

Gems & Jewellery

October 2009 / Volume 18 / No. 4



**Demantoid:
new source in
Madagascar**

**Flux-grown
spinel**

**Gem-A
Conference
and Graduation**

The background of the advertisement is a collage of various jewelry items. At the top left, there are necklaces with green and brown beads and a silver chain with large, elongated, metallic links. To the right, there are necklaces with silver beads and large, clear, faceted stones. In the center, several loose gemstones are displayed: a large blue square-cut stone, a large purple square-cut stone, a small green oval stone, a small red round stone, a small purple round stone, and a small green rectangular stone. On the left side, there are necklaces with brown and black beads and a necklace with large, faceted, brown and black stones. At the bottom left, there are necklaces with blue and white beads and a necklace with large, faceted, blue and white stones. At the bottom right, there are necklaces with green and purple beads and a necklace with large, faceted, green and purple stones. The text is centered in the middle of the page.

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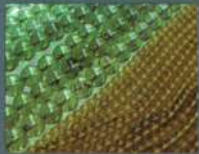
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Fellowship

It was recently pointed out that being awarded the Diploma of the Gemmological Association can be in the gilded magnificence of Goldsmiths' Hall with your hand being shaken by one of the great names in gemmology, but election to Fellowship ('FGA' status) merely results in an email. With most academic and professional organizations, from Archaeological to Zoological, the wonderfully British tradition of election to 'Fellowship' is a significant and very proud moment in the recipient's life. Why doesn't Gem-A celebrate election to Fellowship more seriously?

The answer, of course, is history and confusion. But before the history, let me explain one way in which we are going to better elevate and celebrate 'FGA' status.

What makes Gem-A almost unique among the illustrious family of 'Fellowship' organizations is that passing our exam has been the only criterion for standing for election to normal Fellowship. For most Fellowship bodies, election is based on various combinations of peer recognition, scholarly contribution and academic qualifications. Gem-A's unique stance may have made sense several generations ago, but in the present global context, expert gemmologists reaching the pinnacles of their careers from other scientific disciplines or academic routes, need to be included and duly recognized for their contribution. Gem-A, with its high status and international community is the right body to do this. The Council of Gem-A has thus agreed that in addition to the traditional route to FGA status via our Diploma Exams, gemmologists may also apply for election to Fellowship status if they are already Associate or DGA Members of Gem-A and can demonstrate a significant contribution to the field of gemmology or the promotion of gem knowledge over no less than 10 years. Applicants must be proposed by no fewer than two current FGAs and will be required to pay a joining fee. This is not in any sense a 'watering down' of Fellowship; election by this route is recognition for those gemmologists who have a demonstrably high level of expertise and who have made a significant contribution to the field.

This initiative will help to underline that being a graduate of Gem-A's Gemmology Diploma exam and being a Fellow of the Association ('FGA') are now very different things. When the Diploma Exam was first established, you only retained the Diploma and use of the initials DG (Diploma in Gemmology) while you were a paid up Member. Fellowship with the initials 'FGA' was introduced in 1931 because it sounded grander than 'DG', but until the 1980s the Diplomas bore the title 'Fellowship Diploma' and you still had to return them if you ceased to be a paid-up Member of Gem-A. Now the Gemmology Diploma is a fully accredited stand-alone qualification but if you are a holder you may apply to be elected to Fellowship ('FGA') status. As with other Fellowship bodies, you must be a paid-up member to call yourself a Fellow and use the letters FGA.

Also, from now on election to Fellowship Status will also be recognized by more than an email.

Jack Ogden

Chief Executive Officer

Cover Picture

'Tiara of Useful Knowledge' created by jewellery artist Jan Yager, made of oxidized sterling silver, 14 ct and 18 ct gold, and quartz. Photo by Jack Ramsdale. © Jan Yager. See pages 44-45.



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NATURE'S TREASURES II

The Wonder of Minerals and Gems

The Flett Theatre
Natural History Museum, London

Sunday 13 December 2009

10:00 am – 4:00 pm

An event for anyone with an interest in minerals and gemstones. Students from schools and universities are welcome to attend.

The day will include a programme of short talks as well as a number of displays and demonstrations.

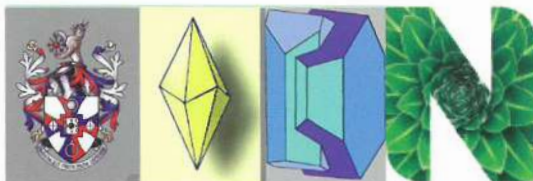
The stimulating programme of talks will include:

- Dr Chris Carlon
Mining the Ocean
- Guy Clutterbuck
Gems from mine to market
- Professor Alan Collins
Diamond – a unique mineral and the ultimate gemstone
- J. Faithfull
250 years of mineral collecting at the Hunterian Museum
- Dr Martin Feely
Teaching gemmology in the Emerald Isle – a geologist's perspective
- Dr Norman Moles
The Russell Society: promoting mineralogy and helping mineralogists in the UK and Ireland
- J. Ralph
Title to be confirmed
- Dr Ruth Siddall
Nature's Palette: Minerals and crystals in pigments and paints

Fee: £16.00 including refreshments and a sandwich lunch.

For further details and to register: www.minersoc.org/pages/meetings/nature2/nature2.html
or contact Kevin Murphy at kevin@minersoc.org

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



Not all conventional at the Convention Centre

Jack Ogden reports on gems at the Hong Kong Jewellery and Gem Fair



The Convention Centre, Hong Kong

The September Hong Kong Jewellery and Gem Fair is now the largest jewellery show in the world, spread across the Convention Centre and Asia World venues, a 'must visit' venue for buyers and a barometer on the state of the world jewellery and gem market. This year business was by no means 'back to normal', but there were some signs of recovery with what might best be described as tentative optimism in some quarters. Two things stood out this year; a greater accent on coloured gem materials – from the wonderful to the weird – and the growing realization that, as the past masters from Cellini to Fabergé knew so well, jewellery should be a conversation piece; it should grip consumers' attention. Gems and jewels must tell a story.

Gems must tell a story

Both IJL and the Hong Kong shows suggest that the first shoots of recovery are in evidence (see *The State of the Market*), and although it may take several years for overall world demand for jewellery to reach the levels of a few years ago in financial terms, there should be noticeable improvement over the coming 24 months. Whether demand will be the same again in terms of consumer requirements is an open question. Certainly the Hong Kong Fair revealed a greater accent on the less conventional and a strong feeling among some exhibitors that discerning consumers will increasingly be looking for something different, whether in terms of design, material or both.

Fine coloured gemstones have suffered far less than the more run-of-the-mill stones over the last year, and some gems may even be subject to a shortage in good qualities and sizes. Recognizing coloured stone trends and adapting to them early can provide excellent financial rewards, but it takes courage and a determination to 'educate' customers. That underlines a vital fact in retailing; for all the management talk about demand-led marketing, sellers can't wait for customers to ask for less-common stones. They need to have them and show them and talk about them in a way that will excite and enthrall their customers. There has to be the story.

Coloured trends

A trend towards stronger coloured gems, and larger jewellery to accommodate them, was noted by Hans-George Wild, CEO of Paul Wild OHG, with his Director of Sales adding that although the Asian market for coloured stones has enormous potential, Europe and America were still the main markets. The spectacular coloured gems exhibited by Paul Wild included a large red spinel of 87.18 ct, a 142 ct cushion-cut yellow sapphire and a 81.28 ct tavorite.

What will be special over the coming year? Predictions include pink tourmaline from Mozambique, prehnite from Mali, Tanzanian spinels and Madagascan sphenes – note the country associations that add interest and 'story'. Also predicted to be in demand are demantoid garnets and fine natural sapphires.

The 87.18 ct red spinel exhibited by Paul Wild.



Shows and Exhibitions



The multi-stone Autore Flying Fish jewel, with detail of the small fish engraved on the reverse.

treatment provides a colour palette impossible to obtain in wholly untreated stones. The fish's eyes are small moonstone cabochons, the backs each hollowed to contain a small, faceted black diamond pupil — an unnervingly realistic touch.

Other coloured gemstones used by Autore include chrome diopside and spinels, whilst white topaz is used alongside diamond to create the desired rich appearance without the expense of large diamonds. One refreshing touch was the deliberate use of heavily included (P3) diamonds in the Autore 'Fire and Ice' range to provide the desired effect and add interest.

This brings us back to our point, and one that Alessio Boshi, Autore's chief designer, wholeheartedly endorses — jewellery must not only be beautiful, it must also have a story to tell. The 4Cs by themselves are no longer sufficient.

Grading

That said, Autore is by no means anarchic in its view of gem classification. The company is best known as producers of South Sea pearls from the *Pinctada maxima* (gold or silver lip oyster) and have developed their South Sea Cultured Pearl Classification Guide by which each pearl (and thus its value) is judged on the 5Ss — Shine, Surface, Shade, Shape and Size. This classification is attracting attention from other pearl producers and the market.

Whilst on the subject of grading systems, the HK Fair also saw the launch of the Chinese version of the detailed diamond grading system by India-based Venus Jewel, a DTC signholder and the largest specialist solitaire manufacturer in the world. With some 500 master stones and a multi-tier

checking system, their system also provides a direct link with value factors. Clarity, for example, is subdivided into 'table inclusions', 'black inclusions', 'inclusion pattern' and 'internal graining' and each of these further subdivided with the impact these have on pricing shown as percentages. More information can be found, in English and Chinese, on their website www.venusjewel.com. Akshay Shah said: "The Chinese and Hong Kong markets are becoming an increasingly important segment of our business."

The weird and the wonderful

For unusual gems, Arthur Birago's Freakingcat.com — 'the rarest and coolest gems on the planet' — was a necessary stopping-off point (www.freakingcat.com). Standing among his rows of gems, from green kyanite from Brazil to transparent sodalite of aqua blue/green colour from Afghanistan (which glowed orange under long wave UV), Arthur commented: "Our gems are not just for collectors. Modern jewellery designers, those young in energy and ideas, are increasingly looking for unusual gem materials to create a focus in their work." Again, gems that have a story. Gem materials at Freakingcat with a story include the Victoria Stone, mineralogically similar to jadeite, in chatoyant green and blue, that had been created by Dr Imori by a secret process that none have managed to replicate since his death — so examples are now rare and costly. Fordite and Dagenham Agate (polished multi-coloured layers of car paint from the Detroit and Dagenham car works (see *Gems & Jewellery*, April and August 2008) have been joined by Boat Paint — but all are now rare and remarkably expensive due to their popularity in recent years.

Cut or uncut?

Several dealers were exhibiting tumbled polished sapphires and other gems. Those illustrated here are blue sapphires by SB Gems (www.sbgems.com) who also exhibited

The desire for the less usual was also reflected in pearls, with increasing interest in baroque and the less usual shapes and colours, according to Jacques Branellec of Jewelm International Corporation.

The beauties

The use of baroque South Sea cultured pearls as an integral part of a design is seen in the Autore Flying Fish Jewel where they provide a Renaissance-like feel. This large and skilfully articulated brooch or pendant is set with coloured sapphires, including cabochon purple sapphires. The orange sapphires are beryllium treated, freely disclosed, because this permanent

Shows and Exhibitions

tumbled rubies, yellow sapphires and spinels. Khatore Giriraj of SB Gems said: "There is a noteworthy growth in interest in less usual cuts of fine gemstones and also in rough diamonds."

In addition to tumbled polished gems, there were carved gems – from SB Gems' coloured sapphire leaves to carved tanzanite by L.D. & Company (www.ldandcompany.in).

Diamonds – a new slice of the market

There were huge quantities of small coloured polished diamonds in all hues of the rainbow and, presumably, not always in the exact colours that nature had originally intended, but what stood out was the

abundance of polished slices of diamond which exhibited a variety of cross, star and other colour zoning. An unusual pair of diamond slices with irregular inclusion patterning from Dynamic International are shown here. The sudden appearance of so many of these diamond slices on the world market was also commented on during September in Gem-A's MailTalk. Zimbabwe is said to be the likely origin. There was also a very large number of necklaces made up of perforated rough diamonds – and in larger sizes than those seen on the European and US markets over the last few years. There was also a considerable number of rough diamonds of a quality that was hitherto considered solely industrial. These were being purchased for incorporation into

jewellery – again for jewels with a story – but tempted buyers should be aware that unless 'worked', even merely drilled or sliced, rough diamonds require a Kimberley certificate when crossing borders (Dynamic International assured me that that Kimberley Certification was available for their rough stones).

The beasts

Alongside the bright and the beautiful there are always the tricks and treatments. A Lithuanian company was offering what they insisted was wholly natural green amber (transparent or cloudy available) from Colombia. We hope to analyse this shortly to find out exactly what it is – presumably



Clockwise from top left: Arthur Birago of *Freakingcat.com* with samples of Victoria Stone; a carved tanzanite rose by L.D. & Company; tumbled polished sapphires by SB Gems; samples of the low quality rough diamonds typical of quantities being sold at the show; and diamond slices with irregular inclusion patterning from *Dynamic International*.

Shows and Exhibitions

died copal. According to Ted Themelis, the remarkably large quantity of good coloured emeralds in large sizes we noted around the show might in part be explained by a high pressure impregnation technique using a mixture of palm oil and resin. Couple this with an organic dye and pale green beryls can be give a good 'emerald' colour. Ted also warned of an increasing number of treated Mexican opals, turquoise subjected to cobalt 60 radiation – which apparently somehow reduced water content and stabilized the stones – and he briefly alluded to his findings that some of the sapphires now coming from Kashmir were being heat treated (promising to let me know more

soon). Glass-filled rubies were, of course, available by the wheelbarrow load, and prices for some good colour and large size stones are down as low as US\$1 per carat. One must imagine that the Madagascan land mass is decreasing.

Metals

Jewellery metals are a bit outside our remit here, but we can note the quantities of rose gold jewellery, rhodium plated silver and 'black rhodium' plating in evidence. There have been huge steps forward in the ability to work titanium in recent years, including casting, welding and stone setting.

Bearing this out was some of the jewellery by Moragen Co. Ltd of Thailand whose jewellery included coloured titanium bangles set with diamonds and an orchid brooch set with pink and yellow sapphires, small diamonds and a central cabochon rubellite. Such developments are again witness to breaking down of boundaries, the search for individuality and the need for the 'story'. Such things as diamonds set in titanium or polished slices of boat paint set in silver also raise the question as to whether a distinction between 'real jewellery' and 'costume jewellery' has any meaning these days.

Jack Ogden

The State of the Market

The most noticeable sign of continuing recession at the Hong Kong Fair was in the lower numbers of European and US buyers. The predominant visitors to the show (over 40%) were from Hong Kong, with Mainland China next at just over 20%. Other Pacific Rim countries and India made up most of the remainder, with fewer European visitors. This very much mirrors Gem-A's own experience as an exhibitor – but that is why we exhibit there, to catch up with our Asian Market. Gem-A currently has six Accredited Teaching Centres in China and four in Hong Kong, plus, of course, Japan, Thailand, Korea and Myanmar.

The predominant visitor business type was 'manufacturer', with retailers second. Coloured gemstones, coloured gem-set jewellery and cultured pearl jewellery together made up some 25% of products being sought – about the same as diamond set jewellery and loose diamonds together.

The Chinese market in particular has been remarkably resilient in this challenging economic climate. However, it is important to differentiate between the Chinese domestic and export markets. Thus while the Shanghai Diamond Exchange reported an increase in cut diamond imports in the first half of 2009 12.7% up on 2008, the bulk of these stones are re-exported once set. China's domestic market for diamonds currently constitutes just some 6–8% of world demand. However the DTC expects Chinese demand to increase by 14–15% annually over the coming years.

Coloured Gems in China

Coloured gemstone jewellery currently makes up only 5.5% of China's annual consumption of some US\$20 billion of jewellery largely because jewellery is still viewed as a store of wealth and so

gold and diamonds predominate. However better promotion and marketing by retailers will lead to greater consumer awareness and there is enormous potential for growth in the coloured stone market.

One of Gem-A's instructors in Guangzhou, Dr Qui Zhili, director of the Gemstones Research and Grading (Assessment) Center of Sun Yat Sen University, noted how the younger generation of Chinese are more aware of, and more interested in, coloured gemstones than most Chinese consumers. Nevertheless, as Dr Qui stressed, growth in the Chinese market for coloured gems will require consumer confidence as well as consumer awareness, and this means accurate descriptions.

Incidentally, Hong Kong is currently the second most important export market for Colombian emeralds, according to Luis Gabriel Angarita, president of the Colombian Emeralds Exporters Association (ACODES).

UK in HK

The UK itself was barely represented among exhibitors in HK and there was a lack of any coherent 'British Presence'. This is a sad reflection on the UK jewellery industry (and UK Government support for the UK jewellery industry). It is hard to correlate the poor state of the jewellery industry in the UK with a recent report by consultants McKinsey & Co. which puts the UK at third place in the world for the percentage of 'wealthy' people in its population – after USA and Japan. UK invisibility was in marked contrast to some other European countries such as Italy and Germany. Germany had a pavilion with 46 Exhibitors (24 with loose gem stones compared to 22 with finished jewellery).

Jack Ogden

Visit Gem-A at the 2010 Tucson Gem and Mineral Show

Booth G31, AGTA Tucson Gem Show, Tucson Convention Centre from Tuesday 2 to Sunday 7 February 2010

Are you going to the Tucson show next year? If so, do come by the Gem-A booth and say hello. Gem-A CEO Dr Jack Ogden, Director of Education Lorne Stather and Senior Tutor Doug Garrod will be at the booth and look forward to meeting you. We will have our new course materials for you to see.

Two-day Gemmology Practical Workshop

Sunday 31 January and Monday 1 February 2010. 09:30 to 17:30

Tutor: Douglas Garrod FGA DGA

Tucson Convention Centre, 260 South Church, Tucson, AZ 85701

Price: £300.00

This workshop is designed to provide the necessary practical endorsement for Gem-A's Gemmology Foundation course, but also offers Gem-A Gemmology Diploma students and Gem-A members the ideal opportunity to refresh their practical skills and get some hands-on experience. GIA graduate gemmologists (GGs) are also welcome. To book this course please contact: Pavet Amrit FGA, pavet.amrit@gem-a.com

Free Seminar

Hand-Held Instruments: Hands-on

Thursday 4 February 2010 from 13:00 to 14:00

Graham Room, AGTA Tucson Gem Show, Tucson Convention Centre

Join Doug Garrod of Gem-A to look at colour in a new light. This is your chance to re-examine how your hand-held instruments can be used to analyse colour in gemstones. In this hands-on session, practice using the spectroscope, dichroscope and the Chelsea Colour Filter to observe the cause of colour in gemstones.

