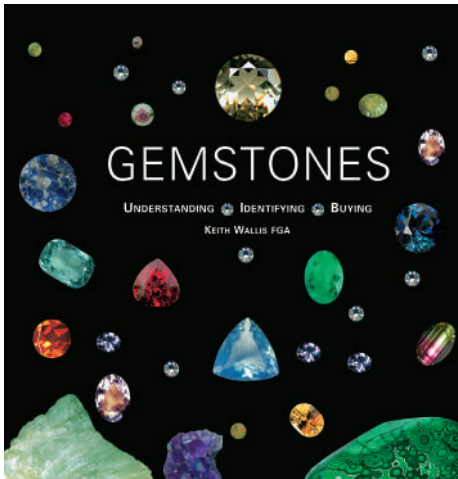
As Lane notes: "Appraising and cutting emeralds was as much an art as mining them." He talks of the cutting carried out in South America, as well as in Europe, and refers to the tantalizing mention of a skilled gem cutter working in Cartagena who was "repairing broken stones". He covers the cutting of emeralds locally in South America in some detail, as well as the main European cutting centres of Lisbon and Amsterdam.

The book ends with a chapter on Colombian emeralds, from the reopening of the Muzo mines after Colombian independence in the 1820s to the notorious 'Emerald King', Victor Carranza.

In sum, *Colour of Paradise* is a scholarly and fascinating book which fills an important gap in our understanding of the history of the coloured gem trade; a history that has, until now, been remarkably poorly served.

J.O.

## Gemstones



Keith Wallis, 2011.  
Antique Collectors' Club Ltd,  
Woodbridge, Suffolk.  
New edition, hardback, 160 pp,  
300 colour illustrations.  
ISBN: 978-1-85149-630-3  
Price £14.95

An expanded and updated version of this informative book; the latest issue of Keith Wallis's *Gemstones* brings the reader fully up-to-date with the latest treatments, simulants and synthetics that could be encountered in the trade today. Without relying on tables of results, the book conveys the author's knowledge and passion for the subject of gemmology, engaging the reader on numerous levels. Gemmologists of all ages will enjoy this, with its down-to-earth approach to the highs and lows of buying gems, and the pitfalls that lie waiting for the uninformed.

Illustrated throughout with high-quality photographs and images, the author takes us on a journey through over 100 gemstones, from the more common ones seen in almost every jeweller's window, to the rarer gems destined only for true collectors. Each is accompanied by a descriptive section, providing key features and identifying factors, along with notes on the current situation with regard to synthetics and treatments.

Each of the sections within the book has been expanded and revised since the previous issue, meaning that this now contains a greater breadth of knowledge, and shows experience that will benefit all. Newer sections include information on all aspects of jewellery, from the metals and alloys employed through the different hallmarks and their importance, to an illustrated glossary of the different terms used within jewellery, as well as useful advice on how to care for gems of all types.

The section on organics covers a wide variety of materials, and outlines the current legal and ethical limitations on the use and availability of each. This also includes possible simulants of each, providing the reader with good reference sources.

Of particular note in the remaining chapters is the section on 'Gemstones around the world', which sets out to provide a summary of notable gem localities around the world in such a way that it can be easily

referenced by country, with the gemstones section allowing any specific gem to be cross-referenced to the various sources. At the end of the eight main sections are a set of appendices that provide easy-to-read information on a variety of subjects, from colours, refractive indices and specific gravities to relative values — all of which are provided in easy-to-read formats. This section also includes a table of tanzanite values — not common to many texts.

Many a gemmologist or student will find this an invaluable asset, and even those with extended libraries will find this a very useful text.

