Gems&Jewellery

July 2009 / Volume 18 / No. 3

Gems of Thailand

An exceptional blue diamond

Scottish Conference Report

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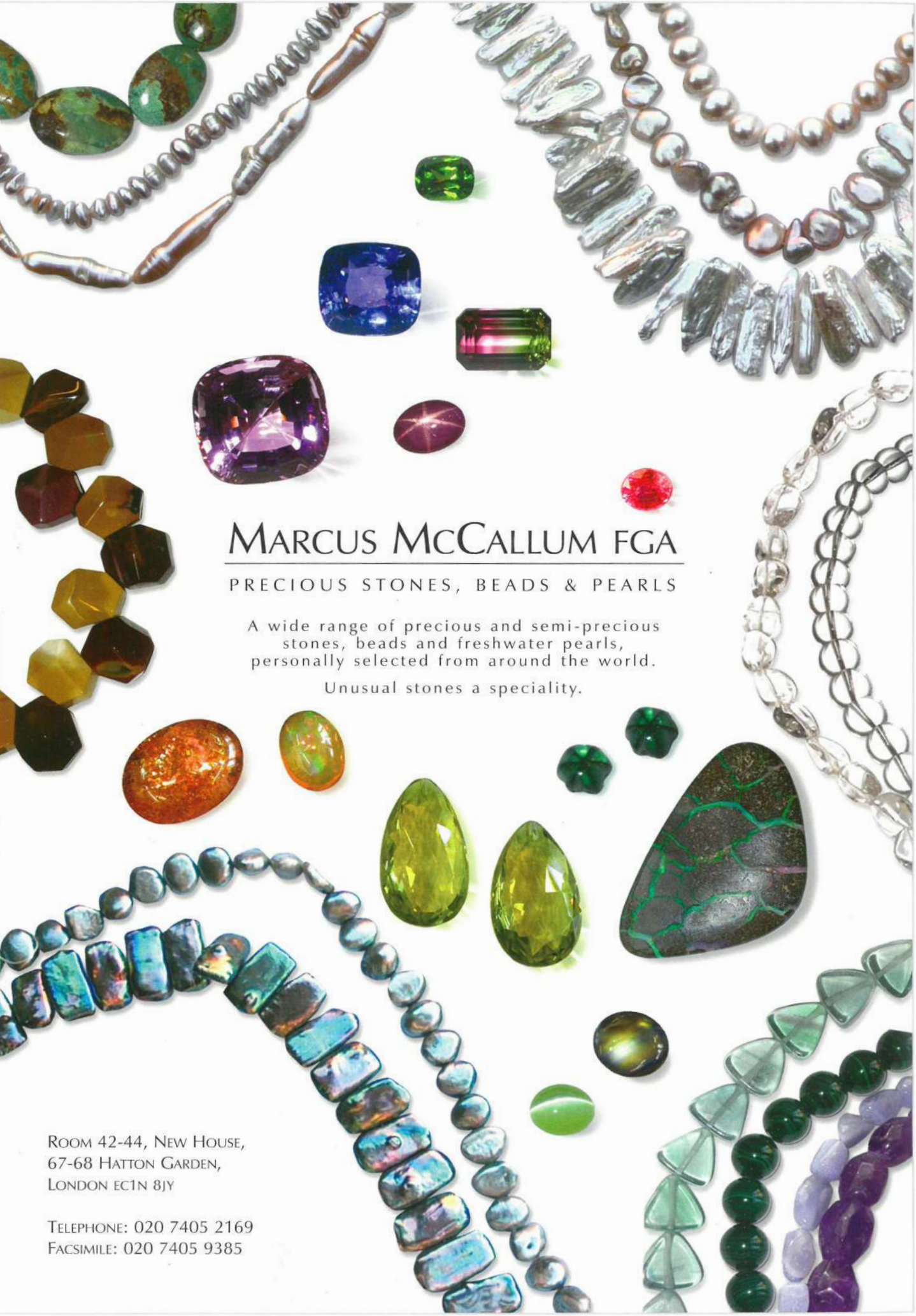

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Editorial

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Contents

Keep it simple

In the last issue of *Gems & Jewellery* we looked at some of the issues related to what we call things. The prompt for this was the on-going debate about what terms should be used to describe synthetic diamonds. There are other terminology issues that need thought, one being increasing blurring of the distinctions between 'treatment', 'artificial' and 'synthetic'.

Brian Jackson had raised this in a Gem-A MailTalk posting a month or two back. He pointed out that corundum may be heat treated to temperatures that bring about partial melting and on cooling a degree of recrystallization. Thus the stone "could be considered as partially synthetic". However, in gemmological circles it is simply described as 'treated' — if the treatment is disclosed at all. How extensively can we modify the colour, clarity, durability or other properties of a gem material and still think of it as simply a treated natural gem? A ruby with a fissure rendered less visible by means of some sort of filler, glass even, might fairly be described as treated. But what of those 'rubies' that are actually natural ruby fragments congealed in red glass and polished to shape? Are they composite, artificial, treated ...?

Every industry needs to know what it is talking about, but one problem with jewellery industry bodies attempting to define terminologies and disclosure rules in the past has been that they have tended to wrestle with the new challenges after they are already out on the market. So the 'Rules' mount up in an ad hoc way. The 'Rules' are tidied up from time to time, but this may be limited because dealers fear retrospectively downgrading gems sold in days of more relaxed disclosure guidelines. Couple that with the synthetics and treatments that will appear over the next generation and the potential for ever more complex disclosure terminology looms large.

Why am I raising this here? Because Gem-A plans to launch a new form of corporate membership over the next few months and so we are investigating the practicability of an accompanying Code of Practice. I've been in this game long enough to realize that unless such a Code can cover the past, the present and at least some of the future, and can be summed up on a single sheet of paper, neither the industry nor the consumer will thank us.

Jack Ogden
Chief Executive Officer

Cover Picture
Looking for rubies by sieving gravel in a river at Bo Rai, Thailand. Photo by Peter Grumitt. See Thai Treasures and Treatments, page 3.

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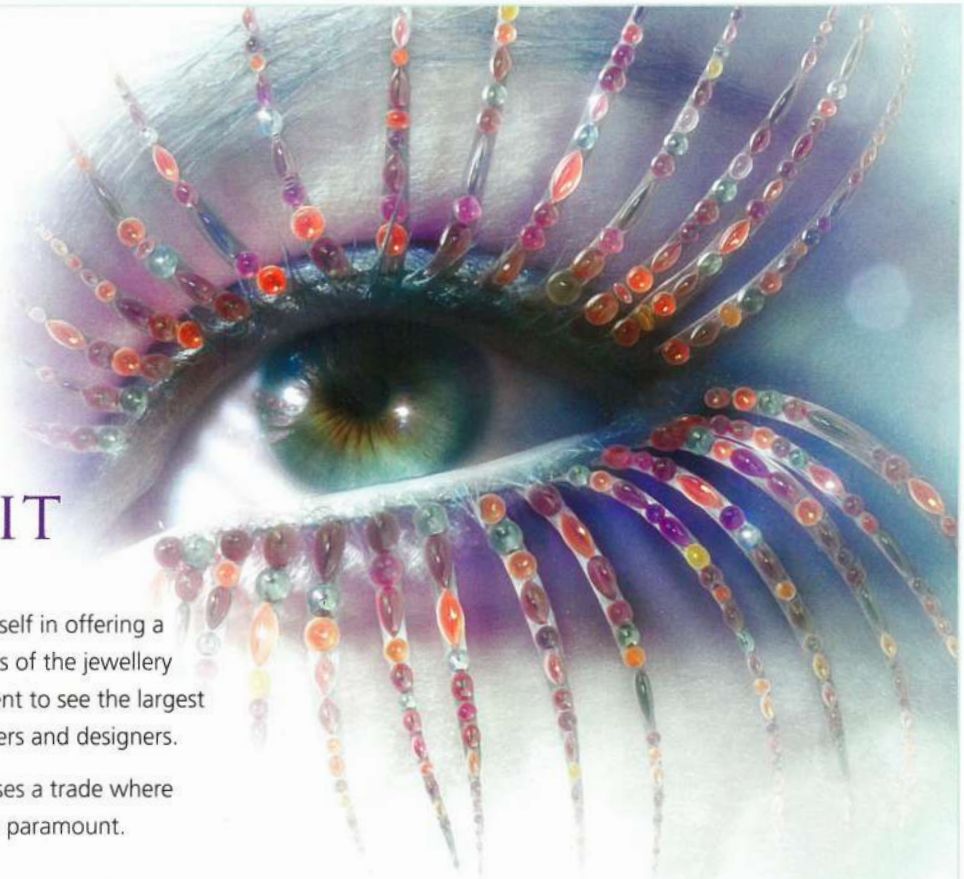

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Thai treasures and treatments

JK-based gem dealer Peter Grumitt gives a summary of a talk he gave at the Gem-A Gem Discovery Club on 7 April, when he took members on what he described as a journey through the Thai ruby and sapphire deposits. His 'tour' covered the mines and the marketing, and looked at some of the treatments used today.