Ideal as a refresher or to learn how to make the most of your portable testing equipment.

For information on this and other seminars go to

<http://agta.org/tradeshows/gft-seminars.html>

New Gemmology Course Notes

These new full-colour notes* combining both the Foundation and Diploma sections, are the perfect gemmological reference tool for members and students alike.



SPECIAL OFFER

Normally priced at £199 + postage, the special introductory price for the course notes of £135 + postage of £65 has been extended to the Tucson Gem Show. There will be a limited number of sets available at Tucson, so to ensure that you don't miss this opportunity, order your copy in advance and collect from our booth. For advance orders and people picking up from the booth in Tucson a special deal of £150 is available, saving you £50 on postage (advanced orders need to be placed by 4 January 2010 to reserve your copy).

* Course notes are available only to members and current students of Gem-A.

AGA Conference and Gala Dinner Dance

Wednesday 3 February 2010 at the Marriott University Park, 880 East 2nd Street, Tucson, AZ

The Accredited Gemologists Association's Annual Tucson Conference is one that Gem-A members won't want to miss. Known for the high quality of their conferences – and the excellent hands-on opportunities they always provide for examining material first-hand – this year's conference offers a stellar line-up of speakers and topics including:

- Dr Don Hoover will present recent findings from his extensive research into the magnetic susceptibility of gems.
- Dr Cigdem Lule will present an introduction to Archaeogemmology, a new concept that advances simple non-destructive analyses and modern gemmological concepts to the interpretation of archaeological gem findings.
- Thomas Hainschwang will discuss advanced instrumentation in gemmology – its uses, advantages, and risks – and its application in dealing with today's treatments and synthetics.

- Alan Hodgkinson will underscore the continuing value of classic gemmology, demonstrating—as always—the valuable lesson that the 'answer' is in the stone.
- David Porter will be discussing a rediscovered source for natural pearls and the difficulties that dealers of rare natural pearls face when trying to obtain laboratory reports on these products.
- Chris Smith will provide an update on some of the latest gemmological challenges observed in the laboratory.

The Gala Dinner Dance will include the presentation of the Antonio C. Bonanno Award for Excellence in Gemology.

Conference registration includes lunch and the Gala Dinner.

Dinner Gala tickets may be purchased separately. Discounted rates for AGA and Gem-A members.

For additional information about the conference and speakers, or to register online, go to www.accreditedgemologists.org.

Shows and Exhibitions

IJL 2009

Record numbers attend London jewellery show

International Jewellery London had the highest recorded number of visitors in 2009 since the first show in 1976, 7% up on the previous year, and many exhibitors reported that business had been good.

As Jack Ogden says (page 3), hopefully this is an early indication that the market is beginning to recover.

At the Gem-A stand there was considerable interest in our new Foundation and Diploma in Gemmology course notes. Many members who had previously taken our courses took the opportunity to purchase the notes which not only provide a reference to gems currently on the market, but also can be supplemented by downloadable pages when new gem sources, treatments or synthetics occur.

Corporate Membership, Gem-A's new initiative for the UK gem and jewellery trade, was launched during the show, and attracted interest from visitors and exhibitors alike. (Further information on the scheme is given on page 32.)

Gem-A's Doug Garrod presented two two-hour hands-on sessions as part of the IJL seminar programme, each to a full house. The first session gave an introduction to gem testing and the second explored some of the imitation, man-made and treated gemstones currently on the market. These popular seminars provided essential information for those in the trade.

This year there appeared to be a marked increase in the number of exhibitors using gemstones in particularly exciting and innovative ways. This was particularly evident in the Design Gallery. Of note was Fei Liu, with designs ranging from refined femininity to high drama. As well as yellow gold and platinum, he uses black gold to enhance coloured gems and pearls. Fei Liu Jewellery was established in 2006 in Birmingham and opened a shop in Beijing earlier this year, the first time a UK-based jewellery company has launched in China. Fei Liu was a winner of the newly launched Editor's Choice, an IJL award that recognizes designers and producers setting the latest fashion trends. During the show he was also presented with the Lonmin Design Innovation Award which recognizes outstanding design in platinum.

Also in the Design Gallery was Valerie Black with a range of bold designs and interesting colour mixes. Born in Argentina, Valerie spent nine years in Brazil where she developed her fascination for gemstones and is now based in London. All her stones she sources from a company in Idar-Oberstein, Germany. Said Valerie: "With so many synthetics and treated stones on the market today, it is important to deal with a supplier you know and trust. It is many

1. From Fei Liu's Dawn collection: 18ct black rhodium plated white gold ring set with prehnite (8 ct), citrine, peridot and diamond. © Fei Liu Fine Jewellery.

2 and 3. Rock crystal with crystal inclusion and agate with dendritic inclusions and quartz crystal. Both stones are from Brazil and were carved by Dieter Lorenz. Photos courtesy of Dieter Lorenz.

4. Citrine necklace and earrings by Valerie Black. The clasp is reversible and set with a citrine that is cabochon on one side and faceted on the reverse. Photo by Edward Allwright. © Valerie Black.



Shows and Exhibitions

years since I exhibited at IJL and I was delighted with the interest shown in my jewellery."

Exhibiting for fifth time at IJL was gem carver Dieter Lorenz of Idar-Oberstein, Germany. The stones exhibited had been carved to display their colours and textures, as well as features such as inclusions. Dieter Lorenz said: "This year IJL was a surprise to us.

We did not expect to do good business because of the depressed economy. But the fair had an optimistic atmosphere with visitors who were looking for interesting new things and sales were OK."

International Jewellery London excites us with new ideas every year, and continues to be the UK's top show for the jewellery trade.

Gem-Empathy Award

Once again Gem-A was proud to sponsor the Gem-Empathy Award at IJL, which is presented to the exhibitor whose gem-set jewellery, in the opinion of the judges, best combines innovation and design with flair and a knowledgeable understanding of the materials used.

For the second time the award was presented to Derbyshire-based jeweller C W Sellors. The company produce a range of hand-made pieces which display not only skill but also a passion for and knowledge of gemstones. The judges were particularly impressed with their unique and creative use of British gemstones Whitby jet and Derbyshire Blue John.

Said Gem-A CEO Jack Ogden: "We were looking for innovative concepts and, quite literally, an empathy for gems. With their platinum and jet 'Stargazer' collection Sellors have propelled British jet out of its rather dreary Victorian connotations into the spotlight of modern, wearable design. Black and white, light and heavy, a perfect and skilful balance of opposites."

Receiving the Award, Chris Sellors commented: "This is a very proud moment for us as a company to be acknowledged once more with this prestigious award. It's our thirtieth anniversary this year and despite challenging economic times, we continue to stand out with our unique designs and expertise which have resulted in this award along with 'Collection of the Year' at the NEC Spring Fair in Birmingham earlier this year. The Gem-A award not only adds prestige to us as a company but also in the promotion of our products to customers in-store."



Above: The presentation of the Gem-Empathy Award to the family business, C.W. Sellors. From left, Rebecca Sellors, Jason Sellors, Diane Sellors, Gem-A CEO Jack Ogden, Sarah Hicks (Marketing Manager, IJL) and Chris Sellors. Photo by Alex Beaton Photography Ltd.

Right: 'Brilliance - jet, diamond and platinum jewellery from the Stargazer Collection by C.W. Sellors. Photo courtesy of C.W. Sellors.



Demantoid from a new source

Dr Karl Schmetzer and Dr Stefanos Karampelas report on samples of the demantoids they obtained from a new source at Ambanja, Madagascar.

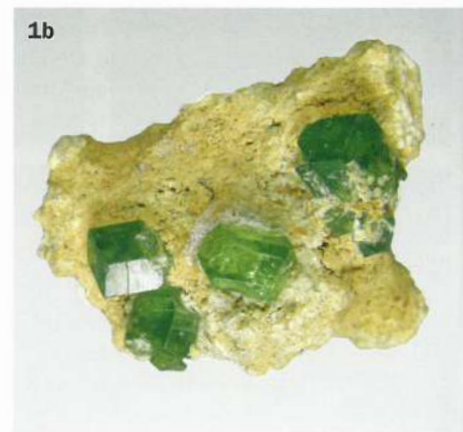
The name 'demantoid' is traditionally applied to green andradites which contain minor amounts of chromium. One of the most popular gems of the garnet family, demantoid, was first discovered in the nineteenth century in the Urals, Russia. Several other occurrences of this valuable gem material are known, including those in Namibia, Italy and Iran. A general survey of this green and yellowish green andradite variety, coloured by chromium and iron, was recently published by Stephenson and Kouznetsov (2009).

At the end of 2008, a new andradite deposit was discovered in Antezambato, near Ambanja, in the northern part of Madagascar. This new discovery caused an 'andradite rush', similar to several previous ruby or sapphire rushes in Madagascar, with thousands of miners entering the new area in Spring 2009. About 10% of recovered crystals are of gem-quality and sizes are often between 1 and 2 ct, with some crystals above 5 ct (Rondeau *et al.*, 2009).

We obtained for examination two samples with several andradite crystals in matrix (**1 a** and **b**), five rough crystals (**2**) and 15 faceted gemstones (**3**). The andradites show a green to yellowish-green coloration with some colour variation from daylight (a bluish green) to incandescent light (more green or yellowish green). However, one



Demantoid crystals from Ambanja, Madagascar, in deeply weathered matrix. Approximate size of samples: (a) 90 x 50 mm (garnet crystals from 12 to 7 mm); (b) 35 x 20 mm (dodecahedral garnet crystals about 6-7 mm).



intense green rough crystal was identified using traditional gem testing and verified by Raman spectroscopy and chemical analysis (EDXRF) as apatite. One piece of the deeply weathered matrix of one sample (**1a**) was removed and the main component was identified by Raman spectroscopy as quartz.

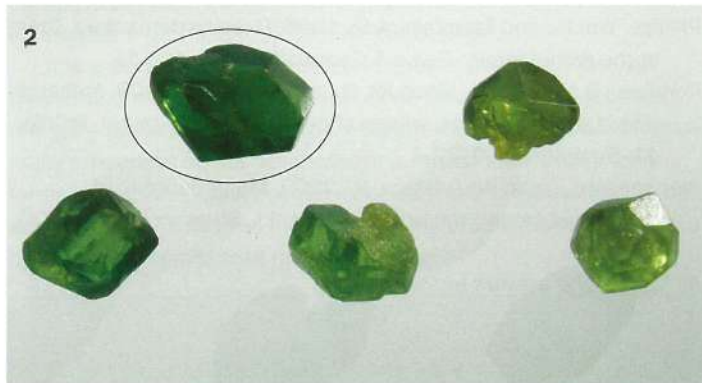
Demantoid from a new source

The green to yellowish green andradite crystals showed a combination of the most typical crystal forms observed in garnet, namely the dodecahedron {110} and the trapezohedron {211}. The relative sizes of both crystal forms varied (4). Specific gravity was found to range from 3.79 to 3.84 and the refractive index was above 1.81.

An initial observation with the loupe indicated that the garnets might contain some fibrous inclusions, so we expected to find some of the curved 'horsetail' inclusions, commonly seen in demantoids from the occurrence in Russia and recently reported in demantoids from Ambanja region by Danet (2009). However, a careful microscopic examination, especially in immersion, revealed that our four garnet samples did not contain any fibrous or other mineral inclusions. In contrast, all samples showed a distinct growth zoning parallel to the two dominant crystal forms (5 and 6); for a detailed explanation of growth structures see 4 and especially the caption given there.

Most samples showed anomalous double refraction under crossed polarizers and some of the garnets revealed small healed fractures (feathers consisting of small particles).

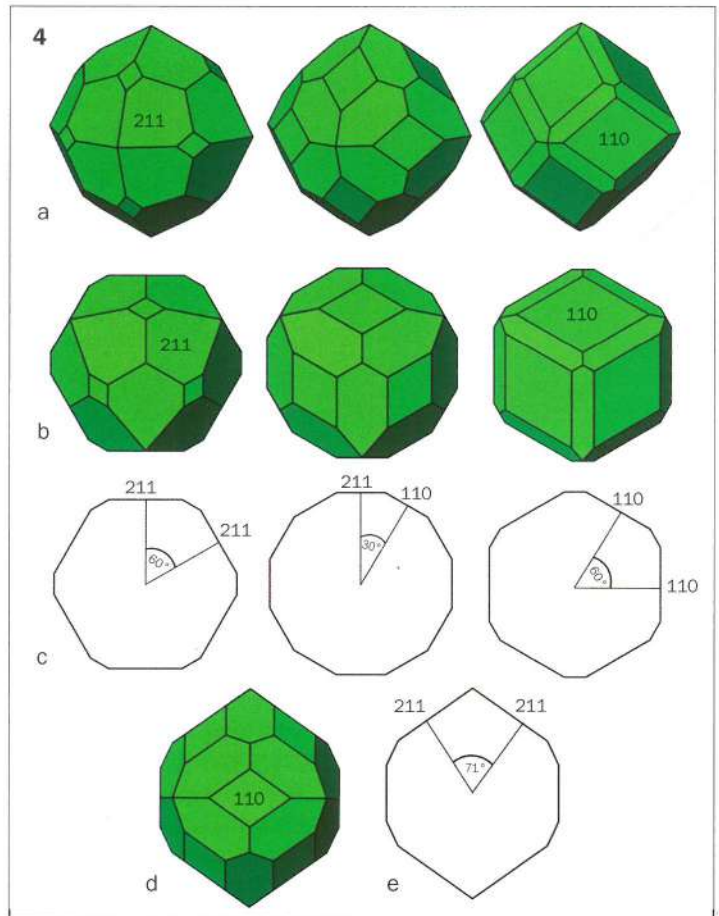
Chemical analyses on these samples using EDXRF were consistent with andradite. Additionally, some minor amounts of chromium, in the range of 0.05 to 0.07 wt.% Cr_2O_3 , were detected



Four demantoid crystals from Ambanja, Madagascar, weight of samples 2.8 to 3.4 ct, size from 6 to 9 mm. The intense green apatite crystal (circled) was also found in the garnet lot, weight 5.9 ct, size 9 x 12 mm.



Faceted demantoid crystals from Ambanja, Madagascar, weight of samples from about 1.3 to 0.5 ct, diameters of round samples from 6.5 to 4.8 mm.



Morphology and growth zoning in demantoid from Ambanja, Madagascar.

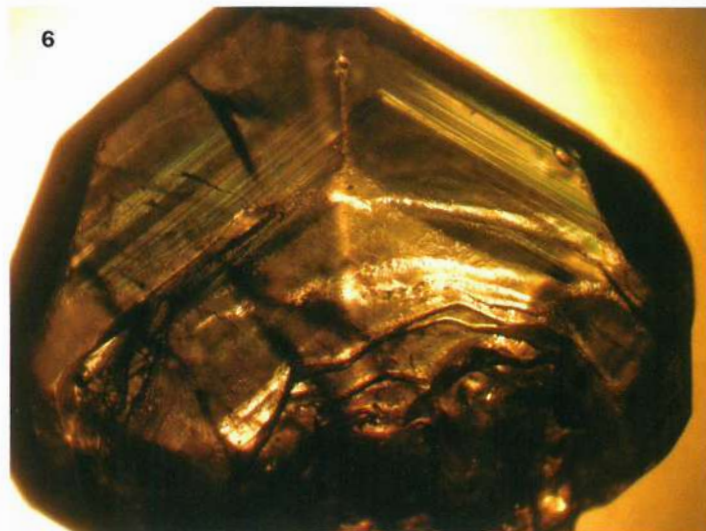
- The rough crystals show a combination of the dodecahedron {110} and the trapezohedron {211}; clinographic viewing.
- A view parallel to one of the cubic three-fold axes of the three demantoid crystals shown at (a).
- Section through the three crystals shown at (b), the dodecahedral and trapezohedral faces reveal interfacial angles of 60° and 30° and form angles of 120° and 150° with each other.
- A view parallel to one of the cubic two-fold axes of one demantoid crystal.
- Section through the crystal shown at (d), two trapezohedral faces reveal an interfacial angle of 71° and form an angle of 109° with each other.

Hands-on Gemmology

Demantoid from a new source



View parallel to one of the cubic three-fold axes of a demantoid crystal; growth zoning parallel to dodecahedral and trapezohedral faces. Immersion, magnified 25x.



View parallel to one of the cubic two-fold axes of a demantoid crystal; growth zoning parallel to trapezohedral faces. Immersion, magnified 30x.

in all four rough samples examined in our study. Similar relatively low amounts of Cr_2O_3 were also observed for demantoids from other sources, e.g. from Namibia (Lind *et al.*, 1997). However, some light green samples from Madagascar which were measured previously using EDS attached to a SEM did not show any presence of chromium (Rondeau *et al.*, 2009).

Spectra in the UV-Vis-NIR range (280–1000 nm) were taken for all four garnets. A total absorption in the ultraviolet part accompanied with a broad band which gradually decreases from the violet to the red range of the visible is observed in all the spectra. Three strong absorption bands were also observed in all four samples, with the most intense at about 440 nm and two broad bands, with less intensity, at 590 and 860 nm. The broad absorption maximum at about 590 nm always showed two distinct components with a somewhat more intense maximum at about 575 and a somewhat less intense at about 620 nm.

The absorption spectra are almost identical to those of chromium-bearing andradites from some other sources (see for example, Amthauer, 1976; Phillips and Talantsev, 1996; Lind *et al.*, 1997). They are assigned to ferric iron (Fe^{3+} ; absorption maxima at 440, 575 and 860 nm) and trivalent chromium (Cr^{3+} , absorption maximum at 620 nm). Consequently, the green to yellowish green andradites from Ambanja examined for this study are coloured by chromium and iron, and are designated as demantoids with the traditional use of the term.

