Gems&Jewellery

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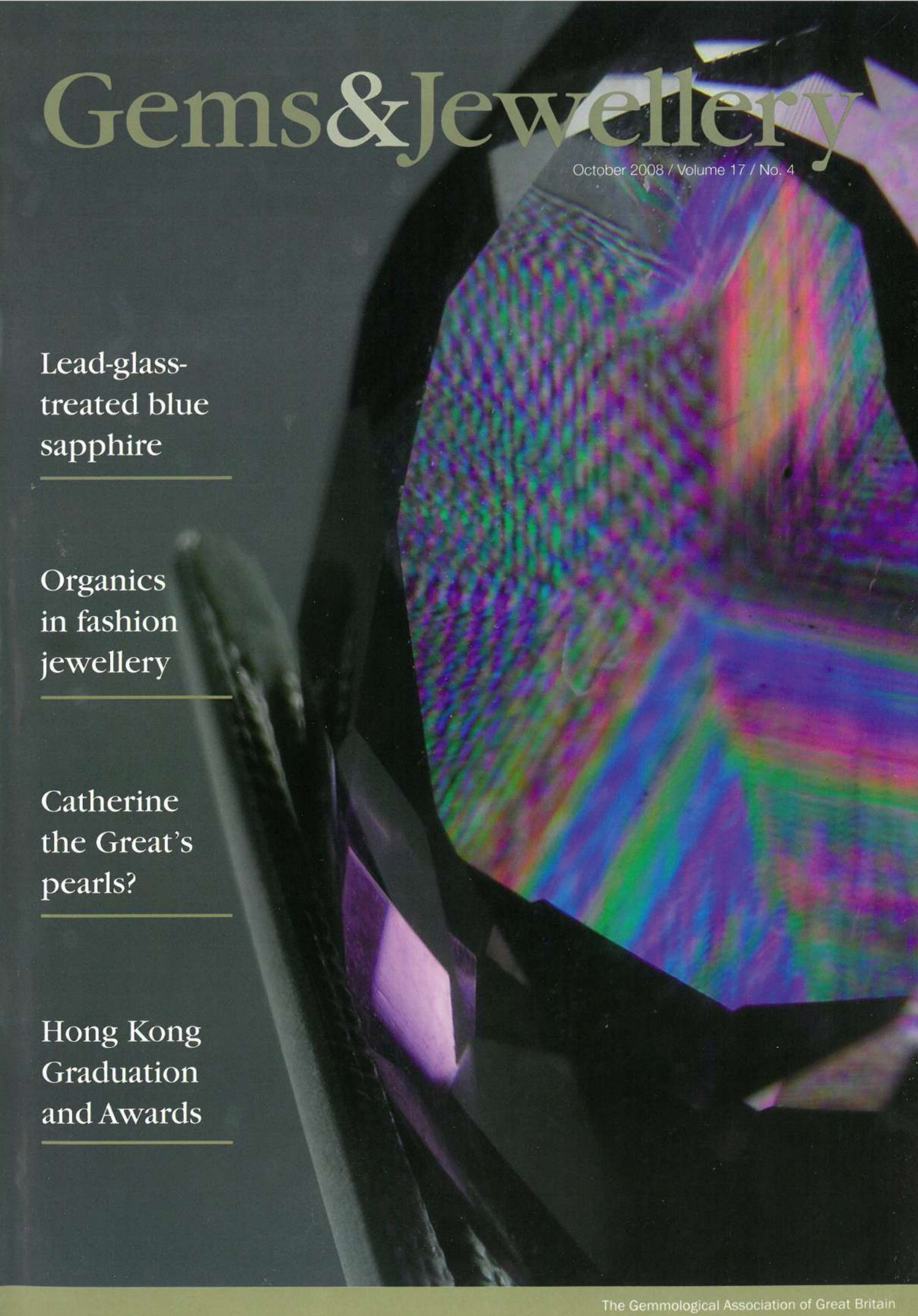

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Editorial

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Exciting times

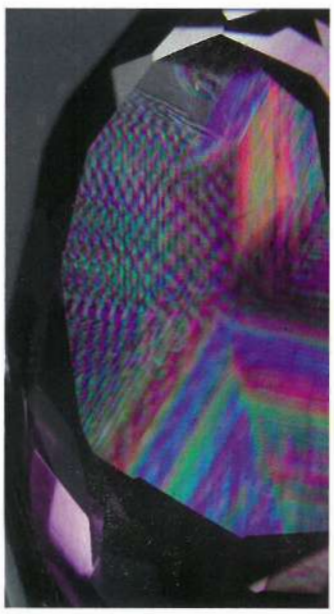
By the time you receive this, our Centenary Conference, which is also the Second European Gemmological Symposium, will be upon us, so it's too late to urge you to come, but there will be a full report in the next issue of *Gems & Jewellery*. Our annual Conference, and the associated Graduation and Awards Ceremony, tend to mark the culmination of our year; after that we are concentrating on the usual end-of-year budgeting, planning and subscription renewals while the gem and jewellery industry concentrate on the holiday season business — which we hope will good, despite the economic woes rattling around the world as I write.

It has been a hectic but exciting few months for Gem-A since the last *Gems & Jewellery*. Outside the offices we've been involved in various events, from a splendid pearl evening hosted by Christie's in London, to the International Gemmological Symposium held in Guangzhou, China, in September to launch Gem-A's new teaching centre there. Then there was the Hong Kong Graduation and Awards dinner, a special one to celebrate the One Hundred Years of Gemmological Education, and the first of the 'new' Herbert Smith Lectures, re-establishing an event in memory of one of our founding fathers which hadn't been held since the 1970s. Gem-A exhibited at IJL and Hong Kong, and provided seminars and a selection of books and equipment at the NAG's Conference for Valuers and Jewellers at Loughborough.

With all these things going on, it might sound if we barely step foot inside our office, but it has also been an extraordinarily busy time there too, with the extensive course, web and database updates. You'll find more about what has been going on in and out of Gem-A the last few months, in this issue.

The future of *The Journal of Gemmology* has been a subject of debate and speculation in recent months, so in this issue we announce our plans. They say you can never please all the people all the time, but we think we have come as close as possible. In 2009 *The Journal* will go online, plus hard copies, plus accessible summaries (further details are given on page 13).

Jack Ogden
Chief Executive officer



Cover Picture

Twinning in natural amethyst viewed between crossed polars. Photo courtesy of Thomas Hainschwang, GemLab Gemmological Laboratory. See Gems at the Shows, pages 8 and 9.

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27 Greville Street,
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t: +44 (0)20 7404 3334
f: +44 (0)20 7404 8843
e: info@gem-a.com
w: www.gem-a.com
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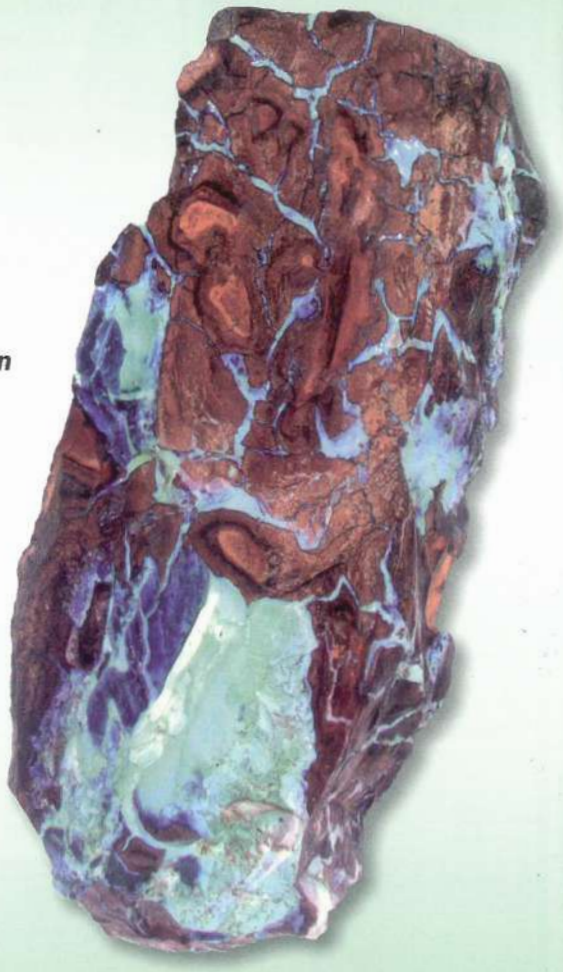
NATURE'S TREASURES:
Minerals and Gems

Flett Lecture Theatre, Natural History Museum, London
Sunday 7 December 2008 10:00 a.m. – 4:00 p.m.

A day of short talks for anyone with an interest in minerals and gemstones, including members of Gem-A. Students from schools and universities are also welcome to attend. Range of exciting talks including:



- **DR ROY GILL, formerly of the University of Edinburgh**
  Minerals and their growth, shapes and colours
- **DR JACK OGDEN, Gem-A**
  Minerals, Gems and The Ancient World
- **DR JEFF HARRIS, University of Glasgow**
  Smashing diamonds
- **PROF. ANDY RANKIN, Kingston University**
  Fluid and solid inclusions in minerals and gems; guide to their origin
- **KATHRYN GOODENOUGH, British Geological Survey**
  Mapping and mineral exploration in Africa
- **KAREN HUDSON-EDWARDS, Birkbeck College**
  'Environmental' minerals: bacteria, fungi, worms, toxins and the human body
- **C. J. STANLEY, Natural History Museum**
  Industrial applications of minerals
- **BOB SYMES, formerly of the Natural History Museum**
  Minerals in the field: where to find them and how to collect responsibly
- **BRIAN JACKSON, National Museums of Scotland**
  Agates
- **ADRIAN FINCH, University of St Andrews**
  Mineral luminescence: the brilliance of imperfections

There will be an exhibition by mineral dealers following the talks.

Cost: £12.00 including refreshments and a sandwich lunch

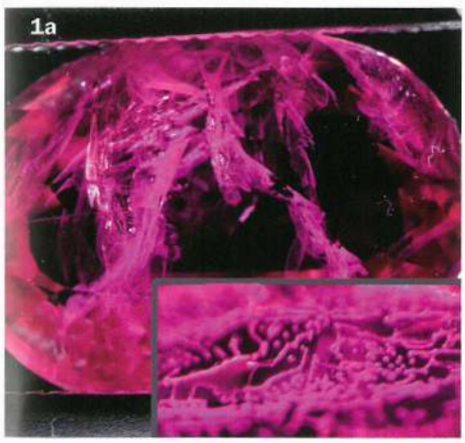
For full details and to register: **www.minersoc.org/pages/meetings/nature/nature.html**
Contact Kevin Murphy for information on 020 8891 6600, email Kevin@minersoc.org

EVENT ORGANIZED JOINTLY BY:

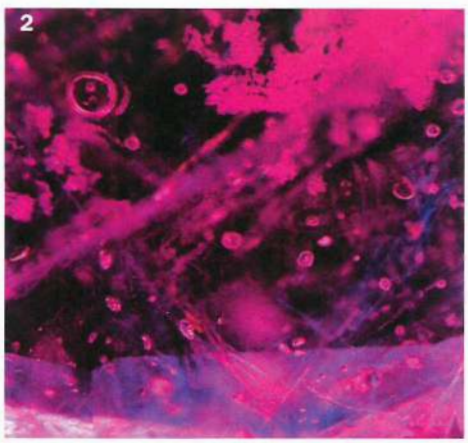
The Mineralogical Society
The Russell Society
Gem-A The Gemmological Association of Great Britain

Lead-glass-treated blue sapphire

Thomas Hainschwang of the Gemlab Laboratory, Liechtenstein, gives identifying features for this latest glass-filled corundum



1. (a) Glassy residues in a flux-SiO_2 heat treated ruby from Mong Hsu, Myanmar. (b) The much rarer case of glassy residues in a flux-SiO_2 heat treated blue sapphire.



2. The features inside the Pb-glass-treated rubies – spherical gas bubbles and a distinct blue interference effect in the filled cracks.

After the first unfortunate marriage of glass (SiO_2) with corundum in the 1980s (the flux/SiO_2 heat treatment), glass appeared yet again in a rather unfortunate manner associated with corundum in 2004: rubies showed up in the market with their fractures filled by highly refractive glass, usually a glass rich in lead with variable composition. This treatment had the fascinating effect of transforming the material into facetable transparent stones which, without the lead glass-treatment, would normally be ground into polishing powder at best.

By far the most common stones to be treated by this method are rubies that are nearly free of solid inclusions but that have an extreme abundance of fractures; the majority of the stones seen so far appear to have originated from Andilamena, Madagascar.

This is one of the rare reports of blue sapphires treated with lead glass; evidently corundum of any colour may be treated by this method, but ruby is the prevalent material due to the fact that much of it is highly fractured and because of its significance as one of the most valued gemstones. The features seen in the blue sapphire were somewhat similar to the ones in lead glass treated ruby, but a note of caution must be given since the tell-tale signs may be far less evident than those usually seen in rubies.

Background information

The introduction of silica glass treatment using a flux and quartz during the heat treatment of corundum (mainly ruby) was the first serious step of the corundum treaters to threaten the market of standard heat-treated gems. The healing of fractures by this process allowed material to be treated that was unlikely to survive a standard heat treatment, and stones after treatment were mechanically more stable and by many factors more attractive. In short – without the addition of flux/SiO_2 these stones could not have been used other than as cabochons. Such treated stones contain glassy residues, sometimes in major quantities (**1**). This treatment by silica glass is frequent in rubies but only rarely seen in blue sapphires (**1b**).