Peter Grumitt buying rough sapphires from miners at Bang Kacha, near Chanthaburi, Thailand.

here are historical references to ruby ining and trading as far back as the fteenth century in what was then known s Siam, but the gem mining industry n modern Thailand really began to be eveloped in the 1960s. There has een extensive sapphire mining to the est in Kanchanaburi province and ruby nd sapphire mining to the east in both hanthaburi and Trat provinces. Productivity eaked in the mid 1980s. Some areas are ow completely mined out, in others some mall scale mining continues to this day, ut in general the gem-mining industry in hailand is in decline and the cost of mining s beginning to outweigh the value of gems ecovered.

Kanchanaburi Province

The sapphire deposits in Kanchanaburi are located about 35 km north of Kanchanaburi city, around the district of Bo Ploi. These have have mined for about 80 years, but large scale industrial mining began in the mid-1980s. The sapphires are often found fairly close to the surface, but today the mechanical diggers excavate down to about 20 metres. After washing, the gem-bearing gravel enters the sorting room on a conveyor belt where sorters sit either side of the belt and hand-pick the sapphires from the gravel. The stones are then taken for further sorting, heating and cutting. There is declining production in this area.

Chanthaburi and Trat Provinces

There are three distinct gem zones in Chanthaburi and Trat. To the west there is Bang Kacha and Khao Ploi Wean; the central zone stretches from Ban Welu Klang to the north to Ban Bo Nawong in the south and the eastern zone comprises the area around Nong Bon and Bo Rai.

Bang Kacha

The village of Bang Kacha is located approximately 280 km south east of Bangkok in Chanthaburi province. Large and small scale mining operations can be found between Bang Kacha and neighbouring Tha

Hands-on Gemmology

Thai treasures and treatments

Map of Thailand showing the mining areas.

Mai with many of the mines situated on family-owned fruit orchards. The sapphires are found in pockets of grey soil with a clay-like texture, called *kee ploy* by the locals. There is still active production in this area. Most of the sapphire mining operations in Bang Kacha are now large scale open cast mines using JCBs to dig and mechanical jigs to sieve the soil, although more traditional, smaller-scale methods are also used. Here shafts are dug by hand, with access foot-holes, and the sapphire-bearing gravel bought up in buckets, with a constant risk of cave-ins. Bang Kacha produces sapphires in colours unique to this region, including some of beautiful golden colours. Green sapphires are more commonly found and sometimes a yellow-green mixture with a beautiful olive colour. Black star sapphires are also found, with a very dark brown body colour and a silver star and, very rarely, with gold stars which can realize high prices.

Bo Rai

Bo Rai is situated in Trat province, about 10 km from the Thai–Cambodian border, some 350 km east of Bangkok. Here mining methods varied from old style hand-dug pits to the more destructive mechanized mining, using high pressure hoses and bulldozers. In the early 1990s the Thai government placed a ban on the mechanized mining methods in and around Bo Rai, and today there are only a few small-scale mining operations, mostly by individuals who dig by hand on private land or sieve the river gravels. These Thai rubies are generally clean but often have a dark hue due to a high iron content. They are thus barely fluorescent.

Pailin, Cambodia

Just across the border in Cambodia lies Pailin, the last stronghold of the Khmer Rouge because of its teak forests and rich mineral resources. The latter include alluvial sapphire deposits which are spread across the valley and up in the surrounding hills. Stones found in Pailin are mostly blue sapphires, small amounts of ruby and large amounts of zircon. Here there was extensive large-scale mechanized mining by Thai companies during the late 1980s to mid-90s and, although production from Pailin is now relatively small, some good stones are still found. On Sunday mornings the Khmer traders bring sapphires to Ban Pakgat on the Thai side where there is a large market.

A small-scale sapphire mining operation at Bang Kacha. Green and golden sapphires are found at this particular mine, along with small quantities of star sapphires.

Traditional old-style pit mining in Bang Kacha. This method is rarely seen these days.

Foot holes dug into the side of an old style mine shaft.

Thai treasures and treatments

Buying rough at the mines or local markets can of course be pretty risky. A fibre optic light can reveal many things, but some inclusions are only visible once a stone has been cut and polished.

Treatments

Treatments are also a very major challenge to everyone involved with gems, from dealer to gemmologist. Gem treatments have been with us for centuries, but it is only in recent decades that they have become a matter of routine. During the 1970s it was discovered that heating milky geuda sapphires could turn them into clean bright blue stones. Heat can also remove the purplish overtones found in Thai rubies. The early heating methods were primitive; the stones were simply encased in clay balls and baked in charcoal fires. Now, however, heat treating is precisely controlled, the exact processes being closely guarded secrets.

Probably one of the most controversial treatments today is the beryllium treatment of rubies and sapphires. This is now performed as a matter of routine on some corundum types, with stones from many parts of the world being treated in Thailand, including reddish-brown sapphires from Songea, Tanzania, which are turned to a fine orangey red with beryllium treatment. The beryllium treatment of blue sapphires is a more recent development and could be a major challenge to the trade — many of whom still seem unaware of it.

More lead-glass-filled rubies appeared on the market in 2004. The Thai treaters referred to this treatment as *pao mai* or 'new bake' and it is mostly used on low grade red corundum from Madagascar which is sometimes available in huge crystals. The crystals are cleaned before glass treatment by being soaked in bleach; acid cleaning causes them to deteriorate and disintegrate to a powder.

Dealers must be vigilant. Treatments which can dramatically affect the value of gems are here to stay, whether we like them or not, and new treatments will inevitably arrive unannounced. It should go without saying that all treatments should be disclosed.

For more information, including videos on Bo Rai, see Peter Grumitt's website www.apsara.co.uk

All photos by Peter Grumitt

Green sapphires before and after beryllium treatment, clearly showing the dramatic change of colour.

Porters picking out sapphire crystals from a conveyor belt at Bo Ploi, Kanchanaburi. The black stones are spinel crystals known locally as nin.

Inspecting a parcel of sapphire crystals at Bo Ploi, Kanchanaburi, Thailand.

Polishing two sapphire cabochons at once.

Hands-on Gemmology

Synthetic sapphires with 'natural-like' sheen

Synthetic gemstones displaying features similar to those of their natural counterparts and vice versa are often encountered in the Gem Testing Laboratory in Jaipur. Gagan Choudhary describes a new type of synthetic sapphire displaying sheen effects similar to those seen in some natural sapphires. The stones tested were yellow, green and greenish blue, but other colours such as red (ruby) and blue are also available. In most stones, the sheen effect is visible at the table facet but in some it is also present as zones well within the stone. However, routine gem testing is sufficient to enable identification of these stones as synthetics.

The four synthetic sapphires obtained for reference and the subject of this study. Note the sheen effect restricted to the table facets, a feature commonly displayed by natural sapphires. Also note the curved zones in the greenish-blue stone. Weights 2.10–3.41 ct.

'Sheen' is a kind of lustre, reflection or milkiness on the surface of a gemstone due to the reflection and scattering of light from evenly distributed minute inclusions. Such an effect is well shown by moonstone but can be observed in any gem which contains inclusions of this nature. Another gem material in which the effect is commonly seen is in those corundums containing minute inclusions of titanium oxide in the form of fine needles ('silk'), discs or dust. The presence of such inclusions has hitherto been a good indication that a stone being natural. However, synthetic corundum is now being created with inclusions which are produced by inducing or diffusing titanium oxide into the structure.

Where such inclusions have appropriate crystal habit and orientation, and are present in sufficiently high concentrations they can give rise to star effects when cut as cabochons. In lower concentrations, however, the inclusions may produce only milkiness.

Recently the Laboratory obtained four synthetic sapphires displaying the sheen effect for study and reference purposes. The stones consist of two yellow, one green and one greenish blue; all are octagonal step cuts and range from 2.17 to 3.41 ct **(1)**. In addition, a 2.14 ct oval mixed-cut synthetic sapphire **(2)** was submitted to the Laboratory for identification. This article presents the gemmological properties and inclusion features of these synthetic sapphires with a sheen hitherto associated with natural stones.

Visual characteristics

The four samples obtained for study have a good transparency and display a sheen-like effect on the table facet **(1)**, appearing slightly hazy; no other facets displayed this effect. The greenish-blue stone has an 'electric' look, similar to that seen in paraíba-type tourmalines. The green and greenish-blue samples also displayed eye-visible blue

Hands-on Gemmology

Table I: Gemmological features of four synthetic sapphires displaying a sheen more commonly seen in natural corundum.

Property	Description		
Colour	Green (1)	Greenish blue (1)	Yellow (2)
Weight	2.83 ct	2.10 ct	3.41 – 2.17 ct
Optic character	Anisotropic; uniaxial optic figure		
RI	1.760 to 1.770; Birefringence 0.008		
SG	3.97	3.98	3.97 – 3.99
UV fluorescence	Bright chalky fluorescence under SW (restricted to table); inert under LW		
SWUV transparency	Opaque		
Appearance under Chelsea colour filter	Weak red at corners	Strong red – intense towards blue zones	No change in colour
Visible range spectra	Weak lines in the red end	Bands at 540, 580 and 630 nm	No distinct absorption bands
Inclusions	Minute inclusions (needles and pinpoints) Curved zones of pinpoints Gas bubbles 'Fingerprints'	Curved bands consisting of blue droplet-like inclusions 'Milky' zones Wavy clouds	
Composition determined by X-ray fluorescence (EDXRF)	Presence of minor amounts of Ca, Ti, Cr, Fe, Co, Ni	Presence of minor amounts of Ca, Ti, Cr, Fe, Co, Ni	Presence of minor amounts of Ca, Ti, Fe, Ni

curved zones of pinpoints which immediately indicated that the stones are flame fusion or Verneuil synthetics. The blue zones in one of the samples (**1**) are quite broad and dense, with green between, giving the appearance of a blue and green parti-coloured stone; the yellow stones are uniformly coloured.