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All figures and artwork by the authors.

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The Bear facts

Bear and Cara Williams have the chance to examine a rare and attractive stone

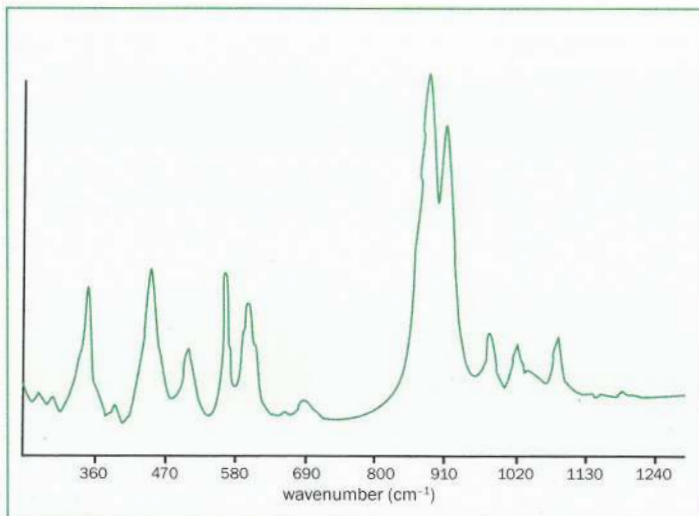
Piemontite

It is always particularly exciting when you realize that the stone you are testing is exceedingly rare, and even more so when it is an unusually nice specimen. This happened to us a short while ago when a colleague submitted a small but attractive pink stone that we were able to identify as piemontite.



Piemontite (also spelled Piedmontite), as the name suggests, is a mineral first discovered in 1853 in the Piemonte region of northern Italy. It is the manganese-rich variety of epidote, sometimes incorrectly referred to as manganoanvesuvianite, and a member of the epidote group. And for another mouthful, the chemical formula for Piemontite is $\text{Ca}_2(\text{Al}, \text{Mn}^{3+}, \text{Fe}^{3+})_3(\text{SiO}_4)_2(\text{Si}_2\text{O}_7)\text{O}(\text{OH})$.

It is unfortunate that facet grade specimens are so rare, as they exhibit a beautiful and pronounced pleochroism of yellowish orange – lavender – pinkish red. Facet grade material is so rare that many references do not acknowledge it exists. It most commonly forms in reddish to pink opaque masses. The one that came into our lab reportedly came from the Shadow Lake area in California, likely a by-product of manganese mining in the area.



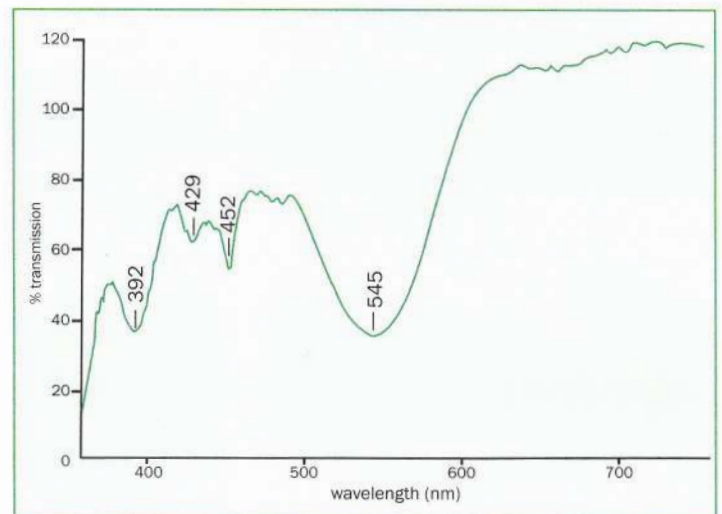
Raman spectrum of piemontite.

About the Authors

Cara Williams FGA and Bear Williams (Lab Director)
Stone Group Labs, Missouri, USA
email: cara@stonegrouplabs.com
bear@stonegrouplabs.com

The stone weighed just 0.24 ct, but was a clean and vibrant pink. There was no change in appearance under the Chelsea Colour Filter, and no fluorescence under either LW or SW ultraviolet light. Due to the known presence of manganese as seen in its spectra, we tested for magnetic susceptibility, but found it to be negligible. Certainly, Raman analysis helped confirm identification, but the pleochroism was a strong indicator as well. With its high birefringence, we were only able to get one, non-diagnostic line on the refractometer at approximately 1.73 – very close to that of flame fusion synthetic spinel – but the pleochroism and spectra confirmed the final results.

Photo and graphs courtesy of Bear Williams.



UV visible spectrum of piemontite. Distinct manganese absorptions are seen at 392, 429, 452 and a broad band centred at 545 nanometers.

Flux-grown synthetic red spinels

Dr Michael Krzemnicki of the SSEF Swiss Gemmological Institute laboratory reports on a number of stones offered for sale as red spinels in Bangkok during September 2008 which had been found to be flux synthetic spinels.



Flux synthetic spinel of high purity and well-saturated colour. © M.S. Krzemnicki, SSEF 2008

Flux synthetic spinels are not a new issue (1). In his book *Gems Made by Man* (1980), Nassau states that flux synthetic spinels were accidentally grown in the mid-eighteenth century in an attempt to produce synthetic rubies. More recently Muhlmeister *et al.* (1993), Schaub (2003) and Notari and Grobon (2004) have described the properties of similar stones. With the recent popularity of fine quality red spinels, it is not surprising that these synthetic spinels have again appeared on the market.

The flux synthetic spinels that we

investigated are very convincing and similar in appearance to natural spinels of best quality, unlike the synthetic spinels produced by flame-fusion (e.g. by the Verneuil process, which are mostly light blue, yellowish-green and colourless) which are easier to identify. Only by meticulous microscopic observation and chemical analysis can their synthetic formation become evident. As their identification is difficult if not impossible for the normal gemstone dealer, testing of spinels by a reputable gemmological laboratory becomes essential nowadays.

Faceted and rough flux-synthetic spinels. The octahedral crystals were produced in Russia in the early 1990s. The colour of the blue crystal is due to cobalt. Although not seen this time in the market, blue flux synthetic spinels may also appear again in the trade. © M.S. Krzemnicki, SSEF 2008





2 The flux synthetic spinels under the polariscope showing anomalous extinction, which may also be seen in natural spinels. © M.S. Krzemnicki, Swiss Gemmological Institute SSEF.

Traditional gemmological methods

When analysing flux synthetic spinels, traditional gemmological methods are no help. The RI (~ 1.717) and SG (~ 3.60) are similar to those for natural stones. The spectroscope is no help either, as both natural and synthetic red spinels are coloured by chromium and show the same absorption lines ('organ pipes') and bands. Between the crossed filters of a polariscope, the tested flux synthetic spinels all showed distinct anomalous extinction due to internal strain (2), which may also be observed in natural spinels, especially around inclusions. Under LW and SW ultraviolet, the stones generally exhibit a distinct orange-red

fluorescence, sometimes slightly chalky yellowish orange along facet edges. But again, a definitive detection based on these observations is not possible.

Microscopic evidence

Under the microscope, all the flux synthetic spinels showed high purity with only a few inclusions. All those tested displayed small jagged to tubular cavities filled with black to orange brown residues of flux (3). The presence of large gas bubbles within the flux residues is due to an exsolution of the homogeneous flux during the cooling of the synthetic spinel. Apart from flux inclusions, one spinel showed a distinct six-sided

metallic flake, most probably originating from the platinum crucible in which the flux synthetic spinel had grown (4). Furthermore, tiny parallel hollow channels were found in that specimen.

Natural red spinels, especially the ones from Myanmar (Burma) are often quite included, showing healed fissures with plenty of small octahedral negative crystals and various crystal inclusions, notably rounded (corroded) carbonates (5). They may also often contain brownish iron-hydroxide in open fissures and cavities, which should not be confused with the above described flux residues in flux synthetic spinels.

Sophisticated analyses support microscopic evidence

At first glance, the chemical composition of the analysed red flux synthetic spinels is quite similar to the composition of natural red spinels. These flux synthetic spinels have a stoichiometric Mg:Al similar to natural spinels, whereas Verneuil-synthetic spinels show a high alumina concentration. This explains why the flux synthetic spinels do not differ in RI and SG from their natural counterparts. Apart from these main constituents, the stones all revealed distinct chromium concentrations (0.5 – 2.5 wt% Cr₂O₃), combined with traces of iron, vanadium, nickel, zinc and gallium. Platinum was found in one specimen due to the metallic flake described above (see 4). These elements (apart from platinum) may also be present in natural spinels. In accordance with Muhlmeister *et al.* (1993), the main distinguishing feature is the low concentration of zinc (0.01 – 0.02 wt%



3 Jagged flux residue with air bubble. © M.S. Krzemnicki, SSEF 2008.



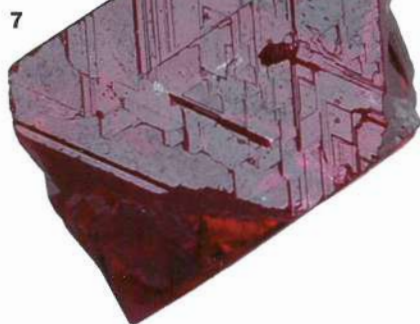
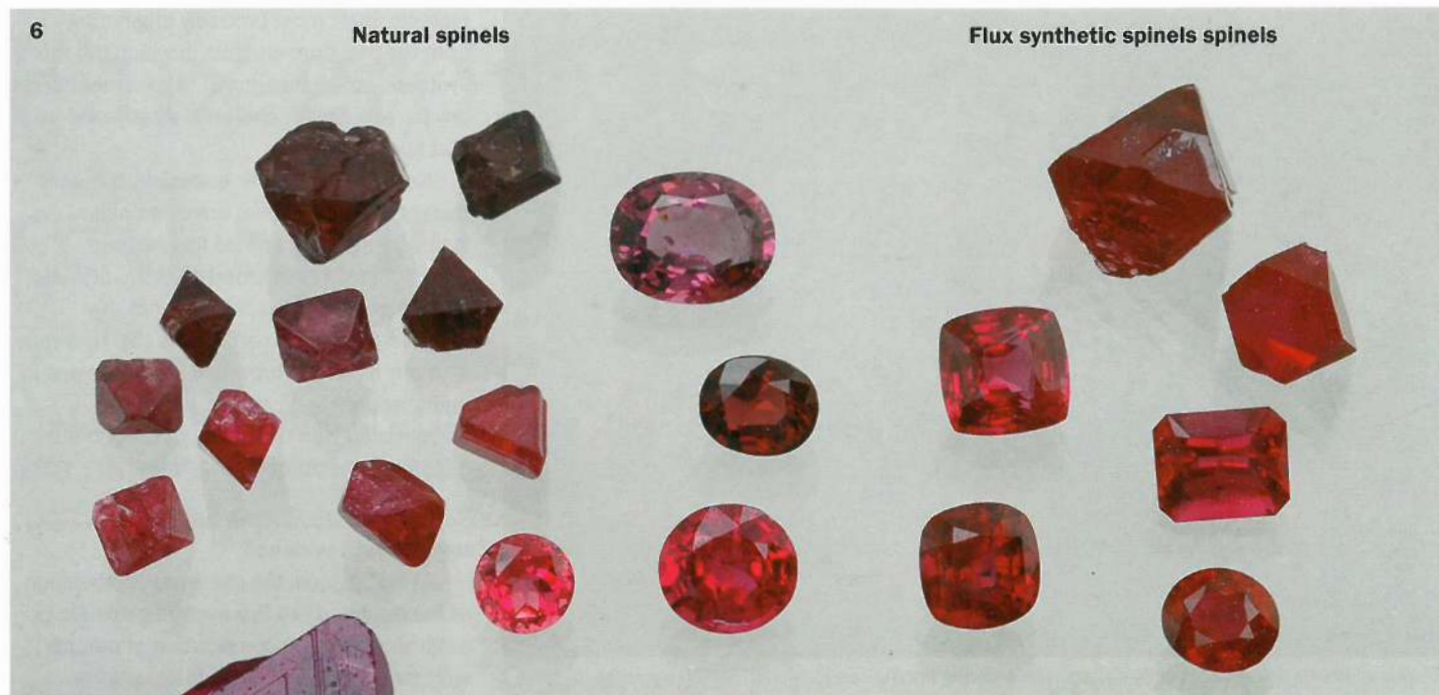
4 Six-sided metallic platinum flake and short hollow tubes have been found in one of the flux synthetic red spinels. © H.A. Hänni, SSEF 2008.



5 Natural spinel from Myanmar with yellow and colourless crystal inclusions, small negative crystals and some fissures. © M.S. Krzemnicki, SSEF 2008.

Hands-on Gemmology

Flux-grown synthetic red spinels



6

Natural spinels

Flux synthetic spinels spinels

6. Natural and flux synthetic red spinels (six samples on the right) on display. Be aware that these synthetic spinels are growing as octahedra very similar to natural spinels. Only careful observation and sophisticated analyses will tell the difference © M.S. Krzemnicki, SSEF 2008.

7. Flux synthetic red spinel octahedron with triangular growth features on its surface. © H.A. Hänni, SSEF 2008.

ZnO). Natural spinels show concentrations generally exceeding these by a factor of ten or more (Schaub, 2004). Raman spectra show a distinctly broader peak shape (at 406 cm^{-1} Raman shift) for these flux synthetic spinels when compared to natural spinels. Similar peak-broadening is also known for Verneuil synthetic spinel and is an expression of internal strain locally deforming the cubic crystal structure. Apart from this, the excitation with our green laser (514 nm) resulted in strong photoluminescence peaks due to chromium. However, these emission peaks are much less structured than in natural chromium-bearing spinels (see also Notari and Grobon, 2003), offering another criterion to distinguish these flux synthetic spinels from natural ones.

Even the synthetic crystals look natural

Flux synthetic spinels grow as well-shaped octahedral crystals (6 and 7). They often show triangular surface features similar to those commonly found on natural spinel crystals. Also slightly different on close inspection, these beautiful crystals may easily fool rough gemstone buyers when mixed with natural spinel crystals. Only careful observation with the loupe or microscope, and eventually sophisticated testing at a gemstone laboratory may enable the correct identification between natural and synthetic.

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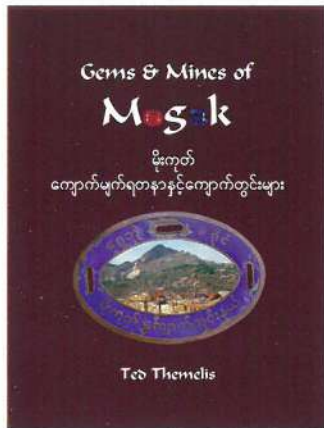
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Ed.: The challenges in distinguishing between synthetic spinels and heat-treated spinels were raised by Ken Scarratt, Director of GIA Laboratory, Bangkok, at the Scottish Conference in May (see *Gems & Jewellery*, July 2009, page 13). A summary of the GIA's research on this topic can be found at <http://www.gjathai.net/lab.php>

New books



Gems & Mines of Mogok

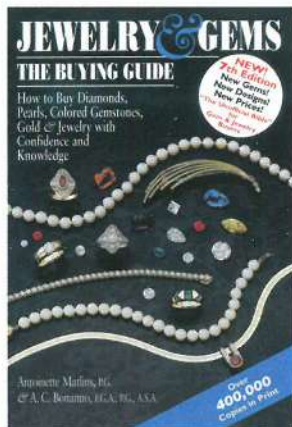
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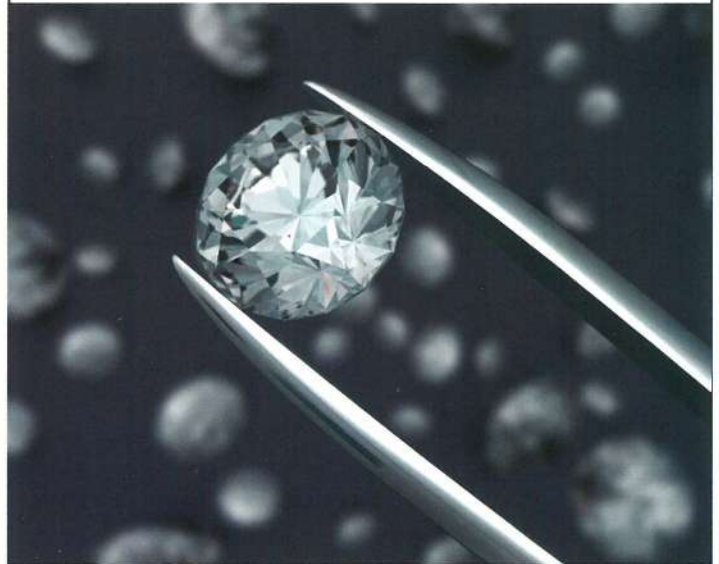
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THE GEMMOLOGICAL ASSOCIATION OF GREAT BRITAIN

Organic gem materials

Maggie Campell Pedersen looks at materials being described as green amber and questions how much we know about organics.

Green amber?

For some years we have known that copals were being treated to turn them into treated Baltic amber look-alikes, rich golden in colour and complete with sun spangles.

We now know that various ambers and copals can also be turned from their natural shades of yellows to greens, when treated. We understand that the process involves a formula of heat + temperature + time, the three varying according to the material being treated.

While it is obvious that none of the green material is natural amber, it is interesting to discover that when tested, the surfaces of both the brown and green treated copals react in very much the same way as amber. According to Dr Ahmadjan Abduriyim of the Gemmological Association of All Japan (GAJJ), who has carried out extensive testing on the materials: "The 'green amber' obtained from copal by this treatment is physically almost identical to amber and extremely difficult to identify by standard gemmological testing." (Characterization of 'Green Amber', *Gems & Gemology*, Fall 2009, pp 158-177).

Infrared and nuclear magnetic resonance spectroscopy can give clear indications of Baltic amber as the starting material, but other resins can give confusing results even with these tests, some treated copal giving results similar to those from Dominican amber.

