Gems&Jewellery

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

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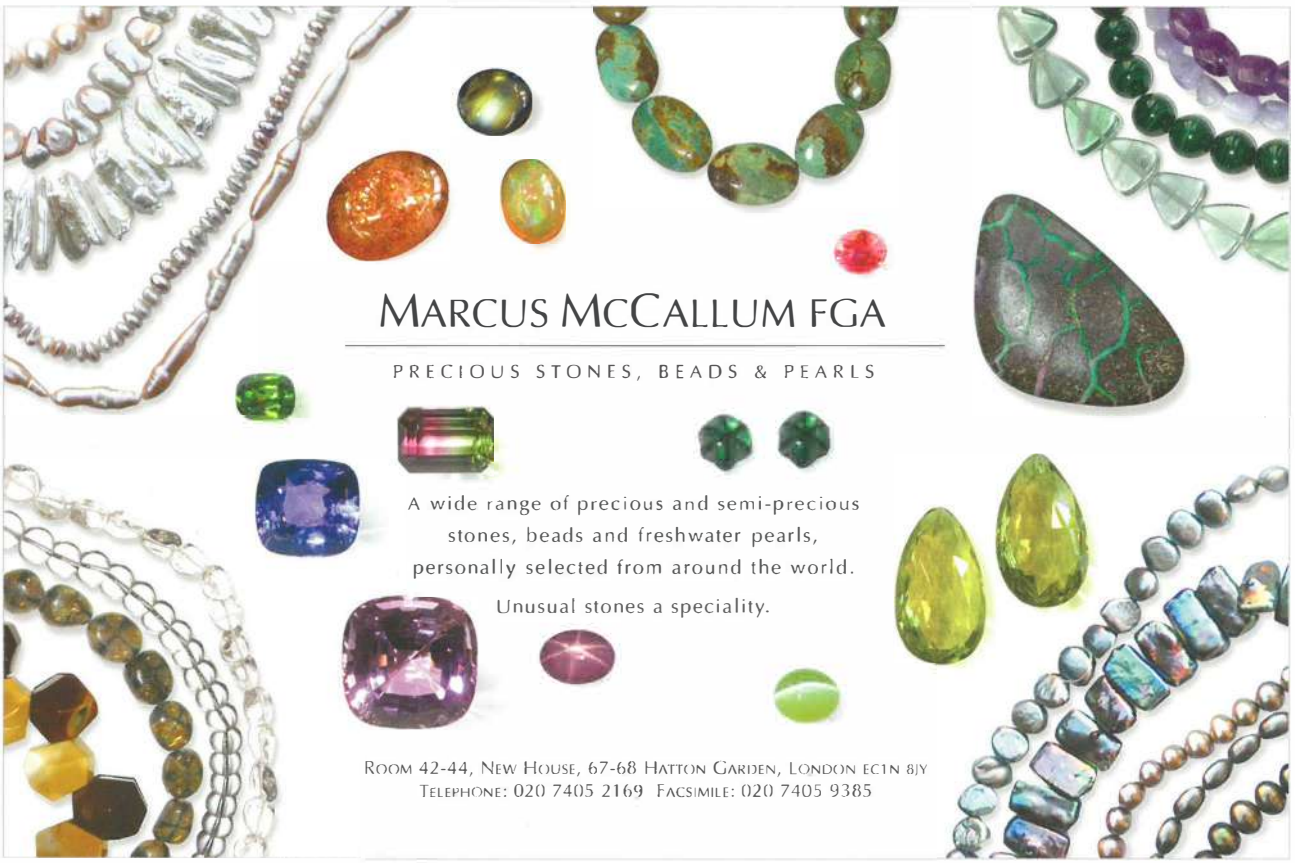

Editorial

Testing Gems and Jewellery

The Gemmological Association is proud to run the oldest gemmological laboratory in the world; after all, it was the one on which most others were modelled. But there can be no resting on our laurels. We are building upon our expertise to expand the international services, support and education we offer.

Jewellery Authentication Service

Our laboratory now examines jewellery-related materials and decorative objects as well as 'just gemstones'. We've always done this to some extent, but there is a greater need now for research on, and authentication of, historic jewellery and precious metal objects. We can offer a unique service here that is a natural extension of our capabilities. Characterizing the glass filling in a gem is much the same as characterizing the enamel on a Georgian ring.

Our Expertise

The gem testing in our laboratory is still headed by Stephen Kennedy, a gemmologist of the highest international standing with particular skills in the identification of treated corundum and pearls – areas where our laboratory's services are frequently sought. I add the historic jewellery and precious metal characterization abilities, my area of research and expertise for more than 30 years. In our lab we also have Carole Gordon and Tim Lodge, both experienced diamond graders and gemmologists. In addition within our London headquarters are five people with other primary responsibilities who are on tap to support the laboratory with top level gemmological and mineralogical skills, and the vital third pair of eyes necessary for professional diamond grading. Guidance from experts on our Council, such as President Alan Jobbins and Chairman Prof. Alan Collins, is also readily available. I doubt that many gemmological laboratories in the world can match our combined knowledge, experience and resources.

Technology

Equipment is always a challenge. We could spend a million pounds tomorrow and still not have all the equipment that we need to find ways to counterbalance the ingenuity of the gem treaters and simulators. We have had, and continue to receive, generous donations towards the purchase of the most vital equipment for which we are very grateful. However, we must also find access to equipment that we cannot own ourselves, and to seek joint research opportunities and funding. Now, as a result of recent discussions, we have convenient access to most of the high-level analytical and examination equipment we need and we will soon announce joint research projects that will greatly contribute to our database of information.

We are a non-profit organization devoted to providing gemmological education and support. We are here for the good of all those involved with gems and jewellery, whether professionally or as amateurs. We are here for the future of gemmology and the future knowledge of jewellery of all periods – futures in which a long established laboratory with expertise, independence and integrity will play a vital role.

Jack Ogden

Chief Executive Officer, Gemmological Association

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Gems&Jewellery
(Formely Gem & Jewellery News)

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Piggy in the middle - an endangered species

HARRY LEVY considers the gem supply chain and the latest developments in synthetics and treatments

Changes continue unabated in the jewellery industry. If it is not technical innovations to improve the appearance of gemstones or to synthesize them, then the old and established methods of distribution are being tampered with.

The demand for jewellery continues as before, but every level in the chain of bringing an article to market is changing. The end user is being bombarded with information that he can buy the piece of jewellery cheaper; the traditional high street jeweller has to contend with the multiples and they are being challenged by the larger supermarket chains and discount stores such as WalMart. The brick-and-mortar outlets are competing with television selling channels and these are now losing out to the myriad of websites in cyberspace.

The ultimate rationale is for those who have the raw materials to deal directly with the end user. The traditional method has been to add value to the product as it goes from one hand to the next and each stage is done by a different group. Thus in the gem industry the miners sell their raw products to dealers, they sell them to cutters, then they pass to cut-stone dealers, then to manufacturers of jewellery. They may use outworkers who are mounters or casters, then setters, then polishers, then wholesalers who sell to shops, who then deal with the public.

To reduce the cost one has to either become more efficient in the production method, now known as 'lean manufacturing', or to do several of the processes 'in house'. The rationale is to reduce the number of hands in the distribution chain. Ours has been an industry of small outfits and it is these who stand to lose the most as they are driven out of business. It has happened in other industries and it is happening in ours. The irony is that those who try to eliminate others in the distribution chain will eventually find their own position becoming redundant.

In the gem industry the miners are trying to cut their own stones.They become dealers and by-pass other dealers, going direct to manufacturers. The manufacturer now tries to cut out the wholesaler by selling direct to the shop, and some now attach their own shop to their factory.

One way of making the distribution chain more efficient is by reducing the number of links in the chain. This has been the rationale of the Diamond Trading Company (formerly known as De Beers), who have reorganized their sight holders to link up directly with manufacturers, especially those with their own shops and stores. This makes the chain easier to control, eliminates treated stones and synthetics, and ensures that the product is untainted by possible politically incorrect products or methods of manufacture. Thus conflict stones and illicit stones (those that could be used by terrorists or criminals to launder their money), and sweat houses and child labour are eliminated.

The ultimate rationale is for governments to get involved in this chain. This too is now happening. South Africa, one of the main sources of rough diamonds and gold, now wants to control and benefit from the added-value sections. The government started by forbidding the export of the larger pieces of diamond rough. The size of export-controlled stones is now decreasing, and there is an ever increasing demand to have the stones cut and polished in their own country. The next step is maybe to ban the export of polished stones and have these turned into jewellery locally, and similar steps could be used in the precious market. This scenario is no fantasy. Other producing countries of rough diamonds are beginning to cajole and urge, and possibly eventually control the export of rough diamonds. This could also happen to the coloured gem industry. Groups are already considering moving their jewellery production outfits to countries that have rough stones, and countries such as China discourage the export of even cut and polished stones by levying export taxes on them, encouraging the exportation of finished jewellery.

All this sounds alarmist. It will probably take years to implement, if at all, and since change is possible at any future date, the path I have outlined above may never be taken. But the smaller middlemen are all seeing a decline in business.

Synthetics and treatments

The advent of synthetic diamonds continues to make good press, the latest being an article in *Newsweek* of 14 February 2005. Although synthetic diamonds are a reality, talking to the producers continues to indicate that the production of larger stones, especially colourless ones, is still too expensive and it is as cheap to dig them out of the ground. The technologists in our trade have and are still working on detection methods and equipment. They are at this stage expensive, large and difficult to use by the average jeweller. But the research will continue until we have instruments that could be used by jewellers in their travels, to detect not only synthetics but also treated stones.

The treatment of stones continues, and new techniques are constantly being developed. The emerald trade has not yet fully recovered from the use of fillers in fissures, especially resins. The trade is beginning to tolerate beryllium treated corundums, but other light metals are now being used in this process. Thus someone who tries to be honest and disclose that the stones being sold have had their colour changed by heating in the presence of beryllium, may be found to be lying as lithium may have been used.

The latest treatment to come to light is the fracture filling of low-grade rubies

with a new lead-glass which not only hides the cracks (as it has a refractive index similar to corundum) but also improves the colour of the stone. Detection at this stage is somewhat difficult for a dealer. As the heating process is done at a lower temperature not all the silk in the stone disappears. One can see occasional bubbles and there is often a flash effect as was seen with the Yehuda treated diamonds and emeralds. But in this instance one sees a purple effect. The exact disclosure is being discussed by the international trade organizations. Since no one advertises a new treatment, discovery comes about when there is a sudden abundance of a certain size and colour of stone with large price reductions. Experts in the ruby trade who were deceived by these new glass-filled stones, became suspicious when they were offered stones at relatively cheap prices.