While this treatment shocked the market and strongly influenced the price of heat-treated rubies, the introduction of the latest treatment, the fracture filling with high refractive index glass, did not have a similarly negative effect, but opened new unknown possibilities to those of a criminal nature. The lead-glass-treated material is traded for very low prices (commonly a few dollars per carat) and their attractive appearance makes them the perfect items for scams. The material analyzed in the GEMLAB lab is commonly presented as untreated Mogok or standard heat-treated

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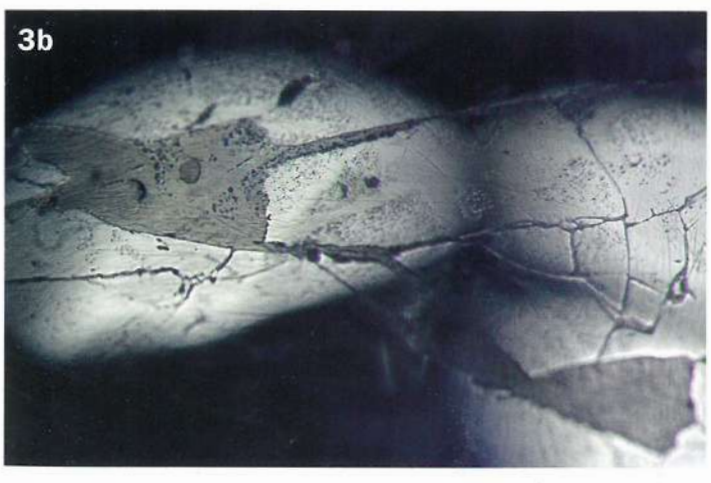
Lead glass treated blue sapphire (Cont.)

material but never declared as lead glass treated. The fact that the treatment does not need very high temperatures (about 900°C, variable with glass composition) results in stones that may appear unheated. The majority of stones treated with such high refractive index glass are rubies; the treatment has only rarely been seen in sapphires. Generally the treatment can be easily identified in rubies by microscopic observation since there is a rather distinct blue interference colour visible in the filled fractures and commonly many spherical gas bubbles are present (**2**).

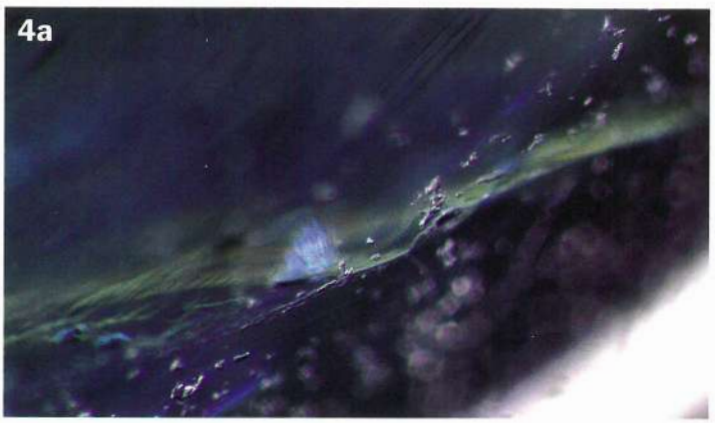
Lead-glass-treated blue sapphires

In a parcel of misrepresented lead-glass-treated rubies there were also a few blue sapphire cabochons that were all treated in the same way as the rubies. The material was heavily fractured but was also full of solid inclusions, and these inclusions prevented the normally dramatic improvement of transparency by this treatment (**3a**). The filled cavities and fractures showed a distinctly lower lustre than the corundum (**3b**). An interference effect was visible in the filled fractures, but in contrast to the lead-glass-treated rubies this flash effect was yellow to green and much more discreet than in most rubies (**4**).

Interestingly no spherical gas bubbles were seen in the treated blue sapphires and only a few flattened gas bubbles were visible; the majority of bubble-like inclusions that were observed in the fractures were remnants of glass, often disc-shaped. The lead glass treatment was confirmed using FTIR and SEM-EDX chemical analysis. The presence of lead glass was found by the author to result in characteristic FTIR absorptions overlaying the FTIR spectrum of corundum. This type of spectrum would never be seen with regular silica-glass-treated corundum.



3. (a) Lead-glass-treated blue sapphire cabochon. (b) Some open fractures and cavities in this sample were completely filled with the glass; the lower lustre and hardness are evident when observing the matt and indented fillings of the fractures and cavities.



4 (a and b). The internal features of the lead-glass-treated blue sapphires: a few flattened gas bubbles and/or glass relicts and faint to weak green to yellow interference colour in the filled cracks.

Concluding remarks

Glass-treated corundum has become abundant in the market. Whether fractures are filled by silica glass and artificially healed by partial re-crystallization or with high refractive index glass, are very important value factors. Today there are on the market some rubies and sapphires that are so heavily filled that they no longer deserve to be declared as 'corundum': what percentage of glass is allowable before calling this material a ruby-glass composite stone? Although often easy to identify, the lead glass treatment is unfortunately the perfect tool for scams; many people are unaware that the lead glass treatment exists and that such material is sold for very low prices. This short study has shown that there is lead-glass-treated material that can be tricky to identify, particularly blue sapphires with few gas bubbles and difficult-to-see interference colours. To distinguish flux/SiO_2 treated samples from the much cheaper lead glass treated material can be a big challenge unless a properly equipped laboratory is on hand.

Photos courtesy of Thomas Hainschwang.

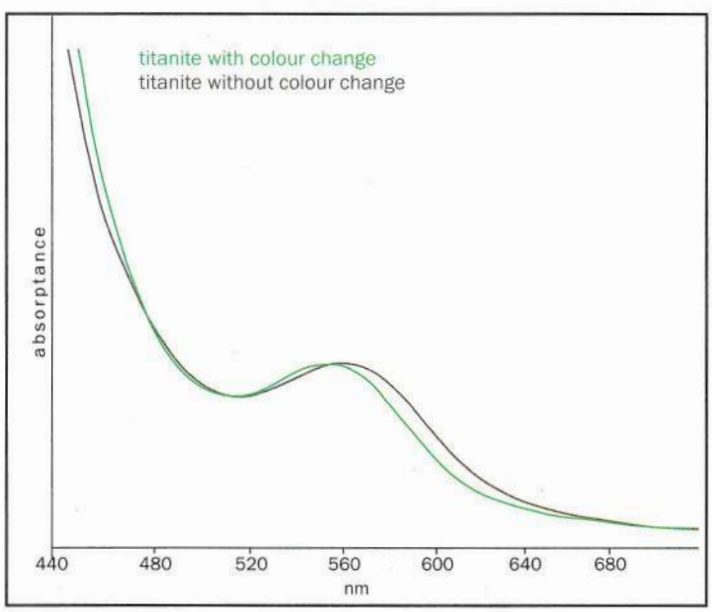
A colour-changing titanite from Afghanistan

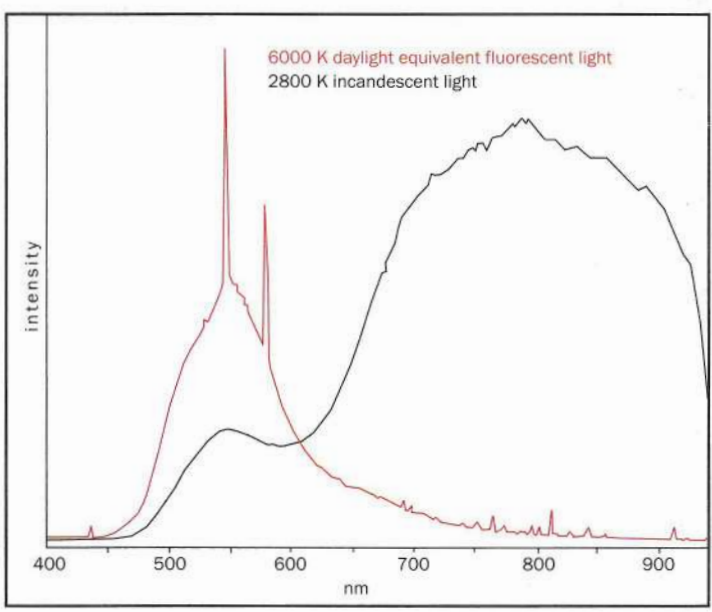
Thomas Hainschwang identifies a stone not commonly associated with colour change

Many gemstones displaying a colour change have been described in the past; there are various causes and types of colour change, the so-called 'alexandrite effect' being the best known. This type of colour change can be observed when the colour change material is observed in natural daylight and incandescent light.

In the best known gems with this property such as alexandrite, some sapphire and some garnet, chromium and/or vanadium are responsible for this phenomenal absorption effect. The vanadium/chromium impurities cause a broad absorption band centred between 565 and 590 nm and two transmission windows in the blue-green and in the orange-red parts of the spectrum. When such a gemstone is illuminated with light rich in blue to green but poor in orange to red wavelengths, the sample will appear mainly green to

1. The titanite under natural daylight (left) and incandescent light (right). Photos by T. Hainschwang





2. *Left:* The visible absorption spectrum of the colour-change titanite compared to a 'regular' yellow green titanite from Madagascar; the spectra were normalized to compare the broad absorption band and the transmission windows. Before normalization the broad band absorption was much more intense for the colour-change titanite.
Right: the spectra of the colour-change titanite under a 6000 K daylight equivalent fluorescent light source and under 2800 K incandescent light; the spectra are uncorrected for CCD sensitivity and the light source and are close to what the eye will observe colour-wise after the light has passed through the gemstone.

blue, and when it is illuminated with light rich in orange to red but poor in blue to green wavelengths, then it will appear mainly red to purple.

A gemstone which is not commonly associated with the colour-change effect was recently submitted to the Gemlab laboratory; the 3.95 ct gem was identified as titanite (sphene, $CaTiSiO_5$) by specular reflectance FTIR spectroscopy. The very attractive stone was brownish yellowish green under daylight and orangey yellow under incandescent light (**1**). According to the owner the stone originated from the Badakhshan province in northeast Afghanistan. He had received only five stones from this source and this one appeared to exhibit the most distinct colour change.

Titanite has high birefringence and extremely strong doubling was observed through the table facet of this stone; it also had high dispersion and the orangey-red flashes seen in **1** are caused by dispersion only.

UV-Vis-NIR absorption spectra were obtained from the stone to find an explanation for the unusual colour behaviour under different light sources, and were compared with the non-colour-changing titanites.

The colour-change spectrum was characterized by a broad band absorption centred near 600 nm; compared to common titanite this band is shifted by about 15 nm towards shorter wavelengths and is more intense (**2**). The difference in the absorption intensity and its shifted position are responsible for the distinct colour change while the reference titanite from Madagascar showed no obvious colour change. The transmission window in the red part of the spectrum is also more developed in the colour-change titanite.

The 'transmission' spectra (the reverse of absorption spectra) of the colour-change titanite clearly showed that it is nearly pure green under light sources poor in orange to red components and rich in blue to green wavelengths and that it showed more orange under incandescent light rich in orange and red wavelengths (**2**, right). The spectrum of the sample under daylight-equivalent lamp consisted of only a broad 'transmission' band centred at about 535 nm in the green while the spectrum of the titanite under incandescent light consisted of a weak 'transmission' band at 535 nm and a more intense transmission from the orange to the deep red.

This unusual titanite is a good example of how sensitive are the factors of absorption band positions and intensities where colour changes are concerned.

Photos courtesy of Thomas Hainschwang.

About the Author

Thomas Hainschwang (thomas.hainschwang@gemlab.net) is a director and research gemmologist at the Gemlab Laboratory for Gemstone Analysis and Reports in Balzers, Liechtenstein.

Gems at the Shows

Among the plethora of gems, jades and pearls on display at the huge Hong Kong Watch and Jewellery Show in September were some less obvious products that proved that new gem materials are interesting, even if they are not natural.

At the show RMC Gems (with offices in Thailand, Hong Kong and Japan) very kindly gave us faceted samples of their 'Mexifire™' (**1**), a synthetic fire opal that first became available in late 2007. As RMC say on their website: "Its dazzling and luminous orangish-red shade is a veritable head turner." They go on to explain that it is a silica gel, similar to natural opal, but with a very small water content – a property that is said to prevent the crazing prevalent with some natural fire opals. Its gemmological properties are similar to natural fire opal.

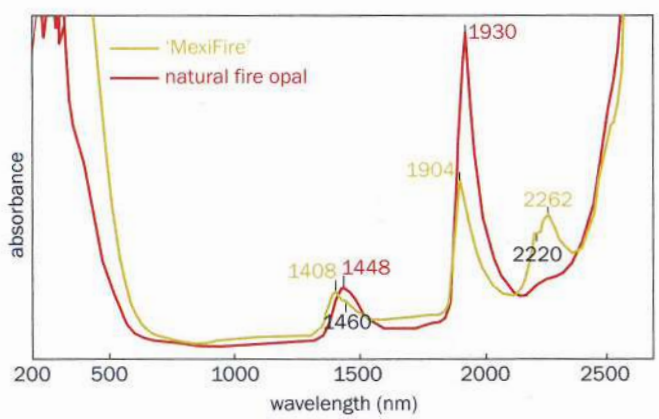
The refractive index of the sample we studied was 1.37. This is lower than the 1.35 obtained on that examined by Taisuke Kobayashi and Dr Ahmadjan Abduriyim at the GAAJ-ZENHOKYO Laboratory and published online by them. Both of these values are lower than for natural Mexican fire opal, which is usually around 1.45, but values as low as 1.37 are cited in the literature.

The internal structures in our samples were also similar to those seen at GAAJ – clouds of minute bubbles and inclusions. Although GAAJ found no significant differences in the spectra between the synthetic and natural opals in UV-visible region, there was some shift of peaks attributed to water content in the near-infrared region and an additional absorption peak at 2262 nm (**2**).