It has therefore been decided by the Laboratory Manual Harmonization Committee (LMHC) that from 1 June 2009, where it is not possible to determine the origin of the material and whether it is old amber or young copal, the material should be termed 'amber', with the added description that the material shows indications of heating or processing, and may have been derived from copal. Unfortunately many dealers will omit the description when selling jewellery, and will undoubtedly feel that 'amber' is now the accepted, official term - indeed one manufacturer of 'green amber' already provides literature calling the material 'natural Caribbean amber'. Most manufacturers like to say that copal is being turned into amber. However the tests that have been carried out show only that the surface of the material resembles amber. Further, Hung Chi of Treasure Green Amber Ltd. in Hong Kong (the largest producer of the green material, and one that is open about origins of the resins and



Carved 'green amber frog on a leaf'. The starting material was Colombian copal.

the treatment processes) states in personal correspondence that the long-term stability of the material is uncertain and that the green colour may fade slightly with time.

We have enough problems with disclosure regarding amber and copal, with vast amounts being sold as something other than what they actually are, and reputable dealers and gemmologists fighting a seemingly losing battle. I fear that this latest decision by LMHC may increase the problem rather than lessen it.

The green material is very attractive, and it is expensive due to the costs of production. There is quite a lot of waste, as only a percentage of the material actually changes to green. Some of the green material on the market may be treated amber, but most of it is not - most of it is treated copal.

Three hundred year old copal is not amber. The volatiles that it contains may be driven off - at least from the surface - in treatment. The material may cross-link and polymerize - again, at least on the surface. But it is no more real amber than a laboratory-grown ruby is a real ruby. So either the majority of this green material is not amber, or else we must accept that amber is now a generic term for all tree resins used in the jewellery trade. Is this what we want? ■

The above represents the views of the author. Gem-A is aware that some say that insisting on a clear nomenclature distinguishing between amber from copal is unrealistic. We would welcome your views.

Organics are not the most popular of the gem materials. They are not necessarily durable, they are usually a lot less valuable than minerals and they are not particularly rare. With the exception of pearls, many people think that organics are uninteresting. So Maggie asks the question:

Why do we bother with organics?

Firstly, organic gem materials have been more widely used than minerals and have a longer history. They were used in very early trade and barter. African ivory has been traded since 200 BC and Baltic amber since the Stone Age. Organics have been regarded as status symbols, have been thought to have talismanic and medicinal properties, and we have used them to adorn ourselves and our surroundings for many thousands of years, as they have not only been used in the jewellery world, but very extensively in the decorative arts as well.

Several of the organics are now covered by strict trade bans, but they still come up for sale at auctions and in antiques shops, and we can see them in museums worldwide.

Too often I hear stories of organics being wrongly identified. Recently I was shown a double row of beads which had been identified by a very reputable jeweller as 'magnificent red amber'. They were magnificent, but they were cast phenolic resin and sank like a stone when immersed in salt water.

And what of green amber? How many people, even amongst gemmologists, believe that it does occur naturally? The answer is, far too many.

How about corals and shell? Who can tell coral beads from polished shell beads, or the new coral simulant – that we are seeing more and more – which uses chips of coral in a plastic base? Would you know how to tell a white hardstone cameo from a faded conch shell one, when they both feel cold to the touch, and are of about the same weight?

Does it matter? Yes, most definitely it matters. We need to know exactly what we are dealing with, for a variety of reasons. Firstly, we cannot judge the value of an item without knowing what it is, and we need to know whether it is one of the materials nowadays banned or restricted under CITES and other similar rules, in other words whether it can be legally bought or sold at all.

We also need to know what is in our museums. Researchers and the public alike want to know what it all is, from where it came, and what the material is. A piece of Boulle-style furniture is all the more impressive today because we know that it is covered in a veneer of tortoiseshell and brass. To label it brass and some mottled brown stuff would simply not suffice.

Recently I spent an afternoon at the British Dental Association's museum, identifying some of their collection of nineteenth-century dentures, most of which are made from either walrus or hippo ivory. It is essential that we should be able to make such identifications. Knowing what the organic gem materials are, how they were obtained and how they were used, tells us a lot about our history through the millennia.

In the gem world we need to know what we are selling to our public. There is a world of difference between red phenolic resin and natural red Burmese amber, yet far too many traders have absolutely no idea. A popular term being used extensively for these beads at present is 'amber Bakelite'. This is obviously an attempt at playing safe by calling it everything (though in fact neither name is correct). Why not just find out what it is?

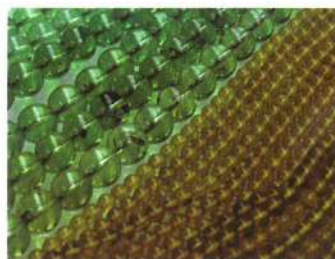
It may be a matter of opinion whether an elephant (ivory) is more interesting than a hole in the ground (a gem mine), but like it or not, we do need to know about organics.



Left: An unusual organic material: woolly mammoth carving made from the central core of moose antler, with tusks of bone.

Below left: Treated copal, often sold as 'amber' and 'green amber'.

Below right: Nineteenth-century dentures, carved from walrus ivory. Note that the secondary dentine is at the back. Courtesy of the BDA Dental Museum.



Instruments and Techniques

Laser inscriptions on diamonds

Although the laser inscribing of a logo or number on the girdle of a diamond has been around for some years, little has been published about the processes used. Ronnie Bauer gives a summary of the procedure followed by Bauer Gemmological Laboratories and the problems that can arise.

The laser inscription of a logo, message or a series of numbers on the girdle of a diamond is only limited by the diameter and quality of the girdle. In reality, only two things are usually inscribed: the logo of the grading lab and the certificate number. However there are instances where the branding of a diamond is important to the retailer so, in addition, the store's logo is added. At the Bauer Gemmological Laboratories in Melbourne, Australia, we have even had requests for messages of love to be inscribed.

With this process comes responsibility. To blindly inscribe the instructions of a client, especially those that include a laboratory certificate number or the colour/

clarity of a diamond, can lead to misuse of the technology. We at Bauer have put in place protocols to ensure that what we inscribe on the gemstone is correct and carried out responsibly. A 'due diligence' procedure is followed to ensure that the stone submitted is the one accompanying the certificate. We check the weight, clarity, colour and dimensions. If, in our opinion, the dimensions and/or carat weight of the gem differ from that described in the certificate, we return the stone unlasered for further investigation.

The process

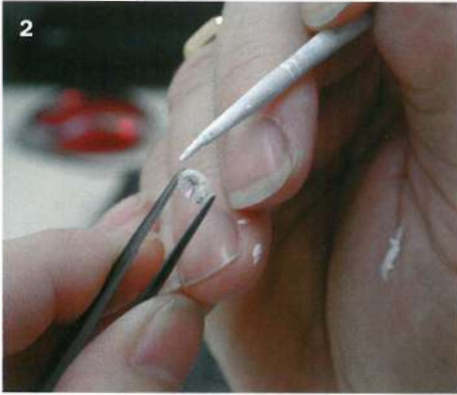
We use the Sarin Technologies® DiaScribe machine (1) which has

four interchangeable stages and four interchangeable focusing lenses. The software uses the width of the stage as its reference point, so it is important that the stages match the lenses. The gem is placed on the stage and is held in position with the aid of a vacuum. Our equipment includes a 70x magnification inscription viewer, which is offered by DiaScribe as an optional extra (we do believe, however, that the viewer is essential and should be an integral part of the machine). We rotate the gem through 360° using the viewer so that we can inspect the quality of the girdle, especially looking at the girdle width and surface-reaching features which may interfere with the quality of the inscription.



1: The Sarin Technologies DiaScribe.
a. Interchangeable lenses
b. Stage
c. 70x viewer
d. Laser.

Instruments and Techniques



2: Preparing the girdle of the stone for lasering. The application of the 'paint' which enhances the carbonization process.

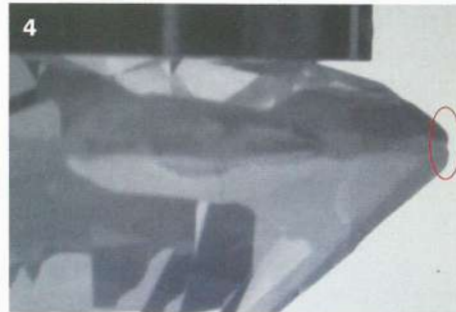
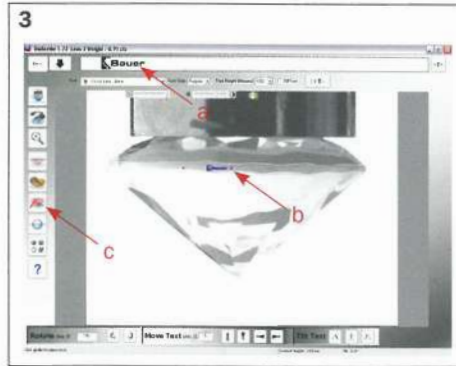
Once we have located a suitable area, we remove the stone from the stage and 'paint' the girdle (2). The white paint that is supplied is quite thick so we dilute it at a ratio of 15:1 with Shellite (a hydrocarbon solvent) to ensure that when the gem is mapped by the machine the outline of the girdle is easily recognized, thus reducing any risk of the laser inscription exceeding the limits of the girdle.

The choice of lens is governed by the diameter or length of the stone. It is important that the gem fits into the screen so that it can be correctly photographed by the computer. During the mapping process the computer takes 800 silhouette shots of the gem as it rotates. The software then places marker lines outlining the girdle. The operator types the logo or the message into the appropriate field (3). Depending on the length and number of inscriptions on a single gem, this may be done in one operation or in stages. The inscription is then positioned on the girdle shown on the screen, which can be manipulated as finely as by one micron at a time. The laser is activated and the message/number or logo is inscribed on the gem (4).

The finished inscription is inspected using the 70x viewer for quality control (5) and the gem is cleaned.

The length of time required for the process ranges from 30 seconds to two minutes, according to the quality of the girdle and the complexity of the message.

The laser wavelength is 1064 nm pulsed with a maximum power of 80 mW. The wavelength used is significant as it



3: The software screen; a. the field where the text or logo to be added is typed; b. the text or logo positioned on the girdle; c. the command buttons with the laser activation button arrowed.

differentiates the Sarin laser from the laser used in clarity enhancement drilling. The inscription laser has to be calibrated in a similar way to that of a pair of spectacles; if the focal point is too short the beam will not touch the surface of the stone, but if it is too long (i.e. it is set beyond the girdle of the stone) the beam will not be 'focused' and thus will not have the energy to inscribe the stone. The 1064 nm laser is so gentle that even when we deliberately tried to damage a 'sacrificial' stone by lasering over a surface-reaching feather, no damage was sustained by the diamond (7), nor was the size of the feather affected.

We have unfortunately seen incidences of the fraudulent use of lasering. These include instances where the number on the girdle does not match that on the certificate and, in an extreme case, an inscription using a falsified GIA logo.

We have a strict policy not to inscribe a logo unless we have the written permission from the company that owns the logo and their direct instructions to do so. However,



4: The laser in action (circled).
5: The laser inscription applied to the girdle.
6: The finished product.

issues of copyright and the law are beyond the scope of this article.

The only possible negative consequence of laser inscription that we have come across thus far is the reflection of the inscription into the gem (8). It is our experience that this will only happen where the gem has an acute angle in the make, and/or if the girdle is not at 90° to the crown/pavilion. The main



7: No damage was done to this diamond, despite the laser inscription being carried out on top of a surface-reaching feather.

Instruments and Techniques

Laser inscriptions on diamonds



8: The girdle being reflected into the stone can be a problem for fancy cuts.

cuts susceptible to this phenomenon are pear- and heart-shapes, and princesses. We have found the solution to this issue which is the careful positioning of the inscription well forward of the culet towards the point. Although we have never come across this problem in round-makes, logically 'fisheye' stones could be affected as well.

Of course, the best remedy is, above all else, to ensure that the technicians hold the qualifications and core-competencies required to effectively identify the issues, such as those discussed in this paper, and prevent errors from occurring.

As with any technological advance in the diamond industry progress is viewed by some as exciting and by others with suspicion. This technology can be a great help to the supplier, retailer and the consumer, and yet can be used to create great mischief. In some ways it is similar to a locksmith. In the wrong hands a locksmith's tools can be used to cause a lot of problems for consumers.

Photos courtesy of Ronnie Bauer.

Standardization

As an active member of the jewellery industry for over 30 years, Ronnie Bauer brought their concerns regarding the standardization of laser inscription to the attention of CIBJO, with the suggestion that the Diamond and Laboratory Commissions might compile international guidelines. At the CIBJO congress in Capetown in 2007 Bauer, through the Australian delegate, raised the following issues around standardization of the process:

- The font;
- The size of the inscription (microns);
- The depth of the inscription (dot point);
- The position of the inscription on the girdle and on other facets (especially on fancy cuts);
- The length of an inscription (number of characters);
- The quality of the girdle upon which an inscription can and should be inscribed;
- Copyright issues, logos, security codes, certificate numbers;
- The voiding of certifications due to subsequent inscribing; and
- The number of inscriptions per stone.

We hope these guidelines will be discussed in due course.

About the Author

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Recent Events

Gem-A Conference and Events

In celebration of the Chelsea Colour Filter

To mark the 75th anniversary of the introduction of the Chelsea Colour Filter, the Gem-A Conference, held at the Hilton London Kensington on Sunday 18 October, covered many aspects of colour in gemstones.

Author and lecturer Antoinette Matlins, the first speaker of the day, demonstrated how to use the Chelsea Colour Filter correctly, and revealed its many uses and what the results indicate. Dr Karl Schmetzer, independent scientist and consultant, gave a presentation on the causes of colour, colorimetry and the extent of colour change in colour-change garnets. John Harris, a Gem-A gemmology tutor since 1986, reviewed methods using the direct vision hand spectroscope to enable the operator to stabilize the image and work with hands free to examine other optical properties. Unfortunately John Hall of Rio Tinto Diamonds was unable to attend, but Dr Menahem Sevdemish kindly stepped in at the last minute with a presentation on digital gem colour communication and analysis. In his presentation 'Putting the 'Gee' back in Gemmology, Alan Hodgkinson, President of the Scottish Gemmological Association, looked at the amazing colours and colour effects seen in gemstones. Thomas Hainschwang of the GEMLAB Laboratory gave an overview of the optical and spectral characteristics of very rare and exotic coloured diamonds. Independent valuer Brian Dunn looked at problems of arriving at the values of coloured stones. Harry Levy gave the final presentation of the day with a talk on what to beware of when buying coloured stones, with plenty of stories and anecdotes on his experiences as a gem dealer.

The Conference was followed by a candlelit dinner. Over coffee Antoinette again brought out her Chelsea Colour Filter and torch, and the diners had endless fun viewing a number of samples she had brought along – as well as a selection of interesting gems that many of those present happened to have with them (as gemmologists often do!).

Events and workshops arranged to coincide with the Conference, included the Graduation Ceremony and Presentation of Awards (see page 26) and a viewing of the Crown Jewels at the Tower of London with a guided tour by David Thomas, Crown Jeweller until July 2007.



Gem-A CEO Jack Ogden with a group of the conference speakers. From left: Harry Levy, Alan Hodgkinson, Dr Karl Schmetzer, Antoinette Matlins, Thomas Hainschwang, Jack Ogden and John Harris.

A half-day workshop on the practical use of the spectroscope was held on the morning of Monday 19 October with John Harris as guest tutor.

A fun and informative evening was provided by Béatrice Gimpel who was the guest specialist at the Gem Discovery Club on Tuesday 20 October. Béatrice spoke on how gems and pearls can complement a person's colouring and also mixing stones to best effect.

A full report of the presentations will be published in the next issue of *Gems & Jewellery*.

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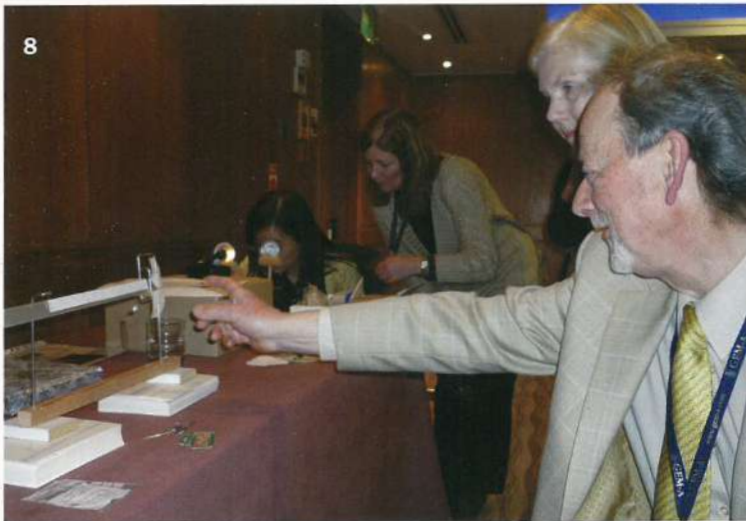
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1. Antoinette Matlins gives the first presentation of the day. 2. Speaker Menahem Sevdemish. 3. A group of the 2009 Gem-A graduates who attended the Conference. 4. Coffee time. 5. 'Guess the Weight' competition: Danish Gem-A student Natascha Trolle (right) tries to guess the weight of a 433 ct citrine. 6. Dominic Mok, Director of the AGIL allied teaching centre in Hong Kong, with the 2009 winner of the Dominic Mok Diamond Practical Prize May-Wei Ho of Hong Kong. 7. Gem-A President Prof. Andy Rankin who chaired the morning session. 8. Alan Hodgkinson demonstrates how to determine SG using a beam balance. 9. Gemmology by candlelight; Antoinette demonstrates the use of the Chelsea Filter once again amongst the debris of dinner.

Recent Events

Graduation Ceremony



Alan Hodgkinson (left) with Alan Jobbins who was appointed a Vice President of Gem-A. © Photoshot.



John Harris (centre) receives the R. Keith Mitchell Award from Keith Mitchell's sons Anthony (left) and Graham. © Photoshot.

Gem-A graduates from around the world gathered at the magnificent Goldsmiths' Hall in the City of London on Monday 19 October to receive their diplomas and awards.

Professor Andy Rankin, President of the Gemmological Association, presided and welcomed those present.

Alan Hodgkinson, President of the Scottish Gemmological Association, presented the awards and gave the address (see below).