The trade is now faced with detection of this process and how it should be disclosed. Most stones are now heated, as are these glass-filled rubies. So merely to disclose them as 'heated' is no longer enough. Different types of heat treatment are used on different stones and since a low grade stone is improved to look like a better quality one, its price increases. One of the factors affecting price is the rarity of the stone, so if we have an increase in the number of better looking stones the price must come down. This is the crux of the problem as some are tempted to sell similar looking stones at similar prices. If an end user pays too much for a treated stone and becomes aware of this, he will lose confidence in these products. The trade is now aware of this and is trying hard to make disclosure more effective.

Trying to preserve the integrity of the jewellery trade has been high on the agendas of recent international meetings including the ICA Congress in Bangkok held in mid-February and the CIBJO Congress in Hong Kong in March. Information on disclosure and terminology will therefore be discussed further in the June issue of *Gems & Jewellery* when the outcome of discussions at these meetings is known. □

The Valentine's Day wolf and other fifty-year-old gem stories

On Valentines day, no less, 14 February 1955 the General Electric Company announced that they had synthesized diamonds using high pressure and temperature. In an article in *The Journal of Gemmology* that April, Basil Anderson described how a 0.1 carat diamond had been produced.

He observed that after years of people 'crying wolf' about synthetic diamonds, "... the Wolf is not merely at the door but has come right inside." Anderson added, "So far at least, the news has been handled with commendable restraint and there has been no absurd panic to undermine the world confidence in the value of natural diamonds." The word panic might well have come to jewellers' minds – the same issue of *The Journal* also included an article by Dan Mayers entitled 'Strontium Titanate: A New Synthetic Gemstone'. (In fact strontium titanate had been developed a few years earlier and a very brief note was included in *The Journal* in July 1952.)

If we keep in the 50th anniversary spirit of things, we can note that the January 1955 issue of *The Journal of Gemmology* included an article by E.H. Rutland in which he described how 'A microscope specially designed for the gemmologist and jeweller' had been produced for the first time in the UK. It included 'an ingenious stone holder', dark ground illumination, polarizers, and would take the 'new hand spectroscope' and the Rayner dichroscope. As Rutland says, "Messrs. Rayner ... are to be congratulated on their enterprise, ingenuity and workmanship."

Those gemmologists whose pockets would have been over-stretched by the purchase of a microscope would have been interested in a letter from J.N. Dave from India published in April 1955's *Journal* that remarked on the boon of having some gemmological methods that did not require a well-equipped laboratory. Dave described a way to hold the table facet of a gem near to the eye and then look through the stone at a light source.The doubling of the images of the bulb filament "... will enable a person to identify many stones without much eye-strain and from an easy chair." This is the forerunner of the visual optics approach honed and made famous by Alan Hodgkinson. □

Rock 'n' Gem Shows

9 and 10 April
Cheltenham Racecourse, Prestbury Park, Cheltenham, Gloucester

23 and 24 April
Newark Showground, Winthorpe, Newark, Notts

14 and 15 May
Alexandra Palace, Wood Green, London

11 and 12 June
Newcastle Racecourse, High Gosforth Park, Newcastle-upon-Tyne

18 and 19 June
Kempton Park Racecourse, Staines Road East, Sunbury-on-Thames

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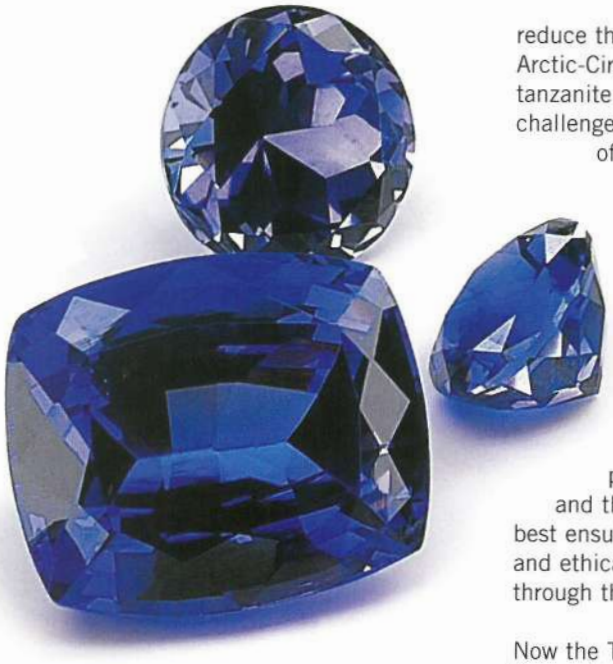
Tanzanite – new era, new markets, new marketing



A group of three fine tanzanites. Photo courtesy of the TanzaniteOne Ltd.

In gem terms, tanzanite is the new kid on the block. The single source of this beautiful gemstone was discovered only in 1967, in the shadow of Mount Kilimanjaro in northern Tanzania, East Africa, and first launched on the world market and named by none other than Tiffany & Co., New York. Like any valuable and diminishing natural resource in a developing country, tanzanite has to be marketed with considerable care and forethought, not simply to ensure high economic return, but to act in the best interests of Tanzania and the local communities, wildlife and environment.

Things are very different now from the grab-and-run approach to gem exploitation by colonial powers a century ago. Recent years have seen a marked and perhaps long overdue awareness by the jewellery industry of a whole gamut of political, ethical and environmental issues, from conflict diamonds to waste from gold mining. We have seen initiatives to reduce child labour in gem cutting and action to reduce the threats to polar bears from Arctic-Circle diamond mining. Even tanzanite has not been immune from challenges – from early talk of deplorable mine safety to allegations in the *Wall Street Journal* a few years ago that smuggled tanzanite was being used to finance the al-Qaeda terrorist network (an allegation for which the US State Department found 'no evidence'). Out of these allegations came a pledge by the gem industry and the Tanzanian government to best ensure legitimacy and high social and ethical standards right up through the tanzanite supply chain.

Now the Tanzanite Foundation had been set up, an independently positioned, non-profit organization dedicated to the development of the tanzanite industry. The Foundation's guidelines seek to ensure trade and consumer confidence by encouraging the entire industry to adopt the highest professional and ethical standards. The Tanzanite Foundation will encourage legitimate employment practices, a transparent route to market, and best practice social and environmental principles.

The Tanzanite Foundation has also developed a grading system, its Tanzanite Quality Scale© and the Mark of Rarity©. They inscribe a microscopic logo onto the table of qualifying cut and polished tanzanites to guarantee the quality, grade, source and ethical provenance of tanzanite and tanzanite jewellery. This symbol can also be stamped onto qualifying tanzanite jewellery. Of course, the Mark of Rarity© may only be used under licence by the Tanzanite Foundation's dealer and manufacturer members. Membership of the Tanzanite Foundation is open to all industry participants, from miners through to jewellery retailers, subject to certain criteria.

One key objective of the Tanzanite Foundation is to stimulate consumers. In mid 2005, the Tanzanite Foundation will launch a global promotional campaign, working alongside high-end jewellery brands and prominent jewellery designers. You can find out more at www.tanzanitefoundation.org

Simulants and Identification

With this new marketing initiative for tanzanite it is important to remember that as with all attractive gemstones, tanzanite has spawned a variety of imitators since its introduction in the late 1960s. These include blue

The Tanzanite Foundation 'Mark of Rarity©' that will be engraved on qualifying tanzanites and may be stamped on qualifying jewellery.

Tanzanite Mining. Photo courtesy of TanzaniteOne Ltd.

synthetic sapphire, yttrium aluminium garnet (YAG) and a blue polycrystalline glass. Various doublets have also been reported, including tanzanite crowns with colourless synthetic spinel pavilions. However, the most plausible pretender is synthetic forsterite which first appeared in 1999. Despite frequent and misleading statements to the contrary, true synthetic tanzanite has not yet been produced. Synthetic forsterite sells for less than a tenth of the price of tanzanite and we see some in jewellery offered for sale in Britain, although it is seemingly more prevalent in some other parts of the world. When not pretending to be genuine tanzanite, synthetic forsterite is sometimes marketed under the name of

An example of synthetic forsterite from Gem-A's teaching and research resource.

'Tanzanion'. A ring set with synthetic forsterite passed through the Gem-A laboratory recently, as noted on the Gem-A Mailtalk news.

Synthetic forsterite could easily fool the unwary. It has similar blue/purple pleochroism to tanzanite and shares its biaxial+ optical character. Synthetic forsterite can be detected by its slightly lower refractive index (1.635 – 1.670) compared to tanzanite (1.69-1.70). Tanzanite also appears a slight reddish-orange colour through the Chelsea filter, synthetic forsterite does not. The polysilicate glass lacks the dichroism, but can appear red through the Chelsea filter. The YAG simulants fluoresce yellow to red under UV light, tanzanite is inert. The Hanneman tanzanite filter essentially combines the Chelsea filter with a dichroscope and will separate Tanzanite from its imitators – although the tanzanite doublets need watching. □

Faceted pearls

MAGGIE CAMPBELL PEDERSEN takes a close look at some faceted blue pearls

Faceted pearls have been around for some time. At the top end of the market are the faceted black Tahitian pearls that are used in very expensive designer jewellery, whilst at the other end are pearls of the type illustrated in the photographs. These particular pearls are Chinese and were purchased for a few dollars at the Hong Kong Jewellery Fair last September.

There has been much speculation as to the treatments and processes used in the present day cultivation of pearls in China, with reports that some pearls sold as 'non-nucleated' do, in fact, contain a nucleus. Also, it has been suggested that some faceted pearls are non-nucleated pearls covered in a layer of coloured wax which has been faceted, leaving the pearl inside intact.

Close inspection of the illustrated pearls **(1)** left me totally puzzled. The workmanship was of poor quality, the facets were uneven, and in some areas an outer layer had obviously been polished away, exposing an inner layer of a slightly different colour. I could find no indication of a wax coating, but when I cut the first pearl in half a metallic bronze pearl fell out, almost suggesting that there was indeed a nucleus **(2)**. The bronze colour showing through parts of the blue dyed layer of nacre gave an uneven overall colour to the finished pearls **(3)**. Further, some of the blue dye came off when the pearls were handled.

At this point I consulted with Stephen Kennedy, who examined the pearls at the Gem-A laboratory. An X-ray showed nothing of any consequence, but visual examination suggested that the pearls were probably originally of a poor colour and quality. The nacre seemed to have become brittle with treatment and therefore liable to split, and the dye had penetrated all the way round some of the growth rings. The pearls were most probably faceted after they were dyed, though this is not certain. Faceting prior to dyeing would have enabled the dye to seep into the layers more readily and a final polish could then have removed some of the colour, giving the patchy appearance.

