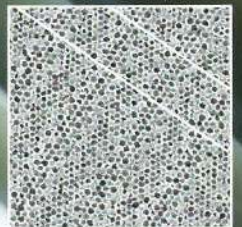


Gems & Jewellery

June 2007 Vol. 16 No.2



The Gemmological Association of Great Britain & The Society of Jewellery Historians

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Trust

It is all about trust, we are told. Diamonds worth thousands, millions even, change hands on a handshake. Ours is a trade to be proud of.

I imagine a simple handshake, if that, sealed the deal whereby one major London emporium purchased a magnificent ring with a large sapphire surrounded by diamonds. The bill would be paid, both parties knew that. They trusted each other. Then one of our graduates, an employee of the said emporium, looked at the seemingly splendid sapphire with a 10x loupe and clearly saw the curved lines identifying it as a synthetic. Oops.

Presumably, the same mutual trust existed between one respectable and up-market provincial retailer and the well-known UK supplier from whom he purchased two fine-looking coloured stone and diamond rings — one described as set with a pink topaz, the other with a pink tourmaline. One of Gem-A's gemmology instructors saw them, had a closer look and then had to break the news that the 'pink topaz' was actually a synthetic pink sapphire and the 'pink tourmaline' was actually a coated pink topaz.

It's true that today's gem industry is flooded with an almost infinitely greater variety of imitation, synthetic and treated stones than even a decade ago, but that is only a partial excuse. There is also a far, far greater amount of information available about what is out there, what to look for and how. How could a modern retailer or manufacturer admit, without a hint of shame, that they hadn't even heard of coated topaz?

Ways in which the industry can be informed and kept informed will be self-evident to those reading this publication.

The question is how can we inform the others, those that don't bother to read the jewellery or gem journals or forums, or say they are too busy to attend courses, workshops or conferences? There is more to trust than just paying the bills on time.

Jack Ogden
Chief Executive Officer, Gemmological Association

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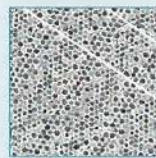
Cover:



Close-up of a fine and strongly banded agate from Ballindean. Photo by permission of the Trustees of the National Museums of Scotland. See *Raman in the Gloaming, Agate*, p.21.



Diamond and engine-turned gold pendant. See *BaselWorld 2007*, p.6.



Electron micrograph of the first bidisperse opal CT, after hydrofluoric etching. See *Raman in the Gloaming, Opals*, p.21.



Modern silver and amber. Photo courtesy of Maggie Campbell Pedersen. See *Amberif*, p.8.

GEM-A ONE-DAY WORKSHOP



The Good, the Bad and the Ugly Estate Jewellery: understanding styles of the last 200 years

An active and stimulating day on the dating and valuing of antique and period jewellery with valuations expert Brian Dunn. The emphasis will be on using the tools of the trade to assess a selection of jewellery representative of period, style and condition.

The day is a 'must' for anyone with a passion for fine jewellery.

**Thursday 18 October 2007 from 10:00 to 16:30 at Gem-A London
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For details of this and other Gem-A workshops and short courses go to
www.gem-a.info/education/londonWrkShops.htm
or call Claire on 020 7404 3334 email information@gem-a.info



The Society of Jewellery Historians was formed in 1977 with the aim of stimulating the growing international interest in jewellery of all ages and cultures by publishing new research and bringing together those seriously interested in the subject, whether in a professional or private capacity. The membership includes archaeologists, museum specialists, collectors, art historians, dealers, gemmologists, practising jewellers and designers, scientists and restorers, all united by their enthusiasm for the subject.

The Society holds eight evening lectures a year at the prestigious apartments of the Society of Antiquaries of London, as well as occasional symposia. The lectures cover all periods from ancient to modern, and a living jeweller is normally included each year. Refreshments are served after lectures, and this provides an opportunity for members to meet.

Jewellery Studies is published in colour on an occasional basis, and contains full length articles, book reviews and other information. Members also receive *Gems & Jewellery* five times per year. The current maximum annual subscription is twenty eight pounds.

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Grading reports or certificates?

Harry Levy explains what is implied by these terms and looks at the problems of grading coloured stones

Diamond grading reports have become an integral part of the diamond trade. They are often referred to as 'certificates'. This is wrong. A certificate implies something factual is being reported on; i.e. it certifies that what has been stated is correct. A report states that an opinion is being given, but others may disagree with that opinion.

Thus, when a stone is sent for identification the report certifies the identity, as it does the dimensions, weight and shape. When a diamond is graded, much of the information is factual and could be certified, but the colour of the diamond and its clarity are the opinions of the graders and are backed by the laboratory that issues the report. Both these components are vague, in the sense that the colour is obtained comparing the diamond to a set of Master Stones and its clarity is ascertained by eye using a scale that is not exact but is descriptive. Shape, weight and measurements are exact since we have exact definitions of, say, carat and millimetre in contrast to 'measurements', such as spoonful, cupful, heap, large, small, heavy and light which are vague. If it were possible for the colour grade of a diamond to be given in terms of wavelengths then this would be factual and could be certified.

A mistake many jewellers make is to give the colour and clarity grades of a diamond when it is offered for sale, say in a shop window or on an invoice. An invoice is a legal contract and should be factual. Thus it is factual to state the grade of a diamond by adding who has issued the grading report, i.e. the seller is pointing to whose opinion is being quoted.

To date the trade has become used to having grading reports for diamonds but not for other stones. The advantage of having a grading report is that the customer has a guideline as to the quality of the stone and can make a reasonable assessment as to what is being bought. It is easier for him to make comparisons between similar stones and price lists are available. What again is not known or understood clearly is that most of these



prices are for the use of traders and work on a discount or premium depending on the demand and availability of a given grade. Also the colour and clarity

are only two factors which determine the quality of the stone, others being the proportions, make and finish, all of which can affect the appearance and thus the beauty of the stone and hence its price.

Another problem is that there are no internationally agreed standards for grading diamonds and thus each laboratory grades to its own standards, although many laboratories issue reports that appear similar to those produced by other laboratories and use similar terminologies. Since the units of weight are agreed internationally, one can sue a laboratory should it be found the weight is wrong. One cannot, however, challenge the colour grade of a stone, since the laboratory will use its own Master Stones, which would probably not be precisely the same as those used by other laboratories. Thus if a laboratory states that the colour of a stone is G, if challenged they can claim it is G according to their own Master Set.

This may seem confusing, but traders know the grading standards of most laboratories and adjust the discounts given on a price list accordingly. If they are given a stone with a report from a laboratory they are unfamiliar with, they may grade it again with a laboratory known to them to compare the colour and clarity. Unfortunately this information may not be passed on to the seller and an unscrupulous trader may pass off a stone with the report that gives it the 'best' grade.

Grading coloured stones

To date, when a coloured stone has been submitted to a laboratory it has been to identify the stone, and to determine whether it is natural or synthetic and untreated or treated. One type of stone frequently sent to laboratories is corundum to see if it has been heated. Some now want to know also if the stone has been heated in the presence of other substances such as beryllium to alter the colour and to see if other foreign substances have been added during the heating process. At the high temperatures used to treat corundum, glass can enter the stone, or may be put in deliberately to improve its clarity and colour.

One confusion in terminology is the term 'natural'. This can be used to describe a stone that is natural (i.e. not synthetic), whether or not it has been heated. Thus, a sapphire described as natural could mean that the stone is not a synthetic but could be heated, or that it is not a synthetic nor has it been treated.

Until recent times grading of stones other than diamonds has not been attempted. The trade has resisted this, claiming that there will be no agreed standards and people could be fooled by such grading reports and the terminology that would be used. Also there are difficulties in grading, say a sapphire, as colours will have a particular shade as well as a depth of that colour to a far greater extent than seen in diamonds. Thus the wide range of colours would require a correspondingly large number of master stones, and to find and agree these internationally could be impossible.

Attempts have been made using machines that can give a vast range of colours, like colour charts one could get in a good paint shop. To date none of these have caught on other than by traders trying to communicate colour for matching purposes and by jewellery valuers.

Recently attempts have been made to grade tanzanite. These are given using multiples of As, such as AAA, AA, A, and a basic clarity grade. Some▷

laboratories are now willing to produce such reports for tanzanite.

On a recent visit to South Africa, I saw a number of jewellery shops showing a great number of tanzanites each with a grading certificate. Any end user with some knowledge of the jewellery business will assume such a certificate is comparable to a diamond grading report and assume the price he has paid for his tanzanite is a fair one, universally recognized.

Also the GIA is attempting to produce grading for some types of pearls.

Other laboratories will try to copy these systems, but at this stage they

will be using standards which have not been agreed. In some ways it is inevitable that the public will not only want to know exactly what stone they are buying, but also to have a grade to give them confidence in the price they are paying. This is due to the success of diamond grading, but again I must repeat comparing coloured stones to each other is a far more complex problem than comparing diamonds. If bodies such as CIBJO and the ICA take it on themselves to introduce grading for gems other than diamonds, then it could take many years and much discussion with the internationally recognized laboratories. □

Update on the Kimberley Process

There was a recent meeting of the World Diamond Council (WDC) in Jerusalem, Israel. Many of those involved with the Kimberley Process (KP) were there. Again I will remind readers that the KP was set up to prevent rebel groups being financed by the sale of rough diamonds. Initially the countries most plagued with this problem were Angola and Sierra Leone. Almost every other African country producing diamonds or bordering countries that produce diamonds is now controlled by the KP.

Many traders now ask what will happen to the KP when such conflicts cease, as many seem to have done now in Africa. The consequence of the KP is that rough stones can only be sent and received from countries that have signed on to the KP. Thus, if a UK trader wishes to send rough diamonds, of gem or industrial quality, to a trader in Japan, both countries must be signatories to the KP and the traders must go through the process of obtaining relevant KP certificates in order to send each other goods.

Those who advocate that the KP should continue, argue that there are still wars in Africa, and in countries where there is apparent peace now, wars could flare up again and diamonds could again play a part in sustaining such wars. The argument seems to be that since there are diamonds in Africa, any war ensuing there will use diamonds to fuel it.

But the KP seems to be changing into a process to keep a check on the rough diamond industry, moving from only conflict diamonds to a system to include illicit diamonds. Illicit diamonds are those

used to break the law in any way, for example money laundering, international terrorism and tax evasion. These are problems endemic throughout the world, so if the KP takes it on itself to control these diamonds then it is here to stay.

These days, many diamond cutters are finding it even more difficult to buy rough to cut and polish. The main source was traditionally De Beers, through its siteholders. Many lost these sites, after many years as siteholders, but some adjusted to obtaining their rough stones through Diamdel. This was set up by De Beers, or the Diamond Trading Company (DTC) as it is now known, to supply rough diamonds to non-siteholders and comply with regulations that may otherwise make it appear to be working as a monopoly. Diamdel is again restructuring itself and is closing some of its offices, thereby cutting off a number of its customers from their source of rough diamonds. It is reported that their offices in Antwerp and Israel will be reduced in size, and that they will be concentrating much of their business in India. All this continues to bring uncertainty into a major part of the jewellery industry. One wonders if one consequence of this will be to make synthetic diamonds more acceptable.

The leaders of the diamond industry certainly now have a more open mind toward synthetic stones. They seem to be fighting a losing battle with the DTC. Yes, they did meet with them to discuss changes in Diamdel to try to ensure a continued source of rough stones for their members, and they are now trying to arrange dialogue with the producers of synthetic diamonds.

We continue to live in changing times. □

IJL

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Gem-A at IJL

Don't miss us!

A new floor plan for IJL 2007 means that Gem-A will be at a different location this year; we will be in the **Loose Gemstones** section at **Stand G455**.

The Gem-A team will be on hand to explain the exciting developments in education and membership services planned for the Centenary of Gem Education in 2008.

Seminars

As part of the IJL seminar programme, Gem-A senior tutor **Doug Garrod** will be giving two presentations: **'Pearls: their separation and identification'** (Sunday 2 September) and **'Diamonds: formation to finger'** (Tuesday 4 September).