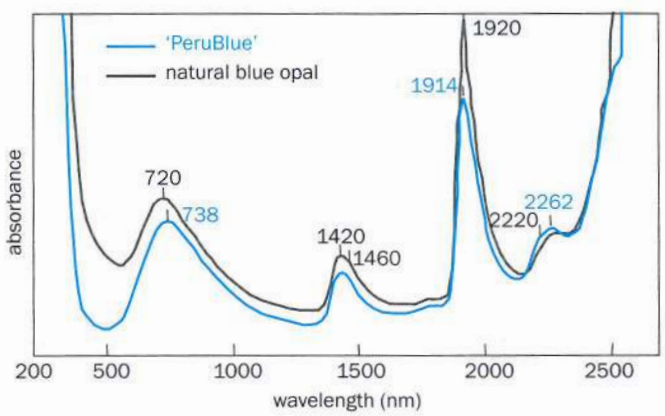
The original patent for this synthetic opal (US 20070275844) is from inventor Rajneesh Bhandari of Jaipur, who RMC refer to as their technology consultant. The manufacturing process, as described in the patent is as follows: absolute ethanol (99.99%), concentrated nitric acid, distilled water and 'an inorganic salt' are mixed in a closed container and then tetraethyl orthosilicate (TEOS) is added. TEOS ($Si(OC_2H_5)_4$) is a chemical with various industrial uses, including protective coatings, which converts easily to silica in the presence of water. In the patented process the nitric acid acts as a catalyst, the inorganic salts provide the colour – namely iron in the case of the orange synthetic fire opal. The solution in the container is stored until the resulting gel can be dried and heat treated to produce the final product.

1. Mexifire™, a synthetic fire opal made by RNC Gems.

RMC also produce a synthetic blue 'Peruvian' opal they call PeruBlu™. We have not examined a sample of this material at Gem-A



2. Absorption spectra in the UV-near infrared region of a MexiFire™ synthetic and a natural fire opal from Mexico. Courtesy of GAAJ-ZENHOKYO Laboratory.



3. Absorption spectra in the UV-near infrared region of a PeruBlu™ synthetic and a natural blue opal from Peru. ourtesy of GAAJ-ZENHOKYO Laboratory.

Shows and Exhibitions

so far, but GAAJ include it in their study. According to the patent, the colouring agent for the blue synthetic opal is copper. The patent also mentions cobalt-coloured pink and red synthetic opals.

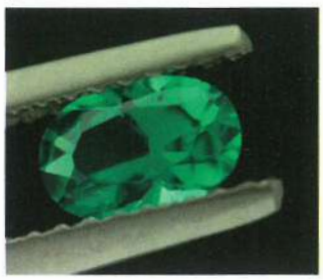
Analyses by the GAAJ detected the iron and the copper colouring agents in the orange and blue synthetic opals respectively, and also noted differences in the trace element content between the natural and synthetic (**3**).

With the current popularity of natural fire opal and the blue Peruvian opals, it is important that buyers are aware that there are synthetic versions of these materials around. It is also worth recording here that we have heard of some blue opals on the market bleeding colour, presumably indicating that they are natural or perhaps porous synthetic opals that have been dyed.

In general, synthetic gemstones seem to be available in ever increasing quantities and in an astonishing array of colours. There are vast quantities of synthetic quartz, in the amethyst, citrine, green and pale blue shades. Synthetic quartz, produced by the hydrothermal process, has been around some time, and should be very familiar to all — for a time it was said that most of the amethysts sold by high street jewellers were actually synthetics masquerading as natural. The usual colours of synthetic quartzes are 'amethyst', of a fine 'Ural' colour, green, 'citrine', pale blue and the parti-coloured 'ametrine'. Synthetic amethysts can usually be detected by a combination of inclusions and the lack of the characteristic interference colours due to polysynthetic twinning when most natural amethyst is viewed between crossed polars (**4**).

There are also some spectacular colour-change materials — for example in CZ and glass. That actually brings us to a another consideration. Gemmologists define a synthetic gem in words to the effect that they are artificial products that have the same chemical composition, physical properties and structure as their naturally occurring counterpart. So what are man-made products that form beautiful gem materials but which have no naturally occurring counterpart — such as some of the extraordinary colours of CZ? They are not imitations, because they are not imitating anything. 'Man-made' has all sorts of sexist connotations, so in its courses Gem-A follows Michael O'Donoghue who titled his splendid book on synthetics and imitations *Artificial Gemstones* and noted: "My use of the adjective 'artificial' embraces all products that have not arisen naturally." However, the term 'laboratory created' also suits and might have less negative connotations than 'artificial' in the market.

4. Twinning in natural amethyst viewed between crossed polars. Photo courtesy of Thomas Hainschwang, GemLab Gemmological Laboratory.



5. The 'nanocrytal' being offered by Rough Synthetic Stones Co. Ltd (RSS).

Another sample received in Hong Kong is the 'nanocrytal' being offered by Rough Synthetic Stones Co. Ltd (RSS). The sample is a small, bright green transparent faceted stone, almost like a demantoid garnet in colour (**5**). The manufacturers describe the material as 'nano-sized' crystals with a spinel structure homogeneously distributed in an amorphous matrix. The trade seems to generally assume that this is really just simply glass, but RSS say that the material has a melting temperature of around 1600°C and can be cast in situ. This would exclude normal glass and points, perhaps, to a silicon matrix, presumably amorphous since the material is singly refractive. RSS's website gives the RI as ranging from 1.5 – 1.7. Our sample had an RI of 1.610. We hope to do more work on this material shortly.

It is worth pointing out that the specialist sellers of synthetics, such as RMC and RSS are generous with information about their products and their production. This tends to become less true further up the supply chain, with some wholesalers being what is now termed 'economical with the truth'. That's a useful expression and dates back to Edmund Burke in 1796 who wrote: "Falsehood and delusion are allowed in no case whatsoever. But, as in the exercise of all the virtues, there is an economy of truth." If only we could remove falsehood and delusion from the gem and jewellery industry.

Jack Ogden

You can learn more about the companies cited and their products, at:
http://www.rmcgems.com/
http://www.rss-synstones.com/
For the GAAJ report on the synthetic fire and 'Peruvian' opal see: http://www.gaaj-zenhokyo.co.jp/researchroom/kanbetu/2008/2008_05en.html

An optimistic end to an anxious beginning

Olga Gonzalez reviews IJL 2008

Leading up to International Jewellery London, exhibitors and the trade worried about the outcome of the show, uncertain if it would prove successful in a more grim global economy.

Without a doubt, the IJL show held its own aesthetically – with a well-planned layout in Earls Court and the introduction of the Design Gallery in the Mezzanine area. The spacious Boulevard and Avenue paved its way through the show with beautiful stands, and exhibitors demonstrated a high degree of presentation and attention to detail. An eclectic mix of seminars and workshops outlined everything from gemmology practical sessions and upcoming trends to sales and the future forecast of the jewellery industry. In his seminar entitled 'Key Trends for 2009,' Matthew Jeatt, UK Director of PromoSTYL, outlined the five concepts of Colour Obsession, Twist & Switch, Heritage, Cosmic Vision and Ecology & Ethics as the key trends forecasted for 2009. Postcards of each trend were made available to all at the IJL Trends Showcase on the Boulevard, ensuring that exhibitors and attendees remained up-to-date on what to look for next year. Martin Rappaport's seminar, 'The State of the Diamond Industry,' encouraged those in the diamond trade to be pro-active about adopting new business strategies that were in line with the globalization of demand and the growth of China and India in the market, while emphasizing the importance of cultivation of a company's niche. Doug Garrod, Senior Lecturer at Gem-A, hosted two seminars: 'Dolled Up Gemstones" and "When Gems are not what they Appear," which looked at gemstone imitations and treatments and helped gemmologists with proper identification of gem materials. Intellectually stimulating and pleasing to the eye, International Jewellery London provided a wealth of information and an excellent ground for networking, despite a slight decrease in numbers in attendance.

Gem-A's involvement in the show revolved around awareness of its centenary celebrations. A laptop was available at stand G400, where the new Gem-A website could be browsed, a five panel timeline highlighting significant events during the last 100 years of gemmological education was available in the Gem-A centenary seating area and a champagne reception for members of the Association set the stage for announcements about exciting initiatives rolling out in coming months. The first three chapters of our newly designed Foundation course notes were also on view, the first in a series of updated courses and course notes.

The positive atmosphere surrounding the show was apparent in the comments made by several exhibitors. Vivian Watson FGA DGA of P.J. Watson said "IJL is going very well. It is better than a lot of people expected, with the top end of the market proving to be very strong." As the UK's premier jewellery show, with representation from over 30 countries, Chris Sellors of C.W. Sellors, winner of the Gem-A Gem Empathy Award in 2007, stated "It is important to exhibit here and have the opportunity to show the year's work as well as see the development of the industry." Indeed, International Jewellery London has been improving every year and is important to support and attend in order to promote the trade within the UK.

Tivon win 2008 Gem Empathy Award

Dr Jack Ogden (left) and Olga Gonzalez of Gem-A presenting the Award to Ariel and Israel Tivon of Tivon Fine Jewellery.

Gem-A was proud to sponsor the 2008 Gem Empathy Award which is presented to the IJL exhibitor displaying, in the opinion of the judges, jewellery that not only makes captivating use of gemstones but also gives accurate ethical descriptions.

The Award was presented this year to Tivon Fine Jewellery, a second generation family-run company with over forty years of experience. From South Africa to the UK, the company has grown internationally and provides an outstanding collection of tanzanite and coloured gemstone jewellery, as well as specializing in diamond and gold jewellery, both with classic and contemporary styles. Judges were impressed by the company's array and use of coloured gems, as well as by their impressive and accurate descriptions of the gemstones in their showcase plaques.

Said Ariel Tivon: "It was truly a big surprise and a big honour to have received this award. It's nice to receive recognition for all the hard work we've put in. We still have a long way to go though! Watch this space!"

For more information regarding Tivon Fine Jewellery, you may visit them on the web at www.tivonjewels.com.

Illustrated are designs featured by Tivon at IJL:
A precision-cut vivid baguette tanzanite with fine diamonds mounted as a pendant in 18ct white gold.
Monte Carlo cocktail ring set with a honey-golden citrine and fine diamonds mounted in 18ct white and yellow gold.

Journal gains a greater presence and accessibility

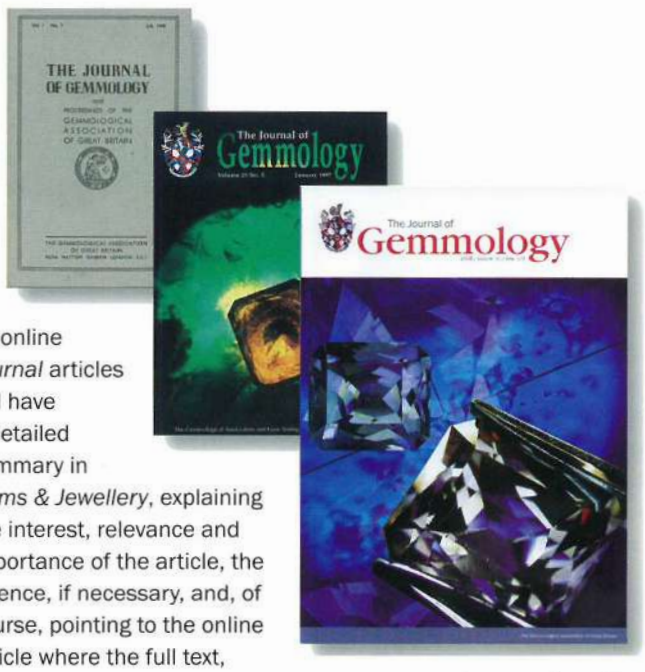
The Journal of Gemmology, a world-renowned academic publication, is the primary publication of Gem-A. However, critics accuse it of being too academic for many Gem-A members and spiralling production costs make its continued publication as part of membership subscriptions problematic. Gem-A is meeting these challenges with an ingenious strategy that will continue to make the _Journal_ articles available, will help all Gem-A members and students to understand the relevance of these articles, and will avoid the need for significant subscription increases.

First some background. In 1931 the Gemmological Association launched the *The Gemmologist* as its official publication. In 1935, following some unspecified disagreements with the *The Gemmologist, Gemmological News* was introduced as the Gemmological Association's official journal. This became *The Journal of Gemmology* in 1945. It is worth remarking that for much of its history, the scope and academic level of articles in *The Journal of Gemmology* were far closer to the current *Gems & Jewellery* than the recent volumes of *The Journal*.

The need today for an academic gemmological journal is not doubted, but it must also be recognized that many of the current articles in *The Journal* require an understanding of advanced gemmological techniques. To stretch gemmologists' knowledge is essential, and there has been considerable effort put into providing insight into these techniques. It is equally essential to make gemmological information accessible and understandable to the widest possible audience. Then there are the financial parts of the equation. If Gem-A were to continue to publish *The Journal* in its present form and as one of the benefits of Gem-A membership, there would have to be a very significant increase in subscription rates.

Gem-A has weighed all the options and is pleased to announce a way forward that should satisfy as many of the interested parties as possible. Here is the plan:

1 As from 2009, *The Journal* will go online. We will be using a state-of-the-art interface for this, providing full search facilities. Access will be via our website and will require membership log-in. The articles will be peer reviewed as now and will be placed online as soon as they are ready.



2 All online *Journal* articles will have a detailed summary in *Gems & Jewellery*, explaining the interest, relevance and importance of the article, the science, if necessary, and, of course, pointing to the online article where the full text, charts, footnotes and so on will published. These summaries will be readable and interesting brief articles, not to be confused with the succinct abstracts that will continue to be provided online.

3 All the *Journal* articles placed online in 2009 will be also published in 'hard copy' as a single issue in similar format to the present *Journal* and sent to all paid-up Gem-A members as part of their 2009 subscription (which will be unchanged from 2008).

4 For 2010 onwards Gem-A membership subscriptions will include only online access, but an annual *Journal*, containing the year's online articles, will be published in hard copy and may be purchased by members.

Sample 'summaries' of 'Thortveitite — a new gemstone' and 'Visualization of the internal structures of cultured pearls by computerized X-ray microtomography' (*The Journal of Gemmology*, 2008, Vol. 31, Nos 1/2, pages 1-6 and 15-21 respectively) appear on the following pages.