Gemmological properties

The gemmological properties of the synthetic sapphires are described below and are listed in **Table I**.

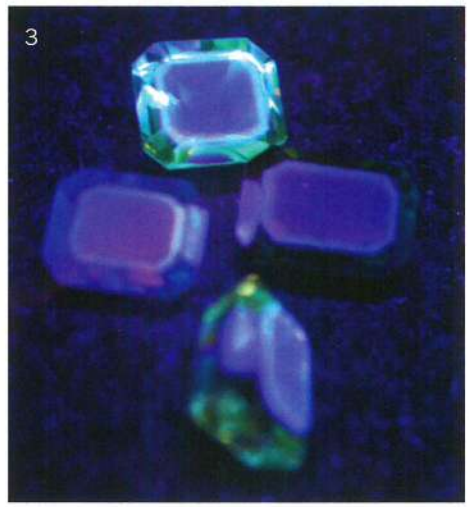
All specimens are clearly anisotropic when rotated between crossed polars, with strong interference colours visible at the table facet. Using a conoscope, a uniaxial optic figure was readily resolved for each stone. This indicated that the c-axis was oriented perpendicular to the table facet. Refractive indices (RI) and specific gravity (SG) values (listed in **Table I**) are consistent with those for natural and synthetic corundum.

Ultraviolet (UV) fluorescence: All specimens displayed a chalky blue fluorescence under short-wave (SW) UV while remaining inert under long-wave (LW). This chalky fluorescence was restricted to the table facet only (**3**) and is probably caused by the concentration of fine inclusions which also give rise to milkiness or a sheen effect.

SWUV transparency. This test has generally been useful for separating light-coloured natural and synthetic corundums; synthetics usually appear transparent while naturals are opaque. However, the presence of fine whitish inclusions causing the milkiness in the four synthetic sapphires causes these stones to appear opaque to SWUV, while in contrast, the stone submitted for identification (**2**) lacks such impurities and appears transparent under SWUV (**4**).

Chelsea filter reaction. Through a Chelsea colour filter, the greenish-blue stone appears red with intensity of red increasing towards the blue bands, while the green stone displayed only a weak red towards the

This synthetic sapphire of 2.14 ct contains fine milky zones resembling those common in sapphires of natural origin.

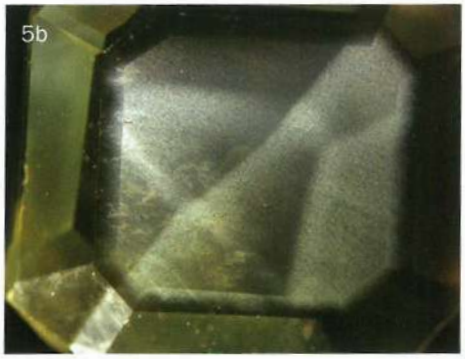


The synthetic sapphires shown in 1 under shortwave UV display a strong chalky blue fluorescence generated by the thin planar areas containing the sheen-producing inclusions near the table facets.

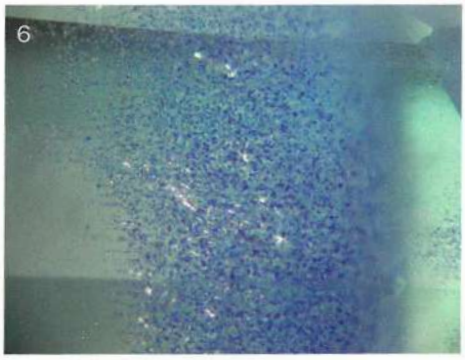
The synthetic sapphire shown in 2, which here shows transparency to SWUV radiation. Note the transparent centre and dark edges.

Hands-on Gemmology

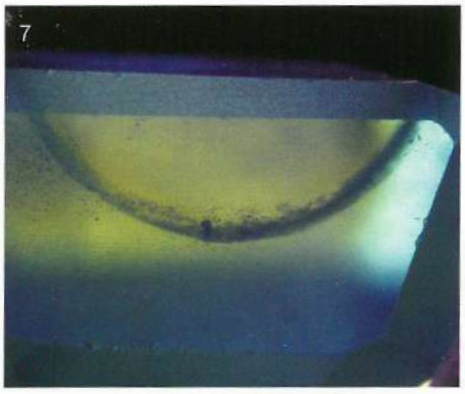
Synthetic sapphires with 'natural-like' sheen



Minute inclusions of variable patterns consisting of short needles, restricted to the table facets (5a) and fine pinpoints similar to dust (5b), causing the sheen effect. Such inclusions are commonly observed in synthetic star corundum or natural corundum with induced or diffused titanium oxide.



The blue zone in the greenish-blue sample consists of fine to coarse blue drop-shaped inclusions.



Curved zone of pinpoint inclusions concentric about an axis parallel to the table facet. This indicates that the growth direction of the synthetic sapphire boule is parallel to the table facet. Optical observations indicate that the c-axis is perpendicular to the table, so this is an unusual growth habit for a synthetic sapphire boule.

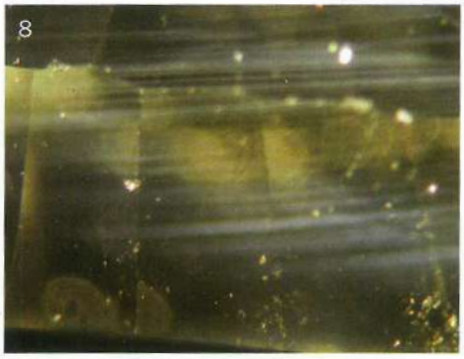
corners. The yellow stones did not exhibit any change of colour through the filter.

Spectra in the visible range. The greenish-blue stone has a spectrum with three absorption bands at around 540, 580 and 630 nm, which is typical of the presence of cobalt, while the green sample displayed only fine lines at the red end. No absorption peaks were seen in the yellow samples.

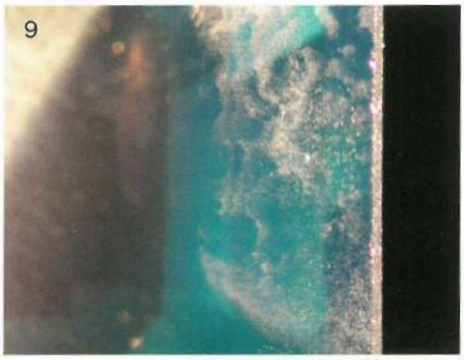
Microscopic features

In all samples minute inclusions of variable pattern are present and restricted to the vicinity of the table facet. These mainly consist of oriented short needle-like inclusions (**5a**) and fine pinpoints (**5b**, looking like dust), both of which cause the sheen effect. These inclusions are similar in appearance to those observed in star corundum, both natural and synthetic with induced inclusions. Such inclusions are formed as a result of exsolution of titanium oxide in the structure of corundum, supported by X-ray fluorescence measurements (EDXRF), and are presumed to be of rutile.

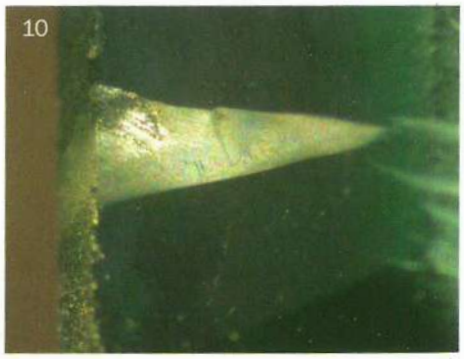
In the green and greenish-blue stones, thick and distinct curved bands are visible with the unaided eye (**1**). These are composed of blue drop-shaped inclusions (**6**) which range from very fine to coarse. EDXRF analyses of these inclusions revealed high values of cobalt, so the possibility of these droplets being tiny cobalt minerals cannot be ruled out. These bands appear quite different from those usually seen in synthetic blue sapphires



The specimen in 2 contains fine milky straight zones, similar to those commonly observed in natural sapphires.



Some randomly oriented wavy clouds composed of whitish pinpoint and crumb-like inclusions in the greenish-blue sample.



The green stone contains one surface-reaching, fingerprint-like inclusion, partly white and partly iridescent. These features resemble those in corundum exposed to high-temperature treatment, and iridescent colours have commonly been associated with natural sapphires.

Synthetic sapphires with 'natural-like' sheen

In addition to the pinpoints described above, these synthetic sapphires also contain curved zones or clouds consisting of fine whitish pinpoints which could be gas bubbles or unmelted feed powder. These pinpoints are in zones generally concentric to an axis running parallel to the table facet (**7**). Such curved zones are commonly formed along the length of a synthetic corundum boule and represent its growth direction parallel to the crystal c-axis. But since in our four stones a uniaxial optic figure is visible looking perpendicular to each table facet, the optic axis or c-axis must be along the line of sight, and this is perpendicular to the growth axis of the boule as indicated by the pinpoint zones.

The specimen submitted for identification (**2**) displays well defined milky zones (**8**) composed of fine pinpoints, some at the limit of optical resolution. Such zones are typically encountered in sapphires of natural origin and, on this basis, it could have been easy to misidentify the stone as natural. However, the stone's synthetic origin was indicated using the SWUV transparency test.