Awards for exhibitors

Gem-A is delighted to announce that not only is it again sponsoring the **Gem-Empathy Award**, but also will introduce a new award, the **Gem-Empathy Designer Edition**, aimed at the Bright Young Gems and those in the British Design Pavilion.

More information on IJL 2007 will be given in the August issue of *Gems & Jewellery*.

BSc Honours Degree

Exciting new opportunities for holders of Gem-A's Diploma in Gemmology

Gem-A's Diploma in Gemmology qualification – leading to Fellowship of the Association (FGA) – is set to become an even more desirable acquisition for professionals and all enthusiasts involved in gems and jewellery. Holders of the Gem-A Diploma in Gemmology are now eligible for entry into the newly-accredited degree programme at Kingston University London.

Gem-A Director of Education Ian Mercer has established the Diploma as the first step towards a full BSc Honours Degree in Gemmology and Applied Mineralogy. Through the long-standing cooperation between Gem-A and Andy Rankin, Professor of Applied Mineralogy at Kingston University, and with the support of Professor Gavin Gillmore, Head of School, Earth Sciences and Geography, this prestigious development in our education programme opens the way to even greater opportunities for Gem-A students.

Not only will Gem-A graduates be able to progress to a gem-relevant degree using the Gem-A Diploma as part of their degree studies, but they will also have the opportunity to reach even higher – to gain a gem-related Master's degree



The scanning electron microscope (SEM) at Kingston University – part of the equipment that will be available to students on the new degree course.

in mineralogical research. Ian Mercer commented: "This is a fantastic new opportunity open to all Gem-A gemmology graduates – past and present – across the world."

All diploma holders who join the new degree programme will need to take a short 'bridging course' with the University, unless they have sufficient geological experience or qualification. The first degree course will start at Kingston University, situated on the outskirts of London, in September next year.

With our fast-track day-time Foundation and Diploma in Gemmology courses at Gem-A London, it is possible for students to start their studies in August this year (or even January next year) and to take their Diploma examination in time to enrol for the first Gemmology and Applied Mineralogy degree course at Kingston University starting in September 2008. Said Ian Mercer: "There are still a few places available for the fast-track course starting on 29 August. These courses are, of course, open to anyone, whether or not they expect to follow their Gem-A course with further studies." □

Information on Gem-A courses is given at www.gem-a.info, where you will find a link to the new course at Kingston University (www.kingston.ac.uk/~kuweb/undergraduate/courses/2008/gemmologymineralogy/index.html).

For enquiries on the Gem-A Diploma and the degree contact Ian Mercer at ian.mercer@gem-a.info and for details of the top-up part of the degree, contact Dr Peter Treloar at p.treloar@kingston.ac.uk.

Jewellery Design Award

Awards for the Gem-A Scottish Branch Jewellery Design Competition were presented at the Branch Conference (see p.19-23). The competition, specifically intended to promote the use of gem materials in jewellery, was open to students in jewellery departments of Scottish art schools and colleges of further education. Entries were judged on their aesthetic design, quality of construction and finish, and innovative use of stone setting techniques.

The winner of this year's competition was Lauren Treadgold, a student at the Edinburgh College of Art. The runners up were Gwen Hosker also of the Edinburgh College of Art and Elizabeth Kirkby of North Glasgow College. Scottish Branch President Alan Hodgkinson announced the results and presented the prizes. The winning entries and those that had been Highly Commended were displayed. □

The winning entry by Lauren Treadgold.



BaselWorld 2007

Imaginative use of gems and techniques of the past at the Basel fair

It is a useful and always enlightening pursuit to wander around the many exhibitions halls and booths of BaselWorld. This is the largest European international jewellery show and one that retailers and others in the industry attend regularly, if not annually, to keep abreast of forms and fashions, and to gain ideas for their own businesses.

This year the comeback of the delicate diamond-set jewellery reminiscent of La Belle Époque was still noteworthy – an increase on that seen last year and, again, a reflection not so much on fashion influencing the jewellery industry as intelligent exploitation of workforce and technical changes. Jewellery set with copious amounts of small diamonds is again an economic viability due to the manufacture in countries with low labour costs (and increasing manufacturing skills) and the growing use of jewellery with the diamonds cast *in situ* in the mount.

The use of a wide repertoire of coloured gemstones was as much in evidence this year as last, with many of even the more traditional players realizing that jewellery is really about the imaginative and attractive use of coloured stones. It is not just diamonds, diamonds, all the way any more. Whether this increasing use of coloured gemstones is consumer led, or whether consumers are being led by retailers, really doesn't matter. The trend is established. Though, sadly, the level of gem knowledge among sellers is not always commensurate with their enthusiasm for gems.

In design terms, there is still really no recognizable early twenty-first century jewellery style discernible – though time alone might reveal this – and many

manufacturers still seem to be taking refuge in nostalgia, trying to evoke Victorian forms, La Belle Époque and Art Deco with varying degrees of flair. The increasing prevalence of jewellery with a plethora of small coloured stones leads some designers into almost JAR territory – Joel Arthur Rosenthal (JAR) being a jewellery designer justly famous for his designs that typically incorporate masses of small coloured stones.

Local forms

This use of diamonds and coloured gems en masse is seen in the jewellery of some of the jewellers who are bringing national and historic styles – such as Mogul Indian and Ottoman Turkish – onto the international playing field. Their blending of the new techniques and/or low labour costs with their local jewellery traditions is refreshing in a world where there has been the worry that the bland international styles of the global jewellery market would eradicate local traditions before the latter had a chance to make themselves more widely known.

The Indian jewellery industry – at both production and consumer level – is expanding rapidly. Many Indian jewellery manufacturing companies simply produce jewellery in international styles for an international market, but others are proud to perpetuate some of India's magnificent jewellery traditions. Such companies exhibiting at BaselWorld 2007 included Saboo's Fine Jewellery with offices in India, Thailand, Italy, Japan and the USA. Their range includes jewellery that is directly derived from Mogul and other Indian historical forms. The example shown here (1) is a ruby-set eagle pendant; Mogul Indian in form, but an entirely modern production and, of course, sold as such.



1. Ruby-set gold pendant in the Mogul style. Saboo's Fine Jewellery.



3. Gold and gem-set rings by Sevan Bicakci.



2. Ring and necklace with diamond-set jewellery. Sevan Bicakci.

Like India, Turkey is becoming a major player in the international jewellery market and this has helped shed the spotlight on some Turkish designers who are deeply influenced by Turkey's own very rich jewellery history. For example, the designer Sevan Bicakci produces a collection of jewellery ranging from interesting reinterpretations of Victorian-style diamond-set silver jewellery (2) to jewelled works of art

drawing on the Ottoman and Byzantine traditions (3). As Sevan points out, he could hardly

avoid history. Istanbul's Grand Bazaar is a short stroll from his workshop and the Blue Mosque, Hagia Sophia and Topkapi Palace not much further.

Engine (re)turning

The interest in historical roots also prompted Décors Guillochés SA of Cernier, Canton of Neuchâtel, Switzerland, to launch their Guinel range of jewellery incorporating engine turning at BaselWorld 2007 (4). Engine turning, sometimes termed 'Guilloché work', is an old technique that has seldom been seen outside the watch industry in recent decades.



4. Diamond and engine-turned gold pendant from the Guinel range by Décors Guillochés SA of Switzerland.

Engine turning is a surface decoration produced by the intricate patterns of fine engraved lines. The complex, lathe-like machine used for this process has a series of wheels that can be set so that the engraving tool will produce one of a large range of intricate and very regular geometric patterns (5). The origins of the process lay in the machine engraving of ivory, wood and other organic materials developed in the sixteenth century, but its use for gold and silver only began in the early eighteenth century. Initially the designs were fairly coarse and the delicate patterns typical of the better engine turning only became more common by the mid 1750s. The development and popularity of engine turning was facilitated by the availability of regular sheet metal with a flat, even surface following the eighteenth-century advances in sheet metal rolling technology.

Often the term 'engine turning' is applied to all work of this type, but technically speaking an 'engine turning machine' creates curved and wavy lines, a 'straight-line' machine straight and angled lines. The finest work may have precise and sharply cut lines a few tenths of a millimetre apart. The origin of the term 'guilloché' is still debated. Some say it comes from the name of the inventor of the technique, a Monsieur Guillot, while



5. The heart of the engine turning machine – geared wheels that can be rotated in a vast number of configurations to produce the intricate geometric designs.

others say it comes from an Italian term for a type of architectural decoration.

Engine turning had a revival of popularity in the early twentieth century and there are many fine examples from such houses as Fabergé and Cartier. Mass production after World War II led to repetitive and uninspiring work, for example under the enamel on dressing table sets, and in recent years there has been little use of the technique outside the watch industry. The Guinel range of jewellery launched by Décors Guillochés SA at BaselWorld 2007 aims to bring engine turning back into fashion. □

J.O.

Seaman Schepps

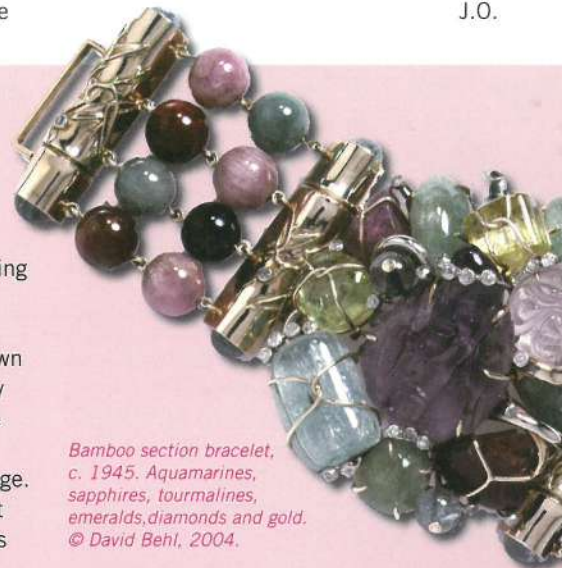
Those who associate the name of Seaman Schepps with vibrant, colourful jewellery will not be disappointed when viewing the exhibition *Seaman Schepps (1881-1972): America's Court Jeweller* at the Gilbert Collection. His bold designs not only appealed to the modern, independent twentieth-century woman, but also to Pop Art icon Andy Warhol, who was an avid collector.

Gemstones often determined the designs created. Schepps mixed colours, cuts and textures to create exciting, often oversized, jewellery that was fun to wear. Typical of this look is the bamboo-section bracelet illustrated, combining carved, cabochon and tumbled aquamarines, sapphires, pink tourmalines and emeralds with brilliant-cut diamonds in between,

and coloured stone beads either side. Schepps also incorporated a diversity of natural materials into his designs including seashells, woods and rock crystals.

The exhibition includes 150 pieces dating from the early 1930s, many shown with the original sketches. The jewellery exhibited in the pedestal showcases are lit from below, showing the many large translucent stones to their best advantage. A large turtle brooch whose 'shell' is set with large pale blue sapphires of various cuts and sizes, actually appears to be 'swimming' in his showcase.

Seaman Schepps; A Century of New York Jewelry Design by Amanda Vaill and Janet Zapata (The Vendome Press, New York. Museum hardcover ISBN 13:978-0-86565-250-7) accompanies the exhibition.



Bamboo section bracelet, c. 1945. Aquamarines, sapphires, tourmalines, emeralds, diamonds and gold. © David Behl, 2004.

Seaman Schepps (1881-1972): *America's Court Jeweller* will be exhibited at The Gilbert Collection, Somerset House, London WC2R 1LA until 27 August 2007. Tel.: +44 (0)20 7420 9400. www.gilbert-collection.org.uk.