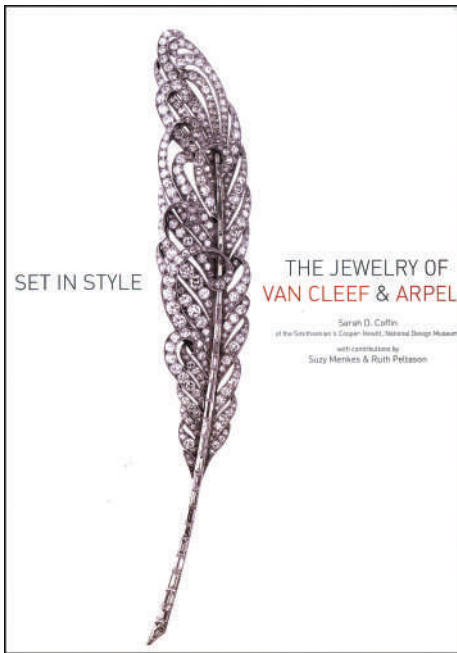
**A.S.F.**

*This review is for the new edition of Keith Wallis's book Gemstones. The Spring issue (Vol. 20, Issue 1) of Gems & Jewellery featured a review of the first edition and not the latest expanded edition. We offer Keith our sincerest apologies for this error.*



## Book Shelf

# Set in Style: The Jewelry of Van Cleef & Arpels



Sarah Coffin, with contributions from Suzy Menkes and Ruth Peltason, 2011. Thames and Hudson, London. Hardback, 288pp, 400 colour illustrations.  
ISBN: 978-0-50051-571-6  
Price: £32.00

Sarah Coffin is curator of seventeenth- and eighteenth-century decorative arts at the Cooper-Hewitt National Design Museum, New York, the venue for the exhibition which this fine book accompanied. It is a large and beautifully produced volume, illustrated with more than 350 of Van Cleef & Arpels pieces, fully demonstrating what Coffin says is the unique selling proposition of Van Cleef & Arpels' designs: innovation. Such innovation, linked with a passion for exquisite craftsmanship and precious materials, accounts for a rightly celebrated, century-long history of fine jewellery.

The story starts in 1896 in Paris, with the marriage between the Van Cleef and Arpels families (the book identifies the newlyweds as Estelle Van Cleef and Charles Arpels, although there are conflicting family stories from various sources; for example, Claude Julien Arpels said that "Alfred Van Cleef, the son of a diamond merchant from Amsterdam, married Estelle Arpels and started the company in Paris with his new brothers-in-law, Charles and Julien Arpels", whilst other sources give the bride's name as Esther). According to some sources, the Arpels family dealt in gems,

whilst the Van Cleefs were diamond dealers, and so perhaps not surprisingly in 1906 the Van Cleef & Arpels trademark was registered and the shop opened at 22 place Vendôme.

It is clear that from the beginning the focus of the company was on the quality of the pieces produced. The illustrations in the book do not follow a chronological pattern, and so it is difficult to gain a quick overview of Van Cleef & Arpels' stylistic development, although in part this disguises the fact that there are very few pieces represented from the earliest days of the company. An exception is the earliest known surviving piece, a magnificent bell push in yellow gold, silver, jasper and enamel depicting the yacht *Varuna* (1), and assumed to have been made for the yacht's owner: the American Eugene Higgins. It can be said that parallels with the work of Fabergé might be made.

From the 1920s and 1930s there is ample material to admire, and although it might well be personal bias, the pre-World War 2 pieces seem the most alluring, from stylish Art Deco vanity cases to the more classic platinum-set pieces, for example the 1928 feather brooch depicted on the front



1: *Varuna bell push*. Paris, France, ca 1908. Van Cleef & Arpels' collection.

## Set in style: The Jewelry of Van Cleef & Arpels (cont.)

cover of the book. In 1939, with the German occupation of France, the Arpels family moved from Paris to New York. This increased the importance of the American market for the company, and indeed the exhibition and book focus on pieces “created exclusively for the American market”. However, the 1939 venture into America (as noted in this book and other sources) is not the whole truth from the historical point of view — a full ten years earlier, the American magazine *Jewelers' Circular* (Volume 98, 1929) noted that “Van Cleef & Arpels, Inc., well-known French jewelry concern, have leased the store at the southeast corner of Fifth Ave. and 53rd St., for the term of fifteen years.” Is this perhaps related to the Parisian jeweller Jean-Louis le Henaff's move to New York in 1929?