The conclusion was therefore that the pearls were non-nucleated but of inferior quality, and that they had been treated (dyed and faceted) to make them more saleable. □

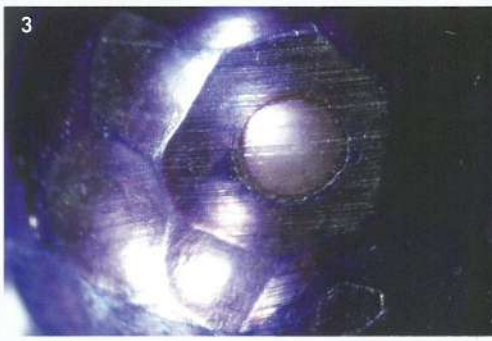
1

Strands of blue faceted pearls.

2

Cross-sections of two pearls, showing concentrations of dye and poor colour of original pearl.

3



Detail of pearl facets, showing underlying layer.

Gem-A in Tucson

Gem-A had a major presence at the AGTA Gem show his year. Our booth acted as a magnet for members, tutors, students and those enquiring after membership and courses. It was a strong reminder that Gem-A is a truly international organization. Fifty per cent our membership is from outside the UK.

The highlight was the Gem-A USA gala dinner arranged at the Marriott University Park Hotel by Gem-A USA director, Anne Dale. The evening was an opportunity to introduce new Gem-A CEO Jack Ogden to members and friends of Gem-A, and present his predecessor Terry Davidson with an award in appreciation of his vital role in Gem-A USA's growth. Renowned gemmologist John Koivula, formerly of the GIA and now with AGTA, was also introduced as a new member of Gem-A USA's advisory board.

The Gala Dinner, kindly sponsored by Stuller Incorporated, one of the largest jewellery manufacturers in the world, also underlined the Gemmological Association's central role in the growth of gemmology over almost a century. There were representatives present from numerous other organizations, including the Accredited Gemologist Association (AGA), American Gem Society (AGS), American Gem Trade Association (AGTA), American Society of Appraisers (ASA), Gemological Institute of America (GIA), Manufacturing Jewelers and Suppliers of America (MJSA), National Association of Jewelry Appraisers (NAJA) and the Swiss Gemmological Institute (SSEF) as well as gemmologists and representatives of jewellery and gemmology schools from all around the world, from China and the Far East to Madagascar.

North America is a major area of growth for the Association and we are grateful to Anne Dale and her Advisory Board for their hard work and boundless enthusiasm. □

E. Alan Jobbins presented with award

At their annual gala in Tucson this year the Accredited Gemologists Association (AGA) presented E. Alan Jobbins, President of Gem-A and SJH, with the Sixth Annual Antonio C. Bonanno Award for Excellence in Gemology. The award was received on Alan's behalf by Jack Ogden, Gem-A CEO.

The Antonio C. Bonanno award – named in honour of the AGA's Founding Father – was created to recognize people who have made significant contributions to the gemmological field. The award – which includes a cheque for $2,000 – calls attention not only to the outstanding contributions of the recipient, but also to the responsibility of the gemmological community to encourage and reward on-going research, education and dissemination of information. Previous winners of this prestigious award include Alan Hodgkinson (Scotland), C.R. Beesley (USA), John Koivula (USA), Robert Crowningshield (USA), Henry Hänni (Switzerland).

E. Alan Jobbins, BSc, CEng, FIMM, FGA, started his gemmological journey as Curator of Minerals and Gemstones at the Geological Museum in London. In 1972 he qualified in the Gemmology Diploma examinations and was awarded the Tully Medal. Over a span of more than 30 years there, he conducted many important research projects, including a major study of East African garnets, the first papers characterizing the structure and identification of synthetic opals, the discovery of a new mineral (magnesio-axinite), and the field study of the Barwell meteorite fall. His work has taken him on assignments for the United Nations and the British Government, where he was called to apply his expertise in numerous ways to assist other nations. Some of his most notable international work included setting up a gemmological laboratory in Rangoon, Burma (now Myanmar) and training that country's first gemmologists; a major study of Pailin ruby and sapphire deposits in

President E. Alan Jobbins.

Cambodia, resulting in important recommendations for improved working methods; an assessment of diamond and opal deposits in Piaui State, Brazil; and a survey of the Sri Lankan gemstone industry to improve cutting techniques. In 1988 he turned his focus to China where he initiated gemmological training – with new laboratory facilities – at the China University of Geosciences in Wuhan. In the UK, his record includes 32 years as a lecturer in gemmology at the Sir John Cass College (now London Metropolitan University), 20 years as an examiner for the Gemmological Association's gemmology examinations, and eight years as Editor of *The Journal of Gemmology*. His most sparkling assignment was being a member of the team that conducted the first gemmological examination of the Crown Jewels from 1986-1989. As well as being President of Gem-A and SJH, Alan is an Executive member of the International Gemmological Conference.

The AGA is an independent, international non-profit organization founded in 1974 by Antonio (Tony) Bonanno as a network for sharing gemmological information and keeping members updated on the newest gemstone materials, treatments, synthesis, instrumentation and technological advances as applied to the field. For more information about the AGA or about how to nominate someone to receive this award, contact Joseph DuMouchelle, President, at joe@dumouchelleauction.com □

The brooch as an indicator of status in early Medieval Ireland

NIAMH WHITFIELD summarizes a lecture she presented to the SJH on 25 January

Brooches were used to denote rank within the stratified society of early Medieval Ireland. The Classical world, in which brooches were also used as status symbols, was probably the ultimate source of inspiration for this practice. Such influences may have come to Ireland directly from Roman Britain when the zoomorphic penannular brooch was introduced. But in the sixth and seventh centuries the Irish were also exposed to Mediterranean influence at second-hand, when their Christian missionaries encountered various Germanic peoples whose leaders tended to imitate Roman and Byzantine traditions of dress.

Four parallels between late Antique and early Medieval Irish uses of the brooch are particularly striking.

■ Early Irish historical sources indicate that the brooch held a cloak *(brat)* which was worn over a tunic *(léine)*. This costume seems to derive from the Roman empire, where officials likewise wore a tunic under a distinctive heavy cloak *(paludamentum)* that was fastened at their right shoulder by a brooch *(fibula)*.

■ Purple was the colour of the cloak worn by the highest status individuals in Ireland and in the Mediterranean. Moreover, in both areas the wearing of purple was controlled by sumptuary legislation. This Irish use of purple evidently derives from Rome, because philologists have shown that the Old Irish word for purple dye, *corcur*, is a borrowing from the Latin *purpura*.

■ The way brooches were used to mark social standing in early Medieval Ireland mirrors the way brooches were used as insignia of office in the late Roman and Byzantine tradition. In the late Roman period changes occurred in the symbolic meaning of men's brooches, and fibulae of varying degrees of opulence were worn by the various ranks. The same is true of early Medieval Ireland.

■ In Ireland in this period an important distinction was made in law and in sculpture between the way men and women wore brooches. A man should wear his on the shoulder, and a woman on the breast. The male practice of wearing a brooch on the shoulder derived ultimately from the Roman world, where military men and civilian administrators wore brooches on the right shoulder (originally to keep the sword-bearing arm free).
The example of Germanic women seems to have led their Irish counterparts to wear a brooch centrally. However, they, in turn, seem to have been influenced by a more recent Mediterranean fashion dating back to about the sixth century AD.

Early Irish texts, some as early as the seventh century AD, reveal other uses of the most precious brooches. These seem to have been reserved for ceremonial occasions. Some seem to have been dynastic possessions, while, as in Byzantium, the donning of a purple cloak with its precious brooch seems to have been part of royal inauguration ceremonies. Valuable brooches also appear to have been used to pay the bride-price and also poets for poetry. In addition they were offered as pledges in law suits, i.e. objects deposited as guarantees that contractual obligations would be met. Just how highly precious brooches were valued is demonstrated by an incident from a seventh-century *Life of St. Brigit*, which describes how a young woman was almost reduced to slavery because she was believed to have lost such a brooch.

These ideas are discussed in more detail in: (i) Niamh Whitfield, The 'Tara' Brooch: An Irish Emblem of Status in Its European Context, in *From Ireland Coming. Irish Art from the Early Christian to the Late Gothic Period and Its European Context*, Colum Hourihane (Ed.),Princeton University, 2001, 211-47; (ii) Niamh Whitfield, More Thoughts on the Wearing of Brooches, in *Irish Art Historical Studies in Honour of Peter Harbison*, Colum Hourihane (Ed.), Dublin: Princeton University in association with Four Courts Press, 2004, 95-6. □

Tara brooch. © The National Museum of Ireland.

Historical settings

Two insights into the history of gemstone settings

The obvious meeting places for gems and jewellery are the settings by which the former are secured to the latter. The historical development of settings is a vital, though often neglected, aspect of jewellery history. The style and mode of manufacture and assembly of a setting are also important factors in authenticating older jewellery – an obvious example being the 'cut down' settings characteristic of the eighteenth- and nineteenth-century jewellery that are seen on some nineteenth-century 'copies' of Renaissance jewellery.

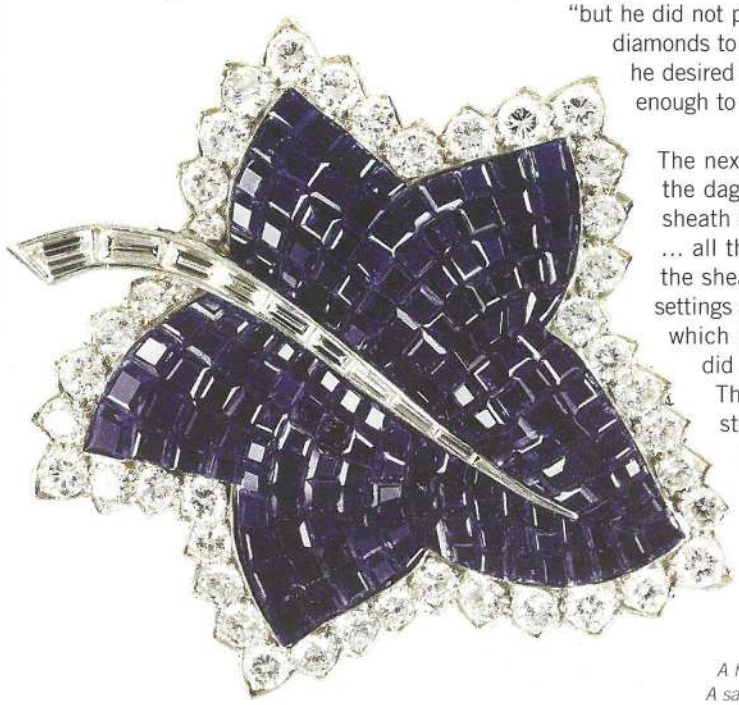
In part the history of settings can be seen as the battle for supremacy between stone and metal. At the risk of over simplification, we can note that, by and large, in the earlier times the stones were cut to fit the settings – you only need to think of the magnificent inlaid ornaments from Tutankhamen's tomb – then, once the rare and harder gems were in favour, the settings were made to fit the stones. For example, settings were almost invariably tailor-made to fit existing diamonds right up until the second half of the nineteenth century when new sources of diamonds, improved diamond cutting and the introduction of mass-produced settings changed things.