Rising Stars

A blazing trail of new talent

This year's summer exhibition at Goldsmiths' Hall features jewellery and silverware by some new designer-makers. Janice Blackburn, curator and journalist, was invited by the Goldsmiths' Company to guest curate the exhibition and to select the artists. The highly individual work reveals each designer's intense creativity and represents a wide-ranging source of inspiration from architecture, throw-away cartons and packaging, to nature and the elements. Although hugely diverse, the works all exhibit their makers' mastery of craftsmanship and passion for working in precious metals.

The exhibition is on view at Goldsmiths' Hall, Foster Lane, London EC2, until Saturday 14 July, admission free.



18 carat yellow reticulated gold band ring set with a triangular red garnet, by artist jeweller Disa Allsopp. Photo courtesy of Julia Leakey.

Hoard earrings in oxidized silver by designer jeweller Ruth Tomlinson. Photo courtesy of Frank Thurston.

The Goldsmiths' Fair

The annual Goldsmiths' Fair at Goldsmiths' Hall celebrates its Silver Anniversary and to mark the event the 2007 Fair will be extended to two weeks. The first Fair took place in 1982 and proved an instant success. A quarter of a century later the Fair remains as popular as ever. With an overall focus on superlative design, craftsmanship and excellence the Fair aims to continue to be a magnet for discerning collectors from both the UK and abroad for years to come.

The Goldsmiths' Fair will be held at Goldsmiths' Hall, Foster Lane, London EC2, from 24 September to 7 October. Website: <http://www.thegoldsmiths.co.uk>

Amberif 2007

Maggie Campbell Pedersen discovers exciting new designs in amber jewellery

The fourteenth Amberif fair was held in Gdansk, Poland, in March. The emphasis was very much on Polish amber, with just a small selection of other jewellery and equipment exhibited.

The World Amber Council in Poland has strict codes which regulate how amber is sold, and insists on disclosure of treatments. A couple of years ago several stands were closed down at the Amberif fair because the owners were found to be selling imitations or copal. The non-sense attitude taken by the Council is very encouraging at a time when so much Baltic amber is being reconstituted and adulterated, and it helps to restore the public's faith in the amber trade.

In Poland amber is used as an exciting material with unlimited possibilities, and not just made into beads. Thus there was a lot of very innovative and beautiful jewellery to be seen at the fair. There were a few stalls selling the usual selections of beads and polished items, though this year there was a trend towards dark, rough pieces of amber being used for necklaces and bracelets. Also available were transparent beads with a matt surface rather than a high polish.

There are two amber fairs each year in Gdansk: Amberif in March and Ambermart



Unpolished amber jewellery.

in the autumn. Amberif is the larger of the two. They are both held at the exhibition hall a few kilometres from the old town centre. During Amberif there are lectures on amber; these are mostly in Polish but a translator can be provided.

The old town in Gdansk is small and very picturesque. It has an amber museum which has very recently been re-opened, and is well worth a visit. □

NB: A longer report from Amberif 2007 can be read in *Organic Gems* – the online periodical – together with an article on the enhancing treatments of Baltic amber. To subscribe (there is a reduced rate for members of Gem-A), visit: www.maggipecp.com.



Modern silver and amber jewellery by Bogdan Frydrychowicz (left) and Marek Nowaczyk (right).

Afghanistan: recovered treasures

Extraordinary find of early gold jewellery

Few archaeological finds have the honour of, in essence, being excavated twice. In 1978 an extraordinary find of gold jewellery dating to the first century AD was made by a joint Russian-Afghan expedition at the necropolis of Tillia Tepe in northern Afghanistan. These finds were thought lost and presumed melted down during the Taliban regime, but in 2003 it was revealed that the finds had been concealed in the vaults of Central Bank of Afghanistan in 1988. An inventory made in 2005 confirmed that nothing was missing.

The gold jewellery from Tillia Tepe was the major component part of an exhibition called Afghanistan: Recovered Treasures held at the Musée Guimet, Paris, from 6 December 2006 until 30 April 2007. Also on show was Bronze Age gold from Tepe Fullol, gold of the fourth to second centuries BC from the 'Palace Treasury' at Ai Khanoum, a town near the border with Tajikistan founded during the reign of Alexander the Great, and a range of amazing finds from Begram, some 50 miles north of Kabul, including an extraordinary large two-handled cup carved from a single piece of rock crystal with possible traces of gilding.

The quality and beauty of the goldwork from Tillia Tepe is outstanding (I was able to describe this in a far longer review in the *American Journal of Archaeology* – see link in box). One of the major exhibits is the magnificent pair of pendants with the so-called Master of the Animals (here dragons).

However, for gemmologists the interest also lay in the gemstones. We saw a plethora of turquoises – it would be interesting to determine their source – as well as the occasional amber, garnet, amethyst and lapis lazuli. One ring is set with an intaglio with a Roman-style representation of a Victory but carved in malachite, a rare material in jewellery found further west in the Roman Empire. Pyrite (iron sulphide) is also encountered as a gem material – again rare further west, though not unknown in Roman and post-Roman jewellery in the Mediterranean



Master of Animals pendants from Tillia Tepe (Afghanistan), tomb 2. Afghanistan, first century AD. Gold, turquoise, garnet and lapis lazuli, 125 x 65 mm. National Museum of Afghanistan – MK 04.40.109. © Thierry Ollivier / Musée Guimet.

region. Particularly noteworthy was a seal made from the nephrite variety of jade, engraved in intaglio with a bull in a simple globular engraving style. The catalogue of the exhibition (see box) includes a

scientific section detailing the examination of a selection of the gems and a handful of gold analyses. So, for a welcome change, some reliance can be placed on the gem identifications. □

Catalogue:

Afghanistan: les trésors retrouvés. Musée Nationale des Arts Asiatiques-Guimet. Editions de la Réunion des Musées Nationaux, Paris 2006. ISBN 978-2-7118 -5218-5.

Jack Ogden's review for the *American Journal of Archaeology* will appear at www.ajaonline.org. The exhibition can be seen at Turin's Museo di Antichità until mid-September with later European and US venues to be announced.

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High in their estimation

In the recent issue of the Australian magazine *The Valuer*, T. Linton reported on the review of three diamond weight estimators. The pieces of equipment chosen were the Gem-A's Estimation Loupe, the Schindler Loupe® and the Lumagny® loupe.

The evaluation committee considered the ease of use in estimating the 'essential dimensions' of gemstones, including the dimensions of gemstones mounted at different heights – a procedure tricky with the

Leveridge gauge.

The article concluded: "On a comparative basis, the Evaluation Committee preferred Gem-A's Estimation Loupe on the basis of its convenience with respect to its use." □

T. Linton. Magnifiers for diamond weight estimation, *The NCJV Valuer (National Council of Jewellery Valuers)*, 25(1), January-March 2007



The Gem-A Estimation Loupe

Gauging it

Tests were carried out in the Gem-A Gem Testing Laboratory on the new Presidium Gem Computer Gauge (PGCG). The instrument measures loose and mounted gemstones, calculates approximate weights and has been developed to include many additional features. A dictionary of gemstones based on a specific gravity (SG) list gives all the common gems as well as those less frequently encountered such as albite and verdite, showing the range typically encountered for each gem, for example. Based on the dimensions and weight, the gauge lists possible gem species matching the SG value. The information may be stored in an inventory function if so desired.

We found the menu easy to navigate and the instrument user-friendly. The PGCG comes with a USB cable allowing it to be connected to a PC or laptop, and readings taken on the PGCG can be input to the computer. Software is supplied on a CD which has an extended list of gemstones.

Measurement

The accuracy of measuring dimensions of a stone using the PGCG was found to be very good. This was tested using the laboratory's Hoxel calibration block which measures 5.00 mm.

Placing the block between the sliding platforms the reading was exactly 5.00 mm, and with the block between the protruding probes the result was 4.99 mm.

Weight

Using the weight estimation function is simple. The gemstone type and shape are selected and the gauge uses the input length x width x depth measurements to give an estimated weight, also taking into account the SG of the stone. Results were widely variable; the closest was an oval ruby weighing 4.04 ct which was estimated at 4.03. As with other gauges of this type, the user has to make suitable adjustments for stones that are not of ideal proportions, e.g shallow, narrow or lumpy stones, or those with a thick girdle.

Other functions

One additional function is the ability to estimate the price of a stone; the calculator function multiplies the weight of the stone by your input price per carat.

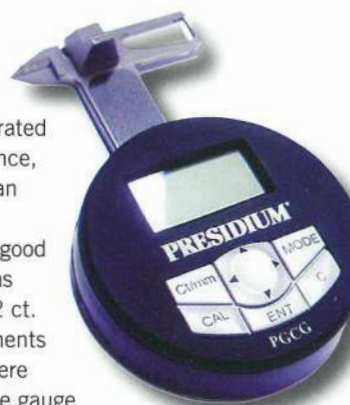
In 'gemstone estimator' mode, the gauge estimates the SG based on the weight and dimensions of a stone. A list of gems in the range of the SG calculation is given providing an aid to the identification of an unknown stone.

Using the lab's calibrated Sartorius balance, the weight of an emerald-cut diamond with good proportions was shown as 3.22 ct. The measurements of the stone were taken using the gauge and input with the weight. The SG was calculated as 3.62 by the gauge (actual SG 3.52) and a list of nine possible identifications was displayed. Despite the reasonably accurate SG reading, diamond was not on the list.

Tourmalines and corundums were tested in the same way, some lists including the correct stones and others not.

Conclusion

The ease of use and accuracy of measurement of dimensions makes the PGCG an excellent and competitively priced gauge, particularly for jewellery valuers. The calculation and identification functions are as accurate as one might expect, and should be used with care. □ The Presidium Gem Computer Gauge is available from Gem-A Instruments for £225.00 + VAT.



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The Age of Gold

A day out

On a fine August morning in 1990 Professor Otto Eugster with colleagues and students from the Physics Institute of the University of Bern set off for a day in the mountains. A day outing was something of a Swiss tradition and typically involved a walk in the mountains, a swim and a beer, or two. But that year it was different. A financial scandal involving institutional funding had rocked the Canton of Bern and prompted a diktat. No more could a university be seen to subsidize a recreational activity. So the trip was not a fun day of work-colleague bonding, it was a serious scientific expedition. They were off to pan for gold. The magnificent alpine scenery and the odd beer or two were incidental.

Why would the renowned Physics Institute at Bern, famous for its work on meteorites and meticulous analysis of moon dust, look for gold? The explanation was that they wanted to see if their specialized methods of analysing the minuscule amounts of rare gases trapped in meteorites and moon dust might also reveal something about the geochemistry of terrestrial gold. Thus it was that a day wading in Swiss mountain streams prompted by a Swiss austerity measure led to a by-product of space research that has the potential to be far more valuable to jewellery historians than teflon or crazy putty.

Gas

The gold grains from the river sands of the Grosse Fontanne near Lucerne were expected to contain little if any of trapped helium gas. So the Physics Institute mass spectrometer was expected to pick up a few dozen counts per second at most – each count representing a detected helium ion. But the results were startling, the instrument was registering some 280,000 counts per second. The first assumption was that something was amiss with the equipment. But nothing was wrong. Could there be something odd about the gold from Grosse Fontanne? Gold samples from other Swiss streams were analysed and similar helium levels detected. With the help of colleagues in other institutions around the world gold samples were obtained from as far afield as South Africa and Australia. All



Professor Otto Eugster (right) with colleagues panning for gold.

revealed unexpectedly high helium levels. 'High' is of course a relative term, we are still only talking about a few helium atoms for every billion gold atoms.

There are various ways in which helium might become associated with gold, but the most significant and intriguing in the present content was the creation of helium by the radioactive decay of uranium.

U too

Uranium, like gold, is a heavy element and some association during the geological formation of gold deposits is not unexpected. Then over millions of years the radioactive uranium gradually decays to create helium. Helium has a convenient atomic size to remain trapped within the gold and not diffuse out. The helium only escapes when the gold is heated to a high temperature, though not necessarily as high as the gold's melting point.