During the 1940s Claude Arpels applied for several design patents in New York, and with the book's US focus it is a shame that there doesn't seem to be any mention of these (they may have been covered in the exhibition, which sadly I could not attend). In some cases at least the actual piece made to one of these designs is illustrated in the book. One is shown in figure 25 in the volume; a yellow gold, ruby and cabochon emerald, titled ‘Raja playing lute brooch’. This is US design patent 15,050 from 1947. The 1946 design patent for a snowflake brooch (US design patent 147,390) is seen in both a photograph (2) in the book as well as a guache drawing reproduced in the book (pages 110 and 147 respectively). In this case the design patent description intriguingly refers to published representations of examples: “*Vogue*, Dec. 1, 1945 page 47 centre snowflake; *Mademoiselle*, Feb. 1946, page 126, lower left; *Harper's Bazaar*, May 1946, page 78, Shopping Bazaar second left,” — it would be fun to look these up.

The concept of a ‘Raja playing lute brooch’ brings me back to my own preferences — my bias towards the earlier pieces might reflect a wider difference between European and American taste. The English version of the book has the 1928 platinum and diamond feather brooch on the cover, while the cover of the American edition shows a far bolder ruby and diamond ranunculi flower brooch “stylized almost beyond recognition”, and dating from 1937.

The ruby ranunculi flowers are examples of the renowned ‘mystery setting’. Naturally the book covers Van Cleef & Arpels' perfection of this so-called mystery setting — stones with recessed girdles that allow them to be set touching side-by-side in a precious metal framework. This is an intriguing and visually amazing technique patented by Van Cleef & Arpels (French patent 764,966; ‘Dispositif pour monter les pierres précieuses’, published 31 May 1934). More coverage of this technique would have been useful, especially considering the American focus of the book. Two 1936 American patents for mystery settings applied for by Solomon Arpels (better known as Charles Arpels) are readily available on the web (see <http://tinyurl.com/vcandamysterysetting> and <http://tinyurl.com/vcandamysteryring>). The stones have grooved girdles which allow them to slide into a framework of sheet metal partitions. Interestingly, the mystery-set ring shown in figure 23 (page 31) in the book, along with a reproduction of an advertisement for it (figure 22), is also the ring shown in one of the 1936 US mystery setting patents, and was also subject of a 1936 US design patent (US design patent 99,982). It perhaps should be added that mystery setting was not a totally novel approach to stone setting. In 1905 Chaumet, another Parisian ‘house’, was granted a UK patent for a form of setting which provided much the same effect overall, but with a framework of wires (see Jack Ogden, ‘Historical Settings’, *Gems & Jewellery*, **14**(1), 2005, p.10–11).

In summary *Set in Style* is a glorious record of what must have been a wonderful exhibition, as well as a record of (and homage to) the work of one of the greatest Parisian jewellery houses. The illustrations — from many different sources — are of course the main feature, and the US focus of the pieces makes this book a welcome addition to the jewellery enthusiast's library. However, greater



2: Snowflake brooch. Paris, France, 1948. Yellow gold, diamonds, platinum. Courtesy of Jean F. and Frederic A. Sharf.

mention of the US design patents would have been useful. As a jewellery historian, albeit of earlier periods, I also feel that a more robust look at the history of the families themselves would have provided a helpful background, and I would also have welcomed a more in-depth look at some of the technical and material issues — particularly the gemmological ones (are those ‘topazes’ really topazes?), but, as any exhibition designer or publisher will tell you, commercial pressures rule, and in the context of the wide audience required to make the book and exhibition viable, I am probably a lonely voice.

J.O.

### Acknowledgements

I am grateful to Dona Dirlam, Director of the Richard T. Liddicoat Gemological Library and Information Center, GIA, and her colleagues for confirming the 1929 *Jewelers' Circular* reference for me.

## The Journal of Gemmology

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

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

# Refractometer expertise\*

Darko Sturman outlines a new set of simple guidelines to using the refractometer, to help gemmologists get the most out of this useful instrument.

Advanced instrumentation plays an increasing part in gemmological testing, but there is still a very important role for more traditional and readily-available equipment such as the refractometer. With careful use and the proper interpretation of data, the modern refractometer's high-quality optics (used with a monochromatic light source), can provide highly reliable and accurate data.