Some scattered spherical gas bubbles are present in all the stones, and in addition to these features typical of synthetic corundum, a few uncommon inclusions are also present. These comprise white wavy clouds (**9**) composed of fine pinpoints which do not follow any consistent crystallographic orientation; it rather appeared as if some stress cracks had been filled by these cloudy masses.

The green stone contains one surface-reaching, fingerprint-like inclusion with a whitish appearance (**10**), resembling features common in corundum exposed to high-temperature treatment. The inclusion is also iridescent, a feature common in natural sapphires, so not diagnostic in this context.

EDXRF

Qualitative energy dispersive X-ray fluorescence (EDXRF) analysis was performed using a PANalytical Minipal 2; trace elements were measured at 25 kV tube voltage and 0.25 mA tube current. The results revealed the presence of Ca, Ti, Fe and Ni in all five stones. The presence of Ti indicates that the sheen-producing inclusions are TiO_2, most probably rutile. However, Ti was detected only on the table facets, not on any pavilion facets (which did not have such inclusions). The greenish-blue and green stones also contain distinct Co and Cr (weak) which are below detection levels in the yellow synthetic sapphires.

Conclusion

Although identification of these sapphires is not particularly challenging, care has to taken when dealing with such stones. Two of the stones tested clearly displayed identifying features like curved zones, but these are not so easily seen in lighter coloured samples such as the yellow sapphires. Synthetic sapphires with fine cloudy bands like 'silk' and with iridescent planar inclusions could pose problems for dealers if not carefully checked with good gem testing equipment.

About the Author

Gagan Choudhary FGA has been an Assistant Director of the Jaipur Gem Testing Laboratory since 2001. Currently he is involved in educational, testing and research activities of the institute.
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Hands-on Gemmology

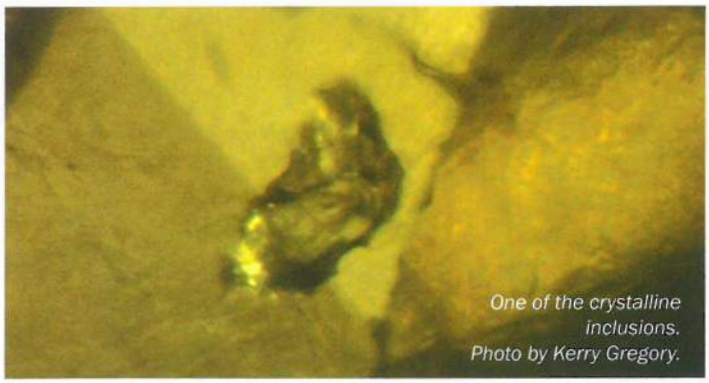
Mystery gem?

Nobody at the South West Branch workshop could identify the green stone brought along by one of the members. But Branch Secretary Kerry Gregory reveals how the answer came to her later that day.

I am on a gemmology high after our first practical gemmology afternoon at the South West Branch in Bath. We had a hectic day with 17 people of all ages and abilities and 60 stones to test. Interestingly, out of 17 people we had only three men. But it was one of our male members who approached me with the words: "Kerry, I've got something to show you." Into my hand he placed an oval faceted bottle-green stone of about 6 x 4 mm and asked: "What do you think it is?"

This question is something that strikes joy and fear into me in equal measure; joy that I might encounter something interesting and fear that it might be so interesting I don't know what it is. On this occasion it was the latter. The colour in the dim light reminded me of a dark peridot, but he wasn't going to be asking me about a peridot so I thought I'd better investigate.

Like a true gemmologist, the first thing I did was not check it on a refractometer or blast it with a laser, but look at it. The stone had really quite worn facet edges and a few chips, but the surface lustre of the stone where not damaged was quite high. When I looked at the interior of the stone with magnification I thought I saw what looked like swirls and bubbles, which led to me to think it could be moldavite, but on closer inspection these appeared to be crystalline inclusions.



One of the crystalline inclusions. Photo by Kerry Gregory.

On the polariscope the stone behaved in a way I've not seen before; it didn't seem to be doubly refractive but I saw what looked like interference colours. I was unable to get an interference figure with the use of the conoscope, and wondered whether what I was seeing could have been due to the many inclusions in the stone. On the refractometer I got a reading of 1.722, but when rotating the polarizing filter I wasn't sure if I was seeing one or two lines. The spectrum showed a single clear line in the blue violet region and a cut off in the violet.

Originally the appearance of the gem had brought to mind peridot, tourmaline, moldavite, demantoid garnet or hydrogrossular garnet, but none of these fitted the data I had collected so far. So we all left the meeting none the wiser as to what the stone was.

I hate to be beaten so decided to do some more research on the train home. I'd like to say I had an epiphany and the true identity came to me in a flash of light, but that was not the case. I trawled through the lists of constants in the one book I had with me, until I came across idocrase. I admit I did actually shout "That's it!" out loud on the train, and immediately texted everyone who had been at the meeting with the answer.

Since the meeting I have had the opportunity to test the stone further, and can confirm a more specific RI to be 1.720–1.723 with a uniaxial negative sign. I have also looked at the stone through the dichroscope and seen quite distinct pleochroism of bottle green and yellowish green.

But this did make me think. There are so many rare and unusual gemstones out there that I haven't seen, so if one comes my way I will find it difficult to identify. So we are planning an 'Odd, Unusual and Rare' afternoon for the Branch, where participants will get the opportunity to study some of the stones we read about in *The Journal* or online (or even hear about on one of the selling channels on TV!) such as hackmanite, sugilite, painite and jeremejevite, so if we are ever lucky enough for one to cross our paths we'll be more likely to know what it is. These afternoons will also include some of the more common gemstones with their unusual look alikes, particularly those with overlapping constants such as citrine and scapolite or topaz and brazilianite.

Kerry Gregory FGA DGA is the Gem-A Ambassador for Wales and the South West of England. If you are in Kerry's area and would like her to call at your store or business to see how Gem-A education can help you and your staff, please contact her at kerry@christophergeorgejewellers.co.uk or call 07771 860323.

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The Scottish Conference

New Sources, New Treatments, covered in two-day programme

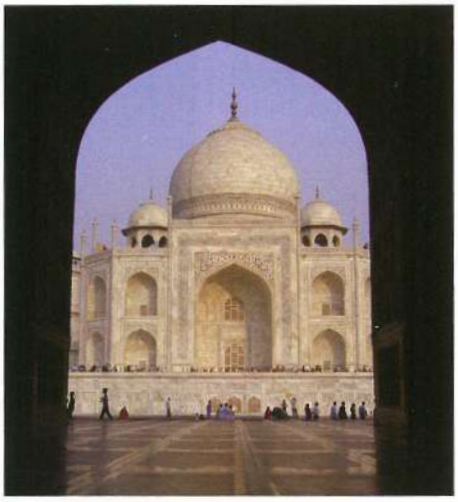
Scotland's annual feast for gemmologists and gem-lovers was held, as usual, in Perth over the first weekend of May and drew participants from many lands, including Canada, Russia, the Netherlands, and Thailand. Of course there were ample opportunities to talk, network and drink over dinners, dances and a jasper-hunting field trip, but the spotlight was on an excellent line-up of speakers.

Mughal jewellery and dress

The opening evening of the Conference brought some historical perspective to gems and jewellery in a study of the relationship between dress and jewellery in a society famous for its opulence and fine gems – Mughal India. 'A Splendid Harmony – Jewellery and Dress of Mughal India', was presented by Jennifer Scarce, former Curator of Middle Eastern Cultures, National Museums of Scotland, and now an Honorary Lecturer at the School of Design, Duncan of Jordanstone College of Art, University of Dundee.

The main focus was the period of Jahangir (1569–1627) and his son Shah Jahan (1592–1666), respectively the fourth and fifth Mughal rulers after Babur's conquest of Delhi in 1526. Centuries' old treasuries plundered in the wars with kingdoms of Southern India plus the trading acumen of the East India Company, brought magnificent jewels to the Mughal court. The jewels, of course, included diamonds from the famed Golconda mines. The range and huge quantities of these gems and pearls, and how they were worn, can be seen in the intricate Indo-Persian paintings of the period which themselves illustrate court life and the Shahs' daily round of audiences and ceremonies. The latter included the annual weighing in gold, in which the Shah was weighed on a huge balance against a mound of golden jewels and gems. Jennifer admitted to a slight scepticism as to whether this mound of treasure was indeed then distributed in a display of royal largesse. In addition to the gems and goldwork, the jewellery of the period was also characterized by intricate and colourful enamelling, a fashion and technique that may have been introduced from Europe. Another European introduction was cameos.

There is little surviving jewellery of this period now in India, but the collections of the National Jewels Museum in Tehran provide a spectacular indication of the original jewelled splendour of the Mughal Court.



(Above) The Taj Mahal which Shah Jahan built in memory of his wife Mumtaz Mahal. Photo J. Ogden.

(Right) Jahangir Preferring a Sufi sheikh to Kings (one of the kings being a European), miniature painting by Mughal artist Bichitr, ca. 1620.