Jack Ogden

Journal Files

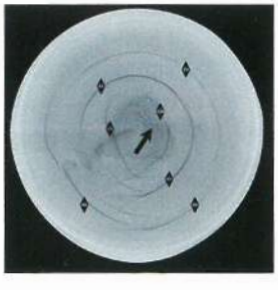
Summaries of recent articles that have appeared in *The Journal of Gemmology*, explaining the interest, relevance and importance of the information given.

Seeing inside pearls*

We can now look inside pearls using a non-destructive technique, a miniaturized version of the equipment used by hospitals for brain and body scans.

The internal structure of pearls has fascinated observers since antiquity, and became a major pre-occupation of gemmologists a century ago when cultured pearls first began to enter the market in significant numbers. Cultured pearls could be distinguished from natural ones by the mother-of-pearl bead 'nucleus' in the former; the presence of which could be identified by eye, in some cases, or by a variety of more advanced techniques, including X-rays.

The development and rapid market penetration of a huge quantity of inexpensive, non-beaded ('non-nucleated') cultured pearls, from China in particular, over the last decade, has meant a reconsideration of pearl identification methods. The lack of a beaded interior means that it can be far trickier to distinguish some of these non-beaded cultured pearls from natural ones. Natural pearls of significant size might well be very rare on the market, but they can command very high prices when they do appear, and correct identification is essential. The variety of colour and other treatments used on pearls today also requires accurate characterization



Two-dimensional X-ray microtomogram of a sectioned freshwater cultured pearl. The darker coloured region of lower density within the pearl is marked with an arrow, whereas the organic layers are denoted with double arrows. Faintly visible concentric rings are artefacts of the tomography. (See page 19 of the article.)

Various advanced methods are now used in pearl identification, including sensitive analysis to detect the minute compositional clues that can point to origin, and Raman spectrography that can help to determine the causes of colour.

There is also the interesting new technique of X-ray microtomography. This may sound complex, but it is simply a miniaturized version of the 'scans' used in hospitals to provide three-dimensional images of brains or other parts of the anatomy. The word 'tomography' comes from the Greek words *tomos* (a section or slice) and *graphia* (written) and really just means recording a cross-section. The three-dimensional computer image is generated from a 'stack' o two-dimensional X-ray 'slices' through the object. Naturally, these are not real slices — the process is non-destructive and the object doesn require any special preparation.

X-ray tomography has found various non-medical uses over the last few decades, for example in archaeology and product quality control, but the availability of miniaturized table-top versions, albeit expensive and developed for such uses as dentistry and electronics, has opened up new possibilities in gemmology.

For the investigation into the potential of X-ray microtomography in pearl characterization, the authors used four samples of cultured pearls: a beadless freshwater cultured pearl from China, another from Japan (Lake Biwa), a bead-nucleus freshwater cultured from Japan (Lake Biwa) and a bead-nucleus saltwater cultured pearl of South Sea origin. The two beadless cultured pearls had been cut in half and the Japanese freshwater cultured pearl was drilled.

The results demonstrated the fine structural details that could be seen in the pearl samples. The structures, bead nuclei where present and other characteristics can be observed in a way hitherto impossible. The structure of the cultured pearls is different to that of natural pearls. It is also possible that slightly different compositional regions in the pearls might be identified. Particularly relevant here is the possibility of using X-ray microtomography to identify areas of vaterite, a polymorph (different crystal form) of aragonite which is the main mineral component of pearls. In recent years vaterite has been identified as occurring in some freshwater cultured pearls, but has not been encountered in natural pearls.

The authors conclude that X-ray microtomography is an efficient, non-destructive and definitive way to chacterize cultured pearls produced by different techniques. Unfortunately, the cost of the equipment means that its routine use in pearl identification or other gemmological investigation is still some way off.

* Summary of 'Visualization of the internal structures of cultured pearls by computerised X-ray microtomography' by U. Wehrmeister, H. Goetz, D.E. Jacob, A. Soldati, W. Xu, H. Duschner and W. Hofmeister. *The Journal of Gemmology*, 2008, **31**(1/2), pp. 15–21. The full article with illustrations, tables, footnotes, details of equipment used and acknowledgements can be found online at www.gem-a.com/publications/journal-of-gemmology/samples.

A new gemstone?*

Discovering a new gemstone is every gemmologist's dream, but it takes time and research to find out if it is really new, and if it is natural. Sometimes questions remain.

The story of the present gem (pictured left) began when it was purchased as a pretty, purple, water-worn pebble in Bangkok. It was amongst a packet of stones described as being of African origin, but as usual in such cases, this origin could not be confirmed. The transparent stone showed pleochroism and was suitable for cutting.

Prior to cutting, a small fragment cleaved off the stone. This conveniently provided a piece for detailed analysis, even though the sampling technique used was somewhat unconventional — the stone was accidentally dropped on a concrete floor.

The cleavage fragment was examined using a variety of advanced techniques, including electron microprobe analysis at the Natural History Museum, London and Raman spectroscopy at the School of Earth Studies, Kingston University, UK (see p.4). The larger piece of rough, once cut and polished, was studied using traditional gemmological techniques.

Results

Analysis quickly showed that the material was thortveitite — a scandium yttrium silicate. This is a mineral, named after the Norwegian Olaus Thortveit, which typically occurs in granite in small, grey to greenish crystals. Thortveitite is a major source of the element scandium, a rare metal that is both light and strong, and used in for various specialist purposes, from hockey sticks to aerospace components. Gem-quality specimens of thortveitite in purple have not previously been reported.

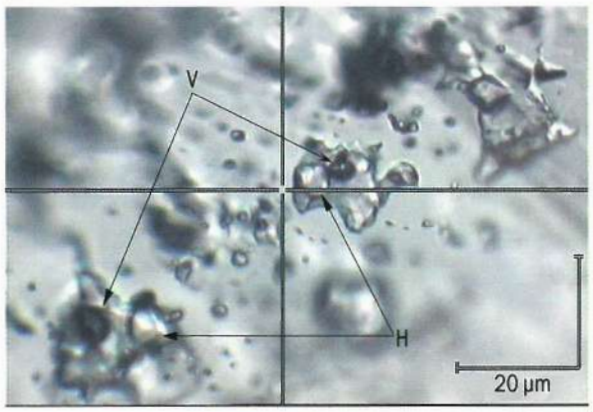
Faceting produced a rectangular stone (12.3 mm x 9.1 mm x 8.95 mm) that weighed 10.01 ct. It is purplish blue in daylight, intense purple in incandescent light, with pronounced pleochroism (violet, blue and straw yellow). There is no discernible luminescence under long- or shortwave ultraviolet.

The other properties were as follows:

Hardness	About 7
Specific Gravity	3.48
Refractive Indices	$\alpha = 1.753$ $\beta = 1.793$ $\gamma = 1.809$
Birefringence	0.056
Optic Sign	Biaxial negative

The questions raised

The sample was fairly pure and had a far higher scandium content than previously recorded specimens of natural thortveitite. This may point to it being of man-made, synthetic origin. Synthetic thortveitite has indeed been produced, although, as far as the authors are aware, so far only in small or impure crystals. If it is synthetic, it can hardly be unique, but to date no further samples have been noted on the market or published. Besides, why would a seemingly unique synthetic crystal reach the market as a water worn pebble in a mixed packet of so-called African gemstones? It seems unlikely that a one-off, attractive new synthetic gem material would be subjected to some deliberate abrasion to imitate a water-worn pebble and then simply sold in a mixed parcel of minor gems.



Group of irregular three-phase fluid inclusions with vapour bubbles (V), halite cubes (H) and an aqueous brine.

In support of the stone being natural, there are 'feathers' of small three-phase inclusions. These indicate a hydrothermal origin and are more indicative of it being natural than synthetic. The authors also note that naturally occurring scandium minerals are now known to be far more widespread than hitherto believed. But there is still the mystery as to why no further examples of this material have come to light since 2004.

As that Roman commentator on natural history and gems, Pliny the Elder, said two thousand years ago: 'There is always something new out of Africa.'

* Summary of 'Thortveitite — a new gemstone' by R. Chapman, I.F. Mercer, A.H. Rankin and J. Spratt (*The Journal of Gemmology*, **31**(1/2), 2008, pp. 1–6). The full article with illustrations, tables, footnotes and acknowledgements, can be found online at www.gem-a.com/publications/journal-of-gemmology/samples.

Gem-A News and Views

News

Gem-A's new website

This year has been extraordinarily busy so far, and it shows little chance of slowing down in the final couple of months of the year.

The main reason is the relaunching of our Gemmology courses to tie in with our centenary. Updating a course is time-consuming work, but things have been complicated by the need to also totally update our website, to allow far greater online support and interaction with students on our courses. Stage One of the website is now up and running.

However, things can't work unless our new website can communicate with our membership and education database – to see who are students and what stages they are at – so that means an entirely new database. The database also has to communicate with the accounts systems to provide full financial reporting and to allow online payments. So that means entirely overhauling our financial systems. A complicated, conjoined project that has gone as rapidly and as smoothly as any new, complex IT installation might be expected to. It has all been a huge team effort and we are not there yet, but the Association owes particular thanks to Lorne Stather, overall Project Director for Gem-A.

The home page on the new Gem-A website.

Gem-A on FaceBook

A far, far, simpler web project was the setting up of a Gem-A FaceBook Group. This is now growing rapidly and all gemmologically-inclined FaceBook users are invited to join. It's a good opportunity to put faces to some of the names we know so well.

Gem-A's Laboratory

The future of the gem testing laboratory, which had become a part of Gem-A in 1990, has been a topic of discussion by the Board for many years. The problem is at heart a simple one. The finance needed to equip and staff a world-class laboratory in this world of ever-changing gem sources, gem treatments and gem synthetics outstrips the likely level of its income. For some time the annual lab deficit could be justified by the lab's role in research and educationa support, but this cannot be stretched to cover the considerable additional funding that is now needed to bring the lab's equipment up to date. After investigating a wide variety of options, it was decide that the laboratory services should be taken over by a third party with the requisite skills and experience, and be run in the existing premises under a licence agreement under the name Gem Testing Laboratory of Great Britain. Funding would then be sought to ensure all equipment was up to the challenges of the twenty-first century. The third party chosen by the Board was Eric Emm's company, Eric being a well known and respected member of the UK gemmological community and a laboratory gemmologist of the highest repute. This alliance was announced at IJL 2008. The focus has now switched to the fundraising and, at the time of writing, this is being actively pursued despite the unstable economic situation. It is taking longer than we had hoped and we apologize to our patient customers. We a very much hope that we will have more news soon.

Gem-A establishes new Allied Teaching Centre in Guangzhou, China

China has long been a major focus for Gem-A's education. The first Gemmological Association Diploma Course was taught in Hong Kong by Marcia Lanyon in 1972 and in 1989 Gem-A Gemmology Diploma courses were initiated on the Chinese mainland by Professo Zhonghui Chen and Professor Weixuan Yan of the China University of Geosciences (Wuhan).

Gem-A courses are now taught in Hong Kong, Beijing, Shanghai, Wuhan, Guilin, Guangzhou, Taiwan, and Singapore. The course notes and exams are provided in both Simplified and Traditional Chinese.


In the seminar room, CIQ, Guangzhou. Left to right: Dominic Mok, Alex Zhili Qiu, Jack Ogden and Weizhang Liang.

Gem-A News and Views

In September, Jack Ogden was in Guangzhou to open a new teaching centre and to take part in the International Gemmological Symposium held to celebrate the event. The teaching centre is being run within the Jewellery Inspection Laboratory of the China Entry-Exit Inspection and Quarantine Bureau (CIQ), Guangzhou. Presiding at the events was Director Wenming Tan. The courses will be run by Weizhang Liang FGA along with Dominic Mok FGA of AGIL, Hong Kong, who facilitated the establishment of the new training centre. Gem-A courses are also taught in Guangzhou at the Department of Earth Sciences, Zhongshan University by Alex Zhili Qiu FGA.

Guangzhou is a major and rapidly expanding centre for the Chinese diamond, gem and jewellery industry. There are more than 3000 jewellery companies in the province and in 2007 these exported in excess of US$4 billion worth of jewellery.

Gem-A 2008 Hong Kong Graduation and Awards Dinner

'Hands Across the World' — Gem-A Educators from Europe, the Far East and Pacific Area celebrate the One Hundred Years Gemmological Education in Hong Kong. Photo by Patrick Kong.

The 2008 Gem-A Hong Kong Graduation and Awards event celebrated One Hundred Years of Gemmological Education with a special dinner that was a truly international gathering of gemmologists and Gem-A students. The evening was organized in conjunction with Gem-A's teaching centres in Hong Kong, the Asian Gemmological Institute and Laboratory Limited (AGIL) and the Hong Kong Institute of Gemmology (HKIG) and held in the opulent surroundings of the Royal Palace Restaurant, Tsimshatsui, Kowloon, on Tuesday 16 September.

Gem-A graduates attended from Hong Kong, Taiwan, Mainland China and elsewhere in the Far East and Pacific area. Other guests came from even further afield, from many parts of Asia plus Australia, New Zealand, India, Switzerland, USA and the UK, and included those in the jewellery industry, gem lab professionals, Gem-A ATC professors, tutors and graduates. Dr Jack Ogden welcomed attendees and introduced Charles Chan, President of the Hong Kong Jewellery and Jade Manufacturers' Association, the evening's guest of honour, and other guests, including King Lee (Chairman, Hong Kong Jewellery and Jade Manufacturers' Association), Louis Lo (Chairman, Gemmological Association of Hong Kong), Dr Michael Krzemnicki, the Deputy Director of SSEF, the Swiss Gemmological Institute) and Andrew Cody, President of the International Colored Stone Association (ICA).

Gem-A is indebted to the many sponsors, donors and volunteers that made the evening possible, and to Prof. Mimi C. M. Ou Yang (President, The Hong Kong Institute of Gemmology) and Dominic Mok (Principal, The Asian Gemmological Institute and Laboratory Limited) who, as co-organizers, worked tirelessly to create a truly memorable occasion.