Here we can briefly look at two extremes of this – a rather charming insight into seventeenth-century diamond setting (and a jeweller's dilemma) and what is perhaps the ultimate example of stones tailored to a mount, the 'invisible settings' of the first half of the twentieth century.

A diamond dealer's dilemma

The travels of the French jeweller and stone dealer Jean-Baptiste Tavernier to India and the East during the seventeenth century are justly celebrated and provide us with a huge wealth of information. Tavernier travelled to the East a total of six times between about 1630 and 1668. On his third voyage, which lasted between 1643 and 1649, he, with his younger brother Daniel, visited the King of Bantam (the western end of Java) whose palace "did not need a very skilful architect". The King explained to Tavernier that he was having a dagger made after the Turkish fashion, "but he did not possess sufficient diamonds to cover the handle, and he desired that I should procure enough to finish it."

The next day "the King sent for the dagger, the handle and sheath of which were of gold ... all the handle and the sheath were covered with settings applied without order, which proved to me that he did not understand design. The King had no other stones, neither diamonds nor rubies, nor anything to place in these bezels, and he wished to induce me to obtain for him some that would fit.



A fine example of invisible setting: A sapphire and diamond brooch by Van Cleef & Arpels. c. 1960. Courtesy of Sotheby's.

I made him understand that this would be impossible, and that he ought not to limit himself to these bezels; that when he had acquired the quantity of stones which were required to cover the dagger, other bezels of the shapes of the stones should be made, and that in Europe when we begin a work of this kind we first arrange all the available stones on wax; this I exemplified to him at the same time, but that was beyond his understanding, and he told me that he did not care to destroy a design which he had himself taken the trouble to arrange, and to have made for his own use."

Tavernier tried to wriggle out of this hopeless assignment, but "In spite of any reasons which I could give for the purpose of escaping from a commission which I was not able to execute, the King wished positively that I should take the dagger with me to Batavia [also in Java, near modern Jakarta]."

Tavernier tried another approach: "I represented to him then that as I was a stranger he risked much, and that I might go off with the dagger without returning it, but he said to me smiling that he feared nothing on that account, and that he well knew that Frenchmen were incapable of so disgraceful an action. At length, unable to excuse myself further, I took charge of the dagger, and having taken leave of the King, my brother and I went to bid farewell to the English President, and to thank him for the civilities we had received from him.

"Having passed these twenty days at Batavia, I resolved to carry back the dagger to the King of Bantam, without having looked for the diamonds or other stones, for if I had remained years I should not have found any suitable for these settings. My brother accompanied me again, and I took with me some jewels which the King had not yet seen.

"As soon as I saw the King in a condition to speak to me I presented to him his dagger in the same state as he had given it to me, and told him that Batavia was not a place where one could obtain precious stones, and when I did find some they wanted double their value for them; that this commission could not be fulfilled except by someone who went to Goa

[the Portuguese colony on the west coast of India], and that I could have accomplished it when at Goa, or at Golkonda [the centre for the Indian diamond trade] or, better still, at the [Indian] diamond mine, where parcels of stones of all shapes and sizes are procurable and might be cut with but little loss to suit the bezels. Upon this the old woman took the dagger, carried it into the harem, and the King never spoke to me about it again."

An invisible centenary

At the other extreme of approaches to jewel setting is that marvel of twentieth-century jewellery – 'invisible setting' (*serti invisible* in French). In this masterful technique gemstones are set in such a way that their metal supports are invisible. The technique is well enough understood – the sides of the gems are grooved and then held in a net-like lattice of metal wires – but the early history has been somewhat clouded. Various of the 'Great Houses' have laid claim to the invention. It has been said that Cartier introduced the technique in the early 1930s while in her 1987 book on Van Cleef and Arpels, Sylvie Roulet has said that this mode of setting was 'invented' by that company in 1935. Although Van Cleef and Arpels became celebrated as practitioners of this intricate style of setting neither they nor Cartier can lay claim to its invention. The honour goes to another great Parisian jewellery name, Chaumet.

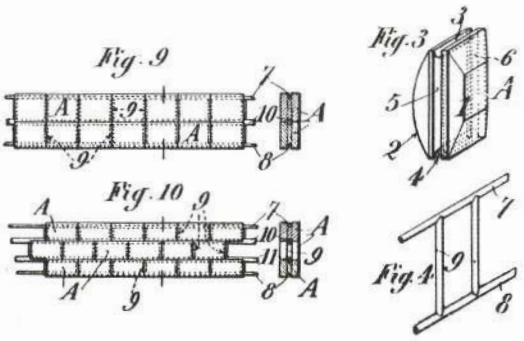
The invention was exactly one hundred years old at the end of last year, as demonstrated by British Patent 18,292 of 1904. This patent entitled 'An Improved Method of Setting Gems or Stones for the Manufacture of Jewellery of all kinds' was in the name of none other than Jean Baptiste Chaumet, 'also called Joseph', of 62 Rue de Richelieu, Paris.

In the wording in the patent "This invention consists of an arrangement for setting gems with a view to the production of all kinds of jewellery such as rings, bracelets, brooches, coronets, diamonds and the like. For this setting a certain number of suitably prepared or cut gems are taken and firmly fixed by means of a metal framework. The preparation of the gems and the arrangement of this framework are such that the jewellery when finished has the appearance of being formed almost entirely of gems or stones, the metallic frame being encased in the latter."

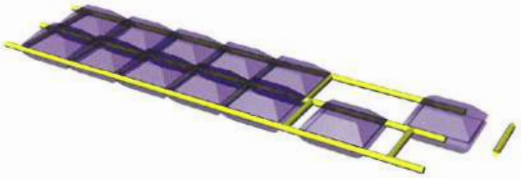
In essence each gem had grooves 'formed in its four sides' and was fitted into the framework of metal wires. Some of the drawings from Chaumet's original patent drawings are shown here, along with a modern rendering.

It is interesting to note that in those days British Patents had an initial 14 year life. Cartier, or anyone else with the access to the necessary skilled craftsmen, would have been able to replicate Chaumet's invisible setting after 1928 since he does not seem to have renewed it.

We can add the postscript that innovation continues. In 1997 the Nili Jewelry Corporation in New York



Drawings from the original 1904 Patent Application by Chaumet.



Reconstruction based on the 1904 patent drawings.

patented a version in which the supporting metal 'bars' and the stones are included in the lost-wax casting mould, thus casting the invisible setting including stones *in situ*. Joseph Chaumet would no doubt have smiled at the patent's observation that this is "a less-expensive and less-time-consuming process than the traditional method." (United States Patent 5,690,477 of 1997.)

The Tavernier quotations are taken from *Jean-Baptiste Tavernier Travels in India*. Translated from the 1676 French Edition by V. Ball, 2nd edition edited by W. Crooke. London 1925. □

J.O.

Masterpieces of American Jewellery

An exhibition from the National Jewelry Institute, held at the Gilbert Collection, Somerset House, London 15 February to 12 June 2005

The style and culture of American jewellery - CORINNA PIKE applauds an exhibition currently running at Somerset House

Iris brooch by Marcus & Co., New York 1900; made of plique à jour enamel mounted in yellow gold, height 4" (10.5 cm).

It is wonderful to welcome such a comprehensive American jewellery collection to London. The 200 pieces on show cover the full spectrum of style and culture of the American dream, jewellery made and distributed in the United States from the late eighteenth century until the late twentieth century: the main themes being Americana, Nature, Humour, Pastimes and High Style. Great jewel houses are represented, Tiffany & Co., Marcus & Co., David Webb, Raymond C. Yard, Verdura, Paul Flato to name but a few.

In some instances, undoubtedly inspired by trends in Europe, the pieces on show have a uniquely North American flavour commemorating special historical events and also representing the glamour of Hollywood. As a balance also shown are more attainable less expensive examples of the early twentieth century, from the jewellery manufacturers in Newark that provided charming mass produced pieces for the general public. Either way, the overall collection presents varied craftsmanship skills with the use of interesting gemstones, including Montana sapphires and Mississippi pearls. Quirky subject matter inspired something a little different as seen in the 1930s diamond set 'bunny' brooches by Raymond C. Yard, and the Walt Disney cartoon charm bracelets of 1939 by Cartier, New York.

Some jewels are dominated by their incredible pedigree and glamorous owners. *Haute couture* combined with beauty, a perfect canvas to display objects of adornment. Emphasis is often on the fabulous wealth of these clients who carry ostentation with confidence thus focusing on the glory of American capitalism; this makes good PR and has done so on near a century. High society goddesses were models of inspiration and as such were set apart. In the silver screen age stars were dressed up all the time and would never be seen in public unless styled to perfection. On display is the unmistakable 'lion's paw' brooch that was made for Millicent Rodgers in 1940 by Verdura; and also designed for her in 1947, a large morganite brooch by Jean Schlumberger, a pink beryl variety named *c.*1900 after J.P. Morgan.

Ballerina brooch, by Van Cleef & Arpels, New York 1940; diamond set with rubies and emeralds, and mounted in platinum, height 2 ¾" (7 cm). This piece was inspired by the eighteenth century Rococo artist Nicolas Lancret.

There are also other pieces that are wonderfully designed and show incredible technical craft skills. Highly commended for their naturalism and realism are the enamelled orchid brooches by Tiffany & Co. made at the end of the nineteenth century and the enamelled flower brooches by Marcus & Co.

Set apart from the conventional jewels, is the raw quality of the simple brass necklace and headpiece made by the sculptor Alexander Calder in the 1950s, coiled spring

Tortoise vanity case, made by David Webb c.1960; tortoise-shell set with diamonds and emerald eyes; length 3 ½" (8.25 cm).

Judith Price, President of the National Jewelry Institute, New York, at the opening of the Masterpieces of American Jewellery exhibition at the Gilbert Collection in London.

designs commissioned by Sir Kenneth Clark for his wife. The artist Georgia O'Keeffe was also a customer of Calder's, and she certainly was a pioneer of American modernism. The statement here is an independence of mind and confidence of the wearer. Somehow these pieces win in sheer contrast over the glitz and razzmatazz of Hollywood.