The question now was would the ratio of helium to uranium in the gold indicate when the original gold deposit was formed? That is, when was the gold last at an elevated temperature and the 'helium clock' set at zero?

Dating

The technique worked. Otto Eugster and his colleagues briefly published this research in the journal *Meteoritics* in 1992 and a longer version in *The Journal of Geophysical Research* in 1995.

In a preliminary draft of the 1995 article, Otto Eugster had made the suggestion that the technique might one day be refined to allow the dating of ancient gold objects. This suggestion was rejected as too fanciful by one of his co-authors and the comment was omitted in the published version.

His co-author had a good reason to be sceptical. With gold from deposits hundreds of millions of years old there were still only minute traces of helium. With gold melted in historic times the number of helium atoms would be several orders of magnitude less. Equipment to detect the odd helium atom among billions of gold atoms reliably just did not exist.

But Otto Eugster was intrigued by the theoretical potential and published a short note on this in *Gold Bulletin* in 1996.

He was not alone. Dr Pieter Meyers, a specialist in the scientific study of ancient metals and at that time with the Los Angeles County Museum of Art, read Otto Eugster's initial publication and also saw the potential for authenticity studies. Pieter Meyers discussed the potential with Otto Eugster and with a Russian scientist Alexander Kossolapov from the State Hermitage Museum in St Petersburg, then working with Pieter Meyers in Los Angeles. Pieter Meyers had been researching the authenticity of a group of gold vessels and other objects belonging to the Shinji Shumeikai of Japan.

Russian expertise

When Alexander Kossolapov returned to St Petersburg he worked with Cadix-R Inc, specialist makers of mass spectrometry equipment to develop an ultra-sensitive mass spectrometer equal to the task of detecting minuscule amounts of helium. Funding for the project was generously provided by the Shinji Shumeikai of Japan who then presented the instrument to the Hermitage Museum. The instrument was named Hermitage-1 (a somewhat contrived acronym – Hermitage-1 stands for Helium Recirculating Mass-Spectrometer in Technical Age Establishing).

Alexander Kossolapov and his colleagues measured the uranium/helium ratios of a selection of Scythian and other ancient Russian gold objects in the Hermitage Museum, along with samples of modern gold for comparison. The results were very encouraging. Samples of gold

from a private collection that Pieter Meyers had been studying were then analysed and the results were equally encouraging.

Gem-A involvement

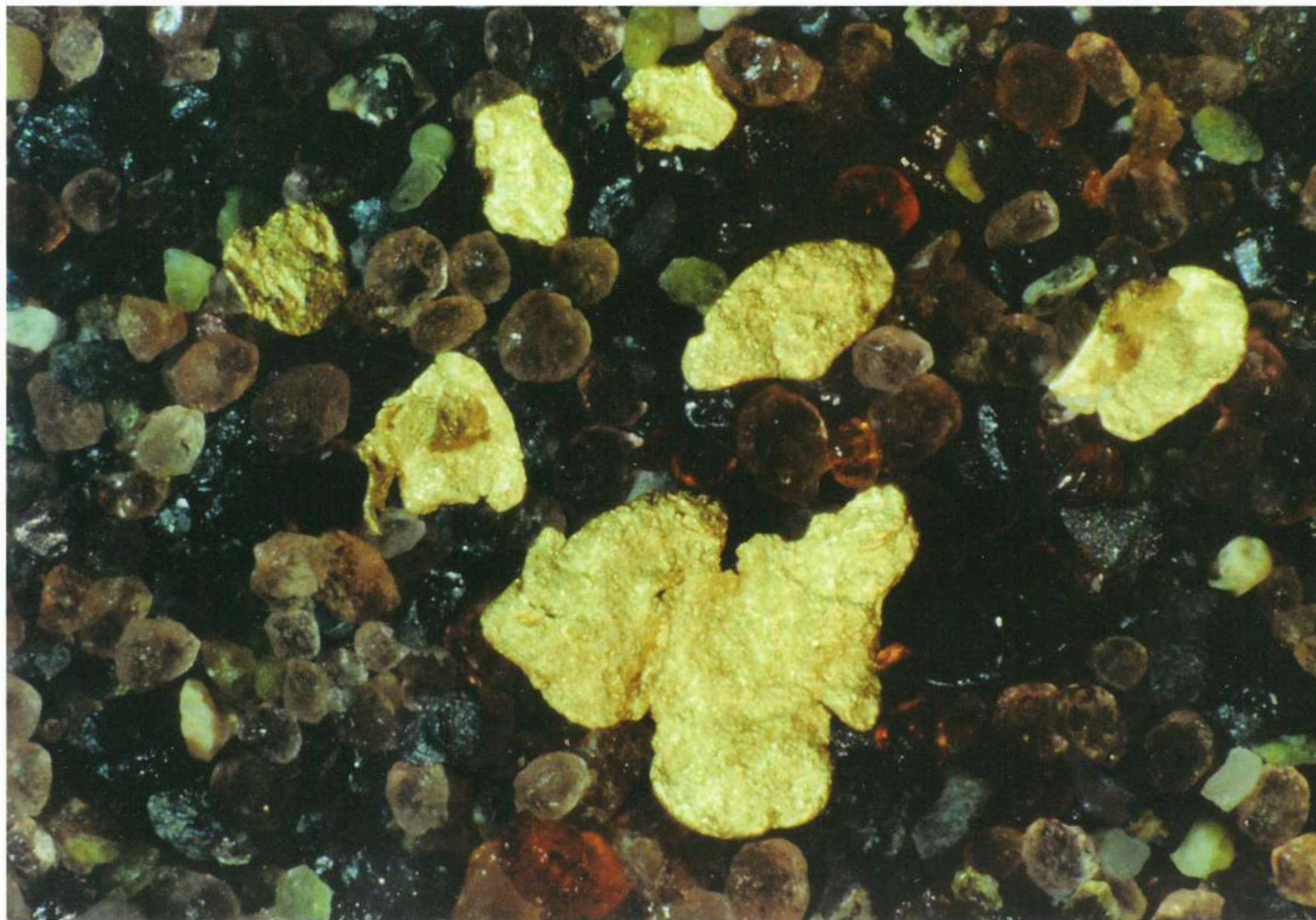
A second version of the equipment was then supplied to Otto Eugster's department in Bern for use in uranium/helium age determinations of meteorites and other samples from space, and for research into the dating of gold. This is where Gem-A comes in. The present writer, while director of the Cambridge Centre for Precious Metal Research, had been involved with Pieter Meyers' original authenticity studies of gold in the private collection and had followed Alexander Kossolapov's subsequent work with interest.

Late in 2006 Gem-A submitted several ancient gold samples to Bern for initial testing, and to compare the results with those previously carried out. The initial results have been highly encouraging

and the early gold samples distinguished from modern gold samples included as comparisons.

Following a meeting between Otto Eugster and the writer in April this year, more collaboration has been agreed. Once the technique has been thoroughly tested on a wide range of gold samples of different ages, different alloy compositions and different manufacturing techniques, the procedure might be developed enough to be made available as a commercial, albeit expensive, service. The technique may never be more accurate than indicating 'many centuries old' or 'new', but in most cases this is sufficient for authenticity work as an adjunct to traditional art historical, technical and analytical approaches. Gem-A might also act as a sampling centre, certifying that the small sample (5–10 mg) did indeed come from the object it is said to have come from. □

Jack Ogden



Placer gold grains obtained by panning in the river Grosse Fontanne in central Switzerland. Typical grain size is 1 mm.

Stone beads – market explosion

Marcus McCallum gives a summary of his presentation to Gem Club on Tuesday 3 April



Some of the wide range of materials now used for beads (from left): bronzite, pietersite, fossil coral, fossil palmwood, prehnite, amazonite from Peru (appeared on the market in recent months) and lava.

It is my business to source and sell gemstones that will titillate the artistic palette of designers and jewellers. I am constantly on the look out not only for what is different and special in my own eyes but for materials and cuts that my clients want to use, and which their clients' interest and enthusiasm tells them are in vogue. So a good part of my business revolves around beads and a glimpse into my office will show you that designers now are responding to and fuelling a fashion that was really the beginning of the whole jewellery business, the origin – you might even say – of the art of adornment.

Until recently, the centre of the bead cutting industry was India. Raw materials are abundant there, it has cheap labour and a long history of gem cutting so it had the gemstone-bead cutting business tied up despite the fact that there was not much real innovation. The materials used for bead cutting tended to be limited to those stones traditionally cut for gemstones in India – ruby, emerald, sapphire, the quartzes, peridot, moonstone and garnet, and shapes and styles were much the same as they had been for centuries. Then China came into the picture and, in the last ten years, there has been an explosion in the range of stone materials cut in the Far East. China too has a plentiful supply of cheap labour and its recent turn to capitalism has produced a booming industrial sector that has proved to be a hotbed of innovation. The new Chinese bead entrepreneurs' willingness to experiment and the range of materials they elected to cut, has meant that we are now seeing a host of stones that we could never have imagined 15 years ago.

The quality of bead cutting from China has now outstripped India in some areas, although not all. India still has an edge when it comes to fine quality hand faceting and the cutting of small sizes. This is where their long history of cutting shows. But Indian bead drillers still often rely on drilling from both sides of a bead and an uneven meeting-point mid-bead can cause problems in threading. Drill holes in Chinese manufactured beads are predominantly parallel and modern techniques and cheap labour have allowed the Chinese to experiment with a wide range of materials from different gemstones like kunzite and kyanite to granites, rhyolites, mudstones and sedimentary rocks – even pumice and lava. This is all great news for the designer because stones are now being cut not just for colour and lustre but also for texture. The range of shapes and cuts of beads also seems to be virtually endless. It is an exciting, forward-looking industry that has also been fuelled by the current growth in the fashion jewellery sector and the blurring of the lines between what is classified as 'precious' and what is purely 'fashion' jewellery. Each time I go to Hong Kong I know that I will see something new – whether in



Chinese lapidaries have made a good job of cutting beads that are notoriously difficult to cut and polish. Examples shown are (from the left): kyanite, kunzite and seraphinite.

the style of cutting or the raw materials used. The cutting industry in China is also quick to react to demand and if the fashion industry market is asking for, say, matt textures or particular colours these will fairly soon be reflected in the beads available in Hong Kong.

Let me give you an idea of the size of the bead cutting industry in China now. One of my medium-sized bead suppliers with an office of seven or eight in Hong Kong, employs a staff of 800 in his factory in China. He is one of many hundreds, no, thousands of cutters. This is big business at the moment. And this is why the variety of beads now available on the market is so incredible and why it is growing all the time. Even materials we would normally think of as facing stones or building stones are suddenly appearing as beads. Cutters will experiment with anything that has an interesting colour or texture, even fossil materials, coral, geodes, etc.



Just some of the beads masquerading as jasper (from left): 'dalmatian jasper' and 'rainforest jasper', both probably rhyolite; 'picaso jasper', sedimentary mudstone.

This is wonderful, but it does present us with a problem. What are half of these things that one is buying? In India and particularly in China, the word 'jasper' is used as a coverall for virtually anything the dealers don't know the proper name for. A good, common example of this is dalmatian jasper – it's not jasper at all, but most probably rhyolite. Rainforest jasper? – a rhyolite. Web jasper? – a dendritic mudstone. The list goes on. These beads are all cheap materials and it is not economically viable to test them, so much has to be

done on a 'best guess' basis – which is not ideal. The only thing to be done is to be up front about it and admit that you are not sure!

Where an industry is keen to innovate and sell, it will also be prone to 'improve' on the material available for sale. As a buyer one has to be constantly on the look out for treatments to enhance the raw materials. Freshwater pearls are now dyed every colour under the sun and the market accepts this without blinking – as long as the seller can define what is and what is not dyed. Some designers will only work with natural colours while others are happy to play with a wider rainbow of colours. The same applies, of course, to stone beads. I personally draw the line at buying dyed beads – the only ones that I will deal in are black onyx and banded onyx. After all, these have been on the market for well over a century and are well known and understood.