Following the presentations to the graduates, it was announced that two new Vice Presidents had been appointed, E. Alan Jobbins and Michael O'Donoghue, and a certificate was presented to Alan Jobbins who was present. A presentation was made to Michael O'Donoghue the following evening at the Gem Discovery Club, our weekly practical evening that he had run for many years.

It was also announced that John Harris had been awarded the R. Keith Mitchell Award for Excellence in the Field of Gemmological Spectroscopy in recognition of his work with the spectroscope and his outstanding photography of spectra. The late Keith Mitchell's sons, Anthony and Graham, made the presentation to John.

The ceremony was followed by a reception for graduates and guests.

Go that extra mile

Extracts from Alan Hodgkinson's address

What a privilege it is to be here this evening and to present prizes to those of you who aspire to a career in the world of diamonds and gemstones. This occasion marks the completion of a gemmological circle for me which began in 1961 when, in the splendour of this wonderful venue of Goldsmiths' Hall, I was presented with my Diploma and became a Fellow of the Gemmological Association. Since then that stepping stone of the Fellowship and the Diamond

Diploma has led to a wonderful lifetime journey of experiences that I could never have dreamed of.

My first job in the jewellery trade was with David Henderson the Jewellers in Aberdeen. In my contract of employment, my boss insisted that I qualify as a gemmologist. If I failed my exams, I would lose the job. I qualified with distinction, but who wouldn't with that threat hanging over them? My fascination with gemmology grew further as I read books outside the actual syllabus. Books on minerals, which amazed me by their enormous numbers compared with the few I had seen in the jewellery trade. But remember, it is the minerals that provide the raw material of our gemstone industry.

Open your eyes to the wider field of gemmology and its niche in the world of science. Don't stop now. Continue your interest and push your gemmology further. One thing is certain: success in your career will only come if you are prepared to go the extra mile.

What other learning points can I share from my gemmological journey? An early Chinese philosopher noted: "The strongest memory is weaker than the palest ink." A man who took this to heart was Gaius Plinius Secundus, who took a writing tablet with him wherever he went and was constantly recording observations. Record everything you see of interest in the world of gemstones and 'Go that extra mile'.

In addition to our *Journal of Gemmology*, subscribe to other gemmological journals. If they are more than you can afford, share the cost with a gemmological friend. Start your own collection of gemstones. You can sometimes trade gems, and maybe some gem merchant who recognizes your commitment will offer you a discount, or even gifts of some stones. Some of your stones may be damaged or of poor quality, but they may have their own surprises or unbelievable inclusions. The internal content of gems are not flaws,

Recent Events

but the very birthmarks which add so much to our understanding of gemstones and to this planet we inhabit.

Be sure of one thing. The general public are as fascinated as we are and will ask you all sorts of questions. As you become more gemmologically knowledgeable, the jewellery trade will want to use your knowledge and ask your advice. This public curiosity and the trade's need is your greatest opportunity for advancement in your career.

Gemmology has taken me on a wonderful lifetime journey to many parts of the world to share my gemmological knowledge, but the more I travelled to teach, the more gemmology I saw and learned.

It is this sharing and pooling of information that has led to the growth of mutual gemmological understanding throughout the world. That in essence has been the role of the Gemmological Association. Gem-A has now shared its information with you through your course of study. Use it well.

Those of you who have collected your diplomas today are now qualified gemmologists. You are now free to explore outside the confines of your gemmological notes. Suddenly those limiting boundaries of the syllabus are blown away and you are in the real world. It is a time when the world's economies are in dire straits, where jobs are harder to come by, where competition in the industry worldwide is the more vigorous and demanding. Welcome to the real world. Don't sit back and admire the view of yourself with your diploma. Increase your gemmological endeavours. Don't miss an opportunity to improve and increase your gemmological knowledge. Go that extra mile.

Go to gem and mineral exhibitions and trade fairs, contact your local museum or university and find out who is involved in the geology, gem and mineral departments. Visit a lapidary club where you might find you have a flair for gem cutting. Join a local



Alan Hodgkinson gives his address. © Photoshot.

gemmological branch. Look for refresher courses, conferences, lectures. Some of you will feel confident to push yourself further and may wish to pursue an advanced gemmological study, such as that offered at Kingston University, a one year course leading to a BSc Honours Degree in Gemmology and Applied Mineralogy. There, you can learn the workings of gemmology at laboratory level.

Of all the careers that are on offer, I cannot imagine one which is so full of fascination and opportunity. So head back home full of gemmological commitment. Work as hard at building your career as building friendships. Both need a good foundation and you now have that foundation by your award tonight.

And finally realize this simple fact. If you enjoy your work, you will never have to work another day in your life. I wish you well.

(Alan Hodgkinson's full address may be downloaded from the Gem-A website at www.gem-a.com/education/gem-a-graduation-and-awards.aspx)



The graduates and award winners in the magnificent Livery Hall after the ceremony. © Photoshot.

Around the Trade

We live in interesting times

Harry Levy looks at the current state of the UK gem and jewellery trade

It is difficult to analyse exactly how the gem trade and jewellery industry are faring in these still difficult financial times. Reading the trade press one gets contradictory reports. Some say there is too much diamond rough on the market, others say there is not enough. A good guide, usually, are Trade Shows and Fairs. Again reports are contradictory. At the recent shows in the UK, organizers said that there were more people attending than in recent years. Yet exhibitors said that people were not buying as much as in previous years, and there were empty booths at the shows.

Perhaps the largest show now is the one in Hong Kong. Here again reactions of exhibitors were mixed. One thing is clear however, the business has moved Eastwards, as reported by Jack Ogden in State of the Market on page 6. Whereas the consuming countries have been traditionally North America and Europe, they have now been overtaken by the traditionally producing countries, such as China and India. China is now a greater consumer of luxury goods than the USA. China and other Far East countries traditionally relied on the tourist industry for their sales, now have a growing local market consisting of locals who are buying jewellery in ever increasing item values. Diamond dealers who came to Europe and America to sell their diamonds are now running to Hong Kong and China.

This is not the place to give the economic reasons for these shifts in wealth, we can just look at their effects. Here in the UK retail jewellers have not suffered as badly as other industries. One hears of furniture stores and shoe shops closing down, but most jewellers are still open. Perhaps all those years of tradition of buying jewellery are still strong in the consumer psyche. I remember many years ago discussing the state of the trade with a much older, wiser and experienced dealer and wondering if we had a future. I remember his words "Harry, as long as people marry, have children, have birthdays and wish to express their love they will always buy jewellery."

Perhaps it is this that is keeping us going, but for dealers for example, the trade has changed. We had a thriving jewellery manufacturing industry in the UK for many years. I remember being told there were genuine 'rush hours' in the jewellery quarter in



Birmingham, when at the end of the working day one could hardly walk on the pavements, so many workers were rushing home. This has all changed now. The Birmingham Jewellery Quarter is still a hub of activity, but many workshops have closed and been replaced by discount jewellery shops, and a similar process has occurred in London's Hatton Garden.

As stone dealers in the UK will attest, the manufacture of cheap- and medium-range jewellery

has almost vanished and the need for quantities of cheap and medium quality calibrated stones has gone. European cutters and dealers have felt the same effect; those in Idar-Oberstein have stopped cutting inexpensive stones, many have closed down and those that still exist now cut large better quality precious stones. I remember one of my suppliers from that town, who specialized in cheap- and medium-quality aquamarines, said he no longer shows these stones. He told me he had an enquiry from manufacturers in Hong Kong who were interested in his stones, but the minimum quantities had to be 100,000 stones in any one size and shape. It was a marvellous order, the only problem being that they wanted to pay next to nothing for such stones.

I myself remember sitting in a small diamond office in Hong Kong, not too long ago, when the phone rang and my supplier received an order for 5000 carats of 3 point diamonds. In contrast here in the UK, an order for 10 carats of such stones could make us delirious. This was an order for a whole kilo of polished diamonds of one size only. In this particular case, the stones would probably go into 12-stone cluster rings. Thus with one carat one could make three rings and 5000 carats would produce 15,000 rings. The mass cheap market seems to have moved to catalogues and TV selling channels.

I suppose our motto to our children should be "Go East young man."

Diamonds

Diamonds are still the mainstay of the industry. It is difficult to know how this part is affected. De Beers (I continue to call them that, although more correctly they now trade as the Central Selling

Organisation CSO, De Beers is now used for their retail jewellery arm) still have a large part of the market. They admit their share has fallen from 95% to less than 40% of the rough diamond market. Their biggest competitor is Alarosa, the Russian giant. They worked closely together until the EU looked at the possibilities of them forming a cartel. They now each sell their own rough. De Beers has maintained its sight-holder method of distribution but here again they have problems in Africa, with the governments there wanting a greater share of the profits, demanding more cutting should be done in their own countries and thus restricting the sale of their diamonds. The fear on the market is that it is the Russian politicians who determine

what should be sold, and they could dump diamonds on the market if they feel the State needs the money.

The other mining companies such as Rio Tinto and BHP Billiton and distributors including Lev Leviev have yet to find their proper niche in the market; although they are all selling their rough, some through tender, others at auction, or they have established their own list of sight holders.

The general economic conditions still dominate so it is hard to determine the immediate future of our industry. There is an ancient Chinese curse which runs "May you live in interesting times."

The Wrekin Ruby

The Wrekin Ruby, recently discussed on MailTalk, variously known as the Gem of Tanzania or the Gem of Zambia, has again reared its (ugly?) head. You may recall that this was a rough piece of ruby weighing 2.1 kilograms which was sold to an ailing building contracting firm for a reputed £300,000. This then appeared in the company books as an asset worth \$20 million, showing the company to be solvent. The company was sold, a large bank loan was obtained on the strength of the balance sheet and when this company too went down the question arose as to the true value of this stone.

Few people have seen the stone, pictures produced in the media show it to be nothing extraordinary, but a valuation was given by a London dealer, accompanied by a certificate from an Italian laboratory authenticating the stone as a ruby, and a letter from a leading London Jewellery store attesting to the reliability of the valuer. Put together, these papers could convince someone not in the trade that this was a true value of the stone.

To me, who gave a TV interview on the ruby a few months ago, this raises an interesting question — how is anything valued? In the case of a gemstone the simple answer is how much you can sell the stone for. Often we have several or many similar stones and this gives a basis for a valuation. It is now easy for diamonds, as we can grade them, and since there are enough of them in circulation we can establish price lists, such as those published by Rapaport. But even this is not 100% accurate. Competition gives rise to discounts and a variation of prices.

A 500 carat plus diamond has just been discovered in the Kimberley Mine in South Africa. This rough piece of diamond has been valued at \$20 Million, a similar price to the Wrekin stone, but this diamond will enhance any list of assets and in all probability if such a stone came to auction such a price, if not more would be attainable. This is because we have acceptable comparisons in the diamond industry and it is a desirable item which many people will wish to possess.

In the case of the ruby both these factors are missing. Only the other day a colleague was asked for his opinion and was reminded that the stone weighed over 2 kilos. He said he had seen similarly



Large chunks of rough ruby. Photo courtesy of Peter Grumitt.

described stones which were over 10 kilos in weight and were used as paper weights or even door stops.

For anyone to be able to dispute a valuation in this case, he has to show that no one would pay such a price, but it is impossible to prove a counterfactual. The valuer can prove his case in one stroke, if he is able to sell the stone at this price. But then we know one swallow does not make a summer, and in such a case the new buyer will in turn have to find a buyer to confirm the price he has paid, and we thus set up a vicious regression.

It is difficult to value rare, large, beautiful stones. Rarely will two valuers agree exactly on a price for such stones, and perhaps the most difficult stones I have seen to value are top quality opals, as there it is almost impossible to get two stones that are similar let alone identical. Luckily it is such challenges and seeing such stones that make the gem trade such an interesting trade to be involved in.

Summaries of two articles to appear in *The Journal of Gemmology* explaining the interest, relevance and importance of the information given. The full articles may be viewed by Gem-A members only at www.gem-a.com/publications/journal-of-gemmology/the-journal-online.aspx (see page 34 for details of how to access the articles).

Identifying dyed jadeite*

Low quality jadeite from Burma is frequently impregnated, dyed or both to improve its colour and transparency.

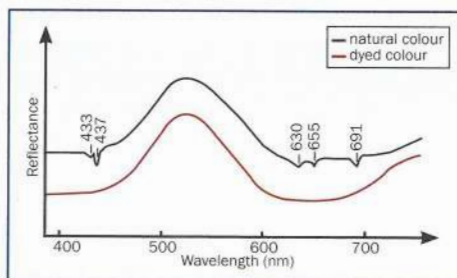
Polymer-impregnated jadeite is classified as B type in the gem trade and can usually be identified using FTIR (infrared) spectroscopy. Dyed jadeite is classified as C type, and is usually identified by microscopy or a high resolution imaging system, which reveals the dye in the pores or between the crystal fibres. However, the dye may not be easily visible when jadeite has a fine-grained, compact and uniformly distributed texture.

Natural green and lavender jadeites commonly display five characteristic spectral absorption lines in the visible wavelength range which are attributed to their Cr and Fe contents. However, these absorption lines are not easily observed using a hand spectroscope and only a small proportion of jadeites are transparent enough to yield transmission spectra with the spectrophotometers typically used in gemmological laboratories.

The authors of the article describe how visible reflection rather than transmission spectra can be used to identify C and B+C types of jadeite which may otherwise be difficult to distinguish. They propose the use of a new type of visible reflection spectrometer (TrueColor Spectrometer) originally developed by one of the authors for

spectral measurement and colour grading of coloured diamonds and gemstones. After calibration, the procedure for measuring the reflection spectrum of jadeites is simple and quick with the whole measurement process taking about one minute.

Many hundreds of natural, impregnated, dyed-only, and impregnated and dyed jadeites were examined, mostly green, but a few lavender and a natural colourless sample as reference spectrum. Naturally-coloured green jadeite and dyed green jadeite can reveal five absorption lines – at 433 nm, 437 nm, 630 nm, 655 nm and 691 nm. The strengths of these five lines varies depending on the nature and saturation of the colour, but normally the 437 nm line is the strongest and may be the absorption line visible. The reflection spectra of most dyed green jadeites do not show these five absorption lines and this absence is an indication that the measured jadeite has been dyed, particularly for those jadeites with vivid green colours. Although a few 'B+C' jadeites dyed green show a weak



Reflection spectra of a typical natural green jadeite and a dyed green jadeite.



B+C type jadeite.

437 nm absorption line (probably because the starting material was low grade pale green), almost all show a relatively strong and broad band at longer wavelengths near 680 nm - a diagnostic feature of a B+C type jadeite. In fact, any vivid green jadeite with only a weak 437 nm absorption line suggests that it has been dyed, since natural vivid green jadeites should show all five absorption lines. The reflection spectra of naturally coloured lavender jadeites also show the five narrow absorption lines characteristic of green jadeite, whereas dyed lavender jadeites only show broad absorption bands in their reflection spectra.

The research shows that while the identification of some dyed-only green jadeites without clearly visual microscopic features can be a challenge using only traditional microscopic and FTIR techniques, measurement of their reflection spectra can provide a rapid and effective technique for their identification.

* A summary of 'Identification of dyed jadeite using visible reflection spectra' by Yan Liu, Taijin Lu, Manjun Wang, Hua Chen, Meidong Shen, Jie Ke and Beili Zhang, *The Journal of Gemmology* (in press).

A giant pearl*

A huge baroque pearl measuring 70 x 43 x 39 mm and weighing 2385 grains is one of the largest nacreous pearls ever documented and possibly the largest freshwater pearl known.

History

This pearl has never been described previously although it was examined in 1979 at the Netherlands Gemmological Laboratory and its importance recognized then. In 1998 it was exhibited publicly for the first time in the National Museum of Natural History, Leiden and now, after a decade out of the public eye, is described in detail.

The pearl's history can be traced back to the late eighteenth century through a 1778 drawing of what is described as an 'Oosterse Paarel' (oriental pearl). This drawing was found in the city archive of Amsterdam along with a note stating: "A large pearl, of 578 carats, visualizing a sleeping lion, left by H.C. Sander, has been sold in 'the Munt' [Mint] on 26th August 1778." A further note tells us that the pearl was sold for 2100 Dutch guilders. Sir Hendrik Coenraad Sander was an agent of the 'Duke of Tweebrugge'. Comparing the drawing with the existing pearl proves it is one and the same (see above).

Travels of the pearl

The second known owner of the pearl was a Polish ship-owner named Plonsky, from Danzig (now Gdansk) who in around 1865 sent one of his daughters to Paris and to Rome to sell the pearl. At that time the jewellers Castellani in Rome were working on the crown jewels of Victor Emmanuel II and it is possible that Castellani advised the King to buy the pearl from Plonsky, to be used for

the sceptre. The jewels were never finished and the pearl was sold to Lodewijk Willem van Kooten, a goldsmith from Amsterdam then working with Castellani, who returned to Amsterdam around 1868. Tradition also has it that the pearl made the journey to Fabergé in St Petersburg, as Louis Van Kooten, Lodewijk's son, knew Fabergé. The idea was to mount the pearl in one of Fabergé's famous eggs, but the faltering political stability in Russia meant that the pearl was returned to Amsterdam in 1914 to remain in the Van Kooten family safe until 1979. In 1979 the pearl was sold to a well-known Dutch art collector and in 1992 set in a gold and gemstone mount designed by Antwerp goldsmith Jean Lemmens.

Weight and properties

The presence of the gold rod of the mount, firmly affixed into the pearl, means that the weight can only be estimated, but is approximately 2385 grains (119.25 g). The variation between this weight and the 578 carats noted in 1778 can be explained by the use of pre-metric carats for the old weighing. The pearl is creamy white with a slightly brownish tint in some areas at the back. It has good lustre and 'orient' over much of its surface. A small area on the reverse of the pearl has surface growth lines where it was originally attached to the shell. X-radiographs and computer tomography (CT) scans taken perpendicular to the direction of the X-radiographs, revealed a layered growth structure, which confirms that the pearl was naturally formed and is solid without any substantial cavities. The pearl fluoresced a strong bluish to greenish-white under long wave UV radiation, and a distinct creamy white under X-rays. This X-ray fluorescence coupled with the relatively high concentrations of manganese and low concentrations of strontium detected with Micro-EDXRF analysis indicate a freshwater origin.