Congratulations go to Judith Price, President of the National Jewelry Institute; to Ashton Hawkins, Chairman; and to Ralph Esmerian, Vice President and curator of the show. □

The jewellery photographs shown in this article are copyright © Zane White.

Yachtsman bunny brooch, by Raymond C. Yard, c. 1930s; set with rubies, sapphires and diamonds, mounted in yellow gold and platinum, height 1 ¾" (4.5 cm).

Fish and fishing rod brooch, by Sloan & Co., Newark, c. 1940-1950; enamelled, with seed pearls and ruby eye, mounted in 14ct yellow gold, length 3 ¾" (10 cm).

At a sign of the Falcon. HG Murphy: Art Deco Silversmith and Jeweller

Goldsmiths' Hall, Foster Lane, London EC2V 6BN

4 to 30 April 2005
www.thegoldsmiths.co.uk

The Spring exhibition at Goldsmiths' Hall will focus on the work of Henry George Murphy (1884-1939), one of the most accomplished silversmiths in Britain during the first half of the twentieth century. Murphy's most prolific period was during the 1920s when he produced fine tableware and flatware, Church silver, regalia, civic and corporate silver, enamels and a range of innovative gold and gem-set jewellery. His jewellery is notable for its exuberant vibrancy and the quality of its execution, many of the pieces incorporating champlevé enamel.

The exhibition coincides with the publication on the life and career of H G Murphy entitled *Arts and Crafts to Art Deco: The jewellery and silver of H G Murphy*, a review of which will appear in the next issue of *Gems & Jewellery*.

New jewellers

Blackwell, the Arts and Crafts House, Bowness-on-Windermere, Cumbria

7 February to 17 April 2005
www.blackwell.org.uk

An exhibition of new work by eleven contemporary jewellers, chosen for their unique styles and diverse influences. Their work is very varied, but what they have in common is a sensitive use of materials and original design. Primarily new makers have been sought out for this exhibition to show the diversity and emerging talent in this field today.

Many combine traditional skills in silversmithing with an interest in modern design and production methods. Others look to the past for inspiration, yet still design with a modern approach. Alison McLeod, for example, incorporates elements of the 1950s ideal domesticity in her witty brooches and earrings, while Ruth Tomlinson's work reflects her diverse historical sources of inspiration from Pre-Raphaelite painting to archaeological finds.

Diamonds

Natural History Museum, Cromwell Road, London SW7 5BD

8 July 2005 to 26 February 2006

A range of rare white and coloured diamonds have been brought together for this, the biggest ever exhibition of diamonds. Included in Diamonds will be the Aurora Collection, a set of 296 naturally coloured diamonds being displayed for the first time in Europe; the Allnatt, a vivid yellow diamond weighing 101.29 ct; and the Steinmetz Pink, the world's largest vivid pink diamond at 59.60 ct.

Further details of Diamonds will be given in the June issue of *Gems & Jewellery*.

Castellani and Italian Archaeological Jewellery

Somerset House, The Strand, London
5 May to 18 September 2005

The magnificent Castellani exhibition first shown in New York is to be exhibited in London. Please note that the dates have been changed from those reported in the *Gem & Jewellery News*, December 2004, page 91.

The things that turn up

A single-stone ring for valuation and synthetic opals(?) supplied for a customer - GRENVILLE MILLINGTON describes tests carried out on these stones

Grenville Millington is a Director of Hinton Millington Ltd, jewellery manufacturers, and has provided a gem testing service in the Birmingham Jewellery Quarter for many years.

Synthetic sapphire of an unusual colour

A jeweller who had been in the trade for some years brought in a ring to have the stone tested.

It was part of a probate valuation and the present owner, a lady in her 70s, had inherited a box of jewellery of which this was one piece. It had been her mother's, which could place the ring at about 50 years old. The claw setting (handmade) was of platinum, the shank 18ct yellow gold, and it had been washed and cleaned by the jeweller.

The jeweller had many years of trade experience and he thought it might be diamond, "... but it looks a bit odd!" he said **(1)**.

1

Round brilliant-cut synthetic sapphire of very pale yellowish-green colour, 7.8 mm.

The stone was a round brilliant-cut, although the pavilion was somewhat deep and the table excessively wide on a shallow crown. Diameter was 7.8 mm and depth 4.4 mm. If this was a diamond, then it would look odder than normal with these proportions. The general appearance was 'bright', the top surface showed sharp facet edges, and the colour was very pale yellowish green; light enough in colour for the stone to look almost colourless when worn on the finger. I thought immediately of synthetic moissanite, but slightly tilting the stone showed light spillage through the pavilion which was too great for diamond or synthetic moissanite.

It is always as well to start any examination with the 10x lens. Apart from the features outlined above, the first impression was of a 'clean' stone. On a more careful look, a few very faint, wispy feathers(?) could just be made out. They were long and narrow and seemingly aligned in the same direction. So, possibly a natural stone. There was no doubling of the back facet edges visible through the crown, but some doubling was apparent when viewing through the outer facets. Only slight, but enough to dismiss any thought of it being singly refractive. The amount of doubling, colour, reasonably high surface lustre and an impression that the stone was quite hard (little surface damage) suggested chrysoberyl. This stone was far more common in the nineteenth century and first part of the twentieth century than it is now, and would probably have been referred to as 'chrysolite' at that time. A cluster ring of the nineteenth century is illustrated **(2)**, set with chrysoberyls of similar colour to our stone under test now.

The stone was next examined with a spectroscope. I know nearly everyone else will try the refractometer at the very outset, even without a 10x lens inspection sometimes, but I generally leave that to last. I want to try and identify any gem without using the refractometer; it's a game, and probably goes back to the time when I didn't have such an instrument. (The retail jeweller that I first worked for, although an FGA, would not let his staff use his refractometer, but would place the gem to be tested in the appropriate position, read out the RI then proceed to ask me or another young FGA what the reading meant!)

The spectroscope did not show me the expected dark absorption band at the

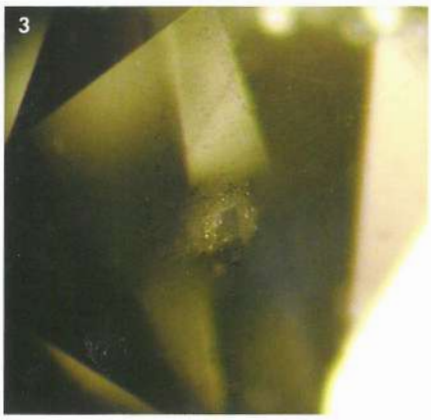
2

Cluster ring of chrysoberyls, dating to about 1900. Length approx. 35 mm.

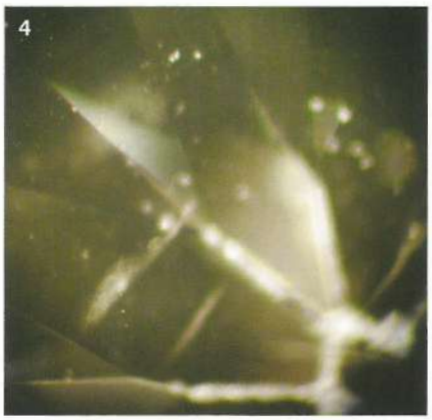
junction of the blue/violet, which is so useful for identifying chrysoberyl (all the stones in the cluster ring **(2)** showed this band). There was the merest hint of a smudgy line at about 450 nm in the blue, only barely visible and at the position we expect to see a line in sapphire. However, even light green natural sapphires show a strong, dense band at this position.

Under long wave ultraviolet, the stone produced a very slight apricot/orange fluorescence, so slight that the eyes had to be accustomed to the low light level first. Response under short wave was similar. Under a Chelsea colour filter a pale yellow colour was seen; no dichroism could be observed.

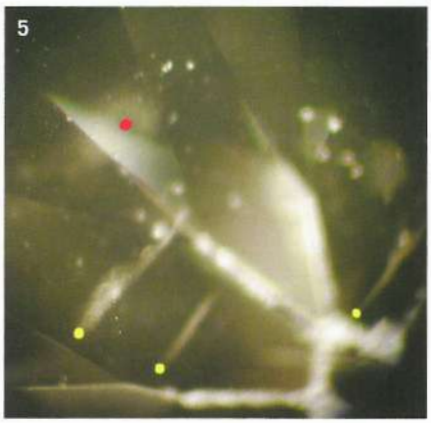
Well, it seemed as though the refractometer would have to be next. The stone gave a clear reading of 1.760 -1.768, with birefringence of 0.008, and a slight movement of the least value shadow edge on rotation denoted a negative sign. So it was a sapphire. That meant the microscope would have to be next to show whether it was natural or synthetic. Those faint wispy inclusions that were just visible under the loupe were easy to see under about 30x magnification with darkfield illumination and turned out to be trails of cloud inclusions. Still a possibility of being natural, but then a few



Magnified view of the sapphire showing a 'space nebula' cloud of very small gas bubbles, with a few slightly larger ones.



Several linear bubble clouds in parallel alignment in the sapphire. (The white 'spots' are out-of-focus bruises on the back facets.)



Explanation of features shown in (4). The red spot shows the position of the 'nebula'-type cloud (now out of focus). The yellow spots show three of the aligned bubble clouds. Just to the right of the extreme left-hand yellow spot are four of the slightly larger gas bubbles.

isolated and very small bubbles were apparent, especially in the main inclusion which was reminiscent of a space nebula cloud. They were typical of the very tiny, round bubbles we see in synthetic corundum, but even under 80x magnification the identification of them as bubbles was not ideal, especially as the linear-type cloud inclusions were atypical of synthetic corundum **(3, 4** and **5)**.

I should try and find some 'Plato' lines (twin planes viewed between crossed polarizers along the optic axis) to confirm the synthetic nature of the stone. This is not the easiest job in the world when the stone is set in a ring, but I was hopeful in this instance because the double refraction I had observed was not through the table facet, so the crystal axis should be perpendicular to the table. Under the polariscope, a uniaxial interference figure was resolved at about 15° off the perpendicular to the table. Before reaching for the glass immersion cell and bottle of methylene iodide, I put the Polaroids in position on the microscope to get confirmation from the interference colours as to the correct direction to view. It was quite a surprise to see a wonderful example of the 'Plato' effect immediately, without any immersion **(6)**.

Examination of the stone from various directions with a 10x lens over white paper failed to show any curved structure lines. (I find this method preferable to using the microscope for synthetic sapphires, although the microscope is usually better for detecting curved lines in synthetic rubies.)

I recalled having read a month or two previously an article by Mayerson (2004) about a light green synthetic sapphire. On retrieving the article I found that the stone mentioned there was a definite green rather than the very pale colour of our stone under test. This was also true of another green synthetic sapphire, reported by Kammerling (1996) in an earlier edition of that journal; both articles commented on the unusual colour of those synthetic sapphires.