However, there are some procedures that have been described in literature and repeated from textbook to textbook for decades that have been shown to be inaccurate or over simplified. For example, in *Gems* by R. Webster (in editions up to 1994), it is stated that a gemstone with a small optic axial angle rotated on a refractometer shows one shadow edge that "moves very little". New research shows that all biaxial gemstones with small, medium or large optic axial angles can have one shadow edge that "moves very little" in some orientations. There is also little point in giving, as some books do, refractive indices (RIs) to two decimal places and birefringence to three. In order to clarify things, a new set of simple but accurate procedures are suggested that can be used in teaching and in practice.



There are some essential rules, namely that rotation of a gemstone through at least 180° on the refractometer is essential; that monochromatic light (around 589 nm) should always be used; and that a polarizing filter will often increase the accuracy of determinations. In some cases anisotropic gemstones have constant RIs and their determination is all that is required for reliable identification. In other cases variable chemical composition is reflected in variation of RIs and therefore identification is based on determination of other optical properties such as the optic sign and optic character.

The maximum and minimum RIs of any anisotropic gemstone can be determined on any facet, regardless of orientation of the optical elements. There is no need to use all three constants (maximum and minimum RIs and birefringence) in identification — these are related and exactly the same results can be obtained from the use of only two constants. An identification chart can be based on maximum RI and birefringence, allowing easy graphical presentations.



Study of the 70 calculated patterns of movements of shadow edges during the rotation of a gemstone on the refractometer show that all observations on isotropic or anisotropic uniaxial and biaxial gemstones, in every possible orientation of the optical elements and facets, may be represented by just seven patterns which can be shown in simple graphical form. The chart showing birefringence against maximum refractive index allows the identification of most gemstones.

Calculations of the patterns of movement of shadow edges during the rotation of a gem on the refractometer permitted modification of the optimal procedures for using a polarizing filter to determine optic sign and the optic character. There are three such patterns and again, based

on these, identification procedures can be presented in graphic form. For accurate use of the polarizing filter, gemmologists should understand how the polarizing filter works. It does not work as some kind of vertical blind that transmits rays that vibrate in one direction only. The polarizing filter transforms an incoming ray into two rays as the light moves through the filter; one of these rays is absorbed and the other is transmitted. The vibration direction of the polarizing filter must be known.

To best observe shadow edges, first rotate a gemstone on the refractometer and observe any changes without a polarizing filter. When two shadow edges are very close, or if we need better contrast to allow greater accuracy, the polarizing filter can be used to bring one shadow edge to extinction. Again,

incorrect use – even the methods described in some earlier textbooks – can lead to errors such as incorrect determination of the optic sign in biaxial gemstones or even the wrong determination of the optic character.

J.O.

\* A summary of three linked articles appearing in *The Journal of Gemmology*, 2010, **32**(1-4): Darko B. Sturman, 'A new approach to the teaching and use of the refractometer', 74-89; Darko B. Sturman and Duncan Parker, 'Use of the polarizing filter on the refractometer in determinations of the optic sign or optic character of a gemstone', 90-100; and Darko B. Sturman and Duncan Parker, 'Use of the polarizing filter to improve observations of the shadow edges on the refractometer', 101-105.

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# Imitations of nephrite and Shoushan stone\*

As reserves of nephrite and Shoushan stone fall dramatically, China is looking to alternative minerals as substitutes.

For several centuries good quality nephrite has been highly prized in China for jewellery, carvings and royal seals, where it was seen as an emblem of the emperor's power. Shoushan stone, although less familiar in the West, also has a long history of use as an ornamental gem material in China. Shoushan stone, named after the source of the same name in Fujian province, actually comprises around one hundred varieties, mostly kaolin group minerals such as dickite, nacrite or pyrophyllite and, less commonly, illite. So-

called 'Tianhuang stone' is the most valuable type of Shoushan stone.

In recent years reserves of both nephrite and Shoushan stone have fallen dramatically, leading to a growing number of substitutes. One of these is brucite, a layered magnesium hydroxide. Brucite is extracted on an industrial scale as a source of magnesium, but the greyish-green and reddish-brown material, coloured by the presence of iron or manganese, is now being used to imitate both nephrite and Shoushan stone.