Een Oosterse Paarel, weegende 578. Caraat.



The first record of the pearl is a print dated 1778. A photo of the pearl in the same orientation shows that it is identical to that in the drawing.

Likely origin of the pearl

A gilded copper box that came with the pearl was originally made for it, possibly in East Asia or China on the basis of its style. A similar origin seems likely for the pearl. Based on the size of the pearl and its colour, the freshwater mollusc most likely to have produced it is the *Hyriopsis cumingii* which occurs in rivers and lakes of China or, less likely because of the size, *Hyriopsis schlegelii* found in Japan. Marco Polo reported on the trade in pearls in China and mentioned a lake near Kain-du (the north-western part of Yunnan) where many pearls were found "of a white colour, but not round" and there is a 200 BC Chinese reference to a "four-inch pearl". In the seventeenth century Tavernier had mentioned pearls that the Dutch brought from Japan: "some of them of large size, but all baroques". A suggestion that this pearl was the Arco Valley Pearl, in the possession of the Italian d'Arco family at least as early as 1700, was discarded when the latter pearl came up for auction (later postponed) in 2007.

* Summary of 'A description and history of one of the largest nacreous pearls in the world' by J.C. Zwaan and H.A. Dommissie. *The Journal of Gemmology* (in press).

In the news

Gem-A Corporate Membership

A new Gem-A initiative to support the UK trade

Launched at the IJL show in September, Gem-A Corporate Membership provides support to all areas of the UK gem and jewellery trade.

Any UK-based company may apply to become a Corporate Member of Gem-A if all or a significant part of their business is the sale, auction, manufacture or appraisal of gems or gem-set jewellery. Corporate Members may display the Gem-A logo or (for Gold Corporate Members only) the Coat of Arms showing that they support Gem-A's commitment to knowledgeable and fair trading, and have agreed to abide by a simple but effective Code of Practice. They will also enjoy the following advantages and activities:

- The Gem-A Corporate logo or, for Gold Corporate Members only, the Gem-A Gold Corporate Coat of Arms. These will be provided as decals and frameable certificates; additional sets may be purchased if you have more than one outlet. The logo and Corporate Coat of Arms will also be downloadable as a jpeg for use on your stationery, website, etc.
- Laboratory services. Corporate Members will have access to gem testing and diamond grading facilities.
- Gem Testing: Gem-A and SSEF have signed a memorandum of understanding for Gem-A to outsource gemstone and pearl testing to SSEF (The Swiss Gemmological Institute) based in Basle, Switzerland. Although SSEF has operated internationally for many years, the new agreement will allow Gem-A's UK Members the advantages of convenience and the cost benefits of consolidated shipping. The final administrative and insurance details are still to be finalized, but the arrangement will start on 1 January 2010, with, it is hoped, a pilot scheme in operation within a few weeks.
- Diamond grading: We are in final stages of negotiations for a similar arrangement for diamond grading. We can't give more details for confidentiality reasons, but the arrangement is being negotiated with a well-known diamond grading laboratory with a very high profile in the international diamond industry.
- Regular meetings for information exchange and networking.
- Discounts on books and gem testing equipment.
- Gem-A's popular magazine *Gems & Jewellery*.
- Special prices for tailored in-house training programmes.

Gem-A Corporate logo



Gem-A

THE GEMMOLOGICAL ASSOCIATION
OF GREAT BRITAIN

CORPORATE MEMBER

Gold Corporate Coat of Arms



**PROUD TO EMPLOY A
QUALIFIED GEMMOLOGIST**

The Gem-A Gem Code (Extract from the by-laws §8)

- a. The Gem Code is a basic Code of Practice for fair and honest gem descriptions and disclosures. Adherence to the Gem Code is expected of all Members and is one of the conditions of being a Corporate Member of the Association. The Gem Code applies at every level of the trade.
- b. CIBJO (World Jewellery Confederation) guidelines and definitions are taken as defining best practice and will be the reference used in the event of a dispute that cannot be resolved by mutual or mediated agreement on the basis of the Gem Code given below.
- c. The Gem Code covers natural coloured stones and diamonds, including those that are modified, whether cut or rough; synthetic or imitation stones whether cut or rough, and natural or cultured pearls and their imitations. For the sake of simplicity, the term 'stone' is used in the following clauses to cover all of these.
- d. The Association considers it to be unfair or deceptive to misrepresent or withhold information which an average consumer might reasonably expect to receive prior to making a purchase decision. This may include information relating to the size, nature, quality, modification, durability, value or rarity of a stone.
- e. In particular the information received by a buyer prior to purchase should:
 - i. Explain whether a stone is natural, synthetic or imitation. (Note: A synthetic stone is not natural, but has essentially identical composition and properties to a natural stone; imitations are in other materials, such as glass).
 - ii. Explain whether pearls are natural, cultured or imitation.
 - iii. Explain if the stone is known to have been modified (treated) and, if applicable, how the modification may affect its durability in manufacture, repair, cleaning or use.
- f. Where reliable information, such as a third party laboratory report or appraisal, is not easily or economically available to comply with §7. d and §7.e. i, ii and iii [of the by-laws], the seller should be diligent and honest in explaining the likely nature and durability of the stone or stones in line with readily available industry information.
- g. Documentation should also comply with the relevant clauses above. Buyers may expect to receive or have access to relevant information in written or electronic form.
- h. The Association does not consider it to be deceptive to describe synthetic stones by alternative terms such as 'Laboratory Created' or 'Laboratory Grown', provided that an average consumer would readily understand prior to purchase that the stones are not natural.
- i. Receipts or other documentation at the time of sale should also comply with the relevant clauses above. Buyers may expect to receive or have access to relevant information in written or electronic form.
- j. Where applicable, local legislation takes precedence over the above clauses.
- k. A complaint that a Member had acted in a manner contrary to this Code will be dealt with as described in the By Laws (§9)

- Discounts on courses and workshops.
- Monthly e-newsletter covering news and upcoming courses, workshops and events.

Additional benefits are planned for the future, including a link from our website, to ensure Gem-A can help its Corporate Members maximize their business potential.

Applications must be supported by two Fellows (FGAs) or Diamond Members (DGA) of Gem-A, who may include employees of the company.

Gold Corporate Membership

The ultimate sign of gem excellence. If you employ a Fellow (FGA) or Diamond Member (DGA) of Gem-A, you may apply for Gold Corporate Membership, entitling you to display the Gold Corporate Coat of Arms stating that you employ a qualified gemmologist. The FGA and DGA designations are internationally recognized as representing the highest status gem qualifications.

The Cost

The annual membership fee for Corporate Members and Gold Corporate Members is £150.00. This is payable annually on 1 January each year; for those signing up in 2009 the first year's subscription will include the remainder of 2009 as well as 2010.

However, it may cost you nothing extra for 2010 if you already employ and pay the subscriptions for two Fellow, Diamond or Associate Members of Gem-A. This is because the Corporate Membership subscription includes two individual subscriptions.

To apply for Corporate Membership

To apply for Corporate Membership or Gold Corporate Membership, simply download an application form at <http://www.gem-a.com/membership/corporate-membership.aspx> or contact Arianna Maccaferri on 020 7404 3334 or email arianna.maccaferri@gem-a.com.

Gem-A News and Views

Exclusive to Gem-A Members

Introduced earlier this year was the 'Members only' area on the Gem-A website. Here paid-up Gem-A members are able to access searchable downloads of the latest issues of our publications, view articles to be published in the next issue of *The Journal of Gemmology* and update their contact details, and Fellows and Diamond Members are able to download the Gem-A Coat of Arms for use on their business stationery and websites. By the end of November it will also be possible to pay your membership subscription online.

Logging into the Members Only area

Step 1:

From the Home page, click on [Login/Register](#) in the top right-hand corner.



Step 2:

This takes you to the Login screen. Enter your username, which is your surname (or family name) only, and your password which is your six-digit membership number.

Click on the [Login](#) button which will take you to the Members only area.



To update your contact details or to change your password, click on [Member area](#) in the top right-hand corner, then go to [My Details](#).

If you would like to add the name of your workplace, go to [My Organization](#).



To access the latest issues and upcoming articles of *The Journal*, click on the [Publications](#) tag, then go to *The Journal of Gemmology* in Publications, and *The Journal online*.



Recent Developments in Gemmology and Applied Mineralogy

A report on the conference held at Kingston University on 7 May 2009

This successful, one day, student-led conference was organized primarily by final year students as part of their BSc honours degree in Gemmology and Applied Mineralogy at Kingston University. The focus of the meeting was a series of review lectures presented by the students together with three research-in-progress from associated research students.

The conference attracted a wide audience of some 50 external participants drawn from academia, industry, commerce and gemmological institutes.

Gem-A President Professor Andrew Rankin (Kingston University), introduced the meeting, highlighting its educational and scientific importance as well as its relevance to commerce and industry.

Warne Chitty began the morning session with an overview of 'Gems as investment tools in troubled economic times'. This was followed by presentations on the 'Global diamond market' (Ian Plantagenet), 'The synthetic diamond market' (Richard Taylor) and 'The future supply and demand for rubies and sapphires' (Mohamed Chaudry). The session concluded with a guest research lecture from Sami Mikhail (a KU graduate carrying out PhD research at UCL/OU) on 'Mantle carbon sources for diamonds'. Opportunities were provided, after the session, to tour the university facilities for teaching and research in gemmology and applied mineralogy laboratories. Participants were shown the Laser-Raman, SEM and Advanced Microscopy Laboratories and the dedicated undergraduate project rooms for Gemmology and Applied Mineralogy students, and a demonstration of the portable Laser-Raman Probe for rapid mineral and gem identification.

The afternoon session commenced with a guest lecture by Edward Johnson (GIA) on the 'Role and future of the GIA in research and education'. This was followed by six further presentations by KU BSc students: 'Mines to market analysis of the coloured stone

Sponsorship

The organizers are grateful to the following organizations and individuals for financial support which ensured the financial viability of the conference: Applied Mineralogy Group (Min Soc), the Gemmological Association of Great Britain, Kingston University (CEESR), Marcus McCallum, MinSouth (IMMM), SpectroLab Systems, ThermoScientific.

industry' (Andreas Mitchell); 'Tourmaline as a gemstone' (Hugo Luzuriaga); 'Be-diffusion treatment of corundum' (Ian Galbraith); 'Jade in the twenty-first century' (Rupert Huddy); 'Sources and supply of pearls' (Janice Kalischer); 'Growth mechanisms and characterisation of pearls' (Azeena Rajap). Research in Progress presentations on 'Unusual H₂S-graphite-bearing fluid inclusions in tanzanite' (Dan Taylor) and 'REE-bearing gemstones from NW Pakistan' (Etesham Khan) completed the session.

Professor Peter Treloar (Course Director; Gemmology and Applied Mineralogy) concluded the meeting with a vote of thanks. He highlighted the unique nature of the Gemmology and Applied Mineralogy course at Kingston and the importance attached to the developing transferable research, presentation and organizational skills in the Curriculum.

The success of the conference was evident from the high quality of the presentations, the level of discussion and debate generated both during and after the conference, the complimentary comments from external participants and the level of external support provided.

Perhaps the highest accolade to the students' efforts and commitment is that many of the papers were deemed to be worthy of consideration for publication, after review, in appropriate journals and newsletters.

Gem-A and SSEF announce gem testing link-up

Gem-A and SSEF have signed a memorandum of understanding for Gem-A to outsource gemstone and pearl testing to the Swiss Gemmological Institute (SEEF) based in Basle, Switzerland. Although SSEF has operated internationally for many years, the new agreement will allow Gem-A's UK Members the advantages of convenience and the cost benefits of consolidated shipping. The final administrative and insurance details are still to be finalized, but the arrangement will start on 1 January 2010, with, it is hoped, a pilot scheme in operation within a few weeks.

Dr Jack Ogden, Gem-A CEO said: "I am delighted to announce that gemstone and pearl testing will soon be available again to our UK Members. SSEF is a famous gem lab of acknowledged world-

class standard and at the forefront of gemmological research. This agreement builds on the long and close cooperation we have had with SSEF."

Dr Michael S. Krzemnicki, Director of SSEF, said: "We have worked closely with Gem-A for many years and this laboratory initiative will hopefully contribute to ever closer cooperation and growth. Our testing for the gem and jewellery industry is vital for our ambitious research programmes which are of benefit to the entire gemmological community and, ultimately, to consumers."

Gem-A has been in discussions with SSEF since finally deciding to close its London laboratory last year when the economic crisis stalled its own ambitious lab upgrading programme.

Gem-A News and Views

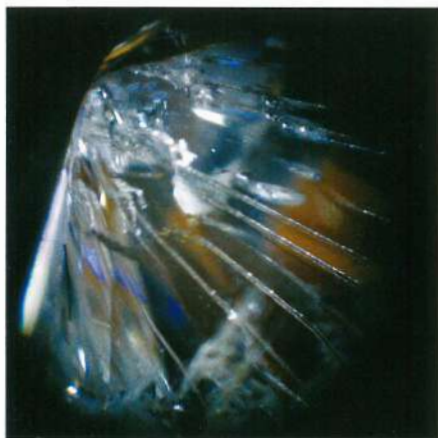
MailTalk

MailTalk is Gem-A's acclaimed email-based forum connecting Members worldwide and providing a platform for discussions and the dissemination of ideas and information. Some recent MailTalk topics are revisited here.

• Chameleons

Chameleon diamonds — natural diamonds which typically change from yellow to green when heated or deprived of light — are one of gemmology's most fascinating phenomena. However, how might one best demonstrate the colour-change effects of chameleon diamonds to students? In answer to this question Nancy Stacy mentioned a student who had put a chameleon diamond in a microwave for minute or two "and it changed colour very quickly". Elise S. described one chameleon diamond that changed to green in less than a minute under a diamond light — and took several hours to revert to yellow. To obtain an academic perspective readers were referred to 'Thermochromic and photochromic behaviour of 'chameleon' diamonds' (E. Fritsch, L. Massi, G. R. Rossman, T. Hainschwang, S. Jobic, and R. Dessapt, *Diamond and Related Materials*, **16**(2), 2007, 401–408). At the other extreme, readers were directed to a video of the change being effected by simple use of a cigarette lighter at www.youtube.com (enter 'chameleon diamond' in the search box).

• Extreme lasered diamonds



Extensively laser drilled diamond. Photo courtesy of Conny Forsberg.

Way back in the 1990s I wrote an article for *Rapaport Diamond News* about laser drilling of diamonds, comparing some stones to 'Swiss cheese' on the basis of their multiple perforations. Extreme cases of such 'improvement' (I use the term tongue-in-cheek) were discussed in MailTalk after Eric Emms had noted a diamond in a

London auction with 20 lasered holes. "Has anyone", Eric asked, "seen a more drilled stone?"

Nobody could beat 20 — though some had seen stones with close to that number and, as Antoinette Matlins pointed out, auction is a common way to sell such heavily treated stones. Ted Irwin referred to a multi-lasered diamond for which he did an appraisal

and the customer's response to his accurate plot of all these features. Ted had explained that all of the little red dots with green circles reflected technological advances that attempted to improve the look of the stone. At this the bride-to-be turned to her fiancé and exclaimed: "Oh honey! Look what they have done for OUR diamond." Ted commented, "The sale stuck, don't know about the marriage."

• Recent lasering

The talk then moved on to the more recent KM laser drilling which is far harder to spot. Readers were directed to the GAAJ website which had a 2007 report (in Japanese, but with a translation option) with good photos (www.gaaj-zenhokyo.co.jp/researchroom/kanbetu/2002/kan_2002_09.html). These show the wiggly lines typical of KM lasering. However, there appears to be an even more recent version of the treatment available now. As diamond expert Michael Hing said: "I don't do much polished grading in my day job and have only had the opportunity to see a few of these 'new method' laser-drilled stones — or should that be 'laser-induced-fracture' stones? However, the ones that I have seen have rather scared me. Apparently they were the latest technology — and this was over a year ago! I could see a couple of unusually short, rod-like laser holes in some, but several of them were very subtle and I think they might well have sailed past me completely unnoticed. Any hints and tips? The 'worm-like' wriggly lines we're supposed to look out for were absent, and if there were surface holes then I just couldn't find them in 10x."

The lack of 'drag' in polishing lines over fissures, as pointed out in the GAAJ report, was taken as a useful tip in detecting new laser treatments — lack of drag means that the 'fissure' has developed after polishing.

• Blue laser pointers in gemmology

While on the subject of lasers, the use of a blue laser pointer in gem testing was raised. Over the years the wavelength of the laser pointers available on the market, intended mainly for use by lecturers, has fallen. The popular red laser pointer was joined by green a year or two back and, most recently, blue. When the red laser pointers first appeared several gemmologists experimented to see if they could serve any interesting or useful gemmological purpose. To my knowledge nothing of note was found. With the green laser pointers (532 nm), there was more joy — as Harold Killingback pointed out in a MailTalk message back in March this year. He explained that he "directed the beam along a half boule of Verneuil blue corundum and the effect was dramatic; a red column of fluorescence forms the axis of the boule". Combining a green laser with a blue filter held to the eye (Lee 'Congo Blue' seems to work best) makes rubies and red spinel glow with red like hot coals — something that can be done even if the gem is many metres away (or in a jeweller's or museum's case).



Field tools. Gem-A's portable Gem Kit.

With the blue laser pointers (405 nm), almost into the violet, now available, some amazing fluorescence can be seen with gems. The glow from rubies is extraordinary and red glows can also be produced with some emeralds, some blue sapphires (as first noted by Barbra Voltaire, maybe mainly Sri Lankan) and other gems with chromium present. One of the most spectacular effects I witnessed was the phosphorescence of an Australian white opal in a totally dark room after it had fluoresced a pale green with the blue laser pointer.

Of course, the safety aspects have to be considered carefully. A strong laser beam reflected off a facet could damage a viewer's eyes. Cheap laser protection goggles are available, but are coloured which can hide the effects. Testing a stone while it is in a poly-bag might help by diffusing the reflected laser beam sufficiently – it's the technique I use. If you want to play around with this technique, research the safety options and act responsibly.