The refractive index showed this stone to be 'sapphire'. Microscope examination under darkfield illumination showed the presence of unusual nebula-like and linear-type wispy cloud inclusions of extremely small gas bubbles, plus some more prominent, but still small bubbles. These cloud inclusions were all aligned in the same direction. No curved lines or bands were seen. 'Plato' lines were easily visible under crossed polars in the direction of the optic axis without the need for immersion.

The faint 'line' at 450 nm in the absorption spectrum was similar to that seen sometimes in some ordinary blue synthetic sapphire spectra, showing the presence of some of the original iron. The conclusion, therefore, was synthetic sapphire.

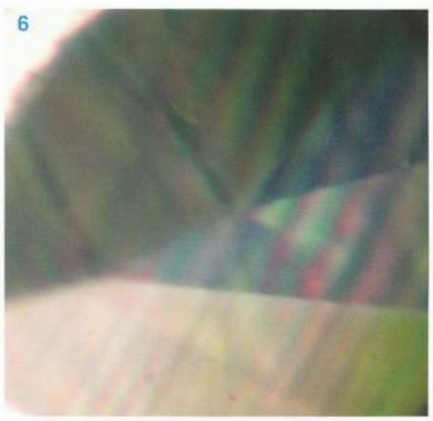
The form of inclusions and the extremely pale yellowish-green colour of this example were both highly unusual. I have not come across a synthetic sapphire of this colour in 38 years of testing stones.

It was my supposition that the stone was probably much older than first thought and had been damaged on its facet edges by 'tumbling' around other stones and workshop benches, as some stones do, and may have been set before. However, at some stage the crown was repolished (it's common to have worn stones just repolished on their fronts to save on cost) and then set into the present ring. It is highly probable that the brilliant-style cutting, with culet, was applied to such a pale colour stone to make some people believe that it was diamond.

Further reading

Kammerling, R.C., 1996. Green synthetic sapphire. In Lab Notes, *Gems & Gemology,* 32(1),51

Mayerson, W.M., 2004. Synthetic sapphire with unusual yellowish green bodycolor. In Lab Notes, *Gems & Gemology*, 40(2), 167-8



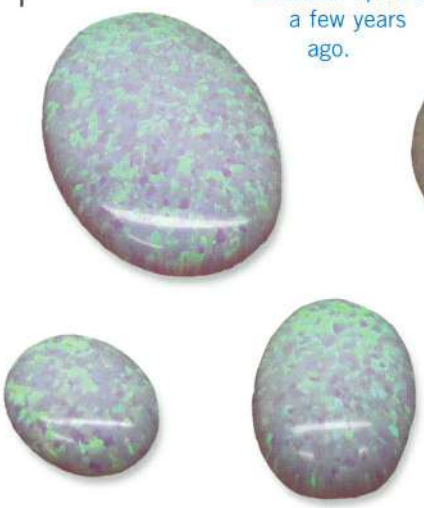
The easily seen 'Plato' striae visible in the sapphire in air between crossed polars.

Synthetic opals(?) supplied for jewellery

Singly refracting stones with two distinct RIs

A retail customer asked us to produce some rings and pendants set with blue/green synthetic opals, a stone we do not normally use. We asked one of our regular gem suppliers to send us some samples, which they duly did. We have, of course, seen and examined synthetic opals over many years, but these looked different. The colour display was very limited – mostly green, and the flash effect seen on the back of two of the three sample stones was reminiscent of the plastic Opalite imitation opals of a few years ago.

1



The three test synthetic opals to the left (the largest 25 x 18 mm); natural opal upper right; plastic imitation opal lower right.

Also, like the plastic imitation, they showed a strong, mostly pink transmitted colour when held up to the light. Anything new stimulates our curiosity, so some tests were carried out.

Three stones from our supplier were examined; all were oval shallow cabochons, 12 x 10 mm, 16 x 12 mm and a relatively large stone of 25 x 18 mm. Their visual appearance was of very regular, small patches of colour, mostly of green and yellowy green, but with a bluish haze, especially when viewed obliquely. The backs were flat, with two of them showing a very pronounced vivid green colour flash. The third stone showed a similar appearance to its front. The three stones are illustrated **(1** and **2)**, together with a 20 x 15 mm oval standard quality natural opal and a 10.4 x 8.4 mm oval plastic imitation opal for comparison. When held up to the light a regular pattern of pink and yellow areas was seen in all test stones **(3)**.

A spot reading (distant vision) on the refractometer (using amber LEDs) showed approximately 1.45 for all three. The backs, being flat, offered the chance of a more reliable reading. Two gave the 1.45 reading, but the third gave two readings at 1.45 and 1.50. Being somewhat shocked at this result, I turned the stone round and made sure the stone and prism surfaces were in flat contact. The same reading was obtained. I removed the stone, wiped both it and the refractometer prism, applied a tiny drop of contact liquid and tried again. There was no doubt; 1.45 and 1.50 readings were obtained again.

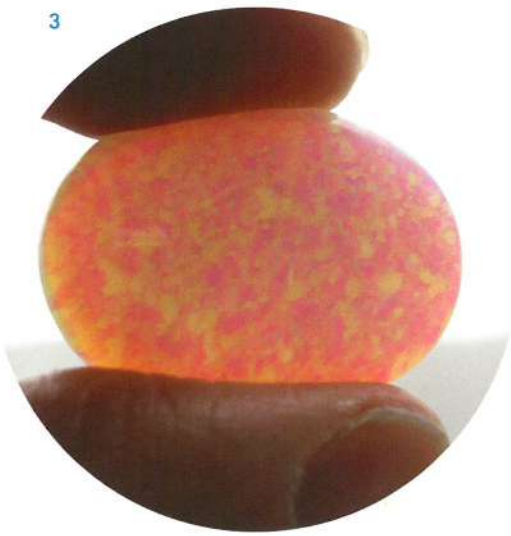
A careful look at this stone under the microscope revealed an extremely thin, possibly colourless layer on the back of the stone. This is similar to the Opalite type imitation I have amongst my sample stones, which I found and compared. It has a similar look to the back, except for a different flash colour, and has a colourless back 'plate'. The RI of this sample stone was 1.47 spot on the front and 1.50 on the flat back. Although hardness tests tend to be destructive and little used in consequence, I thought this time it was in order. A normal pin point was used, which produced an indentation in the backs of the plastic imitation opal and the stone being examined.

No indentation could be made in the upper surface side of this stone but was produced on the upper surface of the plastic example. This test applied to the other two stones being tested showed

2

The undersides of the same stones as shown in (1).

3



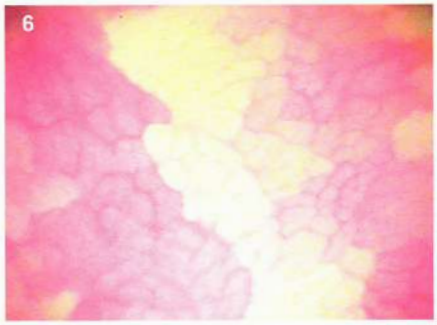
The larger test stoneheld up to white light.

4

The 12 x 10 mm test stone on the left; Gilson synthetic water opal upper right; modern synthetic opal (unknown manufacturer) lower right.

The test stone viewed in darkfield illumination.

they were harder on upper and lower surfaces than the pin; there was no coating on the bases. The coating on the one stone was thin enough to give a reading of its own (1.50) and allow the surface below to give a perfect reading also (1.45).



Magnified view of test stone in (5).

Under long wave ultraviolet, the three test stones gave identical results of whitish blue, medium strength and then no phosphorescence. Under short wave, the colour was more violet than blue.

A hydrostatic specific gravity determination carried out on the largest of the stones, weighing 11.65 ct in air, gave a figure of 1.77. This is much less than the normal opal figure of 2.10, but far above that of much plastic imitation opal which is about 1.10 (it just floats in a salt water solution of 1.11).

Microscope examination of the three showed the typical lizard-skin appearance we have come to expect in synthetic opal, not as prevalent as in some examples I've seen, but more easily visible than in a Gilson synthetic water opal added to my collection of sample stones around 1985 and a more recent synthetic water opal added about two years ago. These two synthetic opals are illustrated next to the 12 x 10 mm test stone **(4)**. The lizard-skin pattern in the test stones is not as regular as I've noticed previously, with some of the 'cells' being distorted **(5** and **6)**.

In a side view of the stones the 'columnar' colour stacks common in many synthetic opals and to some extent in the plastic version, were visible and are shown in **7** and **8**. A columnar structure may also occur occasionally in natural opal so it is not a diagnostic feature.

To sum up

One of the three test stones had a base coating of thin plastic, which had the same refractive index as a similar plate on an all-plastic imitation opal. It also had the distinction of showing two refractive indices on the refractometer, 1.45 for the body material and 1.50 for the base plate.

The other two test stones showed refractive indices of 1.45. The largest test stone had the rather low specific gravity value of 1.77. None of the three stones was affected by pressure from a standard steel pin applied to their top surfaces so they are not plastic. With the right RI and hardness but low SG, could they be a type of synthetic opal? Of course, a sample of the stones under examination here should be subject to further tests to determine chemical composition and structure, and thereby establish their true terminology. I shall play safe and call them 'imitation opal'. However, the chance to study these examples closely has made it far easier for me to identify a 9ct gold pendant set with five of these stones, only 7 x 5 mm each, which arrived in a parcel of jewellery for valuation just as I was preparing this article. The front and back views are shown in **9**, and I must say that the smaller size of these stones will make identification less easy for many jewellers. □

Magnified view of test stone, showing columnar arrangement.

Side view of the test stone, Gilson synthetic opal and another synthetic opal (4), showing columnar arrangement.

9ct gold pendant set with 7 x 5 mm oval stones similar to test stones.

From blue opals to doublets at the Gem Discovery Club

'Ruby' and 'sapphire' doublets.

Gem-A's Gem Discovery Club meets every Tuesday evening at the Gem-A headquarters near London's Hatton Garden. Participants have the opportunity for hands-on examination and informal discussion of a wide variety of gem materials. A range of gemmological equipment is provided for participants' use. At the first meeting of each month a guest specialist brings along a selection of gems for examination and also provides a brief introduction.

Gem dealer Marcus McCallum was the guest at the Club's Specialist Evening in December and brought along rare and unusual gems from his personal collection. Particular mention must be made of his string of blue opal beads from Peru, a bi-colour blue/yellow sapphire with a star in the blue section, quartz crystals with intriguing inclusions (petroleum tar in a moving bubble and pyrite inclusions that appeared to 'float' in the crystal) and a green zircon with an amazing spectrum observable by even those who generally claimed little expertise with a spectroscope. There was also a trio of colour-change gem species – a sapphire, a group of garnets and an exceptional alexandrite.