The treatment of beads can take several forms. First, plain old fashioned dyeing. Obviously the material has to be porous or quite cracked to accept the dye. Many beads from India are dyed on the thread which can be a big problem with the bleeding of dye. Why? You may have to deal with very upset customers with ruined clothes. I have even seen labradorite beads treated with black dye to enhance the appearance of the play-of-colour! A typical ploy is to take quartz chips, dye them blue and then sell them as blue topaz. Strongly coloured thread can enhance the colour of beads, so this is another hazard to watch out for.

Then there is stabilization. This is done to enhance the surface of porous materials; two examples being turquoise and, of course, jadeite. As these treatments are often combined with the dyeing process, identification and disclosure can be a bit of a minefield. Stabilization can be taken to the point where it is basically fracture filling, using resins to make weak materials stronger. This is reminiscent of what happened to Blue John in order to make it a usable material. A modern example would be the blue opal from Peru which is treated in this way quite extensively. You should look out for this as it is a delicate material at the best of times. Waxes and resins are used to stabilize the surface of softer stones like mudstones, and are also used on lava to reduce its scratchy feel and give it a little lustre.



Two Gem Discovery Club members examining the type of stone beads extensively sold on the market as jasper.

Basically, any of the treatments that are carried out on cut stones will be used for beads too. Much cornelian is heat treated and a lot of the darker citrine beads started life as amethyst. Mother-of-pearl beads, which are now very popular and come in a variety of shapes and colours, are commonly laminated so that they show good nacre on both sides. The answer is to set your boundaries and proceed with care. If you use treated beads, or you suspect that the beads you are using are treated but you are not sure – be up front about it. Many stone beads are now as cheap as or cheaper than some glass beads. This is a factor that inclines the market to easy acceptance of enhancements as long as they don't feel they have been misled.

As they were centuries ago, beads are high fashion. The wonderful world of beads just goes on growing – until the market gets bored with them. It has done so in the past and will do so again. When that happens, the world of jewellery will put aside its beads for a while, until a new generation of designers and cutters looks back to the jewels of the Romans or the Egyptians and is inspired, once again, to reinvent the wheel. Personally, I hope it doesn't happen anytime soon. □

Acknowledgement

My thanks to Anne Carroll Marshall, Hong Kong, for the help and advice she gave me on this article.

Etched

On Tuesday 6 March Jack Ogden introduced Gem Discovery Club members to the ancient art of decoratively etching carnelian. He began by explaining how a combination of heat plus an alkali affected the surface of silica, such as quartz or agate, and how this was the basis for the early glazing of quartz and other silica-containing materials such as steatite. It was also possible that heat plus alkali was used to 'chemically polish' some early Western Asiatic Bronze Age rock crystal beads, creating a fused, very high-gloss surface.

When an alkali, such as potassium or sodium carbonate, was painted on the surface of carnelian and this then heated, a white 'bleached' effect was produced. So-called etched carnelian beads of this type are well documented from Bronze Age times onwards and have received a

fair amount of attention in the literature. However, the use of the technique in Roman times, primarily for intaglios, has received far less attention.

Jack illustrated a selection of Roman carnelian intaglios where etching and engraving had been combined – a combination also encountered with Sassanian Persian seals and ring-stones. He explained that there were actually several approaches to the production of decorative designs in this way, two shown in the drawing (1). The stone could be whitened all over by etching and then a design engraved through this so as to show in red against the white field (1, A1–3). Or the stone could be engraved with a design, then whitened all over and then finally the front surface polished to give a reddish field with the engraved design in white (1, B1–4). Other



2. Roman intaglio with 'chequerboard' etched sides (Private Collection.).



1. Drawing showing two different approaches to the etching of intaglios (drawing by Jack Ogden).

decorative possibilities included the chequerboard design on the sides of some Roman intaglios (2).

In addition to intaglios, the Romans used the process for other jewellery inlays, including cameo inscriptions. A systematic study is still awaited, but initial research suggested that in the Roman Empire there were two main regional groups. One was seemingly in Asia Minor, the other in Western Europe. The use of whitened surfaces for carnelian cameos and intaglios also raised the question as to whether some 'nicolo' cameos and intaglios (bluish-black agate with a white surface) might also have had their white surfaces artificially induced.

Following his brief presentation, Jack provided a selection of Roman and other examples of etched carnelian intaglios and beads for participants to examine. □

Gem Club specialist evenings

The Gem Discovery Club meets every Tuesday from 6:00 to 8:00 pm at Gem-A's London headquarters. Once a month a specialist guest gives a presentation and details of the summer/autumn programme follow:

- | | |
|-------------------|---|
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Raman in the Gloaming

The 2007 Gem-A Scottish Branch Conference in Perth

The 'Scottish Conference' has a reputation as one of the 'must do' gem events worldwide and attracts delegates from far and wide and from the trade, academic and 'hobbyist' communities. The conference took place in Perth over the early May holiday long-weekend and included a series of presentations, workshops and, of course, the ever popular Ceilidh (pronounced 'caley', a dinner and dance with a true Scottish flavour) on the Saturday night. The Monday was devoted to a field trip and the photos of an international band of gemmologists lying on a Scottish beach looking for minute garnets would make the perfect caption competition.

Turquoise

The Conference opened on the Friday night with a lecture by Henrietta Lidchi, Keeper of World Cultures at the National Museums of Scotland, entitled 'Precious harmony: turquoise jewellery of the American Southwest'. The turquoise-set silver jewellery of the Southwestern United States will be familiar to some extent to most gemmologists and jewellers, but Henrietta covered the history of the mining, trade and use of turquoise in this region from centuries

before the arrival of Europeans right through to the modern availability and trade in turquoise and turquoise-set jewellery.

Turquoise had been prized and traded by the



Rui Galopim de Carvalho demonstrates that his instrument virtuosity extends way beyond the refractometer and dichroscope. He and his harmonica were a very popular addition to the band at Saturday night's Ceilidh.

Branch Awards

The Scottish Branch present two annual awards to the students in Scotland gaining the highest marks in the year's gemmology examinations. This year Nicola Anderson of Edinburgh was awarded the Ness Trophy for the highest marks in the Diploma in Gemmology examinations and Rheanan Henderson, Glasgow, the Pairman Trophy for the Foundation Certificate in Gemmology examination.

Pictured is Rheanan Henderson receiving the Pairman Trophy from Chairman Brian Jackson at the Branch AGM held during the Conference. Said Rheanan: "I am delighted to have received award. It is such an incentive to continue working hard for my Diploma and maybe qualifying for the Ness Trophy next year!"

Unfortunately Nicola Anderson was not present to receive her award.



indigenous inhabitants of the Southwest states from early times, and certainly by the third century, was being traded over vast distances. Turquoise from the important mines of Cerrillos Park, in what is now New Mexico, was being worked from as early as the sixth century with simple tools such as sandstone 'files' for shaping and sand and water as abrasive. Metals were not then used. Turquoise use and trade continued into the sixteenth century, but although the Spanish who arrived in the region in 1568 noted the presence of turquoise they considered it to be of little value and thus of little interest. The subsequent two centuries saw periods of harsh and disruptive Spanish rule and, briefly, the re-establishment of Pueblo independence. In the seventeenth and eighteenth centuries there was local mining of turquoise and trade, including with unconquered tribes.

By the 1860s what was by then called New Mexico, including at that time what we now refer to as Arizona, was opening up with the arrival of the railroad and the establishment of mining concessions for copper and other desirable commodities. By the late 1860s, the Navajo who were

interned had then re-settled developing a silversmithing tradition, based initially on silver coinage.

The first silver-set turquoise jewellery in the region dates from the 1880s and initially much of the turquoise so-used consisted of re-used beads. Between about 1880 and 1910 this regional art developed primarily for local consumers, but from the beginning of the 20th century it developed into a commercial activity ensuring some measure of self-sufficiency to the Navajo: turquoise jewellery production was a key component in the region's economic development. Mining in the early stages fostered the development of jewellery designs, specifically through supplying the turquoise used. It is not always straightforward - for example, it is said that Tiffany invested \$100,000 in a turquoise mine only to find out that it was already exhausted.

The turquoise jewellery industry continued to develop and by the mid-twentieth century American turquoise was being cut in Germany. By the 1970s the popularity of the turquoise jewellery led to the import of Persian turquoise to keep up with demand. Now Chinese turquoise ▶

is imported in large quantities. Demand has also spawned imitations. By 1930 some Czechoslovakian blue glass was being incorporated in the jewellery and today blue plastic is widely used – being sold in varied hues to match the colour of turquoise from the different mines.

Pearls and coral

The first presentation on Saturday was by Dr Emmanuel Fritsch, Professor of Physics at the University of Nantes. His paper entitled 'Pearls, coral and parrot feathers' looked at the origin of natural colour in Chinese freshwater cultured pearls and how this related to the colour of coral and other organic decorative materials including, as the title suggested, parrot feathers.

A major challenge today in the gem and jewellery market is to distinguish between naturally coloured cultured pearls and those which have been artificially coloured. In order to define the criteria necessary to make such distinctions, a research project had been carried out in Nantes in association with the Aristotle University of Thessaloniki, Greece, with joint PhD student Stefanos Karampelas, and Greek advisors Spyros Sklavounos and Trynatofyllos Soldatos.

The research project used sophisticated Raman spectroscopy with several excitation wavelengths to characterize the different origins of colour of pearls. The Raman spectra showed that the main colouring agents (pigments) were relatively short polymers of the organic molecule acetylene, called polyene. The number of acetylene units in this molecular chain affected the absorbance of light by the molecule and thus different molecular chain lengths resulted in different apparent colours. Very careful resolution of the Raman spectra revealed that all naturally coloured freshwater cultured pearls from China had at least four and up to ten different acetylene segments, thus accounting for the subtle range of hues seen in natural cultured freshwater cultured pearls.

Hitherto, gemmological literature had attributed the yellow and reddish hues in cultured pearls and coral to carotenoid pigment (as the name suggests, also the cause of colour in carrots), not polyenes. The work on the Chinese freshwater cultured pearls suggested that this attribution of pearl colour to carotenoid pigments was too great a generalization.

The research was therefore extended to forty species of shell. Of these, 18 were observed to owe their colours to the simple polyenic molecules and just two to the more complex carotenoid molecule. The two carotenoid coloured shells were *pinna nobilis* ('pen shell') and *pinna rugosa*.

Once Emmanuel and his team had characterized the causes of colour in naturally coloured freshwater cultured pearls, the same techniques was applied to artificially coloured cultured pearls and to other organic gem materials. The results showed that Raman spectroscopy can distinguish natural from artificial colour in fresh water cultured pearls.

Twenty-seven species of coral were also examined using the same technology. Again, simple polyenic pigments were shown to be the cause of colour in all species with the exception of the lace coral *Stylaster*, which owes its colour to carotenoid molecules. Thus Raman allows the ready identification of *Stylaster*, an endangered species.

Diamonds

Dr David Fisher of DTC Research then brought participants up to speed on the high pressure, high temperature (HPHT) treatment of diamonds, a matter of major concern to dealers, retailers and laboratories. David referred to the importance of the 3 Ds - Disclosure, Detection and Differentiation. DTC Research, in collaboration with Element 6 (previously De Beers Industrial Diamond Division), keeps a close watch on all potential challenges to the diamond industry and constantly looks ahead five to ten years attempting to predict technical developments that might impact on the industry.

The main areas of DTC research were the synthesis of diamonds by the HPHT and chemical vapour deposition (CVD) processes and treatments, including HPHT. The effect of HPHT treatment on a diamond depends on its nitrogen and boron content, and thus on the type of diamond. Type IIa diamonds, those with no nitrogen, could be changed by HPHT treatment to colourless or pink. A Type IIb diamond with very low nitrogen content and a small amount of boron could change from brownish or grey to blue while a Type Ia diamond (nitrogen containing) would change from brown to yellow/green or yellow/orange. Rarer Type IaB diamonds could turn near colourless.