Hong Kong Seminar

The Hong Kong Graduation and Awards Dinner was timed to coincide with the 2008 Hong Kong Jewellery and Watch Show during which Gem-A presented a double-bill seminar — Dr Jack Ogden and Dr Michael Krzemnicki (SSEF) talking about '5000 Years of Gemmology' and 'Where do we go? Trends and challenges in gemmology now and in the future' respectively. Dr Krzemnicki's presentation formed the 2008 Gem-A Herbert Smith Lecture, a lecture honouring one of the great founders of Gem-A education and a re-establishment of annual lecture event that had not be held since the 1970s.

Gem-A News and Views

Questions and comments raised by previous issues of Gems & Jewellery and som of the traffic on MailTalk, Gem-A email-based gem forum.

Track back

Karl Schmetzer commented on the article 'A coat of many colours' (*Gems & Jewellery,* Vol. 17, No. 1, pages 9-11) about coated gemstones and the fact that this referred to the diffusion of atoms from a coated surface layer into the gemstone. He rightly points out: "A diffusion layer is formed by a solid state reaction between the coating and the core material (topaz), but it was never proven that some ions, especially colour causing ions, are diffusing into the colourless core of the topaz and produce a coloration by this mechanism." Since the *Gems & Jewellery* article, Karl's 'Surface treatment of gemstones, especially topaz – an update of recent patent literature' has appeared in *The Journal of Gemmology* (2008, Vol. 31, Nos 1/2) and readers are directed there for a fuller treatment (no pun intended) of this subject.

Surface-coated topaz weighing 1.08 ct. See 'Surface treatment of gemstones, especially topaz – an update of recent patent literature' by Karl Schmetzer (*The Journal of Gemmology,* 2008, Vol. 31, Nos 1/2, pages 7-13). Photo by L. Kiefert, AGTA Gemological Testing Center, New York.

We've received several remarks about the article 'Gems of the Highest Water' in *Gems & Jewellery* for April 2008 (Vol. 17, No. 1, page 28) about the ship on Lake Titicaca that was laboriously transported there in the 1820s by the London jewellers Rundell and Bridge to help them access the gold mines of Tipuani and the 'emerald mines of Illimani'. The predominant question is, where were these emeralds from and what is known about them?

Illimani is a high mountain overlooking Lake Titicaca in what is now western Bolivia. Various minerals have been mined around the majestic Mt Illimani including tourmaline, but we have found no reference to emeralds there. So, to date, the 'emerald mines of Illimani' remain a mystery.

On the other hand, we can throw some light on the emerald mines in 'Peru'that are noted by many observers from the later sixteenth century onwards – one of the earliest being Tavernier who suggested that some Peruvian emeralds were reaching Asia by trade long before the Spanish reached South America. Various nineteenth-century books still talk about 'The beautiful emerald of Peru' and how emeralds are found in South America 'principally in Peru'. We migh look in vain for fine emeralds from Peru today, but the explanation is simple; 'Peru' used to mean the Viceroyalty of Peru, a region that included most of Spanish-ruled South America, including Ecuador which had both emerald mines and a huge quantity of emeralds possessed by the indigenous inhabitants before these were seized the Europeans.

MailTalk – Black Track

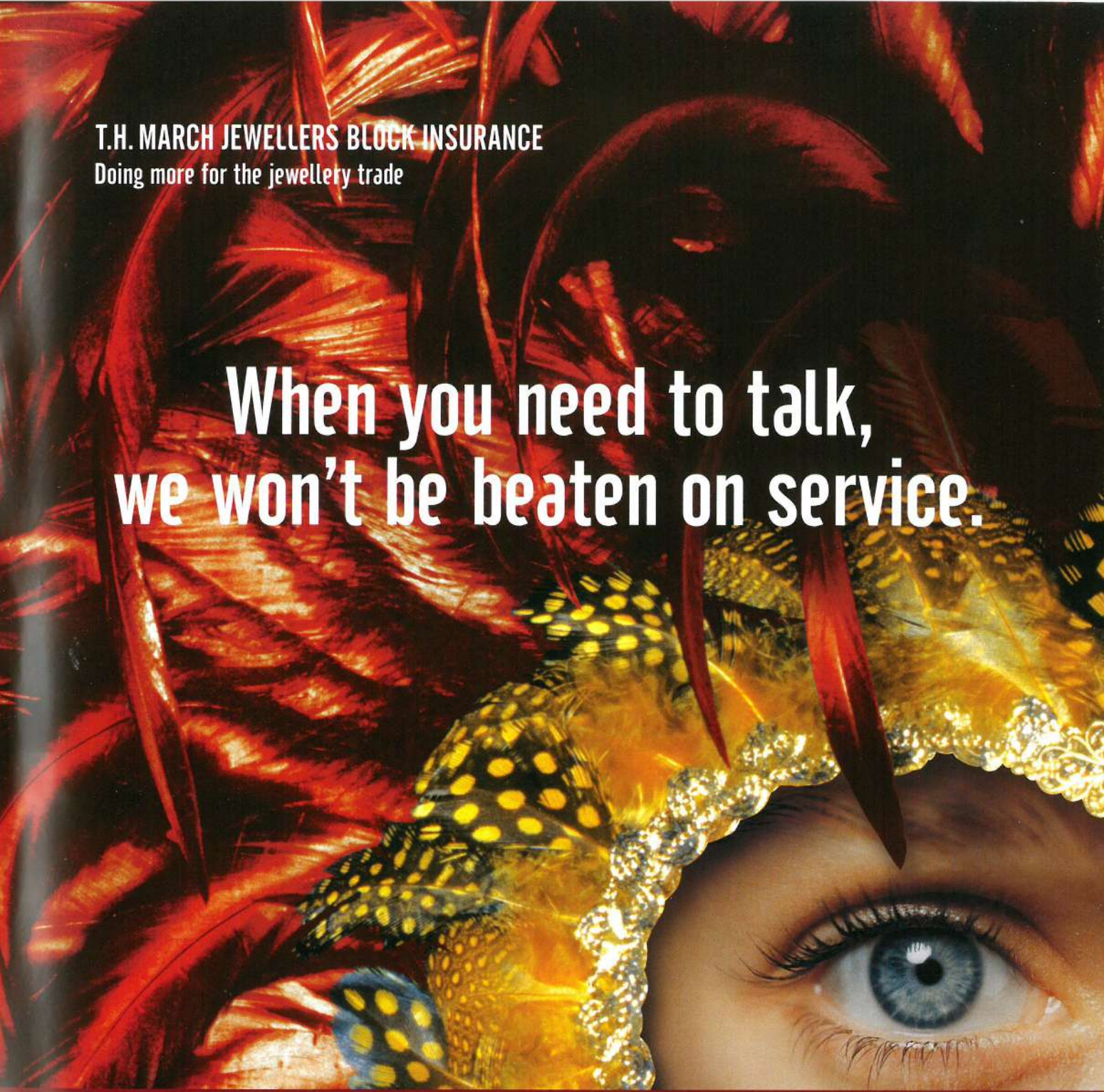
In September MailTalk subscribers' attention was drawn to Vog magazine's 'Don't Miss List' which listed the top trends and people 'Black gemstones' were at number three on the list. We asked MailTalk subscribers to nominate their favourite black gems.

Harold Killingback recommended the 'much under-rated' black star diopside. Antoinette Matlins provided a list of several contenders, including black jade, black sapphire, black diamond, black pearl black onyx and black coral, but pointed out that durabil was a factor, as was treatment. As she said: "Most 'black' diamond used in jewellery – especially the pavé designs – are treated." It is useful to add that synthetic black moissanite is being used to imita black diamonds. Kerry Gregory proposed black spinel: "... a cheape alternative to the black diamond beads that seem so popular at th moment."

MailTalk – What's in a name?

An unusual MailTalk message was from Christine York who had been asked to make a presentation about gemmology and jeweller appraisals at a multi-school Super Sci-Tech Fair. She wanted help with a catchy title. Suggestions came in thick and fast, from the simple 'Gem of a Job' or 'Shine' (from Helen Molesworth and Alain van Acker respectively) to the fuller 'Sparkling Science Mysteries from the Beginning of Time?' (Brad Amos); 'Working in a World of Myth, Magic and Mystery' (Antoinette Matlins) and 'Gemmology: Subterranean Flowers Brought to the Market of the Sun' (Scott Gordon). Bear Williams, tongue firmly in cheek, suggested 'Forensi Micro-Geology through Didactic Interrogation' because, he said, thi might "discourage a fair number of the simple minded green horns that wish to become gemmologists".

MailTalk is Gem-A's email based forum open to all Gem-A members. Simply email arianna.maccaferri@gem-a.com and ask to become a subscriber.



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Organics in fashion jewellery

Maggie Campbell Pedersen looks at the use of organic gem materials in popular, everyday jewellery.

Over the centuries the customs surrounding the wearing of jewellery have changed in the Western world. Originally it was regarded as something to be worn only by nobility. By contrast, today it can be worn by everyone.

Social status no longer dictates otherwise, partly because the vast amount of fashion jewellery on the market is inexpensive. Nor is it any longer regarded as being only for 'dressy' occasions, but is worn by women of all ages, at any time and anywhere. It is a fashion accessory rather than something to be cherished forever, and, changing with the fashions, its style matches the latest trends. This type of jewellery is there to be worn and enjoyed until the owner tires of it – not to be treated as an investment.

The wearing of fashion jewellery is not new, but whereas it used to be made mostly from glass or plastic, today a lot of fashion jewellery is made of, or incorporates, organic gem materials. Sometimes used on their own, but often mixed in with other materials such as glass and plastic beads, we find Chinese freshwater cultured pearls, shell, bamboo coral, little pieces of amber, vegetable ivory, horn, bone, coconut shell and wood, feathers, dried banana skin and

Above: Dyed vegetable ivory necklace. Photo by kind permission of Artisan Life. *Left:* Necklace of dyed bamboo, coral, shell, horn, acorns, bone and jet. Photo © Maggie Campbell Pedersen.

Two shell bracelets: *(left)* dyed and polished chips of Trochus shell left over from the button industry, and *(right)* dyed slices of bivalve shells. Photo © Maggie Campbell Pedersen.

more. Organics are plentiful in today's fashion jewellery. Prices vary from the lowest 'cheap and cheerful', to those appropriate for hand-crafted items. And the wearer can enjoy knowing that organic gems are 'real' — not man-made synthetics

The organic gem most commonly used in fashion jewellery is probably shell. Tiny shells can be strung on a thread, larger ones cut and polished, and many of them are dyed. Even left-over pieces of shell from the button industry can be chopped up and tumble polished before being strung together to make unusual necklaces or bracelets.

Another increasingly popular material is bamboo coral. It is usually dyed red or orange, though nowadays it can be found in any colour.

Pearls have always been popular. In times past imitation pearls made from coated plastic or glass were used in inexpensive jewellery, but with the advent of low-priced Chinese freshwater cultured pearls, 'real pearls' are no longer regarded as such a luxury. As with the coral, they are often dyed, so the wearer can choose the colour that best matches her clothes.

Adding to their popularity today, some organics have 'green' or eco-friendly credentials. An example of this is vegetable ivory, which is a palm nut, usually the tagua (other names for it are corozo nut, or ivory palm nut). As a substitute for ivory it may help to protect the elephant, while also helping to prevent the destruction of the rainforest in parts of South America. Jewellery made from vegetable ivory must be hand-crafted, so its production brings employment to under-developed areas.

In our modern world fashion jewellery has some distinct advantages over precious gems and metals. For example, it does not need to be insured, which is nowadays a costly and complicated process. Nor does it have to be kept in a bank vault. Further, the wearer is unlikely to be mugged for a banana-skin necklace, no matter how pretty it is.

Diamonds and precious gems will never go out of fashion. They will always be admired and treasured, and may increase in value with the years. But for easy wearing and everyday use, these fashionable organic items with their vivid colours and aura of fun should not be underestimated. Diamonds may be forever, but fashion jewellery is for here and now.

Articles describing all the organic gem materials, including vegetable ivory, appear in *Organic Gems*, the online organics archive and information centre, at www.maggiecp.com

Jewellery

Blue John and Whitby jet, riches of Britain

Making the most out of natural resources has become a staple in life these days. In response to our current economic crisis, people everywhere are promoting the 'green' life, recycling responsibly, using more public transport, are proudly looking at what their own regions offer and are using natural supplies. The gemmological equivalent of this trend would be the supporting of the local trade and the use of native materials in jewellery and in the decorative arts.

Britain is fortunate to be the home to a wealth of materials, as well as some local specialities, such as Blue John and Whitby jet. The jet, from the coastal town of Whitby, is soft fossilized wood from the tree species Araucaria. Popular in mourning jewellery in the Victorian era, the current trend for all things black has made the material ideal for use in contemporary jewellery. During a visit to their headquarters in Derby, James Sellors and John Ball from CW Sellors took Claire Mitchell, Diamond Tutor at Gem-A, and me on an educational tour of the Peak District, showing us how their contemporary jewellery reflects the local population and sharing their passion for Whitby jet and Blue John.

Treak Cliff Hill in Castleton is the only known commercial locality of Blue John. Although it is a banded variety of fluorspar, which is relatively common, the blue to purple, yellow and white banded variety known as Blue John is a very rare occurrence. With active Blue John mining occurring from 1765 at the Treak Cliff Cavern, Claire and I were very keen to see the beautiful deposits on our excursion. Deposits in the cavern lie in ancient carboniferous limestones in conjunction with marine fossils, dating some 330 million years for the limestone and 240 million years for the Blue John. Its brittle nature requires that all Blue John be thoroughly dried and impregnated with a resin to help bind it before any fashioning takes place.

Unique 18ct white gold necklace set with Blue John and amber by CW Sellors. Photo © CW Sellors.