Recent Events

Treatments

The first full day of the conference opened with a topic of concern of all gemmologists when Ken Scarratt, Managing Director, South East Asia, and Director of GIA Laboratory Bangkok, talked about Gemstone Treatments Today. He began by stating that he had an aversion to gem treatments, a feature of the gem industry that had caused many headaches over the last few decades. One problem that he pointed out was the secrecy often surrounding treatments, not only the secrecy of the treaters carrying out the work regarding their processes, but the isolation in which laboratories around the world had often worked. A more collaborative inter-laboratory approach was needed. Thus the GIA had decided to post details of on-going research findings on the web – at www.giathai.net/lab.php and www.gia.edu

An example of recent research was that on the rubies found in Greenland. This was still a relatively new source, but there would be an increasing amount coming onto the market, although mostly in small sizes. Tests had shown that the material was generally not susceptible to heat treatment. The relative abundances of trace elements iron, titanium, vanadium and gallium (plotted as Fe/Ti v. V/Ga) had been shown to separate ruby sources quite well. In the case of the Greenland material there was relatively high iron and low vanadium and gallium. There were broad variations in the amount of chromium present, and thus in depths of hue. The Greenland rubies also have considerable twinning and distinguishing inclusions which Raman spectroscopy had shown to include iolite, pargasite and dolomite.

HPHT diamonds

Of treated gems, the treatments to diamond were particularly important to the industry. Diamond was considered the 'perfect gem material' and so treaters strived to achieve perfection. The results of treatment processes depend on the diamond type, in particular whether the diamonds were Type Ia with nitrogen or type IIa without nitrogen. There had been a long history of diamond treatments from early irradiation, with or without annealing, to high pressure, high temperature (HPHT) treatment. Initially in the early 1990s HPHT had been used to induce a green or yellow colour, but by 1999 the more familiar use of HPHT to whiten poor coloured 'brown' stones had been introduced. The treatment removed the defects that caused the brown colour. More recently, in 2005, HPHT had been combined with radiation in a two-stage process. Now much poor quality diamond could be converted into far more saleable material and a variety of colours produced. Light greyish-blue diamonds can be changed with HPHT treatment into fancy blue colours. Type Ia brown diamonds can be turned to intense greenish yellows and Ia Cape stones into vivid orange-yellows. When Type Ia brown diamonds are HPHT treated and subsequently irradiated and annealed, pinks to reds can be produced. When Type IIa brown undergo similar treatment, pink to orangey pink shades are produced. Ken warned that most natural pinks, other than those from the Argyll mine, were Type IIa.

Treated diamonds can be identified by PL, UV-Vis-NIR or FTIR spectrometry.

Coated gems

The next form of treatment discussed by Ken was coating. Coated gems had become far more prevalent in recent years and now included CZ coated with diamond-like material – a product being heavily marketed in Japan. A more potentially dangerous type of coating was that now applied to some paler Tanzanite. This can be hard to detect, especially when mounted because the stones are generally coated only on the pavilions and sometimes girdles, not on the crowns. Thus the usual identifiers such as small pits and holes in the coating are less easy to observe. However, there are identifying characteristics including minute white spots on the coated surfaces that look like dust, but do not come off. These can be seen using reflected fibre-optic light. The multicoloured iridescence often seen on coated gems may be observable and colour fringes are also sometime visible. There may also be pink flashes and orange marks, seemingly due to damaged coatings.

"Comet tails" within unheated spinel from Tajikistan. Photo K. Scarratt. © GIA.

Immersion, even simply in water, can reveal the coating when there is slight wear to facet edges. XRF analysis showed the presence of cobalt in the coating and more sensitive analysis by ICPMS also revealed traces of zinc, tin and lead.

Treated spinel

It used to be almost a mantra in the gem trade that spinel was never treated. In general this is still true. The beautiful spinels from Tajikistan, for example, are untreated. However, there were rumours that the large quantities of spinel from Tanzania that came onto the market in Bangkok had been heat treated. Experimentation showed that this was correct. The heat treatment, at about 1200° C does not seem to improve colour significantly, but it does have an effect on the clarity by dispersing the inclusions that cause cloudiness. Such treatment can be detected by photoluminescence (PL) spectroscopy which reveals a distinct peak widening in the treated stones. However, similar broad peaks are present in synthetic spinels and the distinction between natural spinels that have been heat treated and synthetics requires chemical analysis.

The andesine problem

Another suspected treatment that had become a matter of much controversy and heated discussion for more than a year was the copper diffusion of andesine feldspar; indeed George Rossman had been asked about this at the 2008 Scottish Conference. The controversy surrounded both the source of the material and whether or not it had been treated. Ken explained that following

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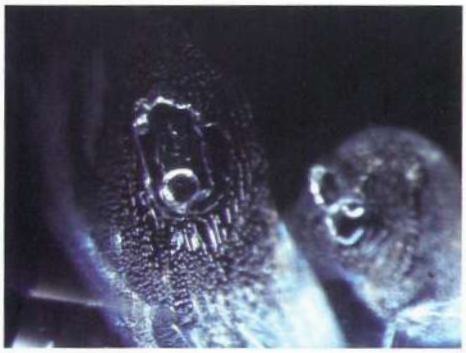
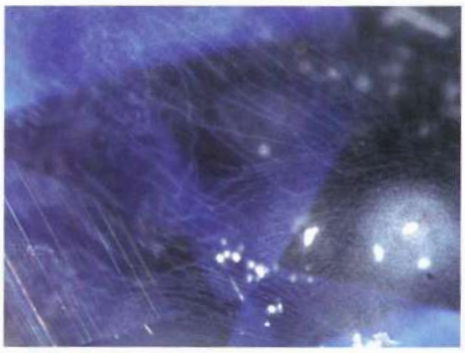


Melted crystals (evidence of high temperature heating) in a beryllium-diffused blue sapphire examined in GIA Laboratory, Bangkok. Photo K. Scarratt © GIA



Spiderweb-like internal damage within a beryllium-diffused blue sapphire examined in GIA Laboratory, Bangkok. Photo K. Scarratt © GIA

a trip to the mine in Tibet by Ahmadjan Abduriyim, it had now been shown that there were actually two new sources of the reddish material — Tibet and Mongolia. That from Tibet was proved to be untreated, whereas that from Mongolia was naturally of a light yellow colour and had been copper-diffused in China to develop the reddish hue.

Ken explained further that given the apparent two types of material, the research programme that GIA was following at present was aimed at distinguishing between the two. The sequence of data acquisition thus far included chemically mapping material from the known sources (which included Mexico and the Ponderosa mine in Oregon, in addition to Tibet and Mongolia) and then determining the effects that heat alone had on the samples. Thus far, it had been found from the mapping that the relative calcium and potassium contents could help distinguish the sources, although it may not be definitive, and detecting treatment with certainty may prove difficult. These same samples had now been diffused with Cu and were in the process of analysis. Ken warned that there were probably vast amounts of the copper-diffused material now on the world market.

Beryllium-treated sapphires

Finally Ken touched on beryllium-treated sapphires. The beryllium diffusion treatment of other corundum types was well known, but the improvements to blue sapphires using this technique had received little attention, even though there were probably considerable quantities on the market. The treatment can be used on any dark blue sapphires to render a fine blue colour, but much of the material was of Madagascan origin. The appearance of inclusions can be diagnostic, but detection of the beryllium using ICPMS or other sensitive analysis is most certain.

'Paraíba-type' tourmalines

The 'paraíba-type' tourmalines from Mozambique were the subject of a talk by Dr Hanco Zwaan, Director of the Netherlands Gemmological Laboratory. These tourmalines, copper-bearing elbaites from Mavuco, Nampula province, Mozambique, have been a hot topic in gemmology in recent years, not the least because of the vociferously debated nomenclature issues (see 'Origins', *Gems & Jewellery*, January 2009, pages 16 and 17). Hanco reported on the geology and the gemmological properties of this material and its heat-treatment, including before and after analyses. The research project had been carried out in cooperation with the GIA and the University of New Orleans.

Mining in Mozambique

Hanco began by describing the source of the material in a region of Mozambique that had been mined for minerals since the 1930s. The copper-bearing tourmalines are found only as water-worn pebbles in alluvial gravels containing milky quartz and weathered feldspar, and probably derived from pegmatites some hundred kilometres to the northwest, although the actual origin had not yet been identified. Mechanized mining is undertaken by Mozambique Gems, but much mining is still informal with a network of small, though sometimes interconnected, diggings. At the time of Hanco's visit to the area there were some 600 local miners and some 200 buyers, mainly West Africans. These stones are eventually sold onto foreign buyers, mainly from Brazil, Thailand and Germany, and go to Hong Kong, Thailand and Germany for cutting. The Mozambique Gems material goes to Brazil for cutting and treating.

Colours and sizes

The tourmaline pebbles as found are in blue-green, greenish-yellow and shades of violet-blue, and purple, rarely with colour banding. Buyers must be cautious because the material is also now salted with imitations such as glass, synthetic corundum amethyst and fluorite. Most of the faceted tourmalines weigh between 1 and 4 ct, occasionally 5 to 20 ct and rarely much heavier. The largest stone illustrated by Hanco was just over 88 ct.

Selection of rough (about 1 kg) copper-bearing tourmalines from Mozambique. Photo by J.C. Zwaan.

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(Above) Characteristic colours before (bottom row) and after (top row) heat treatment. Weight of the stones between 0.42 and 0.85 ct. Courtesy of Barker & Co. and Pala International; photo by J.C. Zwaan.