Samples of brucite that had been sold as Shoushan stone were tested at the National Gold and Diamond Testing Center (NGDTC) of PR China, and, in terms of their transparency, lustre and colour, were similar to some varieties of Shoushan stone. Two strands of brucite beads that were originally sold as nephrite showed an unusually dim lustre compared to nephrite – a potentially diagnostic feature.

All of the brucite samples were tested by routine gemmological methods. No obvious absorption spectra were observed when viewed with a hand-held spectroscope and, as expected for such soft and translucent to opaque materials, specific gravity, hardness and refractive indices (ascertained using the distant vision technique) were not sufficiently diagnostic. The Mohs' hardness of the samples was approximately 2.5. However, Fourier Transform Infrared (FTIR) spectroscopy provided conclusive evidence that the samples were brucite. Energy Dispersive X-Ray Fluorescence (EDXRF) spectrometry detected the major and trace elements, but further research is required to confirm its usefulness as a testing procedure for brucite.

**J.O.**



Carving of a traditional Chinese pattern in brucite; it is 130 mm tall and 100 mm wide. This imitates high quality Shoushan stone. Photo by Li Jianjun.

\* A summary of 'The gemmological properties and infrared spectra of brucite, an imitation of nephrite and Shoushan stone' by Li Jianjun, Yu Xiaoyan, Cai Jia, Liu Xiaowei, Fan Chengxing and Cheng Youfa, *The Journal of Gemmology*, 2010, **32**(1-4), 67-73.



## Letter to the Editors

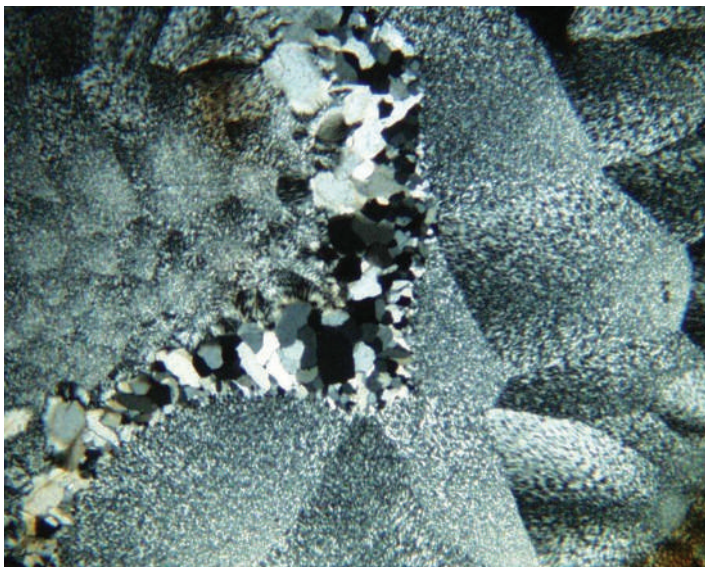
# Agate origin and Beilby flow

Following the article 'Scottish Agates' by Brian Jackson (*Gems & Jewellery*, Spring 2011, 3–9), I would like to add a note about Beilby flow.

I have been collecting, cutting and polishing Scottish agates for over 40 years since reading geology at Strathclyde University. The numerous Old Red Sandstone lava flows in the Central Valley of Scotland have provided rich pockets of agate and still do. Though the sources of free silica to provide the chalcedony and quartz are debated (alkaline lakes, 'rafts' of organic-rich sediments, etc.) the iron oxides necessary for colouring are at least non-contentious decomposition products of the lavas.

What is becoming more certain, at least in nodular agate from andesitic lavas, is that current thinking leads one into the theory of a nascent gel introduced into the cavity relatively quickly rather than one of a slow layer-by-layer growth, as was thought in the recent past. This gel takes an as yet unknown time to crystallize into growth bands and this currently unquantifiable length of time will depend, surely, on the physical and chemical conditions present during gestation, such as the depth of burial and the temperature of the surrounding lavas (probably long-solidified). Current theories indicate that a moderate temperature of around 100 °C is most likely to be the approximate temperature of crystallization as suggested by Terry Moxon<sup>1</sup>.