Opal beads.

Our February guest was Roy Huddlestone accompanied by his collection of over 70 doublets and composites. He gave a brief explanation of the assembly of such stones and then invited members to identify the various types he had brought along. Roy's collection included a variety of differently coloured garnet-topped doublets, including a peridot-green and a very bright pink, but particularly difficult to identify were the two corundum doublets shown here. The 'ruby' had a natural green sapphire top and synthetic ruby pavilion, while the 'sapphire' had a natural green sapphire top and a synthetic sapphire base. Inclusions visible in the natural sapphire tops could fool the unwary, especially if the stones were set. However, closer examination revealed their true nature, for example characteristic flat bubbles in the adhesive in the junction of the ruby-coloured doublet. Jewellers often think of doublets as gem fakes of yesteryear, but these types of sapphire doublets are currently on sale in Thailand. □

Gem Discovery Club membership is open to all Gem-A members. For further details and our programme of specialist evenings visit www.gem-a.info/membership/gemClub.htm

The gemmologists' jewel box

Cecilia Pople will be the specialist speaker at the Gem Discovery Club on Tuesday 3 May. Cecilia has collected gemstones from around the world, including many of the less familiar gems listed in the Gem-A Gemmology course syllabus, which have been made up into attractive pieces of jewellery. She will give a short slide show illustrating many of the items from her 'jewel box' and will also bring some of them along for Club members to examine.

Cecilia has been a Gem-A tutor teaching the Gemmology Diploma course for 14 years and during that time has built up a 'teaching set' of stones. These will also be available for Club members on the evening.

Errata

In the December Issue of *Gem and Jewellery News* a last minute change of photographs was not accompanied by the right change of captions. The large red crystal in the centre of page 87 is, of course, not an uncut synthetic diamond, but one of Thomas Chatham's synthetic rubies. The smaller green crystal is a synthetic emerald.

Two readers have sent us further comments about this article on Chatham and synthetic diamonds. As they point out, the article, and the report on the Gem-A Conference (page 77) did not make it plain that Chatham is not producing the synthetic diamonds himself, but is having them made for him by another undisclosed producer, reportedly in Asia. Chatham had indeed clearly stated this at the Gem-A Conference.

Having a field day

The gems and jewellery of Thailand - ELIZABETH PASSMORE recounts the recent Gem-A trip

The first piece of corundum found in the slurry at the sapphire mine. Photo: Bob Frost.

Gems and jewellery, a beautiful country plus company and excellent food to match, what more could we want? Last November Gem-A's Doug Garrod, with Dr Bill Gaskarth as UK co-ordinator, lead the Gem-A trip to Thailand. Our group was met at Bangkok airport by Dr Theerapongs Thanasuthipitak (known as Finn) from Chiang Mai University, our Thai co-ordinator, and Manop Kanjanavarut who was to be our tour guide.

We began at the Grand Palace and Wat Phra Keow or Temple of the Emerald Buddha. Later we met with the Thai Gem and Jewelry Traders Association and our discussions ranged over many topics, most notably the treatment of stones, a subject we returned to time and again during our trip. At the Gem and Jewelry Institute of Thailand at Chulalongkorn University, we were privileged to pass beyond the point where those bringing stones for assessment have to stop and were able to talk with staff and watch them at work assessing stones and writing reports.

The presentation at Gemopolis Industrial Estate described the government's tax incentives to encourage businesses to establish a base adjacent to the new international airport. Here we watched rows of young people faceting diamonds of about 0.50 ct and then inspected the loose stones and jewellery on offer, a glittering treasure of rubies, sapphires, diamonds, pearls, tourmalines and gold.

Then on to Chanthaburi via Pattaya where, after enjoyable meals, we sampled exotic fruit and some of us even paddled in the sea. We visited a small but excellent exhibition of stones from every part of the world at the World Sapphire Company. Here there were also sapphires of every colour, set in jewellery and loose, available for purchase. Again, we were invited beyond the public areas to the work rooms where sapphires were being sorted pre and post heat treatment, and after faceting.

Heat treatment? We visited an almost windowless building with heavy reinforced doors, inside which were the furnaces. The process was described to us and we studied the apparatus, but for commercial reasons we were asked not to take photographs. We grappled with some sobering figures: up to 5000 ct of corundum treated per day; usually stones to the value of 10,000 Baht (~70Baht=£1) per crucible, but could be up to 30 m Baht; rough and cut stones heated together. And then on to see some rubies, and what rubies! included was a tray of 1-2 ct Burmese stones, graded by size, colour and cut. Also specimens from the dealer's personal collection: a 12 ct cushion cut Mogok stone and Thai stones of 31, 57.35 and 55.39 ct.

On our way to a remnant of a basaltic volcanic plug, Finn encouraged us with tales of his promise to his students: anyone finding corundum would get an 'A' for their course. What a ploy to keep them working. No-one has found any corundum, or is expected to! Our fossicking was also corundum-free, but we did find pyroxene, olivine and black spinel. We moved on to a real sapphire mine where we watched the slurry passing over the shaking box and then the trays being washed by workers standing in chocolate-coloured sludge. They discarded stone after stone, but then gave something to the boss. It glistened in the sunlight, a beautiful blue.

The sapphire mine at Bo Phloi has over time covered a large area but is now nearly worked out, but showed the potential for turning old workings into a

The group gem hunting. Photo: Bob Frost.

resort offering golf and other attractions. After lunch by the River Kwai and a walk over the bridge we were conducted round a factory and visited a shop dealing in black spinel. We also took the opportunity to visit one of the War Cemeteries, a chance to escape the bustle and silently reflect on the lives of those lost in the region during the Second World War.

Kanchanaburi Inland Fisheries and Research Development Centre provided a different dimension to our field trip. We had a masterly description of freshwater cultured pearl production, and a demonstration of preparing the mussel for receiving pieces of mantle to initiate pearl development and of harvesting pearls from a mussel treated two years previously.

Harvesting pearls at the Kanchanaburi Island Fisheries and Research Development Centre. Photo: Bob Frost.

We were honoured to visit the Department of Geological Sciences, Chiang Mai University in company with Finn's wife, an eminent member of the department, and some of their students. We saw the gem testing and some of the research facilities, including heat treatment furnaces which lead to further discussion about gem treatment.

Sapphires before and after heat treatment. Photo: Bob Frost.

Apart from the corundum and other stones already mentioned, on our trip we had pored over synthetic opal and cubic zirconia in Chiang Rai Province and jadeite, red spinel and peridot in Mae Sai, the most northerly town in Thailand. A few of our party had even crossed into Myanmar to investigate the gems on offer there.

Accompanying all this gemmology and gem activity had been beautiful flowers, lush vegetation and plentiful fruit; we had been entertained by elephants, one even playing a mouth organ, and had enjoyed wonderful meals and hospitality. Our last night at Laan Tong Mekong Basin Hotel was highlighted by the stunning show of music and dance put on especially for us and the 'thank you' speech by Harold Killingback that did us all proud. (Harold, who had celebrated his eightieth birthday during the trip, had taken up gemmology when he retired and qualified for his Diploma in 2002.) All in all a remarkable and memorable trip.

Special thanks go to the following for their generous hospitality: The Thai Gem and Jewelry Traders Association, the Thai Gem and Jewelry Manufacturers Association, Chanthaburi Chamber of Commerce, World Sapphire, Chanthaburi Gem and Jewelry Traders Association, Expert Gems Manufacturing and Chiang Mai University.

We should also note that, although none of the areas we had visited were affected by the Tsunami that struck just a few weeks after our trip, we should heed the pleas of the people to return and support the tourist trade in their beautiful country. □

Gem-A's next field trip is to Brazil in August 2005. This trip is already fully booked, but if you would like to be on the waiting list in case of a cancellation please contact: Doug Garrod on +44 (0)20 7404 3334 or e-mail doug@gem-a.info.

Gem-A Scholarships

£2000 Gem Diamond Scholarship

Monika Kuchard's prize-winning entry: a silver and 18ct yellow gold ring with perspex tentacles and set with white and black diamonds, rubys and pink sapphires.

Gem-A has presented London-based jewellery designer-maker Monika Kuchard with the first ever Gem Diamond Diploma Scholarship. The prize worth £2150 was awarded following the judging for the 2005 Goldsmiths' Craft and Design Council Awards at Goldsmiths' Hall in February. Monika, whose dynamic designs are inspired by plant forms, was unanimously judged the winner by a panel consisting of Anthony Elson of the Goldsmiths' Craft and Design Council, Ian Mercer, Gem-A's Director of Education, and Terry Davidson of the Gem-A Council and Gem-A's former CEO. Monika's design and written submission were chosen from fourteen entries within the twenty-eight sections submitted to the Awards.

The Scholarship will pay for Monika to take the internationally-recognized Gem-A Gem Diamond Course, a four-month course leading to the coveted, UK government-accredited Gem Diamond Diploma. In Monika's words, "The scholarship will provide me with the practical skills that will help me to sell my work, to feel confident to buy diamonds wherever I go and to be recognized by gem and jewellery professionals as having gained the hallmark of accomplishment, credibility and distinction without parallels in the trade."

We wish Monika well in her career as a jewellery designer and maker, and are confident that this scholarship will help her to fully build upon her talents, combining artistic innovation and manufacturing skills with a firm foundation of diamond knowledge.

Gem-A USA Foundation Course Scholarship

For the first time Gem-A USA has offered a scholarship competition, open only to USA citizens, for the Gem-A Gemmological Foundation Correspondence Course. The winner of the scholarship competition was announced during the AGTA Show in Tucson on 4 February.

The scholarship was awarded to Alison Withey of Carlsbad, California, who has been employed by the GIA as a diamond grader/staff gemmologist since 2003. She has a long standing interest in the arts including jewellery and hopes to further her professional growth in the gem and jewellery industry. Alison Withey recognizes that the Gem-A Diploma carries significant weight in the industry, "I am particularly interested in the Gem-A programme because it will enable me to learn more about the physical properties of gems while enhancing my gem identification skills. The receipt of the Gem-A USA Scholarship will enable me to enrol in the Foundation course, the first step toward realizing this second aspect of my professional goals. I have a lot of energy and enthusiasm for this new endeavour. Truth be told, I'm having a great time!"

Gem-A USA Scholarship winner Alison Withey.