(Left) Polished paraíba-type tourmaline from Mozambique weighing 11.54 ct, showing a prominent hollow growth tube. Photo by J.C. Zwaan

The violet-blue stones appear greyish green under incandescent light and range from very slightly included to heavily included. The inclusions are typically flattened, fluid-filled cavities, often linked by capillaries and sometimes elongated. There are also triangular two-phase inclusions with gas bubbles, and hollow tubes parallel to the *c*-axis often coloured yellow-brown due to hematite. More than 60% of the Mozambique tourmalines were found to contain these tubes. Other inclusions noted included quartz grains, lepidolite and feldspar. The mineral inclusions observed in the Mozambique tourmalines appear to distinguish them from those from Brazil and Nigeria, but are not considered to be locality-specific as they have been found in elbaite from many different sources.

Heat treatment

The violet-blue Mozambique tourmalines are heat-treated at about 500°C to produce the well-known bright 'paraíba' colour. This heating appears to affect some of the inclusions, such as getting rid of the gas bubbles, and generates small cracks, visible with dark-field illumination but not bright-field. Heat treatment can also be distinguished using UV-Vis spectrometry.

Elemental mapping showed that paraíba-type tourmalines from Mozambique have low Fe and Ti concentrations and low to moderate amounts of Cu. The research shows that the colour change on heating can be attributed to a change in the valence state of manganese (from Mn^{3+} to Mn^{2+}), reducing the contribution of manganese to the colour. Those stones with low iron and titanium produced the bright 'neon' blue colour on heating, those with distinctly higher iron and titanium showed little change. Thus it should be possible to predict the effect of heat treatment on the basis of elemental composition. Hanco illustrated tourmalines before and after treatment.

Naming controversies

The controversies over nomenclature were also mentioned. Describing the stones from Mozambique as Paraíba tourmalines on the basis of their resemblance to the material from Paraíba, Brazil, had been objected to by the Brazilians on the basis that it detracted from the market for the Brazilian material. The Laboratory Manual Harmonization Committee (LMHC) proposed that the Mozambique gems can be described as 'paraíba', either as a variety or a trade name, but this had not found universal favour because they applied a rather strict definition of the colour, namely blue to green of medium to high saturation and tone. Currently, alternative names, such as 'cuprian tourmaline' and 'paraíba-type' tourmaline are also used.

Enthusiastic end users

The focus then turned to a crucial part of the gem trade – enthusiastic and wealthy buyers of jewellery. These are the people who ultimately finance gemmological research and exploration. Clare Blatherwick of Bonhams, Edinburgh, approached her subject 'Jewellery of Famous Women' by looking at the collecting habits and personalities of four women: Evalyn Walsh McLean (1886–1947), Marjorie Merriweather Post (1887–1973), Elizabeth Taylor (1932–) and Madeleine Albright (1937–).

Evalyn Walsh McLean

Evalyn Walsh McLean was the only daughter of an Irish immigrant, Thomas Walsh, who after investing in service industries related to the Californian Gold Rush struck gold himself and made a considerable fortune. His appointment as US Ambassador to the Paris Exhibition of 1900 exposed his daughter, then just 14, to the world of fine jewellery. In 1908, she married Edward Beale McLean, Washington Post heir, thus combining his and her fortunes. Her jewellery collection included both the 94 ct Star of the East and 45 ct Hope diamonds. The Star of the East was purchased from Pierre Cartier for $120,000 on her honeymoon in Paris in 1908 and the Hope, also from Cartier, for $154,000 in 1911. She also owned the McLean diamond, a 31.26 ct D VS2 stone. These three diamonds were purchased by Harry Winston on her death. The Hope went to the Smithsonian, the Star of the East to King Farouk of Egypt and the McLean to the Duchess of Windsor which sold for $3.1 million when auctioned in Geneva in 1987.

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Marjorie Merriweather Post

Marjorie Merriweather Post was an almost exact contemporary of Evalyn Walsh McLean but, although she was the wealthiest woman in America, she had a more philanthropic approach to her collecting. She was the daughter of Charles Post, founder of General Foods, and, unusually for the period, accompanied her father and was groomed for business. She married four times. Her third husband, Joseph E. Davies, was American Ambassador to the Soviet Union under Joseph Stalin, and during her time in Russia she was able to purchase pre-revolutionary works or art, including many fine Fabergé pieces that were then being sold quite literally by weight.

One of her many homes, Hillwood in Washington DC, was given to the state and is now a museum displaying her fine collection of Russian and other art works. Jewellery she owned, such as a 30.82 ct heart-shaped blue diamond and the Napoleon diamond necklet given as a gift from Napoleon I to his second wife Marie Louise in 1811 set with 234 diamonds with a total weight in excess of 260 ct, were given to the Smithsonian Institution.

Elizabeth Taylor

Unlike the two previous women, Elizabeth Taylor was not born into considerable wealth, but she shares their passion for jewellery. Her acting career brought her and Richard Burton together. They became a wealthy 'celebrity couple' and her jewellery collecting began. In 1968 Burton bought her the 33.19 ct Krupp for $305,000, then the most expensive diamond ever sold at auction. The following year he purchased the Peregrina pearl for $37,000 and also the Taylor Burton diamond, a pear-shaped 69.24 ct D colour internally flawless stone for $1.1 million. The Taylor Burton diamond was sold following their divorce in 1978 and is now in the collection of Robert Mouawad.

Madeleine Albright

The fourth woman jewel-lover described by Clare was Madeleine Albright, Secretary of State under President Bill Clinton. Madeleine Albright's addiction to brooches is well known. A large collection of brooches inspired by her has been on exhibition and was described by her in a book entitled *Read My Pins: Stories from a Diplomat's Jewel Box.* As the title suggests, each brooch communicated a message, some more subtle than others. Diplomats and others with whom she met could often gauge her point of view, or the outcome she desired, by her choice of brooch.

The Napoleon necklace presented by Napoleon Bonaparte to his second wife Marie-Louise. Photo courtesy of Chip Clark, Museum of Natural History, Smithsonian Institution.

A history of synthetics

The focus then moved from treatments to synthetics when Brian Jackson, Principal Curator of Mineralogy at the National Museums of Scotland, presented a 'History of Synthetics'.

Synthetic versions of gem materials have been around for almost two centuries. Indeed, the earliest examples might have been 'Egyptian blue', a siliceous material coloured blue by copper that the Egyptians had produced some four thousand years ago and which was effectively a synthetic version of the calcium-copper silicate mineral cuprorivaite. Egyptian blue was sometimes carved into small decorative objects.

Early days

The European study of synthetic gem materials can be traced back to the science that developed out of the work of the alchemists. Antoine Lavoisier, who was the eighteenth-century 'father of modern chemistry' amongst other accomplishments, first discovered that diamond was composed solely of carbon. This led to many attempts to synthesize diamond including those of James Ballantyne Hannay. Minute diamonds were indeed found in the residues of his experiments, but it is strongly suspected that these were added without his knowledge by his assistants, a suspicion supported by recent studies on the subject.

Three methods of synthesis

There are three methods by which gem materials may be synthesized — crystallization from a melt (flux grown), crystallization from solution (hydrothermal) and deposition from a vapour phase. Experiment in the early nineteenth century revolved around crystallization from a melt, but this approach really only became a practical possibility late in the century with researchers such as Fremy who worked on synthetic rubies, and one of whose

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assistants, Verneuil, perfected the method using a technique which still bears the latter's name and which is still used in essentially the same form to produce huge quantities of synthetics today. This technique is used to produce many different colours of corundum and some spinel. Verneuil-type synthetics are relatively easy to detect using traditional gemmological techniques. Another form of the melt-generation of synthetics is the Czochralski crystal pulling technique developed in 1915. This is used to produce various gem types including corundum, star corundum and alexandrite, and forsterite which is used as a tanzanite simulant. The Seiko Floating Zone technique is related to the Czochralski method.

Gems grown by flux or crystallization from a melt include different types of corundum, spinel and emerald. A seed crystal is usually used, often itself a Verneuil synthetic, although the Ramaura synthetics do not have a seed crystal. The various internal characteristics, such as flux residues, were discussed.

(Above) Hydrothermally grown synthetic quartz. Exhibitiion area at VNIISIMS (the Russian Institute for Mineral Synthetics), Alexandrov, Russia. Photo: Brian Jackson.

(Right) Two flux synthetic spinels. By permission of the Trustees, National Museums of Scotland.

Hydrothermal quartz

Hydrothermal synthetics also contain characteristic internal features, including metallic inclusions of iron, nickel and cobalt deriving from the container. The process is used to produce emeralds, less commonly rubies, and a variety of quartzes coloured by metallic ions, some with irradiation treatment. The colours produced in synthetic quartz include green (Fe^{2+}), blue (Co), turquoise blue (Cu), yellow (Fe^{3+}), smoky (Al + irradiation), purple (Fe^{3+} + irradiation) and 'ametrine' (sections of Fe^{2+} and Fe^{3+} + irradiation). There is also some synthetic rutilated quartz, and a form of synthetic pink rose quartz coloured by aluminium and phosphorus followed by gamma irradiation, but this is rare. The distinction between natural and synthetic quartz is often based on the characteristic presence of Brazil twinning with the natural. However, if the seed crystal used to grow the synthetic is twinned, the final synthetic will be too.