Externally most agates will present a pitted 'skin' of celadonite, the greenish chloritic mineral that often coats the inner wall of a gas cavity. These pits, though sometimes corresponding to protrusions in the adjacent lava, are often unassociated with any external influence and can be seen to be five-sided (on average) and resemble



*Thin section of condor agate showing main growth layers composed of long and short intertwined microscopic fibres. Photo courtesy of John Mackenzie.*

### Beilby flow

This is the supposed melting of a very thin surface layer in the final stages of polishing with a compound softer than the stone being polished. The 'flow' or 'melt' must be microscopic and describes migration of surface material and there is still discussion as to whether this is true melting or rather molecular migration under pressure. The resulting Beilby layer is supposedly amorphous, and is not simply a reduction of ever-smaller scratches but an apparently smooth surface devoid of any blemish.

– Editor

shrinkage polygons in dried mud. Internally these can provide the basis for spherulitic growth within the clear outer layer present in agates. The main growth layers in agate are composed of long and short intertwined microscopic fibres that always grow at right angles to the preceding layer and can merge into a more granulated area and eventually into crystalline quartz, due to lesser amounts of bound water. The fibres help give agate its 'toughness' (as compared to hardness) and this can vary from agate to agate.

What I and many others would like to know is what happens to the nascent gel in the intervening period between deposition and crystallization. Is it a long or short period? Will fluctuations in temperature or chemistry within the surrounding lavas affect what happens within the gel and the formation of differing structures? It has to be assumed, by logic if not by proof, that once crystallization has occurred there will be no further structural alteration to the agate unless it be by tectonic forces allowing ingress of further silica into rents, or fractures.

As such the 'tube of escape' (in 3D usually seen to be in fact a rent) is most likely to be for expulsion of part of the gel which fits in well with the supposed plasticity of the gel and the fact that chemical/physical reactions (as suggested by Harry MacPherson<sup>2</sup>) take place prior to crystallization with the resulting variations both of banding and inclusions. These do not necessarily follow either previous inclusions or the shape of the nodule walls. Thus each agate will be truly unique in form even if sharing a 'more-or-less' common genesis combining perhaps more than one theory of genesis. These variations can be seen admirably in Brian Jackson's clear photographs.

In Scotland it is common to find some localities (such as Fullerton Den or areas around Usan for instance) to have a preponderance of onyx as compared to wall-banded agates. However in some areas nearby wall-banded agates can exist side by side with onyx-layered ones; indeed it is possible to have nodules filled with zeolites immediately adjacent to ones filled by chalcedony. Though Heddle pointed out in the nineteenth century that there is no definite order of deposition of minerals within agates he failed to mention the fact that

## Letter to the Editors

there is no definite preference of deposition of minerals adjacent to each other either.

The most interesting talk by Ken Harrington, reported in 'Cutting it fine', (*Gems & Jewellery*, Spring 2011, 40-41) mentions Beilby flow of the 'Beilby Layer' and certainly reinforces my own polishing observations on agate. I have always polished at a higher speed than normal (1500 RPM) on a flat 10 inch felt lap using cerium oxide and just sufficient water to achieve heat without damaging the stone which produces a mirror-like polish. Any scratches left over from sanding can be seen under a lens to become gradually more rounded and then to 'flow' and finally to disappear leaving an unblemished surface. This process does not take too long, though obviously dependent on the scratch size. Some reaction has to be taking place between the friction of the felt wheel, the cerium oxide and the water. It is certainly hard to imagine generating high enough temperatures

to actually 'melt' chalcedony or quartz this way but that is what appears to be happening. It would be most interesting to see what the science is behind the theory. Having never used tin oxide, would this be as good as or better than cerium oxide for polishing agates?

I hope you do not mind what in fact seems to have turned into a short article but the quality of your magazine has been inspiring.

**John Mackenzie**

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- 1: Moxon, T., 2009. *Studies on agate*. Terra Publications, Doncaster.
- 2: MacPherson, H. G., 1989. *Agates*. British Museum (Natural History), London, and National Museums of Scotland, Edinburgh, 72 pp.



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## Stone Scoop



# Up close

## Jack Ogden takes a look at the history of the loupe.

“He had just lit a lamp that shed a strong light on the work before him, and was adjusting the loupe which jewellers use for a close examination of minute objects, when the door was suddenly opened, and a stranger came in.” You can read the rest of that story in *The New Monthly Magazine*, published in London in 1851. It is the earliest English reference I’ve found so far to the jeweller’s loupe and one using the word ‘loupe’ — that accessory essential to every gemmologist and gem dealer.