CW Sellors (www.cwsellors.com), which celebrates its 30th year in 2009, is committed to local materials and building the local market. Their search for Derbyshire girls to model their jewellery is just one reflection of this. In times of economic uncertainty, it is refreshing to see an active and creative use of British gem materials, such as Derbyshire Blue John and Whitby jet.

Olga Gonzalez

Blue John in situ in Treak Cliff Cavern. Photo by Olga Gonzalez.

Sorting the Blue John in the CW Sellors' workshop. Photo © CW Sellors.

Centenary

Syllabus

In the last issue of *Gem & Jewellery* we gave the questions set for our first ever Gemmology Diploma exam in 1913. As noted then, despite the great success of the course and the exam, it had not been a simple matter to agree the syllabus.

From the jeweller's perspective, for centuries if not millennia 'gemmology' had largely been a matter of experience and a few simple tests. Ruby, for example, could be distinguished from its imitations or other gems that might be mistaken for it by little more than by hardness, good colour 'memory' and the presence or absence of double refraction and dichroism. There might be a problem separating pale ruby from pink topaz but as the gemmologist Max Bauer noted: "Since there is little difference between them in value it is not important from a pecuniary point of view to be able to distinguish the one from the other."

By the beginning of the twentieth century things were changing. In particular synthetic rubies were now available, a disconcerting fact for the jeweller. In addition the Victorian Period had seen a huge increase in a prosperous middle class willing and able to buy jewellery, and new gem materials entering the market in the wake of expanding global trade. Also, there had been great advances in the production of scientific equipment meaning that the average jeweller now had access to new gemmological tools – but needed the knowledge and training to use them. One example is the little gem refractometer introduced by Herbert Smith in 1905.

Herbert Smith was a curator of mineralogy at the Natural History Museum in London. It was to him the jewellery trade turned when they wanted help to establish the syllabus for the new gemmology course and exams.

The Gemmological Committee had procured the services of B.J. Tully (inventor of the Tully refractometer) as instructor, and in March 1911 Samuel Barnett, secretary of the Committee and the man who had first proposed a gemmology course and exam, wrote to Herbert Smith asking him if he would be the examiner for the theoretical part of the examination. Lewis Abbot, a member of the Geological Society and possibly one of the perpetrators of the Piltdown Skull forgery scandal would be examiner for the practical part. A proposed syllabus was enclosed.

The theoretical part of the proposed Syllabus was as follows:

Crystallography
Origin, modes of occurrence and formation, characteristic crystal forms of Precious Stones in their rough state.

Mineralogy
Definition, classification, construction and composition & constitution of Precious Stones.

Light
Definition, simple laws, composition of spectrum.

Properties of Precious Stones
Optical: Surface (form and lustre), substance (light and colour).
Physical: Reflection, refraction, dispersion, polarization, pleochroism, hardness and Specific Gravity.

Fashioning of Precious Stones
Cleaving, slitting, bruting, various styles of cutting, polishing.

Description of all gem stones & Pearls, coral, amber & jet and localities from which they are derived

Scientifically constructed stones, doublets, triplets and pastes

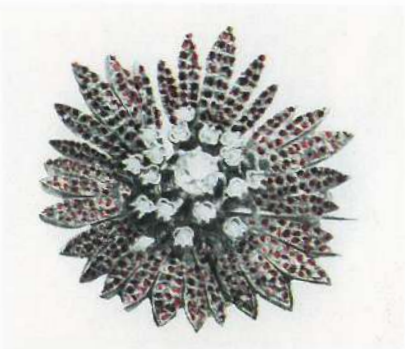
Principle of the Refractometer and Dichroscope.

Samuel Barnett. Reprinted from *The Jeweler, Watchmaker, Silversmith and Optician*, 1911.

Herbert Smith replied, agreeing to being examiner, but noting that the syllabus would require a few modifications and that he would write again shortly.

There was a delay; Herbert Smith was confined to bed for a week due to "an untimely bicycle accident", but he replied with his version of the syllabus on 9 May 1911. As might be expected, Herbert Smith's syllabus went into more depth. His Theory section was as follows:

1. *Morphology.* Distinction between a crystal and glass. Crystal form The seven systems, forms of crystals typical of each. Twinned crystals. Cryptocrystalline and amorphous masses.
2. *Optics.* The undulatory theory of light and the relation between colour and wave length. Reflection and Refraction; Total-reflection. Refractive Indices; Colour Dispersion. Double



Brooch set with uncut synthetic ruby crystals produced in the laboratory of the Natural History Museum, Paris, published by E. Fremy in 1891.

Refraction; uniaxial and biaxial crystals. The construction and use of the Refractometer; the influence of double refraction on the phenomena.

Lustre, Opalescence and sheen. Absorption effects, colour, Dichroism, Absorption spectra. The construction and use of the Dichroscope and Spectroscope.

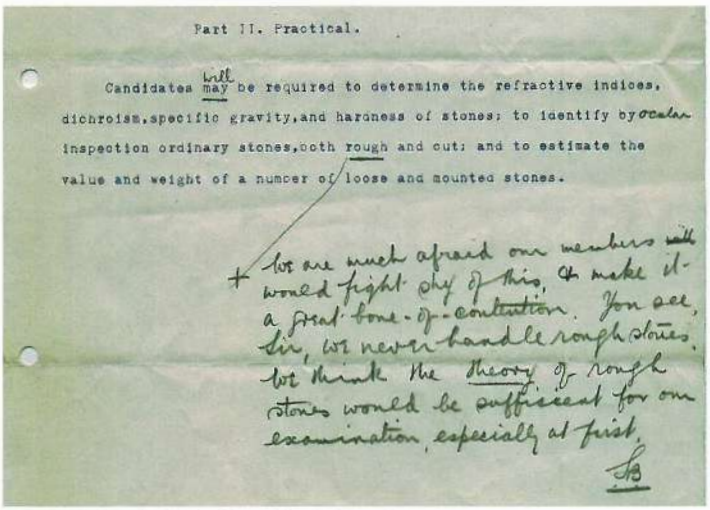
3. *Specific Gravity and its determination.* Methods of Heavy Liquids and of Hydrostatic Weighing.
4. Hardness and Cleavability. Mohs' Scale of Hardness.
5. Chemical Composition. Isomorphism and its effects on the physical properties. Fusibility.
6. Fashioning of Gem-Stones. Cleaving, slitting, bruting, polishing. The various styles of cutting. The machinery and appliances used.
7. Imitation stones: doublets, triplets and pastes..
8. Reconstructed Stones. Synthetical stones, Verneuil's inverted blow-pipe.
9. The morphological and physical characters, chemical composition, mode of occurrence and principal locations of Gem-Stones and the organic products, Pearl, Coral, Amber and Jet. The approximate market values of various qualities.

Herbert Smith also added rough stones to his proposed practical section.

Barnett reacted with some anxiety. On his copy of the syllabus he underlined all references to absorption and the spectroscope, to cryptocrystalline and amorphous material, and, in the practical section, the word 'rough'. Against this last he added the pencilled margin note: "We are much afraid our members would fight shy of this and make it a great bone-of-contention. You see, Sir, we never handle rough stones." In his letter to Herbert Smith he complimented him on the most comprehensive nature of the syllabus, but added: "I fear that it would have a very frightened, and possibly deterrent, effect on the members of our trade. As a member of the trade, I am ashamed to have to admit that our members as a whole are in a woefully crude state to accept any training on the science of gemmology." Not surprisingly Herbert Smith was not sympathetic in his reply: "If the scheme is worth considering at all, the standard aimed at should be adequate. A pretence to knowledge without any foundation is worse than useless. I framed the syllabus with full realisation of the requirements of the trade, and I could not assent to any material alteration."

A couple of weeks later – 9 June 1911 – the reply was sent by Samuel Barnett. The Committee was adamant – "If our members come to the conclusion that the syllabus is too advanced and beyond them, both the tuition and the examination will prove a fiasco...". He stressed this again in another letter three days later – too much technical gemmological information would be rejected by the trade and "The ignorance in the trade of this subject is abnormal...". Samuel Barnett also asked: "With regard to the spectroscope, is it really necessary for us?"

Back came a revised syllabus from Herbert Smith. Rough could go from the practical section. With regard to the spectroscope he notes: "I have left the spectroscope in because it is a very interesting point, even though the practical application is limited, and I think it


Part II. Practical.

Candidates ~~will~~ may be required to determine the refractive indices, dichroism, specific gravity, and hardness of stones; to identify by ocular inspection ordinary stones, both rough and cut; and to estimate the value and weight of a number of loose and mounted stones.

+ We are much afraid our members would fight shy of this, & make it a great bone-of-contention. You see, Sir, we never handle rough stones. We think the theory of rough stones would be sufficient for our examination, especially at first.

A draft of the original syllabus for the Practical section, with hand-written notes by Samuel Barnett.

worth a passing remark in a lecture. It is, however, a matter of no importance and may be omitted if your committee strongly wishes it."

This apparent softening of Herbert Smith's stance, particularly in view of his earlier statement that he "could not assent to any material alteration" might be related to a matter referred to in the final paragraph of his letter. Gemmology textbooks were a problem. Those available then were Arthur Church's ('rather short and elementary'), Wilbert Goodchild's ('not free from mistakes') and Max Bauer's ('too costly') – each with the title *Precious Stones*, but as luck would have it, Herbert Smith's own book *Gem-Stones* was by then in press. Barnett suggested that this book might form the textbook for the course. In a letter dated 30 June 1911 Barnett also suggested an addition to the syllabus – 'Cultured Pearls'. This is an early UK trade reference to the Japanese cultured pearls then just beginning to enter the European Market.

The late progress of the printing of Herbert Smith's *Gem-Stones* was a contributing factor in the decision to postpone the first Diploma Exam, but it was finally published on the 21 March 1912 and was formally adopted as the course textbook in June that year – and heavily promoted along with the course and exam at the National Association of Goldsmiths' Conference in Scarborough on 2 July 1912.

In the formal report of the conference, printed as a supplement to *Jeweller and Metalworker*, reference is made to the Committee's acceptance of Herbert Smith's book as the textbook. The Conference and the report provide the perfect opportunity to explain the 'fairly high' level of the course. There is no mention of the existing 'woefully crude' levels of knowledge in the trade noted in the private correspondence, of course, but the Committee did say 'It must be borne in mind that the Diploma will denote efficiency in the subject, and no one would have the right to hold such a certificate unless he had a good amount of knowledge, just the same as the optic diplomas are a guarantee that the holder is efficient in the subject of optics and sight-testing.'

Jack Ogden

Salesroom News

Champagne and lustre anyone?

A report by **Olga Gonzalez** on the Christie's Jewellery Reception: an Evening of Pearls

Always delighted to see exquisite pearls and jewellery, I was thrilled when the opportunity arose to take part in a pearl-themed event at Christie's, aimed at promoting an awareness of natural pearls and the art market and promoting pearl education.

On Monday evening 29 September, Christie's King Street graciously hosted a champagne reception and pearl evening for the benefit of Gem-A's educational initiatives. Three talks were given: the first, 'The Romance and History of Pearls', was given by Dr Jack Ogden of Gem-A and was followed by a talk entitled 'Pearls: A Perspective on Size and Value' by David Warren of Christie's before the final lecture by Kenneth Scarratt of GIA Research (Thailand) entitled 'Pearl Fishing in Scotland'. Providing a brilliant background of the history of pearls up to today's sensational sales in the auction houses, all the speakers provided insight for attendees.

People adding lustre to the event (from the left): Kenneth Scarrat, David Warren, Elisabeth Strack, Eric Emms, Dr Jack Ogden and Stephen Kennedy, with some of the famous pearls on display during the evening. Photo © Christie's King Street.

The talks were followed by a champagne reception and private view of the upcoming Jewels and Watches Dubai Sale to be held on 29 October, as well as highlights from Christie's Geneva jewellery sale and a collection of some of the most famous ancient pearls in the world, including the Hope Pearl, the Pearl of Asia, the Pearl of Kuwait and the Centaur Pearl. There was also a large pearl from a private collection that may be either that illustrated by Tavernier in the seventeenth century ('Tavernier I') or the famous but lost Gogibus Pearl, or possibly both. The Dubai Multi Commodities Center (DMCC) kindly sponsored the champagne and the oyster bar, an appropriate and delicious companion to the evening's theme.

Helen Molesworth of Christie's Geneva and David Warren discussing the large pearl unveiled during the event. *Photo © Christie's King Street.*

David Warren, Head of the Jewellery Department at Christie's Dubai, said: "The evening was quite a unique event. Not only was it a celebration of the centenary of gemmological education, but it was also a rare gathering of many of the world's top experts on pearls, along with the exciting unveiling of what may well be the world's largest natural, non-blister, saltwater pearl, not documented since the eighteenth century. Throw in a mix of good champagne and oysters and you have the ingredients of a legendary party."

Proceeds from the evening went to benefit the development of international Gem-A courses with an emphasis on pearls.

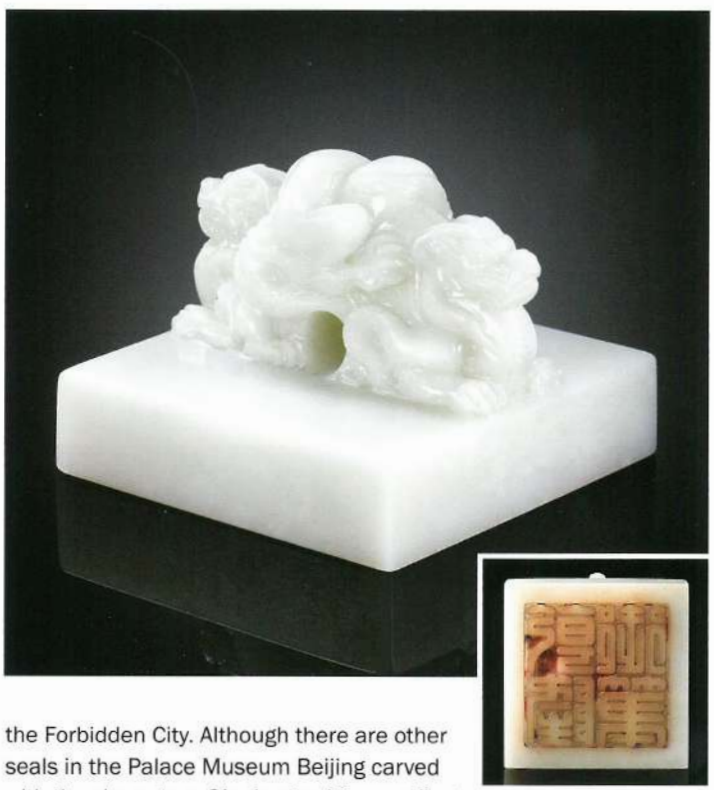
Christie's is strongly committed to the Middle Eastern jewellery market, and is the first auction house to establish a permanent presence in the Middle East. Details of their sale can be found on their website at www.christies.com.