The first step in detection was to determine the type of the diamond. This could be done with DTC's DiamondSure (detects Type II), HRD's DScreen (detects types II and IaB) or SSEF's Diamond Spotter (detects Types IIa and IaB). Most major laboratories would use FTIR spectroscopy to determine or confirm the type of a diamond.

Classical gemmological study with a 10x loupe could not allow the detection of HPHT treated diamonds, although microscopic examination would sometimes reveal indications of possible treatments - such as secondary fractures around inclusions or partial healing of fractures. However, definitive detection required advanced spectroscopic techniques of which photoluminescence (PL) was a vital component.

Research into the detection of HPHT treated stones and their characterization required unequivocally untreated diamonds from many sources, diamonds treated by known techniques and under known conditions, and access to a full array of advanced spectrographic and other analytical equipment. The DTC was in the unique position of being able to lead research in the area.

Diamond treatment detection has become more complex in recent years with the introduction of multi-stage treatments, such as HPHT treatment followed by irradiation followed by annealing. The detection and characterisation of these multi-stage treatments requires sophisticated and flexible approaches, for example, using a wider range of excitation wavelengths for photoluminescence - not simply the traditional 514 nm. Even so, there are still some problematic areas where detection provides major challenges.

It was interesting to note how this requirement to look at a wide range of excitation wavelengths in diamond treatment detection mirrored Emmanuel Fritsch's experiences with the characterization of pearl coloration.

The coloured stone industry

Participants returned from the lunch break to hear Rui Galopim de Carvalho FGA DGA, Executive Liaison Ambassador and Portugal's Ambassador to the International Colored Gemstone Association (ICA), give a thought-provoking and entertaining talk entitled 'The coloured stone industry

today'. Rui explained that a characteristic of the modern coloured gem industry was the increasing trend towards vertical integration and the move in the primary markets towards China, India, the Middle East (Dubai) and Russia. It was also important to realize that the final seller had the huge responsibility of representing the entire industry to the consumer.

The growth of the new world markets would create enormous new demands and the resulting pressures on the price and availability of some gemstones might well lead to increasing markets for other natural gem materials and treated and synthetic gemstones. The price increase that has affected diamonds in the last few years may well be a consequence of a higher and consistent demand, creating opportunities for synthetic diamonds as can be seen by the increase in branding and marketing efforts from lab producers.

Rui discussed various forms of gem treatment – although he also used the provocative term 'modified' – and explained that "modified gem materials should be seen as opportunities". Treated and enhanced gems provided consumers with greater choice, but identification and disclosure were of paramount importance towards trade transparency and consumer confidence. The key factor with disclosure was how it was addressed by the retailer. The retailer must remember that however familiar he or she is with jewellery, it must still be presented as something rare and beautiful to the potential buyer. Treatments and any special care requirements had to be explained truthfully but creatively to buyers.

Treatment should be seen as adding value, by increasing commercial value and availability of gem materials. It was also something of a paradox that treatment could be seen as a positive selling point, as could lack of treatment.

As final remarks, Rui addressed the issues of fair trade and corporate and social responsibilities in the coloured gemstone sector. Today, there is an increasing awareness of such matters and field projects and study groups have been set up to operate under the auspices of development agencies and trade organizations, such as the ICA, to identify and deal with these issues.

Agates

Unfortunately Stephen Whittaker who was to have been speaking after the tea break was unable to attend, but

Brian Jackson FGA DGA of the National Museums of Scotland kindly filled the gap with a paper on 'A history of Scottish agates'. With a series of startlingly beautiful photographs of Scottish agates, Brian talked about the history, localities and characteristics of his specialist subject, as well as explaining the current theories about agate formation.

The agates formed in gas bubbles in volcanic rocks, mostly in those formed during the Devonian Period, spanning from about 417 – 354 million years ago. The most prolific source of agates in Scotland was in the Montrose area and these were first exploited commercially after the Napoleonic wars in Europe had cut off agate supplies from Germany.

Brian explained the differences between structural and colour banding, and pointed out the various features that were common to most agates, despite the varies of patterns and colours. These consistent features included a thin outer clear layer and what were termed 'tubes of escape', the fractures where the silica, in gel form, was squeezed out under intense pressure. The characteristics of these 'tubes of escape' were the thinning of the layers seemingly consistent with outward flow. The gel formation of agates had replaced the older view that silica had simply leached from the volcanic rock and entered the gas cavities. However, the actual mode of formation was still debated. The banding was a result of varying compositions and internal dynamic forces of crystallization.

Opals

On Sunday morning Emmanuel Fritsch presented his second paper – a report based on almost ten years of research at Nantes on opals. This was aptly entitled 'Shining new light on opals'.

The basic nature of opals is well enough known; chemically it is silica with between 2 and 20% water. However, there are actually four ways in which opal can be classified. The standard gemmological approach is to simply distinguish between common opal and 'precious opal', that which displays a play-of-colour. Mineralogists base their classification on X-ray diffraction patterns and thus distinguish between so-called 'A' or amorphous opal and 'CT' opal which is disordered alpha-cristobalite. There is also the less common 'C' opal which forms a series with CT opal. This mineralogical



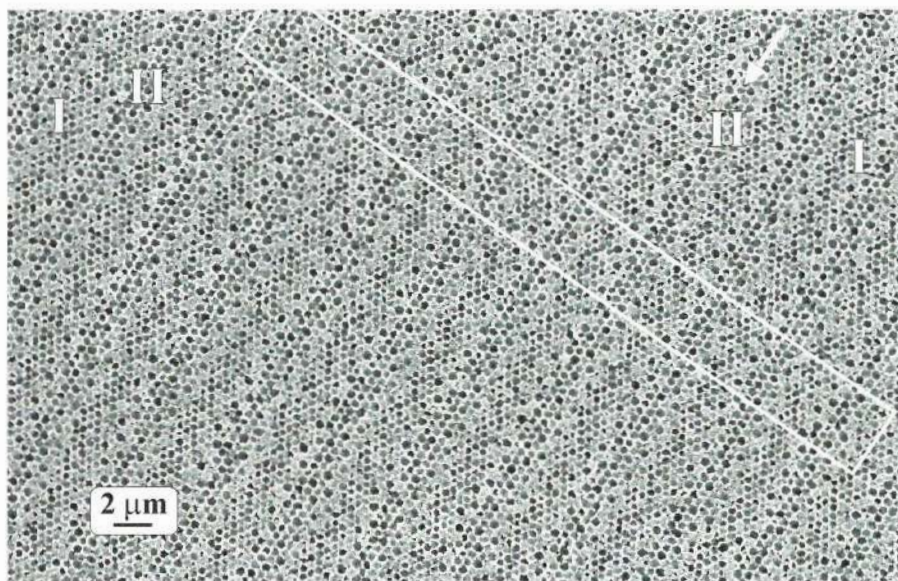
Close-up of a fine and strongly banded agate from Ballindean, Perthshire showing band thinning around the wall-banded infilled tube of escape (top right quadrant). Photo by permission of the Trustees of the National Museums Scotland.

classification had been inconvenient for gemmologists because X-ray diffraction is a destructive test. However, more recently opals have been classified on the basis of their Raman scattering. This has proved a useful diagnostic tool as it non-destructively distinguishes between A and CT opal. Finally, geologists separate opals into those of sedimentary and volcanic origin.

Research using Atomic Force Microscopy (AFM) has shown that the basic building blocks of opal are not microspheres about 200 nm in diameter but grains some 20 – 40 nm in size. These nanograins pile at random to form the structure characteristic of fire opal from all sources. Similarly the pink fibrous opal from Peru and Mexico can be shown to be CT opal composed of 10 – 40% polygorskite fibres about 20 nm in diameter.

CT opal with a play-of-colour has been shown to have two possible microstructures after etching – either microspheres composed of aggregates of tabular crystals, or a network of holes. Etching play-of-colour CT opal with hydrofluoric acid revealed a holey microstructure that was composed of two different types of silica, but further work needs to be done to characterize these.

Emmanuel showed some remarkable scanning electron microscopic views of opal structures, including some Mexican CT opal with play-of-colour that were composed of two different but optimally ▶



Electron micrograph of the first bidisperse opal CT, after hydrofluoric etching; This piece contains lepispheres of two different diameters (237 and 470 nm), cemented by nanograins (zone I: small lepispheres; zone II large lepispheres).

related sphere sizes, the growth mechanism for which was also uncertain.

The three dimensional structure of opals with silica plus air or two different kinds of silica could act as diffraction gratings, causing the play-of-colour.

Emmanuel provided four explanations as to why play-of-colour was absent in common opal. In 45% of the cases he had studied, the lack of play-of-colour was due to variation in sphere sizes; in 30% the particles were non-spherical; in 20% the spheres were of identical size but were disordered; and in 5% of cases the spheres were too large or too small to cause diffraction. The mechanisms defining sphere size and ordering were still uncertain, but presumably the speed of formation, temperature and pH played important roles.

The various colours of opal were in all observed cases the result of minute inclusions. Shades from white through yellow, orange and red to brown were often due to finely distributed iron oxihydroxides – the cherry-red colour being due to hematite, the brown to goethite or lepidocrite. However, some yellow-orange opal was coloured by realgar (arsenic sulphide) and some pink by cinnabar (mercury sulphide). The turquoise-blue opals from Peru seemed to owe their colour to chrysocolla (magnesium rich), purple opal from Madagascar was coloured by fluorite and black opal was coloured by amorphous carbon. It was also pointed out that in Mexico opal was sometimes treated

to give a black colour by wrapping it in brown paper and subjecting it to the heat of a torch.

Luminescence in opal is caused by intrinsic surface-related defects, the presence of uranium and the ratio of uranium to iron – iron acting as a luminescence inhibitor.

Trace element analysis of opals by laser ablation inductively coupled plasma mass spectroscopy (LA-ICP-MS) had shown that opal sources could be determined on the basis of trace elements and their ratios – such as the ratio of barium to calcium.

Emmanuel also touched on the crazing and whitening of opals - a common problem. Raman studies of the destabilized regions of opals showed a shift in the signal from water suggesting there were two types of water involved, including what was termed 'cristobalitic water'. Further research was required.

Amber

The final 'formal' presentation of the conference was one on 'Amber' by organics expert Maggie Campbell Pedersen FGA. Maggie presented an overview of the amber market today, explaining about the varieties of amber and amber simulants likely to be encountered and various aspects of treatments. Maggie had been at the Amber Fair in Gdansk, Poland, in March this year and was able to provide participants with up-to-date information about the Baltic amber market as well as

describing the characteristics of amber from various sources. She began with a brief recap on amber history, about its use for ornaments and jewellery from the Stone Age to modern times, and pointed out that while in the United Kingdom amber was largely thought of as a material for beads, it was far more widely used in jewellery elsewhere, often set in silver. As an aside, she noted that care should be taken when cleaning the silver components of silver-set amber jewellery because some treatments will also affect amber.

The fossil resin discovered in Australia on the Cape York Peninsula three or four years ago was of interest because it was still unclear what it is and what it should be called – it may turn out to be a resin half way between copal and amber. In any case, it is too soft for jewellery and appears to deteriorate quickly. Amber from Borneo is relatively young by amber standards – just some 15 million years old – and tends to be dull, although it is occasionally used for carvings. Dominican Republic amber is a little older (15 – 25 million years) and better known, but is not now so readily available as in the past. Mexican amber is older still, at 20 – 30 million years, and this is very suitable for ornamental use, with the rich cognac colour being considered best. The oldest family member is burmite from Burma (Myanmar) which has recently been redated to about 100 million years old. The Chinese in particular have greatly prized burmite which is the only amber to look red naturally by reflected light. The cause of this red colour is still uncertain, but its attractive appearance accounts for the many supposedly old 'red amber' carvings from China that are encountered on internet auction sites. Examples of these examined by Maggie proved to be composites or plastics.