Opal, malachite, diamond and jadeite

There are forms of so-called synthetic opal, including that made by Gilson and fire blue opal, but these did not exactly compare with their natural counterparts in composition and were thus not true synthetics. The same holds for the Gilson 'synthetic turquoise'. On the other hand synthetic malachite is almost indistinguishable from its natural counterpart

Solution growth with HPHT was first used by GEC in the mid 1950s to produce synthetic diamond, although the technique had been earlier developed in Sweden. The diamonds grown in air, a nitrogen-rich environment, will be of brownish colour, although this can be removed by subsequent treatment. There will also sometimes be metallic inclusions of iron and nickel, leading to increased magnetic susceptibility of the stones, although such inclusions are less frequent in more recent HPHT diamonds. In the absence of the metallic inclusions, natural and synthetic diamonds are best distinguished by cathode luminescence.

Synthetic jadeite is also made by an HPHT solution growth technique. The starting point is a sodium- aluminium silicate glass, the aluminium and oxygen present resulting in the diagnostic presence of a corundum peak when examined by Raman spectroscopy.

Carbon vapour deposition (CVD)

Vapour Phase deposition for synthetic gem production is currently best known with the CVD diamond. The process is fast and provides huge potential for the future. CVD diamonds can be identified by their growth structures, as revealed by cathode luminescence, and sometimes anomalous birefringence between crossed polars.

Origin determination of ruby and sapphire

Keynote speaker, Ken Scarratt of GIA Laboratory, Bangkok, opened the second day with a talk entitled 'The GIA approach to origin determination and collecting ruby and sapphire samples in the field'. Ken explained that Dr Edward Gübelin was considered to be the father of origin determination; he had collected gems for his own collection and

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Collecting corundum samples in Pailin, Cambodia. Vincent Pardieu, GIA's Field Gemologist based in Bangkok, observes a mine being dug for ruby and sapphire next to a house and in the centre of Pailin. Photo S. Jacquat.

for that of the Gübelin Gem Laboratory. It had initially been a relatively straightforward matter of a microscopic examination of inclusions on the basis of which an opinion of origin was offered. Recent decades, however, have brought complexity to origin determination as the relatively limited number of traditional gem occurrences were augmented by an increasing number of new sources.

For many decades the GIA laboratories had not provided origin opinions, but when it was decided to undertake such work on corundum, it was crucial that opinions were based on as full an understanding of the material as possible. Strictly defined standards were put in place to underpin sampling and analysis, and the interpretation and recording of the results. The diligent collection and collation of data about corundum was also important for the better understanding of existing and potential corundum treatments. A reliable and reproducible approach was vital to ensure consistency between GIA's three laboratory locations – Carlsbad, New York and Bangkok.

Ken described the types of equipment required in a gem research laboratory today – including UV-Vis, FTIR and Raman spectroscopy plus EDXRF and LA-ICP-MS analysis. Another vital component was research staff with science qualifications well beyond usual gemmological qualifications.

Sample preparation and analysis

The samples for study were very carefully prepared using special equipment to polish flats perpendicular to the optic axis – and at other defined angles to this. These were placed in specially designed mounts that could be inserted into both UV-Vis and FTIR spectrometers so that the chemical data would be consistently presented. For the chemical analysis by EDXRF and LA- ICP-MS suitable standards were a necessity. The glass National Institute of Standards and Technology (NIST) standards were found to be unsuitable for corundum analysis where they led to an underestimation of trace element concentration. Thus high purity synthetic corundum standards were specially produced with suitable combinations of doping elements. A special sample holder was also developed to ensure reproducible results.

Sample integrity

Near-perfect analytical procedures are still of very limited value unless the integrity of the samples is assured. So a crucial part in the equation is the sample collection procedures. In the ideal case, the sample is collected from the deposit in the mine by a GIA gemmologist. This case represents 'A' in the GIA's A to F system of cataloguing gem samples from the field. 'F' represents a sample purchased on the world market with a stated provenance. Only stones with a 99% origin certainty are relied on in the creation of the GIA database. The importance of this stringent collection policy was underlined by Ken. In one case he cited,

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rough ruby offered by the miner at an frican mine was found to be glass filled, n another case the ruby was a synthetic. Ken stressed that collecting gem samples n the field was not tourism, it was an xpedition requiring considerable experience, eological knowledge and a preparedness o face everything from leeches to mud to bstructive bureaucracy. The GIA had been ucky to have recently acquired the services f veteran field gemmologist Vincent Pardieu.

Polariscope

After a brief coffee break, Alan Hodgkinson, President of the Scottish Branch of Gem-A, continued a series of presentations which he has been giving around the world devoted to gaining maximum information from a basic repertoire of gemmological instruments. This time his focus was on the polariscope. In an informative and well-illustrated talk on 'Pushing the Polariscope', Alan drew his audience's attention to how this instrument, too often neglected, could supplement the refractometer in determining optical character and sign. The polariscope could provide information in some instances where the refractometer could not, for example with materials where the RI was in excess of that of the contact fluid, where a setting impedes the refractometer, or, to quote one case, where thin coating films on topaz obscured an RI reading.

Origins

The use of the polariscope could be traced back to the pioneering work of Scotsman David Brewster and the first polarising microscope. Here the 'polars' were constructed of tourmaline and the microscope lenses of gem materials because the glass of the period lacked good resolution. The modern polariscope incorporates sheets of Polaroid, aligned needle-like crystals in a polymer film, as developed by the Land Corporation in the 1930s.

Anomalous effects

Gemmologists will be well acquainted with the basic use of the polariscope, but there can be less familiar and thus potentially confusing anomalous effects. These include the growth phases of CZ which give anomalous anisotropy and what Alan referred to as the 'beguiling effects' seen with some colour-change East African garnets can be disconcerting due the internal structural strain caused by their complex composition. Some of these colour-change garnets could be confused with alexandrite on the basis of their appearance and similar RIs.

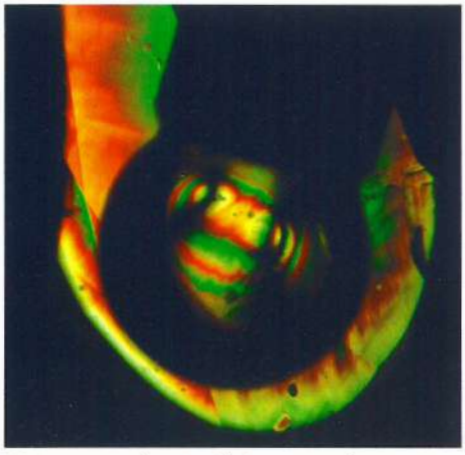
The anomalous polariscope effects due to strain during growth seen with Verneuil corundum were also important to remember. A particularly curious example was the biaxial figure, rather than the expected uniaxial one, observed by Alan in a slice of tourmaline (specimen courtesy of Don Warren). This was the consequence of a mixed intergrowth of tourmaline types. There were also the distinctive bull's-eye interference figures seen in quartz resulting from its circular rather than linear polarization, and Airy's spirals seen at the junction of left and right hand quartz twin boundaries.

Conoscope

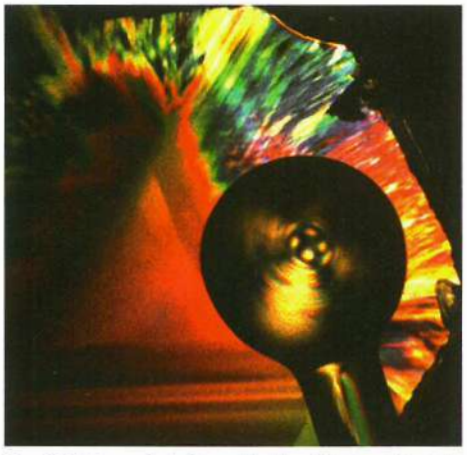
The use of a conoscope rod in conjunction with the polariscope allows the determination of the optical character and sign, often crucial information in the identification of a gem species. Large conoscopes were easy to use on large gem specimens and were ideal for teaching, but Alan stressed that for small stones or stones with small facet surfaces, a conoscope in conjunction with a loupe above the analyser of the polariscope were necessary.

Accessories

The conoscope is not the only polariscope accessory, although the others



The conoscope locates the two eyes of a kornerupine biaxial figure. Two such simultaneous eyes only possible with a small 2V angle mineral, in this case 20°. Photo Alan Hodgkinson.



Fourfold Airy spirals found in Brazil twinned quartz as the conoscope traces across the left and right hand quartz spiral structure twins. Photo Alan Hodgkinson.

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are better known to users of the polarising microscope. The three main accessories are the mica or quarter wave plate, the gypsum or sensitive tint plate, and the quartz wedge. The quarter wave plate slows down the light passing through it, thus it separates the ordinary and extraordinary rays passing through a uniaxial material, making it easier to distinguish uniaxial positive from uniaxial negative. Determination of optical sign was also facilitated by the gypsum plate which retards light by one wavelength, and the quartz wedge which retards light by an amount relating to its graduated thickness. The use of these accessories with a polariscope, and examples of the results obtained, were carefully illustrated and described by Alan.

He also explained that a homemade version of a sensitive tint plate could be made using self adhesive tape (Sellotape ™ or such like) applied to a microscope slide and that clear plastic sheet with a area with a tapered cross-section, such as some plastic boxes, could be used as a cheaper alternative to a quartz wedge. These two substitutes were introduced to Alan by Pat Daly some years ago.

The lecture was a shortened presentation of the Polariscope chapter in Alan's forthcoming book *Gem Testing Techniques*.