Legacies of Imperial Power

Two jade Qianlong Imperial Seals were included in Sotheby's Hong Kong Chinese Ceramics and Works of Art sale held on 8 October.

The seals were from the estate of Émile Guimet (1836-1918), the great humanist, philanthropist and visionary French collector. Guimet has left a significant mark in the world of Asian art with the establishment in 1889 of the Guimet Museum in Paris, which remains one of the world's greatest Asian art museums. Guimet also collected works of art privately and the collection of Qianlong Imperial Seals has been passed down among his descendants.

Imperial seals crystallize the authority of an Emperor and legitimize his word. The masterpiece in the collection was a seal carved out of a large, flawless piece of white jade with two intertwined dragons measuring 12.5 cm square. Stylistically, this seal relates closely to two solid gold seals in the Palace Museum Beijing that bear the mark of the Kangxi Emperor. His grandson, the Qianlong Emperor, for whom Kangxi had always been the mentor and role model, must have greatly admired it and had the seal face ground down and recarved during his reign sometime in the mid-eighteenth century. The four characters on the face read *Qianlong yubi* (in the Imperial hand of Qianlong) and were impressed on monumental calligraphies of the Emperor to be hung in the palace halls of the Forbidden City. Although there are other seals in the Palace Museum Beijing carved with the characters *Qianlong yubi,* according to the imperial archives the present seal is the largest one of its type. The seal sold for US$8.1 million, setting a world record for white jade.



Another noteworthy seal was the Imperial Khotan, a green jade 'dragon' seal measuring 12.7 cm square, which sold for over US$2 million. It had been carved out of a massive piece of Khotan green jade with the characters *Tian'en Baxun Zhibao* (Treasure of the Emperor at Eighty Thanks to Heaven's Blessing), and was produced to celebrate the Emperor's eightieth birthday. Qianlong himself commented: "I have been particularly blessed by Heaven, which is why I had the *Tian'En Baxun Zhibao* seal carved to express my gratitude to Heaven." On 5 December 1789, the Emperor sent an order for a large Khotan green jade seal to be sent to Suzhou to be carved with this inscription, and this very seal was delivered back to the Emperor in the Forbidden City on 28 January 1790.

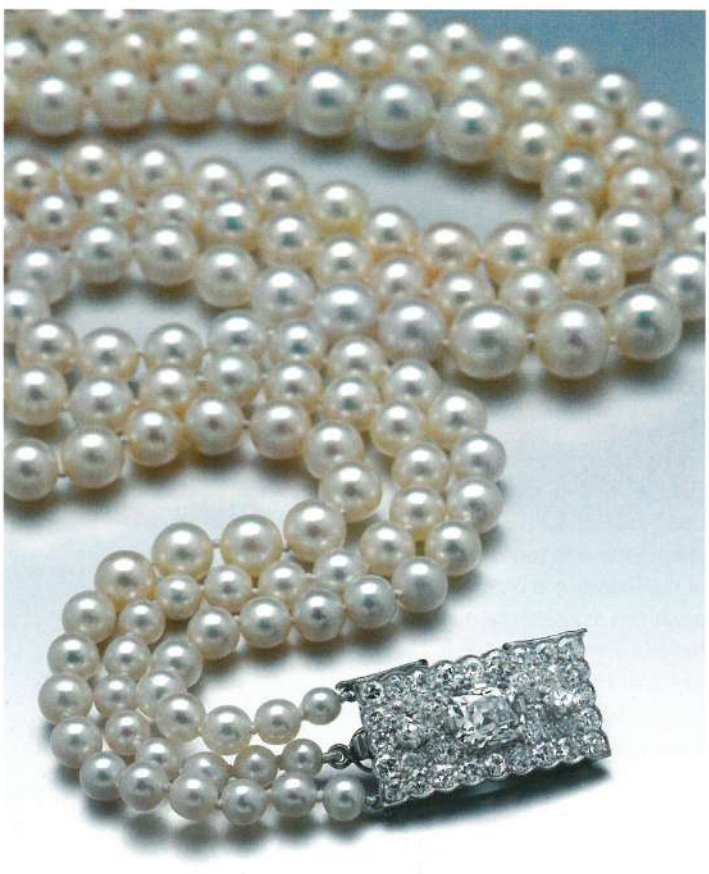
The two Qianlong Imperial Seals each with the inscribed face inset. Photos © of Sotheby's.

Did Catherine the Great own these pearls?

Mystery surrounds the provenance of the pearls forming a three-strand necklace to be auctioned by Bonhams New York on 16 December.

In 1920 Horace E. Dodge, US founder of the Dodge automobile company, bought a natural pearl necklace from Cartier for his wife Anna Thomson Dodge for an unprecedented US$825,000 (about $8 million in today's money). Originally comprising five strands of pearls and three clasps, the necklace was acquired from Anna by her granddaughter Yvonne in 1968, who subsequently divided the strands between her family and heirs. Three family members have now reunited their individual strands to sell as one necklace.

The three-row necklace, comprising 224 natural pearls and two Cartier diamond-set clasps, is expected to realize US$500,000–$700,000 in December's sale.



The natural pearl necklace with diamond clasp. Photo courtesy of Bonhams.

The 1920 Cartier sales invoice states that the five-row pearl necklace, consisting of 389 natural pearls weighing 4305 grains, was accompanied by an "enamel clasp representing Catherine, Empress of Russia" and "two diamond alternate clasps". Many newspaper articles written in the early 1920s and since then, including those from The New York Times and Detroit Times, have suggested that the pearls once belonged to Catherine the Great and, furthermore, the heirs of Anna Thomson Dodge maintain that Horace bought the pearls from Cartier on that basis.

Anna Thomson Dodge wearing three strands of the necklace. Photo courtesy of Bonhams.

Whilst proof of a direct connection between the pearls and the Empress remains inconclusive, it is a fact that in the early 1900s jewellery from Russian aristocrats found its way onto the open market. Russian émigrés, fleeing the Revolution, who had lost their land and fortune and whose funds were quickly exhausted in foreign countries, had no other means to subsist than by selling the family jewels their wives were able to carry with them in their flight. Russian royal jewels found new owners in the wives of wealthy industrialists, many of them American.

"In the early part of the twentieth century, pearls were seen as one of the most precious of commodities. They commanded astronomical prices as new-money businessmen tried to outdo one another by buying the most extravagant pearls they could find for the women in their lives," says Bonhams' International Director of Jewellery Matthew Girling. "Pearls were more valuable than diamonds and the market was hugely overheated, so much so that in 1917 Cartier acquired premises on New York's 5th Avenue in exchange for a double strand of pearls!"

Daffodil ring to be auctioned for charity

A diamond-set cocktail ring has been made and donated by George Pragnell to be auctioned for the benefit of the Marie Curie Cancer Care. The ring, estimated at £20,000–£40,000, will be offered for sale at Sotheby's on 6 November.

The charity was founded in 1948 following the donation of a diamond engagement ring which raised £75 at auction, equivalent today to around £5,762. Sixty years later, Stratford upon Avon family-run jewellers George Pragnell have hand-crafted the ring in celebration of the charity's sixtieth anniversary. Charlie Pragnell, the founder's grandson, based the design of the ring on the charity's emblem — a daffodil. The centrepiece of the ring, a rare oval fancy vivid orange yellow diamond weighing 0.82 ct, had been purchased previously by Charlie's father, Jeremy Pragnell FGA DGA, who said: "I was immediately attracted to the stone because of its exceptionally deep and unusual colour." The ring has pavé-set diamond petals and peridots set in the stem and leaf.

All money raised through the sale of the George Pragnell daffodil diamond ring will help fund Marie Curie Nurses who give people with terminal illnesses the choice to die at home supported by their families.

Photo couresy of Marie Curie Cancer Care.

Auction Houses

Listed below is a selection of auction houses specializing in jewellery. Visit their websites for details of forthcoming sales.

Bonhams	**www.bonhams.com**
London, Knightsbridge	t: 020 7393 3900
London, New Bond Street	t: 020 7447 7447
Edinburgh	t: 0131 225 2266
Los Angeles	t: +1 323 850-7500
New York	t: +1 212 644 9001
San Francisco	t: +1 415 861-7500

Christie's	**www.christies.com**
London, South Kensington	t: 020 7930 6074)
London, King Street	t: 020 7839 9060
Amsterdam	t: +31 (0)20 575 5255
Dubai	t: +971 (0)4 425 5629
Geneva	t: +41 (0)22 319 1766
Hong Kong	t: +852 2521 5396
Milan	t: +39 02 303 2831
Beverly Hills	t: +1 310 385 2600
New York	t: +1 212 636 2000

Lyon & Turnbull	**www.lyonandturnbull.com**
Edinburgh	t: 0131 557 8844
Glasgow	t: 0141 333 1992
London	t: 020 7930 9115

Fellows & Sons	**www.fellows.co.uk**
Birmingham	t: 0121 212 2131

Sotheby's	**www.sothebys.com**
London, New Bond Street	t: 020 7293 5000
Geneva	t: +41 (0)22 908 4800
Milan	t: +39 02 295 00201
New York	t: +1 212 606-7000
Hong Kong	t: +852 2524 8121

Woolley & Wallis	**www.woolleyandwallis.co.uk**
Salisbury, Wiltshire	t: 01722 424500

Instruments

Raman — an anniversary

Modern Raman spectrography has its origins in a 'cross filter' technique first demonstrated 80 years ago this year.

On the 16 March 1928, an Indian scientist made the inaugural address to the South Indian Science Association in Bangalore. His opening words were: "I propose this evening to speak to you on a new kind of radiation or light emission from atoms and molecules." The speaker's name was Chandrasekhara Venkata Raman and this 'new radiation' now bears his name.

A new and unaccounted-for form of 'feeble fluorescence' had been studied by Raman and his colleagues from 1921 onwards. They had found that the depolarisation of the light scattered by distilled water increased greatly when a violet filter was placed in the path of the incident light. This observation was published as *Molecular Diffraction of Light* in 1922, but the causes of this effect remained a source of puzzlement until early 1928 when Raman realized that the effect might relate to a type of X-ray scattering that had been discovered by Arthur Compton and for which Compton had been awarded the Nobel Prize in 1927.

Raman immediately began to experiment and soon found a way to demonstrate the effect using remarkably simple equipment. He concentrated a powerful beam of sunlight through a telescope objective, though a blue-violet filter and then through the water. If a second filter of green glass, complementary in colour to the blue-violet one (i.e. the two would cut out all light) was placed so as to cut out the light entering the liquid, no light could be seen passing through the liquid. However, if the green filter was placed between the liquid and the observer's eye, an 'opalescent track' of light through the liquid was faintly visible.

The next stages were to use monochromatic light rather than sunlight and to observe the spectrum of the new radiation. Using a monochromatic light at 435.8 nm (in the violet) the spectrum was found to show two or more sharp bright lines in the blue and green regions. These spectrum lines, first observed on 28 February 1928, were not present in the light from the source or in that entering the liquid. Thus they were, in Raman's words, "manufactured by the molecules of the liquid".

Raman concluded his address by saying: "We are obviously only at the fringe of a fascinating new region of experimental research which promises to throw light on diverse problems relating to radiation and wave-theory, X-Ray optics, atomic and molecular spectra, fluorescence and scattering, thermodynamics and chemistry. It all remains to be worked out." Raman was awarded the Nobel Prize in 1930 for his work.

The last eighty years, and the last twenty in particular, have seen enormous advances in the equipment used to detect and measure Raman radiation, and the uses to which analysis by Raman spectrography can be put. The science behind all this is outside the scope of this brief note, but in simple terms, the light entering a substance is scattered by the atoms or molecules. The vast majority of this scattered light retains the same wavelength as it had when it entered the substance, but a very small amount of the light (about 0.000001%) is scattered at a different, usually higher, wavelength.

Today Raman spectrography is used for many purposes in gemmology. It is now often used routinely in gem testing, where it can be quick and efficient, and for a variety of vital special purposes such as the detection of treatment in diamonds, origin determinations and the classification of inclusions, fillers and colouring agents. The equipment can be costly, but there are an increasing variety of smaller and often portable versions that are becoming, relatively speaking, affordable. When combined with a microscope, inclusions deep within gems can be identified. Work is also greatly facilitated by the online RRUFF™ Database — a comprehensive set of Raman spectral data to which mineralogists, gemmologists and others have free access. http://rruff.info/about/about_general.php

For C.V. Raman's 1928 address to the South Indian Science Association in full, see his 'A New Radiation' in the *Indian Journal of Physics*, 1928, 2, pp. 387-98 (1928). This is available online: http://dspace.rri.res.in:8080/dspace/bitstream/2289/2135/1/1928+IJP+V2+p387-398.pdf

Jack Ogden

The µSense-M Raman microscope by Enwave Optronics; one of the lower cost Raman microscopes for gemmological applications.