If you would like to know more the about sponsoring a scholarship for one of our courses, and how this might help to publicize your company, please call Ian Mercer on +44 (0)20 7404 3334 or e-mail ian.mercer@gem-a.info

UK auctions
Spring 2005

BONHAMS, New Bond Street London

Fine jewellery:	**7 April, 30 June**

Knightsbridge

Jewellery:	**20 April, 11 May 8 and 29 June**

(For sales at other UK venues visit the Bonhams' website)
t: 020 7393 3970 www.bonhams.com

CHRISTIE'S, South Kensington

Jewellery:	**26 April**
Antique Jewellery:	**17 May**
Pawnbrokers unredeemed pledges:	**27 May**
Fine Jewellery:	**8 June**

t: 020 7752 3269 www.christies.com

DREWEATT NEATE, Donnington, Newbury, Berkshire

Priory Sale with Jewellery and Silver:	**24 May**

t: 01635 553553 www.auctions.dreweatt-neate.co.uk

Godalming, Surrey (formerly Hamptons)

Jewellery and Fine Arts:	**13 April**

t: 01483 423567

FELLOWS & SONS, Birmingham

Second-hand Jewellery and Watches (by direction of Pawnbrokers Nationwide):	**7 and 21 April, 5 and 19 May, 2 and 23 June**
Antique and Modern Jewellery:	**14 April, 9 June**

t: 0121 212 2131 www.fellows.co.uk

GARDINER HOULGATE, The Bath Auction Rooms, Bath

Jewellery:	**13 and 27 April, 11 and 25 May**

t: 01225 812912 e: auctions@gardiner-houlgate.co.uk

LYON AND TURNBULL, 33 Broughton Place, Edinburgh

Fine Jewellery and Silver:	**26 May**
Jewellery and Silver:	**6 June**

t: 0131 557 8844 www.lyonandturnbull.com

SOTHEBY'S, New Bond Street, London

Fine Jewellery:	**9 June**

t: 020 7293 5000 www.sothebys.com

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

March Puzzle
Grandma's ring

I was recently asked to repair a ring. It had belonged to grandma, but the stone had fallen out. It turned out to be an old cut having seen the ring I found a stone which fitted and the family agreed that it looked 'just like the one that had been in the ring'. The ring of course had great sentimental value and they wanted to restore it.

I gave the mount and stone to a jeweller, who informed me that the head was much too worn and should be replaced as it was too thin and any stone put in would soon fall out again.

I posed this problem to the family and they all agreed that the head should be replaced, but the new head should be as similar as possible to their grandma's ring. Being a good jeweler, he made a magnificent job but was unhappy with the result, as the new head was too good for the old shank, it did not 'look right'. My first reaction was to have the shank changed, but my philosophical background came to the fore, as I realized that by changing every component in the ring, it would no longer be grandma's ring, but a mere replica. I consulted the family and they all agreed with me that they could not regard a totally new ring with the same sentimentality they had for grandma's ring, and were happy to have the new diamond and head with the old shank and could still refer to it as grandma's ring.

At what stage of a repair does an object cease being 'the same' ?

Harry Levy

Answer to the puzzle in the December issue

Since the number of stones remains the same in both packets, the number of sapphires taken out is replaced by an equal number of rubies. So no matter how much I mix each parcel and how often I take stones from one packet and put them in the other, and take out an equal number from this parcel and return them to the original, the number of rubies in the sapphire will always be the same as the number of sapphires in the ruby packet.

Forthcoming SJH lectures

Tuesday 24 May
ERIKA KISS
Sixteenth- and Seventeenth-century Hungarian Jewellery
Erika Kiss is the curator of the silver and jewellery collections of the Hungarian National Museum in Budapest, and organized the exhibition of Hungarian gold and silver shown at the Gilbert Collection in November 2003 to February 2004. Her main research interest is in silver and jewellery of the early modern period; her doctoral thesis was a study of 17th-century court goldsmiths' work in Transylvania and Hungary, and her lecture to the Society will also concentrate on jewellery of that period and region.

Tuesday 28 June
OTTO KUENZLI
His Life and Work
Otto Kuenzli is a distinguished jeweller and goldsmith with a long-established international reputation for his distinctive designs and outstanding technical skills. Born in Zürich, he studied metalworking and goldsmithing in Switzerland and Germany, and since 1991 has been head of the Jewellery Department of the Akademie der Bildenden Kunst in Munich. His work has been exhibited all over the world, and he has taught, lectured and held seminars in many countries, including Canada, the USA, Britain and Australia.

Private Viewings for SJH members

Monday 11 April – Goldsmiths' Hall
'At the sign of the Falcon'* with a talk by John Benjamin
(form circulated to SJH members with *Jewellery Studies*)

Friday 6 May – The Gilbert Collection, Somerset House
'Masterpieces of American Jewellery'* and 'Castellani and Italian Archaeological Jewellery'* (form enclosed for SJH members only)

* Details of the exhibitions and a review of Masterpieces of American Jewellery are given on pages 12 and 13.

Jewellery Studies

The Society of Jewellery Historians is delighted to announce that it has recently published *Jewellery Studies 10, Jewelled Arts of Mughal India,* edited by Beatriz Chadour-Sampson and Nigel Israel. This volume puts into print most of the papers given at the Conference of the same name held jointly by the Society and the British Museum in 2001. The Conference was attended by many members of both SJH and Gem-A, as was the major BM exhibition that it accompanied.

The volume has 132 pages and the papers are profusely illustrated in colour.

The Society of Jewellery Historians is extremely grateful to Sheik Nasser al-Sabah and Sheikha Hussah al-Sabah of the al-Sabah Collection, Kuwait, for their generous assistance towards the production of this volume. It is also most appreciative of the efforts of the authors, and of the assistance of the many people and institutions that supplied illustrations.

Copies of the volume (already sent to all paid-up SJH members) are available at £25 to paid-up SJH members, £30 to non-members, plus post and packing per copy of £3 UK, £5 EU and £8 rest of the world. Your orders together with payment (cheques to be made payable to The Society of Jewellery Historians) should be sent to the Membership Secretary, SJH, Scientific Research, The British Museum, London WC1B 3DG e-mail: jewelleryhistorians@yahoo.co.uk. Volumes 2 to 9 of *Jewellery Studies* are also still available.
Nigel Israel

SJH Meetings

Unless otherwise stated, all lectures are held at the Society of Antiquaries, Burlington House, London W1 and start at 6:00 p.m. sharp. Lectures are followed by an informal reception with wine. Meetings are open only to SJH members and their guests. A nominal charge is made for wine to comply with our charity status.

Tuesday 26 April
IAN FREESTONE
The Science of some Glass Gems and Enamels from Late Antiquity to the 18th Century

Tuesday 24 May
ERIKA KISS
16th-17th Century Hungarian Jewellery

Tuesday 28 June
OTTO KUENZLI
His Life and Work

Tuesday 27 September
MONICA JACKSON
Gold Hellenistic Jewellery: the Significance of the New

Tuesday 25 October
LYNNE BARTLETT
Titanium: the Rainbow Metal

Tuesday 22 November
MARGARET SAX
The Development of Gemstones/ Cylinder Seals in Mesopotamia

The Society welcomes new members and would ask them to make themselves known at meetings to Committee Members, who will in future wear name badges. 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.

Branch Events

Midlands Branch

Friday meetings will be held at
The Earth Sciences Building,
University of Birmingham, Edgbaston.
Admission £4 for a member.
For details call 0121 445 5359.

Friday 1 April
DAVID CALLAGHAN
Gems by candlelight

Friday 29 April
GWYN GREEN
Identification of gem materials using the microscope

Saturday 18 June
Summer Supper Party

Midlands Gem Club

For details contact Paul Phillips on
02476 758940
e-mail pp.bscfgadga@ntlworld.com

North East Branch

For information call
Neil Rose on 0113 2070702
e-mail gema.northeast@gemro.com

Wednesday 13 April
JOHN HARRIS
Chasing rainbows

Wednesday 15 June
JOHN CARTER
The world of pearls

North West Branch

Meetings will be held at the new venue:
YHA Liverpool International, Wapping,
Liverpool L1 8EE.
For further details contact
Deanna Brady on 0151 648 4266.

Wednesday 20 April
ERIC EMMS
Diamond treatments

Wednesday 18 May
WENDY SIMKISS
Mineralization of fossils

Wednesday 15 June
DAVID CALLAGHAN
1960 and all that

Scottish Branch

For details call Catriona McInnes
on 0131 667 2199,
e-mail scotgem@blueyonder.co.uk
branch website
www.scotgem.demon.co.uk

SCOTTISH BRANCH CONFERENCE

Friday 29 April to Monday 2 May
The Lovat Hotel, Glasgow Road, Perth

SHANE McCLURE - Keynote Speaker
Gemmological Frontiers
News from the GIA Gem Laboratory

MARIA ALFEROVA
Gems of Russia

JONATHAN CONDRUP
Diamonds and their colours:
a reflection of the rainbow

BRIAN JACKSON
Feldspar: the forgotten gem

HAL REDVERS-JONES
Whitby jet

COLIN WINTER
The use of the spectroscope

Workshop sessions will be held on the Sunday afternoon and a field trip on the Monday (weather permitting).

South East Branch

For details contact Colin Winter
on 01372 360290
e-mail info@ga-seb.org or visit the
branch website at www.ga-seb.org

Sunday 17 April
JEM JUMBLE

South West Branch

Contact Richard Slater
on 01635 553572.

Sunday 24 April
HENRY MEADOWS
Between a rock and a hard place

RICHARD SLATER and LIZ LATHAM
Agates and other hard stones

For up-to-the-minute information on Gem-A events visit our website at www.gem-a.info

Short courses and workshops

A BRIEF HISTORY OF JEWELLERY MANUFACTURING TECHNIQUES

Thursday 14 and Friday 15 April
10:00 a.m. to 4:30 p.m.

A two-day seminar that covers the history of jewellery manufacture from the earliest times up to the end of the nineteenth century.

Gem-A members: £205.63
Non-members £223.25
Price includes buffet lunches

GEM TESTING – A 'REFRESHING' WORKSHOP

Tuesday 3 May
10:00 a.m. to 4:30 p.m.

This workshop will be of benefit as a refresher course or for anyone whose practical testing skills may be a bit rusty. An opportunity to test a wide variety of natural and synthetic gemstones.

Gem-A members: £123.37
Non-members £135.12

SPECIAL:
SYNTHETIC DIAMOND SEMINAR

Monday 9 May
12 noon to 4:30 p.m.

The development of synthetic diamonds including the varieties available on the market today and the latest identification techniques.

Gem-A members: £84.60
Non-members £94.00
Price includes buffet lunch

All courses are held at the Gem-A headquarters at 27 Greville Street, London EC1N 8TN.

For further details and a booking form visit www.gem-a.info/education/londonWrkShops.cfm or call Claire on 020 7404 3334.