By and large Burmese, Mexican and Dominican Republic ambers are not treated as the supply is limited. However, the same is not true of Baltic Amber (dated at between 30 – 45 millions years old) where a significant proportion on the market has been treated, and much is actually reconstituted. The treated and reconstituted amber can be difficult to detect using conventional gemmological methods. The basic treatment of Baltic amber is clarification whereby it is heated to expel the minuscule gas bubbles that give opacity. Most beads on the market have been clarified.

Some Dominican amber appears blue, but this is a fluorescence effect and the body colour by transmitted light is yellowish, not blue. This blue fluorescence can be readily seen in sunlight. The same is true of Dominican green amber – it is a fluorescence effect, not the body colour. A form of so-called 'green amber' that has become common on the market is treated amber. It has been clarified and heated, and then had its back burnt or a black backing applied. If part of the burnt, blackened back is polished away, the resulting effect can be reddish. There are a variety of other treatments being used, such as drastic surface heating to create a decorative blackened 'crust' and inverted intaglio effects where a design is selectively engraved through a blackened back of a cabochon. 'Green amber' is also being produced by heating Colombian copal several times, drying and hardening it in the process. This copal simulation of amber is becoming increasingly hard to detect.

Pressed amber, amber powder or fragments heated and pressed to shape, has been known since the nineteenth century and reconstituted amber of this type is now increasingly common. When the small pieces of amber are dirty, the particulate structure can be seen in the final reconstituted material, but when clean pieces are used, reconstructed amber can be hard to distinguish.

For the gemmologist without access to advanced equipment, such as FTIR

photospectrometry, amber simulants could be hard to detect. The low specific gravity of amber means that the buoyancy of amber in a saturated salt solution remains a useful test, but at least one plastic used to imitate amber floats. Besides, the flotation test will not differentiate between amber and reconstituted amber. 'Cherry amber' beads are also frequently encountered on the market, and these often turn out to be phenolic (hitherto wrongly termed 'Bakelite') beads. The regularity of colour and clarity are a usual warning sign.

Displays and workshops

Sunday afternoon was devoted to the popular displays, demonstrations and workshops, which are now a regular – and expanding – feature of the Scottish Conference. During the afternoon the winners of the Scottish Branch Art Schools Competition for gem-set jewellery displayed the winning entries and were presented with their prizes (see page 5).

On the beach

The Conference drew to a finish with the field trip to 'Ruby Bay' (see below). Most of the day was spent lying on the beach, scraping at the sand hoping to catch the tiny red glint of a garnet. It was voted a great day out, but the suspicion must remain that one of its most positive aspects was the chance to

spend a peaceful day lying down after the combination of interesting lectures and exuberant festivities. J.O. □

Thank you ...

The Scottish Branch Committee would like to take this opportunity to give very sincere thanks to:

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The Scottish Conference is an annual event of the Scottish Branch of the Gemmological Association organized by the Branch Committee.

Searching for garnets at Ruby Bay

On a rather cloudy, damp and windy afternoon, some of the conference delegates travelled to 'Ruby Bay' at Elie to hunt for pyrope garnets.

This very picturesque bay is the site of a long since eroded volcano. An eruption brought the pyrope garnets some 70 km to the surface many millions of years ago. Erosion has since claimed the volcano, leaving behind fine black sand which extends along the bay in patches for about 300 m, and it's within these sands that fragments of pyrope garnet can be found. These vary in colour from a deep red to a lighter orange red.



10 mm

Once down on the beach geologist Brian Jackson gave the group a brief talk regarding the geology of the bay, and how and where best to search for the garnets.

There was great discussion regarding what the tourists and dog walkers thought, seeing twenty or so gemmologists lying prone on the beach in the damp intensely searching in the black sands!

Samples were on the whole very small and fragmented, although everyone by the end of the afternoon seemed to have found something.

Gem-A's Mary Burland sparked a brief 'gold rush' after finding a sizeable piece on her 'claim' (pictured left) and suddenly that particular pile of black sand became a very popular site indeed!

The weather did not dampen the



spirits or the enthusiasm for the die-hard gemmologists amongst us; I had a thoroughly enjoyable afternoon and would like to thank the Scottish branch for a fantastic field trip. Beautiful scenery, gem finds, and great company. Gem heaven ...

Claire Scragg

Two royal collections

Major royal collections featured at Christie's London June sale

Royal jewels from two separate collections led Christie's London sale of Important Jewels on 13 June. Many of the prices realized were well beyond estimates, and Raymond Sancroft-Baker, Director of Christie's Jewellery, London, commented: "The results of the auction demonstrate the enthusiasm for jewellery of exceptional provenance and London's preeminent position in selling outstanding jewellery."

Collection of the House of Savoy

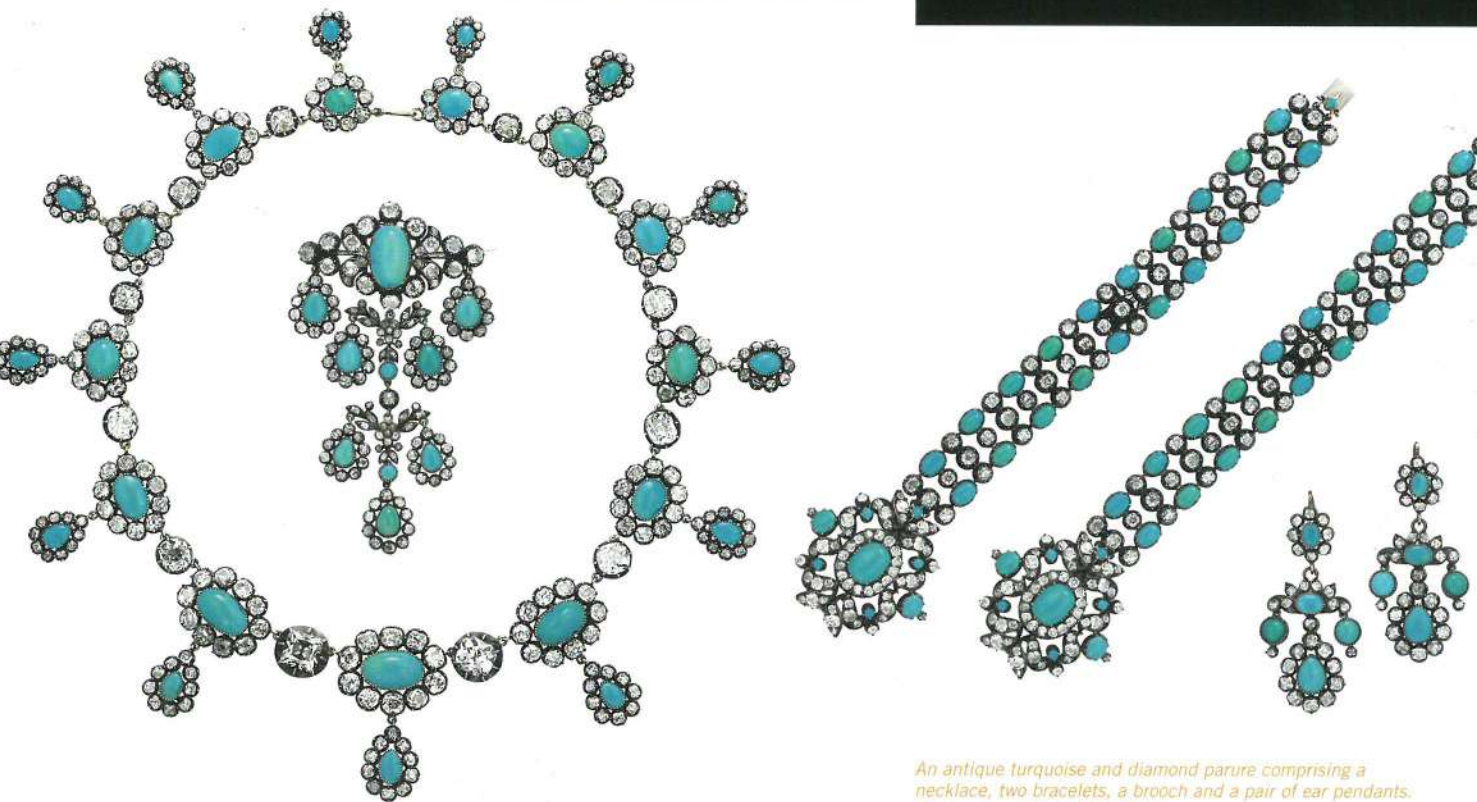
Leading the jewels from the Collection of HRH Princess Maria Gabriella di Savoia, inherited from her mother HM Queen Maria José of Italy, was a diamond tiara (pictured right) by Fabergé. Her Royal Highness

Princess Maria Gabriella di Savoia is the daughter of His Majesty King Umberto II and Her Majesty Queen Maria José of Italy, who inherited this tiara from her brother Prince Karl Theodor, the Count of Flanders, upon his death. In his will, the Count referred to this jewel as 'The Empress Josephine Tiara' because it was said to be the briolette-cut diamonds in the tiara were a gift from Tsar Alexander I of Russia to the Empress Josephine. The Tsar used to bring presents for Josephine when he visited her at La Malmaison, following her divorce from Napoleon.

The tiara was created by August Holmstrom (1829-



An antique diamond tiara with a row of briolette-cut diamonds, centre pear-shaped diamond of approx. 8 carats, circa 1895 by Fabergé. The tiara sold for £1,050,400, a world record price for a tiara at auction. Photo courtesy of Christie's Images Ltd. 2007.



An antique turquoise and diamond parure comprising a necklace, two bracelets, a brooch and a pair of ear pendants. The parure sold for £120,000. Photo courtesy of Christie's Images Ltd. 2007.

1903) circa 1890. He joined Gustav Fabergé's workshop as chief jeweller in 1857 and was made workmaster in 1870, thereafter responsible for most of Fabergé's greatest jewels. Set with old-cut diamonds and briolettes, the tiara is mounted in silver and gold on a gold wire frame.

A turquoise and diamond parure, comprising a necklace, two bracelets, a brooch and a pair of ear pendants, circa 1830, was given as a wedding gift from the King and Queen of Belgium to their daughter when she married the Crown Prince of Italy, who later became King Umberto II. Queen Maria José wore the suite two days before her wedding for the reception in the Royal Palace, on 6 January 1930. The necklace was mounted as a bandeau in the style of the period and the Milanese fashion house Ventura created a Royal train, embroidered in silver thread with flowers entwined with the Savoy knot, to match the suite.

Russian jewels

More can be learnt about items in the Savoy collection from the beautifully illustrated book *Jewellery of the House of Savoy* by Maria Gabriella of Savoy and

Stefano Papi, Mondadori Electa Spa, Milan, 2007. ISBN 978-88-370-5241-6.

The collection of Her Royal Highness Princess Elizabeth of Yugoslavia included historic Russian jewellery with examples of Fabergé and Cartier. Many of the jewels originally formed the collection of Princess Elizabeth's great-grandmother, Her Imperial Highness Grand Duchess Maria Pavlovna (1854-1920), whose collection was one of the largest of the Imperial family.

Included in the sale was an historic royal portrait brooch of Prince Nicholas of Greece and Grand Duchess Elena Vladimirovna of Russia (illustrated right), to commemorate their marriage in 1902.