• Field tools

Interwoven with the discussions about the use of a laser pointer were comments on what were described as 'field tools' – simple and readily portable gem testing equipment. Although advanced testing using laboratory equipment is necessary sometimes, particularly with some of the modern treatments, a huge amount can be accomplished by a trained gemmologist using relatively simple equipment. The equipment recommended is included in the Gem-A Gem Kit available from Gem-A. This kit is supplied to students taking the Gem-A Gemmology Foundation Certificate, supplemented with a refractometer for Open Distance Learning students.

During some discussion the use of the microscope, Padraic Lavin posted a photo of an early dichroscope (pictured right) that he had been given "if he could identify what it was".

• Pearl polishing

In response to a comment about a Wikipedia page in which South Sea cultured pearl producer Paspaley is said to have implied that all Akoya cultured pearls were polished, Antoinette Matlins noted: "To say that the high lustre on Akoya pearls is the result of polishing is completely misleading." High lustre was not always the result of polishing. It is true that most Akoya cultured pearls from Japan and China have been polished for the past 15–20 years, because of shorter cultivation times and thus poorer nacre, but this was not always true. Pearl expert, Peter Groenenboom, although essentially agreeing with this, did point out that lustre depended on the thickness of the individual nacre layers – and that the colder the water, the thinner the individual nacre layers.

• Green amber

A discussion about treated amber and treated copal being sold simply as 'amber' launched an exchange – that became quite heated – about the lack of ethics or knowledge exhibited by retailers. None disagreed that a significant amount of material sold as 'amber' was treated or copal or both, and was not being disclosed properly. The dispute lay in whose fault this all was. The simplest answer is that there are unethical people at all levels of the trade and also ignorant people. When the latter buy from the former, there are problems. Disinterest also has to be brought into the equation – for what is essentially costume jewellery, it seems that the gemmologically savvy members of the trade are more worked up about poor gem descriptions than the general buying public. Clearly gem education for shop staff and buyers is necessary, along with more information for consumers about what to look for and what to ask.

For amber and copal, and the various treatments – and terminology – see 'Organic gem materials' on page 18.

Jack Ogden

To subscribe to MailTalk (one of Gem-A's most popular membership benefits) email Arianna@gem-a.com. Make sure you provide your full name and/or membership number and the email address you wish to use. There can be several emails a day, so you can opt to have a single emailed 'digest' daily – just tell Arianna if you prefer the Digest option. It is easy to change between Normal and Digest options at a later date.



New exhibitions

Rare diamonds on display in New York City

Joshua Sheby reports on an exhibition of diamonds being held at the American Museum of Natural History.

The new diamond exhibit illustrates the range of diamonds available today, from natural white and fancy coloured diamonds to those created in a laboratory.

Natural diamonds in the exhibit include an intense pink brilliant-cut diamond set in gold with small pink diamonds, all from the Argyle Mine in Australia, designed by Carvin French, and a 5.4 ct diamond surrounded by sapphires in a pendant designed in California in 1960.

The Olympia Diamond Collection

Five of the strongest colours that occur in diamonds are displayed in the Olympia Diamond Collection. The collection comprises a 1.01 ct vivid orange-yellow, a 1.02 ct vivid blue-green, a 2.17 ct vivid purplish-pink, a 2.13 ct vivid blue, and a 2.34 ct vivid orange. Vivid is the highest colour level grade given by the Gemological Institute of America (GIA) and indicates colours that display the most saturation. Within each colour level that GIA employs (example: light, fancy, intense vivid), there is a range (high-medium-low). The diamonds housed in this collection are in the strongest level (vivid); but more impressive is that they are also some of the most saturated colours ever to belong in this top tier level. The diamonds are generously on loan by Scarselli Diamonds, Inc.

While all are unique and have their interesting stories, two of them really stand out. The 1.02 ct vivid blue-green originates from Brazil. It is very difficult to tell if radiation was induced naturally (natural colour) or by man (treated colour) to a diamond. A diagnostic answer can be found in radiation patches: areas of green colour on the outer surface of natural diamond. As the patches are only 'skin-deep' much of it can be cut off in shaping and forming the diamond, resulting in a desaturated green to colourless diamond. Whereas in most stones highest clarity is more valued, in green diamonds the inclusion of radiation patches is what gives both the colour and proof of its natural origin.



Rare and extraordinary diamonds on exhibit at the American Museum of Natural History © Digital Jewelry Photography.

The second interesting diamond is the 2.17 ct vivid purplish-pink. This was bought in Rio Tinto's Argyle Pink tender, an auction of the best pinks in the world from the Argyle mine in Australia. This was the second-largest diamond at the 2005 Argyle Tender. Pinks are known to be of an imperfect clarity. Through careful examination and cutting the result, besides a spectacular colour, was a diamond of a much higher clarity than what is normally seen in this material.

Laboratory created diamonds

Two types of synthetic diamond are included in the display. Those from the Apollo Diamond Corporation are created using the chemical vapour deposition (CVD) technique whereby diamonds are produced by adding a gas mixture to a heated chamber containing so-called seed material. The display includes stages of growth of CVD diamonds.

Laboratory-grown diamonds from the Gemesis Corporation are also displayed, produced using the high-pressure, high-temperature (HPHT) technique in large presses. Examples include uncut and cut diamonds and a cultured pearl necklace with a pendant featuring a 2.01-carat cultured yellow diamond surrounded by a pave of natural white diamonds.

The diamond display, curated by George Harlow, Curator of the Museum's Department of Earth and Planetary Sciences, is exhibited in the American Museum of Natural History, Morgan Memorial Hall of Gems.

Joshua Sheby is Curator of the Olympia Diamond Collection for Scarselli Diamonds

Maharaja: The Splendour of India's Royal Courts

The V&A's autumn exhibition brings together magnificent objects, many on loan to the UK for the first time from India's royal collections, featuring Indian turban jewels and jewellery commissioned by Cartier and Van Cleef & Arpels, as well as textiles and dress, pictures, photographs, furniture and metalwork.

The heyday of the maharajas began after the collapse of the Mughal Empire in the early eighteenth century. The exhibition opens with this period of chaos and adventure and closes at the end of the British rule in 1947, when Indian princes ceded their territories into the modern states of India and Pakistan.

The exhibition shows the changing role of the maharajas in the historical and social context and looks at how their patronage of the arts both in India and Europe resulted in splendid and beautiful commissions designed to enhance royal status and identity.

On entering the first gallery of the exhibition, the atmosphere is set with life-size models of an elephant and a horse dressed for procession in fine textiles and full jewellery.

On show for the first time in the UK is the Patiala necklace, part of the largest single commission that Cartier ever executed. Completed in 1928 and restored in 2002, this piece of ceremonial jewellery originally contained 2930 diamonds which weighed almost a thousand carats (many of which have since been replaced with simulants). The position of the yellow stone was originally occupied by the De Beers diamond of more than 234 ct, which has been replaced with a cubic zirconia cut to the exact dimensions of the diamond.



The Patiala Necklace, 1928. Cartier Paris. Photograph by N. Welsh. © Cartier.

Of the many wonderful gems on display, of particular note is a carved 409 ct emerald set in a belt buckle made by Cartier in 1925. The buckle is reputed to have been owned by the Mughal Emperor Shah Jahan.

Displayed in the section covering the period of the Raj is a canopy of pearls, rubies, emeralds and diamonds made for the Maharaja of Baroda and exhibited at the durbar of 1903.

The maharajas' patronage of European firms resulted in luxurious commissions. On display are saris designed by leading French couture houses, a costume by Madeleine Vionnet, diamond and emerald necklaces designed by Van Cleef & Arpels and by Cartier, and a Louis Vuitton travelling case.

Maharaja: The Splendour of India's Royal Courts will be displayed at the Victoria and Albert Museum, South Kensington, London, until 17 January 2010. The exhibition will then tour to Kunsthalle der Hypo-Kulturstiftung, Munich, Germany, from 12 February to 23 May 2010. A version of the exhibition is also planned to tour North America from autumn 2010.



Procession of Raja Ram Singh II of Kota and his son at Kota, c.1850
©V&A Images

Gem and Jewellery History

A remarkable manuscript on diamonds, written more than 300 years ago, pre-empted modern diamond grading methodology in its coverage of the '4Cs', cut grading, master stones for colour and clarity comparisons, and the use of a microscope.

A pretty useless fancy

A handwritten document on diamonds is among original papers of Sir William Petty, now preserved in the British Library*. Sir William Petty (1623–1687) was an English economist, scientist and philosopher. The document was probably written c. 1650–1675 and, like many 'philosophical' writings of the period, it is presented as a dialogue between two people — A, someone with expertise in the assessment and valuation of diamonds, and B who has bought a diamond and is worried he may have been cheated. The economic factors affecting value as explained in the document might suggest the words were Petty's, but the details of diamond appraisal that it reveals indicate considerable experience in that field.

In what follows I have edited the spelling and punctuation of some of the quotes to make them easier to read for the modern reader.

The discourse begins simply enough:

- A "You have a fine ring there on your finger, what did it cost you?"
- B "I am ashamed to tell you, for I am afraid I gave too much for it and the truth is I wonder how any man tell what to give, there be so many nice considerations in that matter in all which one has nothing but mere guess to guide himself by."
- A "Why did you buy it set?"
- B "What should I do with it unset?"
- A "If you bought it set you lost two of the best guides and measures whereby to have known its price. Namely the weight and the extent [proportions], both which are computable otherwise than by mere guess beside the water and colour of the stone as also the clouds, icicles and

points are somewhat better discerned when you can look round about it than when you look upon it but as through a window."

In other words, A is saying that you can view an unset stone from all directions and study its internal characteristics. Once set, the stone can be examined from one direction only "... as through a window".

B also admits to A just how he acquired his ring, illustrating that some types of transaction haven't changed much with time. "When I bought my ring I bid £85, £86 and £87 for it and the merchant swore he could not afford [to let] it go and seemed to go away once or twice and thereupon I gave him £90 and he told me that he would give me £85 for it at any time within a twelve month and defied me to match it anywhere for the money I gave him."

So B seeks A's guidance saying: "I was not so wise, but I must needs buy some more diamonds shortly wherefore pray instruct me if you can."

A explains in some detail that the costs of a diamond will reflect not simply its own features — weight, colour and so on — but also a variety of external factors. These include availability. If merchants can buy other more profitable commodities in India, they will not bring diamonds. Fear of war could force prices up — so diamonds become "a subsistence for exiled and obnoxious persons" — or an impending royal marriage could boost demand and thus prices because "great numbers of persons are to put themselves in splendid appearances". A also stresses that the diamond market was then, as now, a global



A portrait of Sir William Petty

one: "If the price of diamonds should considerably rise in Persia it shall also rise perceivably in England." This was because merchants were in contact with each other, being "partners in most of the considerable pieces" and "do use great confederacies and intrigues in the buying and selling" of diamonds.

B then objects that although he finds this discourse interesting, he doesn't need "so deep an inspection into the matter". He only has £200 or 300 to spend on another diamond and simply needs to know how to judge a diamond's quality and thus worth.

A then starts his explanation about diamond 'grading'. The four main factors influencing value were "weight", "extent", "colour or water" and "cleanness from faults". In other words, the 4Cs — Carat weight, Cut (actually proportion here), Colour

Gem and Jewellery History

and Clarity. To these were to be added “the mode and workmanship in the cutting” — cut grade!

We can cover Petty’s grading under the 4Cs headings:

Carat Weight

For weight the scales should “weigh with certainty to less than a quarter of a grain”, that is to say, within a 1/16th carat.

The basic rule was that diamond prices rose by the squares of the weight. As Petty explained: “Suppose a diamond weighing one grain to be worth £1 then a diamond of two grains is worth £4 because the square of 2 is 4”. This was the usual method of calculating diamond prices in the seventeenth and eighteenth centuries and some older readers may remember a similar rule being used to calculate the price of natural pearls a generation or two ago. A cautions B: “Now judge you whether it be safe buying a diamond of 20 grains by the eye without weighing, in which a grain’s difference in the weight makes about £43 difference in the price, reckoning the single grain but for 20 shillings.”

B objects that if weight was so important, why did diamond cutters not try to get maximum yield from the rough? An octahedral stone was usually divided into two stones; why not cut it as one large stone? A congratulates B on this “judiciously observed” point, but stresses that the shape and proportions of the stones were also important. You can get two well-proportioned stones from an octahedron that would be worth more than one that was very poorly proportioned. Which, naturally enough, brought A to the next factor, cut.

Cut

To measure proportion, or ‘extent’ as they call it, a square was drawn in a piece of ‘Muscovia glass’ (a transparent cleavage plate of mica) or very fine horn. The square should have sides an inch long and be divided into “20 parts by the finest lines that can be drawn”, thus dividing the square into 400 smaller. Our meticulous guide suggests “making every fourth division in

a line something bigger than the rest for distinction sake”.

“Ah ha!” says B. “I now understand the use of your glass or horn table, and I suppose that by applying the flat section to the squared table you may with diligence measure the difference of any superficies [edges] almost exactly.” A simple proportionscope.

Colour

Next you required five or six diamonds to hand, each of a different colour — colour master stones. Also, of course, you must have sought the opinion of the ‘best jewellers’ as to the relative values of these different colours. As an example, A says that if a stone weighing a grain of the best water was worth 25 shillings (£1.25), then one of ‘a black water’ might be worth 20 shillings, one of a red water 16 shillings, of a yellow water 14 shillings, of a bluish water 13 shillings and a brownish water 12 shillings.

“... have as many foul diamonds as do contain samples of every sort of fault and a note of such abatements as an experienced Jeweller would make for every such fault.”

Clarity

If this use of colour master stones 350 years ago is surprising, even more so is the next piece of advice — to “have as many foul diamonds as do contain samples of every sort of fault and a note of such abatements as an experienced Jeweller would make for every such fault, the same to be expressed in aliquot parts of the whole value.” That is a set of clarity masters — something encountered among few diamond graders even today.

A then explained how clarity affected values. “Suppose there be a black speck in a stone which without it would be worth £10 according to our former rules, but with it is worth 4 shillings less. Now you must remember that this 4 shillings must be looked upon as the fiftieth part of the value and therefore you must abate £10

in a stone of £500 ... moreover suppose there be not only the black speck above mentioned, but an icicle also in your stone of £10 for which you are to abate 10 shillings. ... because there are two faults you must not only abate 4 shillings and 10 shillings, but the double of the same namely 28 shillings.” And so on. If the stone also had a cloud “for which alone you might abate 6 shillings” the three faults would mean that you should reduce the value by three times the sum of 4 shillings plus 10 shillings plus 6 shillings “... leaving your stone of £10 reduced to £7”.

B then astutely queries what happens when a stone has so many faults that by these calculations the stone ends up with a negative value — “the stone in such a case is so much worse then nothing?”. “Good question”, says A. “’Tis a pleasure to teach you.” But, he continues, according to “able jewellers” the maximum difference in values between “the best with all its perfections is but triple the worst with all its faults”.

“And you must also have a pair of excellent spectacles for the older sight with a good microscope and then I conceive you are furnished with the means of knowing more than most Jewellers do know.” So there is it, a complete description of diamond grading written over 300 years ago and including the use of masterstones, a proportionscope and a microscope.

“Lord Bless me. What a fool was I”, admits B, realizing now how little you could judge the quality of a set stone, especially as “the workmen who do set diamonds endeavour so to set them as to make them look 5 grains or 5 squares in 100 bigger than they are”. He was pleased with the conversation “by which in a quarter of an hour one may learn to get or save £200 or £300”.

A was delighted that B accepted his advice when “some men would have made a frivolous objection against it or have received it with a scornful smile as a pretty useless fancy”.

Jack Ogden

*Petty Papers. Vol. XLVIII. British Library reference ADD 72897 14 f105

Gem and Jewellery History

Gem-A exams continue through WWII

Seventy years ago World War II started with devastating impact on so many people and nations. Although trivial in comparison, ripples of these events reduced Gem-A student numbers, and bombs hit the room where exam answer papers were stored. War also disrupted one woman's gemmology studies, as revealed by surviving correspondence.

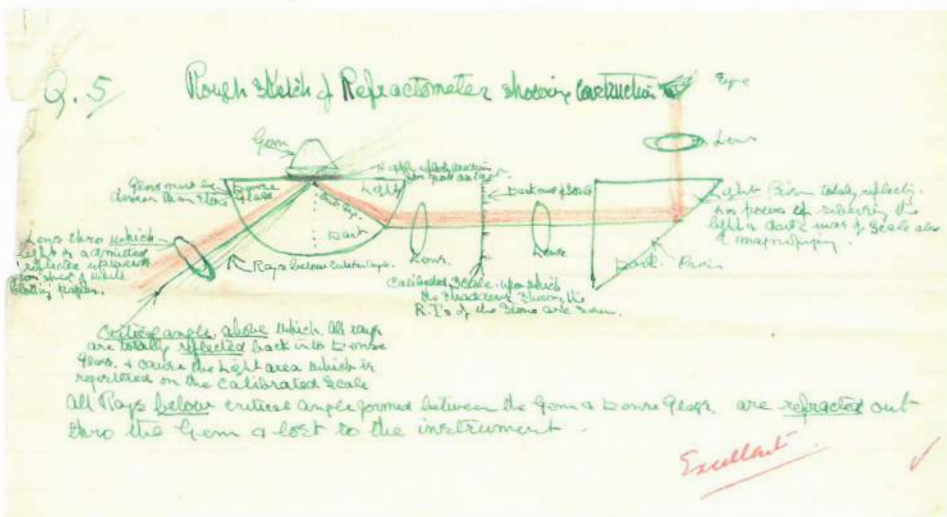
In 1937 the official instructor for the gemmology correspondence courses was John Stanley, based in North London. In October that year he received a cheque for £2:2s:0d (£2.10) as the enrolment fee for the full 'Preliminary Course of Instruction in Gemmology' from Arthur Batty of Bromborough, on Merseyside, not far from Liverpool. What happened next can be seen in the correspondence kindly lent to us, via Peter Dwyer-Hickey, by Philippa Deeley, Arthur Batty's granddaughter, who herself is an FGA DGA. The correspondence is sadly one-sided as the Batty letters to John Stanley have not survived, apart from the marked written answers, but a picture still emerges.