For a long time the term ‘loupe’ (French in origin) referred to the glass that watchmakers held in the eye. A useful definition is found in an 1897 US patent which explains that watchmakers’ loupes “are used by watchmakers, watch-repairers, jewelers, and others who require a magnifying-glass which can be held in place in front of the eye by contraction of the adjacent muscles, leaving the hands free and permitting the user to move his head at will.” That patent was for an improved version, not enclosed like the traditional type and therefore lighter in weight, and so could be worn by someone with glasses. There were improvements to the design, particularly during the 1920s, including loupes that were especially designed to clip onto glasses, as well as folding loupes. Of course, the traditional enclosed versions continued to be made and used — the GIA even had to issue a warning about celluloid ones that could instantaneously combust.

## Power crazy

Loupes with various magnification strengths were available, but there was little consensus as to what powers were best for diamonds and gems — indeed, nineteenth-

century books on gemmology make little mention of any use of magnification in gem identification other than with a microscope. The degree of magnification was probably a personal choice, much as it has always been for watchmakers, and there was plenty of choice. The writer of an 1887 microscopy handbook noted that “jewelers’ eye-glasses or loupes are cheap and generally made of excellent lenses. I find it convenient to have four of them, of focal lengths ranging from a half inch to two inches ...”. Magnification was defined in terms of focal length; when descriptions of what could be observed were being made for comparative purposes, the magnification needed to be recorded, thus in 1917 it was said that a blue diamond “without any perceptible milkiness under a one-half inch loupe ... may be considered a rare gem”. In modern terms, a half inch loupe would give a magnification of x20.

## Loupe clean

From at least as early as the 1920s the term ‘loupe clean’ was applied to diamonds, and so there had to be agreement as to what power loupe was being used. The trade seems to have viewed 7 power as the minimum and in 1931 the US Retail Jewelry Code specified a loupe of ‘not less than 7 power’ for decisions about the perfection of gems. However the US Federal Trade Commission (FTC) rules of that same year merely specified an ‘ordinary diamond loupe’ which, as an issue of *Gems & Gemology* published that year pointed out, would presumably include loupes as low as three power. Some of the trade was using the ten power magnification we consider normal today — for example in 1934 one jeweller commented that “brief study of the gem under a good ten-diameter Hastings aplanatic loupe revealed the unmistakable silk of a fancy sapphire”. However that same year, 1934, the Codes of Fair Competition

for the US retail jewellery trade retained the 7 power minimum rule when it said that jewellers may not use the word perfect “as descriptive of, any diamond, ruby, sapphire, or emerald which discloses flaws, cracks, carbon, spots, clouds, cloudy texture, or blemishes of any sort when examined by a trained eye under a diamond loupe of not less than 7 power.” There was a push by the industry to get the FTC to follow suit and in 1936 the trade urged that the word ‘ordinary’ be stricken out of the FTC rules and the “not less than seven power” be inserted.

## x10

When the US Federal Trade Commission issued its Trade Practice Rules for the wholesale jewellery industry in 1938 it brushed aside the x7 minimum and opted for the higher magnification, stating: “The use of the word ‘perfect’ in describing a gem that under a 10-power loupe shows any imperfection is unfair.” The US trade had a new standard and jeweller’s equipment providers didn’t miss a beat — one 1938 advertisement in the US trade press said “Protect Yourself With A 10 Power Diamond Loupe. This loupe satisfies the 10 power requirement of the new Trade Practice Rule.” The x10 was now official.

I trust my UK readers will excuse the American-centric content above, but, as Selwyn noted in his *Retail Jeweller’s Handbook* published in London in 1945, the Americans necessarily needed a standard — he gives it as x7 quoting the 1934 rules — but “Our British Public are not so trained in diamond distinctions.” However, Selwyn does go on to say that “‘Flawless’ is recommended in place of ‘perfect’ and should justify its use after examination of the stone internally and externally under a x10 glass.”

J.O.



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