Christie's state that the jewels, originally from the collection of HRH Grand Duchess Maria Pavlovna, would have been lost forever had it not been for a single act of human kindness. During the Russian Revolution the Duchess fled the country leaving everything including her collection of jewellery in the family's palace in Moscow. A young English gentleman named Bertie Stopford, who worked at the British Embassy in St. Petersburg, managed to get into the Palace and rescue the abandoned jewellery, putting



A royal portrait brooch of Prince Nicholas of Greece and Grand Duchess Elena Vladimirovna of Russia. The brooch sold for £72,000 against the estimate of £8,000 to £12,000. Photo courtesy of Christie's Images Ltd. 2007.

it into two suitcases, which he returned to her in 1917. Over time the collection has been dispersed into other private collections including that of Her Majesty Queen Elizabeth II, in which a tiara originally acquired by Her Majesty Queen Mary in 1921 from HRH The Grand Duchess now resides. □

UK Auctions

BONHAMS

www.bonhams.com

Knightsbridge (t: 020 7393 3900)

Jewellery: 11 July

Oxford (t: 01865 73252)

Jewellery: 17 July, 14 August

Ipswich (t: 01473 740494)

Racing Sale at Newmarket (racing jewellery including stick pins and brooches): 20 July

CHRISTIE'S

www.christies.com

South Kensington, London (t: 020 7930 6074)

Jewellery: 24 July

Fine Jewellery: 11 July

DREWEATT NEATE

www.dnfa.com

Neales, Nottingham (t: 0115 962 4141)

Affordable Jewellery and Silver: 7 August

FELLOWS & SONS

www.fellows.co.uk

Birmingham (t: 0121 212 2131)

Second-hand Jewellery and Watches: 5 and 19 July, 9 and 23
Antique and Modern Jewellery: 12 July

LYON AND TURNBULL

www.lyonandturnbull.com

33 Broughton Place, Edinburgh (t: 0131 557 8844)

Jewellery and Silver: 11 July

WOOLLEY AND WALLIS

www.woolleyandwallis.co.uk

Salisbury, Wiltshire (t: 01722 424500)

Jewellery: 26 July

Dates correct at time of going to press but may be subject to alteration.

The Nacred and the Dead

This month Stone Scoop has a pearly theme, to complement our 2007 Conference which focuses on Pearls and Jade (London, 28 October see www.gem-a.info/membership/conferences.htm). What follows is a bit of historical perspective for those that think Chinese freshwater cultured pearls are a relatively new phenomenon.

History and culture

This year is the 300th anniversary of the birth of Linnaeus, the Swedish scientist who experimented with the production of cultured pearls – indeed some samples of his pearls are owned by the Linnaean Society in London and have been included in the exhibition Pearls: A Natural History, most recently seen in Abu Dhabi.

As Europeans congratulate themselves on this early accomplishment in pearl culturing, it is worth remembering that the Chinese have been doing something similar for centuries.

Johann Beckmann describes the Chinese approach to culturing pearls in his section on Artificial Pearls published in 1786 in *Beiträge zur Geschichte der Erfindungen* (published in Leipzig in several volumes between 1780 and 1805). We can use the translation from the 1846 English version – John Beckman, *History of Inventions and Discoveries*. This describes how the Chinese wait until the summer when “the mussels repair to the surface of the water and open their shells” and then insert into the shell “five or six

small beads, made of mother-of-pearl, and strung on a thread.” A year later “the mussels are drawn up and opened, the beads are found covered with a pearly crust [‘coating’ might be a more sympathetic translation of the original German], in such a manner that they have a perfect resemblance to real pearls.” Beckmann observed that the truth of that information cannot be doubted, but that “some experiments made in Bohemia for the same purpose were not attended with success.”

Beckmann’s 1786 account was also presumably the source of a report in 1815 in *The New Monthly Magazine and Universal Register* (vol. 4, p.141), that repeats the description of the Chinese process and explains that when the mussels were opened “the artificial pearls are found covered with a new coat, which fully equals in beauty the surface of the genuine ones.”

Not surprisingly, Beckmann noted that “The invention of Linnaeus cannot be called altogether new.” However, he knew Linnaeus personally and records something of Linnaeus’s work. He tells us that Linnaeus informed the Swedish King and Court in 1761 that he had “discovered an art by which mussels might be made to produce pearls” and had offered “to disclose the method for the benefit of the kingdom.” This did not happen and the secret recipe, written on paper and sealed, was eventually sold for a high price to a Mr Bagge, a merchant of Gothenburg. In the

1780s Bagge’s heirs sought to sell it, but Beckmann admits he was not aware of who the buyer was. At this point the translator of the 1846 English version of Beckmann’s work added the footnote that according to Linnaeus’ biographer, the recipe was said to be in the hands of a Dr J.E. Smith in London. Dr Smith was the Founder and First President of the Linnaean Society. Linnaeus had shown Beckmann “a small box filled with pearl” and told him that “these pearls I made by my art, and though so large they



are only five years old.” Linnaeus’ son confirmed that his father had used the *unio margaritifera* in his experiments – the freshwater mussel.

Dickens’ rows

Both Linnaeus and the early Chinese ‘cultured pearl’ producers were mentioned by Charles Dickens, though he says the Chinese versions were produced by “introducing small shot and sand between the mantle of the animal and its shell.” This was in his *Household Words* for 5 February 1859. Dickens adds that a Mr Gaskoine “has a specimen consisting of two strings of pearls ...”. Is this the earliest cultured pearl necklet on record?

Interference

A footnote added in the revised 1846 Fourth Edition of the English translation of Beckmann (as cited above) provides an interesting early scientific account of the play of colours seen with pearls. The note explains: “When the surface of a pearl is examined with a microscope, it is found to be indented by a large number of delicate grooves, which by their effect upon the light give rise to the play of colours ... the surfaces of the grooves, from their varied inclinations, reflect the incident white light at various angles, hence the correspondence of the luminous undulations is interrupted and some of them check or interfere with one another, others continue their course. Now, ordinary white light being a mixture of coloured rays, when some of these are checked or interfered with in their progress, the remainder continue in their course and appear that colour which results from the ocular impression communicated by them.” □

J.O.

Durch die Perlen von den Muschelthieren selbst machen lassen, die Erzählung des Philosophus einigermassen zu bestätigen. Zu der Zeit im Anfange des Sommers, wann sich die Muscheln an die Oberfläche des Wassers begeben, und sich öffnen, wirft man in jede eine kleine Schnur von fünf oder sechs aus Perlmutter gemachten Kügelchen. Wenn nach einem Jahre die Muscheln wieder herausgeholt und geöffnet werden, findet man die eingelegten Kügelchen mit einer Perlenhaut dergestalt überzogen, daß sie völlig den echten Perlen gleichen. Diese Nachricht darf man nicht in Zweifel ziehen, ungeachtet einige in Böhmen angestellte Versuche nicht

Part of the passage describing Chinese freshwater cultured pearls from Johann Beckmann’s *Beiträge zur Geschichte der Erfindungen*, Leipzig 1786 (2nd Vol. 3rd part, page 316).

Forthcoming SJH lectures

Tuesday 25 September

The Royal Society, 6-9 Carlton House Terrace, London SW1

SIMON FRASER
Men and Jewellery

The nineteenth-century reformation of men's dress into a formalized set of costumes also codified what jewellery men wore and what sorts of jewellery were appropriate for a man. The austerity inherent in those codes is still seen as essential to the public construction of masculinity in the developed world. Despite much social change, men on the whole still don't wear much jewellery. Ranging across groupings including hip hop and rock music industry performers, body modifiers and consumers engaged in branded goods purchasing, the paper will examine how men really wear jewellery in 2007.

Simon Fraser is Course Director, MA Design by Project, Central Saint Martin's College of Art and Design, University of the Arts London.

Tuesday 23 October

The Society of Antiquaries, Burlington House, London W1

DAVID POSTON
My Life and Work

David Poston trained as a jewellery designer at Hornsey College of Art from 1967, initially under Gerda Flockinger. His belief that jewellery will contribute better to society if its role is challenged, informs all of his work, and since 2001 he has been exploring the presentation of jewellery 'as worked', and has thus increasingly abstained from post-manufacturing refinement and the concealment of process. He also incorporates some narrative elements to raise questions and provoke responses. □

David Poston, 'Well, well, well.' Bangle, 2006. Recycled steel (laser-welded treacle tin), wood. 150 mm x 170 mm x 90 mm. The title refers to 'Alice in Wonderland'. Courtesy of Lesley Craze Gallery.



SJH Meetings

All lectures start a 6:00 p.m. sharp and are followed by an informal reception with wine.

Please note the changes of venue:

Tuesday 26 June

The Royal Society, 6-9 Carlton House Terrace, London SW1

JUDY RUDOE
Queen Charlotte's Jewellery

Tuesday 25 September

The Royal Society, 6-9 Carlton House Terrace, London SW1

SIMON FRASER
Men and Jewellery

Tuesday 23 October

The Society of Antiquaries, Burlington House, London W1

DAVID POSTON
My Life and Work

Tuesday 27 November

The Society of Antiquaries, Burlington House, London W1

KATE HARRISON
Jewellery to Medal-making

Dates for Tuesday meetings in 2008:

22 January, 26 February, 22 April, 20 May, 24 June, 23 September, 28 October and 25 November. Details of venues and speakers to be announced.

Meetings are open only to SJH members and their guests. A nominal charge is made for wine to comply with our charity status. For those requiring further information, contact details for the Society are given on p.2.

The Society welcomes new members and would ask them to make themselves known at meetings to Committee Members. The convivial partaking of refreshments after lectures is also an opportunity for members to exchange views and information about jewellery, and is an important part of the Society's activities.

For the latest information on forthcoming events visit the Society's website at:

www.SocietyofJewelleryHistorians.ac.uk

Gem-A Conference 2007

Sunday 28 October

The Renaissance London Heathrow Hotel

GEMS OF THE ORIENT - PEARLS AND JADE



The 2007 conference celebrates those wonderful gems of the Orient, pearls and jade. An international panel of speakers has been invited to provide a stimulating and varied programme covering subjects ranging from the history of the jade roads to the latest identification methods for pearl.

As well as the presentations, the film 'The Pearl Coast', a documentary from the Pearl Museum at the National Bank of Dubai that includes historic footage of pearl diving, will be shown. The latest books and equipment from Gem-A Instruments will be available for sale during the Conference – take time during the breaks to see what's new.

The conference is to be held at the Renaissance London Heathrow Hotel, conveniently placed for the airport and major motorways.

Additional events

As in previous years, a programme of events and workshops has been planned to coincide with the Conference.

- **Graduation Ceremony:** The annual ceremony for 2007 graduates is to be held at Goldsmiths' Hall in the City of London on Monday 29 October.
- **Private viewing of the Crown Jewels:** A private viewing of the Crown Jewels in the Tower of London, with a guided tour by Crown Jeweller David Thomas, is to be held on the afternoon of Tuesday 30 October.
- **The School of Earth Sciences, Kingston University:** Half-day visits to the School have been arranged for the mornings of Monday 29 and Tuesday 30 October. As well as learning about current research on inclusions in minerals from Professor Andy Rankin and his team, there will be an opportunity to visit the School's laboratories which house equipment such as the Raman microprobe, scanning electron microscopes and electron microprobes.
- **Gem Discovery Club:** A specialist evening is to be held on Tuesday 30 October. Full details will be published on our website at www.gem-a.info/membership/gemClub.htm nearer the date.
- **One-day workshops:** Two workshops are to be held at Gem-A London to coincide with the Conference. The first will be 'Pearls – Nature's Gift' on Friday 25 October and the second 'Bead Stringing' on Wednesday 31 October. □

The Conference brochure and booking form will be circulated to Gem-A members during July.

Provisional programme

Shigeru Akamatsu *Mikimoto, Japan*
One-hundred-year history of cultured pearls

George Bosshart *Switzerland*
The old and new jade roads – from the Burmese jadeite mines to China's vast jade markets

Professor Henry A. Hänni *SSEF, Switzerland*
How to make a cultured pearl

Mimi Ou Yang Chiu Mei *Hong Kong Gems Laboratory*
Aspects of green coloration in jadeite jade

Kenneth Scarratt *GIA Research (Thailand)*
Identification of rare pearls and pearl treatments

Elisabeth Strack *Gemmologisches Institute, Germany*
Computer tomography – a new testing method for pearls



Shigeru Akamatsu



George Bosshart



Professor
Henry A. Hänni



Mimi Ou Yang
Chiu Mei



Kenneth Scarratt



Elisabeth Strack

Visit www.gem-a.info for the latest information on the Conference and additional events, and for full details of the workshops.

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