By early November 1937 it would seem that Arthur Batty had realized that he had too little leisure time to undertake the course. No doubt he had seen the syllabus and 'The first and second papers' which Stanley had sent,

so he suggested that his wife Gladys might take over and do the course instead. That was acceptable, and Stanley noted: "I am sure she will prove a good student." Indeed, her answers to papers were soon described as 'splendid' and she apparently very much liked the sphenes that Stanley had sold to her husband. John Stanley also expressed a willingness to provide further "uncommon gems on approval" should Mr Batty so wish.

In early 1938 her answers to question papers continued to be of high standard including, we hear, her drawing of a refractometer (reproduced below). Then in May, as exam time approached, Arthur Batty contacted the Gemmological Association of Great Britain expressing willingness to "act as Supervisor [sic] for the examination of Mrs Batty and the two Liverpool candidates" at his home. Such a close link, with a student sitting an exam in her own home invigilated

Gladys Batty's 'excellent' drawing of a refractometer.



Gem and Jewellery History

by her husband would be out of the question these days, but those were simpler times.

Then disaster struck in the form of flu. John Stanley wished Gladys Batty well and reassured her that her answers were still "thoroughly sound" despite her problems. He added: "I know you have plenty of pluck." She had expressed great anxiety about the exam, but was reassured that "the thing really is to get down the maximum amount of real information in the fewest possible words".

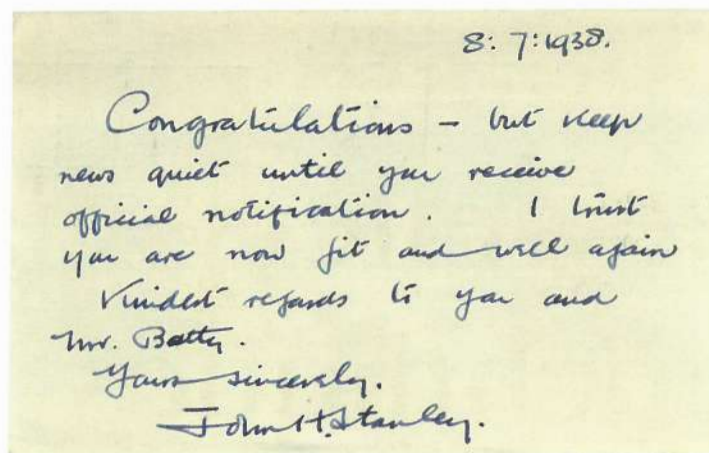
Stanley's letter was in the post to Gladys as further east in Berlin Hitler assembled his principal military and political advisers to tell them of his plan to attack Czechoslovakia.

The exam was set for 9 June 1938. Mrs Batty sat it — gaining Stanley's admiration: "I think you were very plucky to take the Exam under such conditions" — presumably meaning with the after effects of the flu, although other worries seem to be alluded to.

They then both waited for the results, due out a month later. In fact John Stanley sent a postcard to Gladys Batty on the 8 July saying: "Congratulations — but keep news quiet until you receive official notification." She had indeed passed with 71 marks out of a 100. That year 38 candidates had entered for the Preliminary exam, of which 33 passed, four failed and one was absent. Sitting in the same exam was the present writer's uncle (68%), but the most noteworthy aspect of the exams in 1938 was one of the candidates in the Diploma exam — Basil Anderson. Anderson had become an instructor and it was imperative that he gained the Gemmology Diploma as soon as possible. As the Education Committee noted in its report that year: "It must be almost without precedent for teacher and taught to sit simultaneously for the same examination." It had been agreed in advance that he would not be eligible for the Tully Medal, even though he returned "a faultless set of answers".

The Diploma level of the Course was due to commence on the 16 September 1938, but Gladys Batty decided not to enrol; Hitler's actions could no longer be ignored. John Stanley wrote to her saying: "In view of your activities you are wise ... I am sure you will make an excellent Senior Air Warden."

John Stanley's postcard to Gladys Batty advising her (a little prematurely) of her success in the examination.



He added: "I think and sincerely hope that 'active service' in this direction will not be needed." This is, of course, a reminder that this was just one year before war was declared between Britain and Germany, and right in the middle of the 1938 European crisis when Hitler's proposed invasion of Czechoslovakia was seen as an almost inevitable precursor of a major European war.

On 1 September 1939 Germany invaded Poland and Britain was indeed at war with Germany. A few weeks later an emergency Council of the Gemmological Association was set up, that year's awards ceremony cancelled, future examinations cancelled and the Chelsea Polytechnic, where classes were held, 'closed indefinitely'.

In the event, examinations were held in 1940, although that year's examiners' report notes that "As would have been anticipated, the outbreak of war had a marked repercussion upon the examinations and caused a drastic reduction in the number of candidates, since so many of those who otherwise might have sat were liable to be called up for service with His Majesty's Forces." There was a further decrease in numbers in 1941, but in 1942 numbers were up again and exams were also organized outside London — one American candidate sat the exam in the GIA's premises in Boston.

The same relatively high level of exam candidates was retained in the following two years, even though in 1944 the examinations were held "in the midst of the enemy's ... indiscriminate air-attack".

With minds inevitably on aircraft and the airforce, the Gemmological Association of Great Britain seriously considered planning for a post-war vocational gem course for former Royal Air Force pilots, but it was felt impractical and that the existing correspondence course was sufficient.

Also in 1944 the Association's company secretary, Gordon F. Andrews, was called up for active service, leaving Mrs A. Sharpe with the assistance of Miss V. Benson to run the office. This was not without its problems in central London, the year in which the development of pilotless V-1 flying bombs and V-2 rockets enabled Germany to attack London with weapons launched from the European continent. In fact, the room in which the exam answer papers were stored was damaged twice.

Gladys Batty never did continue her gemmological studies at Diploma level after the war. We don't know all the factors that led to her making this decision, but perhaps the retirement of John Stanley as course instructor in 1944 played a part. His role had been taken over by Basil Anderson. It is easy to think of correspondence courses in the past, in the days before emails and even the common use of the phone, as being formal and lacking in tutor-student interaction. But, as the surviving correspondence between John Stanley and Gladys Batty shows, the most important factors then as now are an enthusiastic student matched with a motivational and experienced tutor.

Jack Ogden

A crash course in jewellery materials and techniques

Olga Gonzalez reviews the ASJRA conference 'In its time: materials and techniques throughout jewelry history'



Déjà vu. I made it back to school for Jewellery History. ASJRA, also known as the Association for the Study of Jewelry and Related Arts, held their annual conference at the Fashion Institute of Technology on 11 October 2009. Armed with Starbucks and a pen, I was prepared to learn something ... and learn I did. The speakers came from a knowledgeable mix of backgrounds: Barbara Berk (jewellery artist), Ursula Ilse-Newman (Curator of Jewellery, Museum of Arts and Design, New York), Rui Galopim de Carvalho FGA DGA (founder of LABGEM), Lucie Heskett-Brem (jewellery artist), Barbara Seidenath (jewellery artist), Gerald W.R. Ward (Curator, Decorative Arts and Sculpture, Museum of Fine Arts, Boston), Jan Yager (jewellery artist) and Gem-A Chief Executive, Dr Jack Ogden. The conference was co-directed by Elyse Zorn Karlin (Editor, *Adornment Magazine*) and Yvonne Markowitz (Curator of Jewellery, Museum of Fine Arts, Boston) and presentations proved a fabulous success.

Lucie Heskett-Brem provided a documentary detailing her skill as a goldsmith and chain maker, deeming her 'The Gold Weaver', followed by Barbara Berk, who led an insightful talk demonstrating how the use of textile techniques, such as braiding, crochet, and bobbin lace could be interpreted in metalwork. Through her illustrations, it was clear this vocabulary of textures added to the artist's wearable palette. Ursula Ilse-Newman discussed the use of glass in jewellery, depicting both beautiful and somewhat unsettling pieces – such as jewellery representing body organs and clogged arteries. Rui Galopim de Carvalho worked his magic on the audience, making all fall in love with the progression of Portuguese jewellery, while providing an easy to understand diagram of the

Toccata pendant of hand woven 22 ct and 18 ct gold done in the soumak technique (used in ancient rug-weaving). Mexican fire opal carved by Sherris Cottier Shank. Photo by Robert Weldon. © Barbara M. Berk, 2007.

Gem and Jewellery History



Silver and enamel 'branches' brooch set with spinels by jewellery artist Barbara Seidenath. Designs are created by engraving techniques used under the layers of enamel. Photo courtesy of Barbara Seidenath.

history of the country and its influence on jewellery styles and their use of gemstones. After his talk, lunch was supplemented by two performances from a musical in Eatontown, NJ, called 'Diamonds at 22 West', based on competing booths at New York City's Diamond Exchange. After, Gerald W.R. Ward spoke about the innovative use of materials by American studio jewellers, fascinating the audience with eggshell jewellery finely placed on bamboo, among other highlights. Enamelling made a strong appearance in a lecture by Barbara Seidenath and Jan Yager captivated the students with her city-inspired jewellery collections, using crack bottles for necklaces and creating beautiful tiaras depicting weeds sprouting from her native Philadelphia pavements. If that wasn't enough fun for the day, Dr Jack Ogden covered 5000 years of jewellery making in thirty minutes, focusing on how the discovery and invention of materials in science affected the capability to create jewellery designs at various stages



The individual items of jewellery that make up the Tiara of Useful Knowledge created by Jan Yager that is featured on the front cover. Photo by Jack Ramsdale.

in history. Interspersed throughout the lectures were brief 'Moments in Jewelry History,' alternately introduced by Yvonne Markowitz and Elyse Zorn Karlin, where innovative materials and jewellers were featured, such as the discovery of aluminium and the brilliance of John Paul Miller.

The conference embraced the contemporary within the context of society, science and history. Above all, it was a gathering to appreciate the aesthetics of living artists and emphasized the need for further education in jewellery history, particularly within contemporary jewellery history studies. To survive the fast-paced industry, it is important to pursue knowledge of the past and equally important to be supportive of today's artists. I look forward to seeing more conferences embrace forward thinking in the way ASJRA's 'In Its Time: Materials and Techniques Throughout Jewelry History' has, and will surely attend next year.

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Stone Scoop



Nothing new under the Sun

A Diamond Miscellany ranging from the self purchase of diamonds by women to diamonds from Angola to how UV may affect judging the colour of a diamond – but all from the past.

Girl's best friend

There is, indeed, nothing new under the sun. The 'self purchase' of a diamond by a woman is often presented as a recent phenomenon, a sign of the rising financial independence of women. This may be a convenient modern marketing approach, but self purchase does have some historical precedents. In November 1800 *The St James's Chronicle* noted examples of the expenses of a "pretty French Woman" which were "sufficient to shew what a pretty woman at Paris pays for. One entry was 'To the jeweller, for my solitaire, paid 46 Louis'." (The Louis was a gold coin.)

The term 'solitaire' in old documents can be a bit confusing – it originally meant a form of men's neck-ware – but its use in a diamond context can be found from the first half of the eighteenth century. Thus there is a 1734 report of a theft in London which included: "A large Rose Diamond Solitaire set in Wheel-Fashion; a Brilliant ditto with an Amethyst colour middle stone." Among "the finest Set of Jewels ... ever made in England" by celebrity jeweller Henry Jernegan described in 1736 there are "a Diamond Necklace, Ear-rings, Solitaire, all exceeding large and noble". Essentially 'solitaire' then seems to have meant any ring in which a large diamond was the focus or centre. We will look further at Henry Jernegan and his gems and jewellery in a future issue.

Brilliant career

The use of the term 'Brilliant' as just quoted above might surprise some, but the brilliant cut was developed during the seventeenth century and diamonds were being described as 'brilliant' by no later than about 1680. As we have seen, old newspapers sometimes provide frustratingly tantalising snippets of information. In 1736, the same year that Henry Jernegan's excellent jewels were listed, the *Grub Street Journal* had the brief mention of the death of "Mr Sam Sheaf, a diamond cutter, who first brought to perfection the brilliants etc."

Danger

It was not recorded how Mr Sheaf, diamond cutter, died, but exactly 200 years later in an article about insurance and job safety, *Popular Science* magazine (February 1936) noted that when going about their daily tasks a diamond cutter faces significantly greater dangers than a prison warden. This was according to a list of the relative safety of some 5000 jobs ranging from bookkeeper (low risk) to steeplejack (high risk). Gemmologists weren't listed among dangerous professions in that article, despite the damage that can be done by toxic heavy liquids or short wave UV light.

Gemmological taste

Another potentially dangerous gemmological test was mentioned in a British newspaper that Mr Sheaf may well have read. *The Daily Courant* in 1732 recorded that the year before a churchman in Auxerre, France, had sent a doctor in Paris a sample of 'crystallisations' found in his region. The good doctor tested these and noted with dubious gemmological nomenclature that "the crystallisations are of that sort of Diamonds which shine like polished iron". He considered their high specific gravity, noted that a crystal could easily be crumbled to a powder and then announced that "in about three hours I almost dissolved one by holding it in my mouth". They were not diamonds; from what was said they sound like some form of iron ore.

Early Angolan diamonds

Finding true diamonds in Auxerre would have been something of a surprise, but remember that just a few years earlier diamonds had been reported from Brazil – a discovery greeted with disbelief in many quarters. The diamonds used in Europe were sourced from India from antiquity, then Borneo (see *Gems & Jewellery*, September 2005, Vol.14, No. 3) followed by Brazil in the late 1720s. The usual

books on the subject tell us that other sources, such as South Africa and Australia, only followed in the second half of the nineteenth century, joined by an increasingly wide range of sources in the twentieth century. Among so-called 'recent' sources is Angola where, we are usually told, diamonds were first discovered in 1913. That date is some two centuries out. *The Universal Magazine* in 1749 noted that the Portuguese had recovered some diamonds from Angola by then, when Angola was a Portuguese colony and, ironically, was also providing slaves for the working of the gold and diamond mines in Brazil.

UV fluorescence and diamond assessment

The Universal Magazine goes on to repeat the usual information about diamond quality, mining and cutting, but also gives some interesting information on diamond inspection. The Europeans, it tells us, "examine the goodness of their rough diamonds by day light", but in India inspection was done at night using the light of a lamp. It also quotes another authority who said that "The only infallible way

to examine a rough diamond is in the shade of some tufted tree." More mysterious is the statement that "The grand distinguishing criterion of a diamond is, when it gives no light, when in the open air you put your hand or any thing over it to prevent its immediate communication with the sky." Actually this statement is a slightly garbled version of what was said by a Mr Wall several years earlier, in the *Philosophical Transactions of the Royal Society*: "A Diamond being expos'd to the open air in view of the sky, gives almost the same light of it self without rubbing, as if rubb'd in a dark room; but if in the open air, you put the hand or any thing a little over it, to prevent its immediate communication with the sky, it gives no light; which is a distinguishing criterion of a Diamond." This seems to be describing a diamond's fluorescence under the UV from sunlight and comparing this with a diamond's phosphorescence in a dark room when rubbed — the UV fluorescence was immediately extinguished when the sunlight on the stone was obstructed.

So, did the Indians judge diamonds by artificial light at night so as to avoid UV fluorescence caused by sunlight affecting the perceived purity of colour?

Jack Ogden



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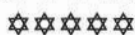
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Events and Meetings

The Gem Discovery Club

Once a month the Gem Discovery Club, held at Gem's London headquarters, opens its doors to members and non-members to participate in Specialist Evenings. Details of upcoming specialist evenings follow:

Tuesday 1 December 2009

Valuing the Past: Putting a price on the Staffordshire Treasure and other UK Treasure Finds

JACK OGDEN

The Treasure Valuation Committee of the Government's Department of Culture Media and Sport, has the interesting but often tricky task of determining the likely 'market' value of finds of ancient and historic items which are deemed to be 'Treasure' under English law. Dr Jack Ogden, vice-chairman of the Committee, has been involved with the treasure process for many years, serving on the Committee and prior to that as an advisory valuer. In this talk he will give a background to the Treasure process, explain the way in which the valuations are arrived at, and discuss some of the treasures, from the wonderful to weird, that he has examined while serving on the committee – including the recently discovered Staffordshire Treasure.

The fee for non-club members for specialist evenings is £5 payable at the door, but if you plan to attend a specialist evening please call 020 7404 3334 or email arianna.maccaferri@gem-a.com, as space is limited.

Tuesday 15 December – 6:00 to 7:30 pm
at Gem-A's London headquarters

Gem Discovery Club Christmas Party

This year our popular GDC party will be open to **all Gem-A Members and Students** – but do apply early as space is limited and GDC Members have priority.

There will be some fun competitions to tax your gem skills (but nothing too taxing!).

Admission: *GDC Members* – a bottle of wine, juice or soft drink plus some sort of savoury or sweet 'finger food'

Non-GDC Members – £5 plus bottle of wine, juice or soft drink; *reservation in advance essential.*

February Guest Specialist (date to be announced)

Gem Carving, Inspiration and Skills

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Friday 30 April to Monday 3 May 2010

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MARIA ALFEROVA

Fabergé – The 'Lost, Last' Egg

DAVID CALLAGHAN

Upon reflection – an excursion into the phenomena of reflection

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Midlands Branch

Contact: Paul Phillips
02476 758940
email: pp.bscfgadga@ntlworld.com

Meetings will be held at the Earth Sciences Building, University of Birmingham.

Friday 27 November 2009

Adventures with the Microscope
DOUG MORGAN

Friday 29 January 2010

Branch AGM, Bring and Buy, and Quiz

Friday 26 February 2010

Emeralds - formation, treatment, manufacturing and identification
DOUG GARROD

Scottish Gemmological Association

Contact: Catriona McInnes
0131 667 2199
e-mail: scotgem@blueyonder.co.uk
website: www.scotgem.co.uk

Monday 25 January 2010

Burns supper
at the Tusitala Restaurant in Edinburgh

Tuesday 2 March 2010

Members' night - Tales from Tucson
at the British Geological Survey, Edinburgh

NATURE'S TREASURES II: The Wonder of Minerals and Gems

Sunday 13 December 2009 at the Flett Theatre, Natural History Museum, South Kensington

A one-day seminar for everyone with a fascination for gems and minerals. Organized jointly between Gem-A, The Mineralogical Society and The Russell Society.

See page 2 for further details.

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