No gems please, we are jewellers

This Centenary year we have often explained that Gem-A's roots lie in a meeting of proactive British jewellery retailers in 1908. They believed that the level of gem knowledge among retailers was, to be frank, dismal, and that the trade would benefit greatly from gemmology courses, exams and a qualification. This was the spark which fired Gem-A to become the leading provider of gem education that it is today.

Where are we today? I had hoped that after 100 years, British jewellers would have recognized the necessity of gem knowledge. Sadly, not all have. We were recently approached by a UK jewellery-related charity for a prize for them to raffle at their annual dinner. As a charity ourselves, we are somewhat limited in what we can 'donate' to others, so we offered a voucher for free attendance at one of our day workshops – which range from basic introductions to gemmology to treatment updates to diamond grading – or a free day at our conference. Both prizes with a 'retail' value of £120+. The prizes were initially rejected. Not wanted, thank you. The committee concerned felt that such a prize 'will not really be suitable for the event given the fact that those attending the dinner are almost all jewellers'.

No holely cure

Jewellers offering an ear piercing service should be aware of the potential damage it might cause. In August 1699 the British press noted that the Queen of Portugal had died a couple of days before her 33rd birthday: "Tis said that her sickness was occasioned by an opening which she had made in her Ears for the wearing of Diamond Pendants, that an inflammation hapned therein; that the Physicians applied remedies, which in lieu of Drawing it out, and make it ripe, caused it to strike in, in so much, that altho' she was bled 11 times in her foot, yet could find no relief."

This was Maria Sofia who married the widowed King Peter II of Portugal in 1687 and became queen consort of Portugal. She indeed died of fever on 4th August 1699, possibly of an acute streptococcus bacterial infection. Incidentally, infection following ear piercing, but luckily not death, was the subject of a twentieth-century court case against a British jeweller, but he was acquitted because, as the judge said, a jeweller was expected to take reasonable care, but wasn't expected to have the skills of a surgeon.

False gems

Talking about law cases, a hundred years after Queen Maria Sofia died from ear-piercing, a London auctioneer by the name of John Warren was taken to court by a customer, Richard Gibson. Gibson had paid 25 pounds and 6 shillings (£25.30) for 'one oriental stone called a topaz, set in gold'. It turned out to be a "false and counterfeit stone made in imitation of a topaz, of the value of three pounds" and it was alleged that Warren had intentionally set out to "deceive and defraud". I haven't found out how the case ended yet, but at least it is an early example of legal action based on a wrongful gem description.

The benefits of child labour

In the late seventeenth century coral was a significant import into Britain. It was imported in both rough and worked form, the latter especially in the form of beads. John Houghton in his short-lived periodical *Collections for the Improvement of Husbandry and Trade* suggested that this bead making "we might very much encourage here [in Britain]". He went further: "If among our Children's Recreations we would also teach them some Arts, they might learn, as, Turning [lathe work], &c. This beside the Diversion would procure them (tho' sold at easie Rates) Money enough for their Childish Expences; and not only so, but inure them to the custom of getting Money, and push out their minds to greater Adventures."

By pointing this out, Gem-A is certainly not condoning exploitive child labour in the gem and jewellery industry today, but it always fascinating to see how attitudes change with time.

Old lustre

We have noted with some surprise that the earliest recorded use of the term 'lustre' applied to a diamond dates to as far back as 1522. It was used by Sir Thomas More, the catholic statesman, lawyer and scholar who was the personal advisor to King Henry VIII and beheaded in 1535. He referred to the "very trewe lustre of the Dyamonde". Sir Thomas also coined the word 'utopia' – a word used less often today than 'lustre' in the context of the UK jewellery industry.

Jack Ogden

Events and Meetings

Gem-A Centenary Conference and Second European Gemmological Symposium

Saturday and Sunday, 25 and 26 October
The Hilton London Kensington

Gem-A Graduation Ceremony

Monday 27 October
Goldsmiths' Hall, London

Awards to be presented by Gem-A President
PROFESSOR A. RANKIN

Nature's Treasures: Minerals and Gems

Sunday 7 December
The Flett Theatre,
The Natural History Museum, London

A one-day seminar organized jointly by Gem-A, The Mineralogical Society and The Russell Society. Further details given on page 2.

Gem-A Midlands Branch Anniversary Dinner and Conference

Celebrating 100 years of gemmological education

Menzies Strathallan Hotel, 225 Hagley Road, Edgbaston, Birmingham B16 9RY

Anniversary Dinner
Saturday 29 November – 7:00 for 7:30 p.m.
Tickets: £30.00 members; £34.00 guests

Centenary Conference
Sunday 30 November – 9:30 a.m. to 4:30 p.m.

PRESENTATIONS:

DOUG GARROD: Diamonds
GWYN GREEN: A Visit to Coober Pedy Opal Fields
PROFESSOR HENRY HÄNNI : Pearls
E. ALAN JOBBINS : The Crown Jewels
SHENA MASON: 100 years of Birmingham Jewels
VANESSA PATERSON: Amber

Tickets: £35.00 members; £39.00 non-members/guests

For further details and a booking form contact Gwyn Green on 0121 445 5359 email gwyn.green@talktalk.net

Gem-A Branch Events

Midlands Branch

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

Friday meetings will be held at the Earth Sciences Building, University of Birmingham, Edgbaston.

Friday 31 October
British and European Hallmarking, Birmingham Silver and the Influence of Matthew Boulton
DR SALLY BAGGOTT

Friday 28 November
Eighteenth-Century Jewellery: Buttons, Bows and Bones
JOHN BENJAMIN

Saturday 29 and Sunday 30 November
BRANCH ANNIVERSARY DINNER AND CENTENARY CONFERENCE
(See panel left)

Friday 30 January 2009
Branch AGM followed by Bring and Buy and Team Quiz

Friday 27 February 2009
The Cheapside Hoard
JAMES GOSLING

Sunday 15 March 2009
PRACTICAL TRAINING DAY
Identification of gemstones mounted in jewellery
Venue: Barnt Green, Worcs

Friday 27 March 2009
An Exploration into the World of Pearls
GWYN GREEN

Friday 24 April 2009
Cometh the Day, Cometh the Jewel
DAVID CALLAGHAN

Scottish Branch

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

Meetings are held at the British Geological Survey, Edinburgh, unless otherwise stated.

Tuesday 11 November
The Challenge of Valuing One of the World's Largest Diamonds: Appraiser's Dream or Nightmare?
PETER BUCKIE

Wednesday 21 January 2009
An evening with gems
ALAN HODGKINSON

Wednesday 25 March 2009
Scottish pearl evening at CAIRNCROSS OF PERTH

Friday 1 to Monday 4 May 2009 SCOTTISH BRANCH CONFERENCE
The Queen's Hotel, Perth

Speakers will include:
KENNETH SCARRATT (Keynote)
MARTIN DONOGHUE
ALAN HODGKINSON
BRIAN JACKSON
JENNIFER SCARCE
DR JOHANNES ZWAAN

South West Branch

Contact: Richard Slater
07810 097408
email: richards@fellows.co.uk

Meetings held at Bath Royal Literary and Scientific Institution, 16-18 Queen Square, Bath.

Sunday 9 November
Beat the Dealer
JASON WILLIAMS

For the latest information on Gem-A events visit our website at www.gem-a.com

Gem-A Diploma in Gemmology

EIGHT-MONTH LONDON DAYTIME COURSE

- This eight month course includes both the Foundation and Diploma sections of the gemmology course, and enables students to see and test a wide range of gem materials under the supervision of experienced Gem-A tutors.
- Classes are held at Gem-A's London headquarters from 10:00 am to 5:00 pm on Tuesday, Wednesday and Thursday* each week.

* Supported study

The course fee of £6895 (payable in five monthly instalments of £1379 commencing July) includes tuition and practical classes, access to study stones, course materials, the Foundation and Diploma examination fees, and a one-year subscription to *Gems & Jewellery*.

Start date for the next course: **4 March 2009**

For further information contact Gem-A Education on +44 (0)20 7404 3334
email education@gem-a.com

Details of this and other gemmology and diamond courses run by Gem-A are given on our website at www.gem-a.com/education/gemmology-courses.aspx

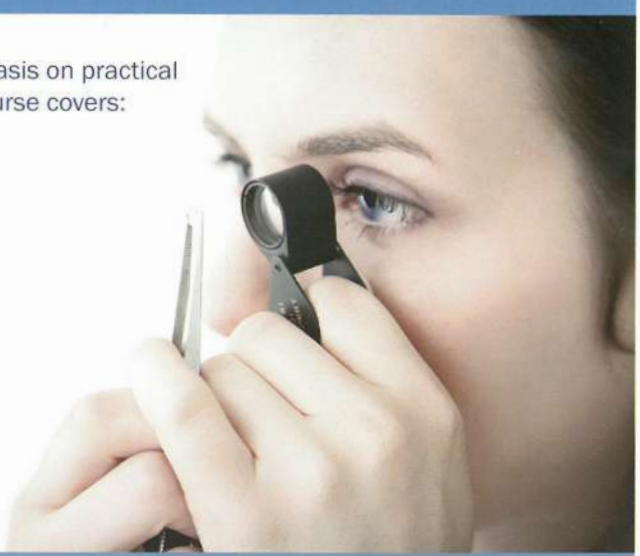
DIAMOND PRACTICAL CERTIFICATE

A diamond practical qualification in just six days

This intensive certificate course and exam places the greatest emphasis on practical techniques that can be used in your workplace or elsewhere. The course covers:

- Colour grading by eye
- Clarity using a 10x loupe
- Carat weight estimation
- Aspects of cut including symmetry and proportions
- Simulants and treatments
- Description of rough crystals

The course is run at Gem-A London over two weeks (Wednesday, Thursday, Friday and subsequent Monday, Tuesday and Wednesday, followed by the exam on the Thursday). Course times are 10:00 am to 4:30 pm each day. No prior diamond experience is required.



Course fee: £995 (inc. VAT)

Start dates: 5 November 2008 and 18 February 2009

For further information on this and other Gem-A short courses go to www.gem-a.com/education.aspx
To book, contact Gem-A Education on 020 7404 3334 email education@gem-a.com

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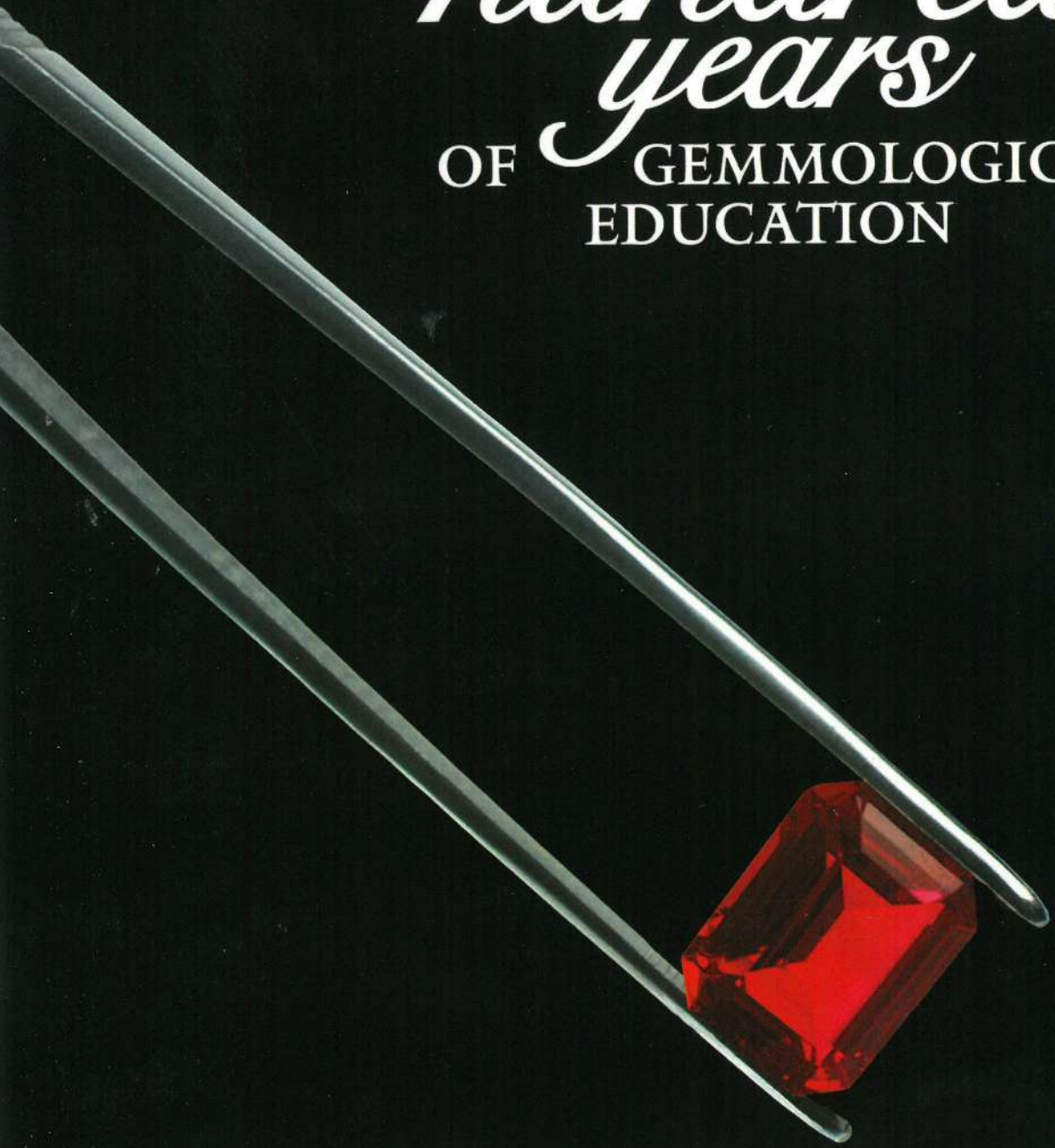

Gem-A

THE GEMMOLOGICAL ASSOCIATION
OF GREAT BRITAIN