Field trip to the Campsie Fells

Lorne Stather tells how she found her 'prize'

This year the Scottish conference field trip was to Campsie Fells to hunt for jasper. In the morning we gathered in the hotel foyer looking out at the ever more ominous grey sky. As we set out the ever-present clouds started to open, and the closer we got to our starting point at Strathblane near Glasgow the lower the clouds came and the less we could see of the surrounding countryside (which is a real shame as Scotland is a truly beautiful country). On arrival we all assembled again to check our gear including hard hats, hammers, chisels, picks and the absolutely necessary waterproofs.

On a good day, the walk up the Fells would give spectacular views looking down into the valley and across to Loch Lomond which could be seen in the distance, and even on a day such as we had the potential of the view could be seen. Above was our target, tiers of rocks with the grass and budding bracken broken up by scree which appeared as rivers of weathered rock flowing from the small cliffs. The Campsie Fells are made up of about 30 lava flows which date from the Carboniferous period and the jasper occurs as veins in these lava flows. The jasper has a distinctive red to yellow colour making it stand out from the surrounding rock and has been used in jewellery since ancient times.

After about a 40 minute climb led by our intrepid leader Brian Jackson (who, legend has it, is part mountain goat), we reached our destination. Brian gave pointers about what to look for and after a further short scramble we were shown what is believed to be the Victorian jasper workings to give us a taste of what could be found. Unfortunately the Victorian diggings are now too overhung

Campsie Fells

(Left) Maria Alferova and Marina Lisurenko on the jasper hunt.
(Below) A chunk of the red and yellow jasper in situ. *Photos by Brian Jackson.*

Recent Events

The Scottish Conference

safely remove any more from the niches at remain, but you can see the gorgeous d and yellow veins of jasper that attracted e Victorians to travel to such a secluded ot to retrieve this under-appreciated aterial. So with hammers and chisels to and we were let loose to claim our spoils. n the positive side, the walk had warmed s up and the rain had given the rocks an most polished sheen allowing the jasper to ine out.

My first find and the next brought halation and a feeling of relief – I had y prize. However, after a couple of hours errily bashing rocks and collecting a pile of the pretty red to yellow jasper the hardest decision of all was needed – what could I carry back down to the car and what would I have to abandon to the weather and the next lucky collector.

Of course I was not the only one with such decisions to make. My fellow collectors were all making hard choices from among their finds and the reason for some of the large rucksacks became apparent. This also gave us the opportunity to see the success of our fellows and to compare finds, and although pleased with my jaspers I could not but note with a touch of the green-eyed monster a very nice quartz crystal found by Kerry Gregory, one of my fellow field trippers.

By this time the rain which had almost been forgotten was making itself felt again and as I squished my way down the fell I reflected on a very enjoyable day and decided that I would definitely take the opportunity to try my luck again should the opportunity arise.

I would like to thank both the Scottish Gemmological Association for organizing the trip, Brian Jackson and Gillian O'Brien for herding us up and down the fells, and all my fellow collectors for a thoroughly enjoyable day. I look forward to the next trip and more Scottish rain.

Gemmology and Applied Mineralogy Student Conference

report of the Gemmology and Applied Mineralogy Student Conference held on 7 May 2009 at the School of Geography, Geology and the nvironment at Kingston University, will be published in the October issue of *Gems & Jewellery*.

Organics expert Maggie Campbell Pedersen says

Let's forget those 'lines of Retzius'

Cross section of mammoth ivory, showing the pattern of intersecting arcs (actual width 25 mm).

Ivory is derived from teeth or tusks (which are modified teeth). Its main component is dentine, which is a creamy-white, mineralized, connective tissue with an organic matrix of collagenous proteins. Dentine contains microscopic channels called 'dentinal tubules'. The configuration of these varies from one species to another, giving the different ivories their distinctive structure.

An example of this is the pattern seen in a cross-section of proboscidean tusks (i.e. those from elephants or mammoths). Many people in the gemmological world still use the term 'lines of Retzius' to describe the pattern, yet it is incorrect. Lines (or striae) of Retzius refer to a phenomenon that occurs in mammalian tooth enamel only, and not in dentine.

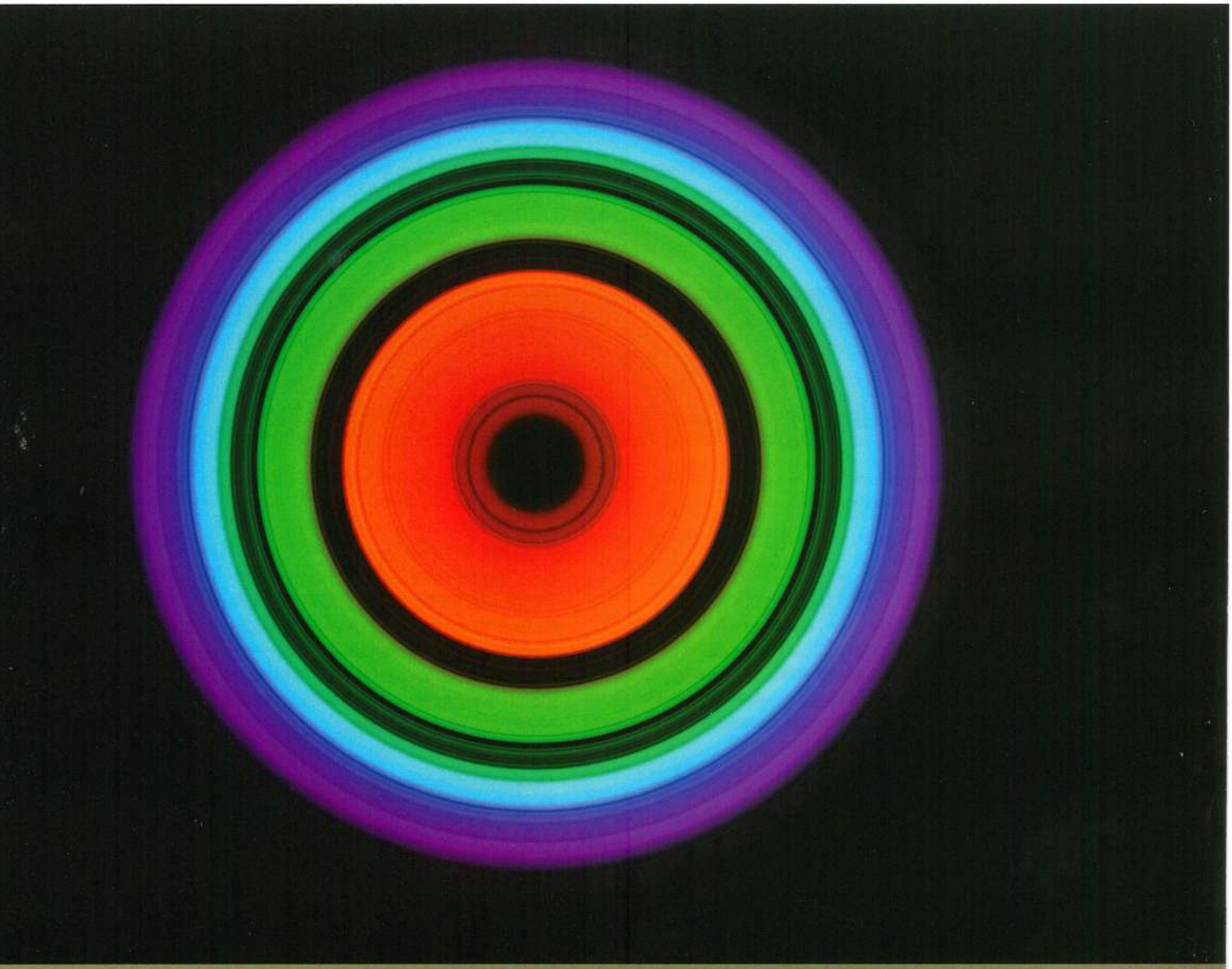
Some scientists call the pattern in proboscidean dentine 'Schreger lines', because they were first described in about 1800 by a German, Bernhardt Schreger. However, this can be confusing as Schreger, together with a man called Hunter, also described another pattern in certain formations of tooth enamel, which became known as 'Hunter-Schreger bands'. Although referring to two different phenomena, the two terms are often interchanged and thus confused.

Therefore, in order to avoid confusion and the risk of using incorrect terminology, it might seem logical to abandon these names altogether and to use a term that describes the pattern, for example 'intersecting arcs' or 'decussating arcs'. But please, no more 'lines of Retzius'!

Maggie Campbell Pedersen is to the speaker at the Gem Discovery Club Specialist Evening on Tuesday 15 September when she will be speaking on past uses, present bans and Identification of ivories (see page 44 for more details).

Gem-A

THE GEMMOLOGICAL ASSOCIATION
OF GREAT BRITAIN



Gem-A Conference 2009: SHOWING COLOUR

Sunday 18 October 2009
The Hilton London Kensington

To celebrate 75 years since the introduction of the Chelsea Colour Filter, presentations will look at colour in gems, its causes and effects.

The Conference will be followed by a Gem Party to which all members, students and their guests are invited.

Conference

Ametrine cut by John Dyer

The Conference and Gem Party

The programme will allow you ample time for networking and the purchasing of books and instruments. The conference will open at 9:30 am for registration and coffee, finishing at approximately 5:00 pm.

A Gem Party to include dinner and disco will be held on the Sunday evening, which is guaranteed to be an exciting event. Dress for the party is smart casual.

The fee for the Conference, to include lunch and refreshments, is £130.00 plus VAT An early-bird discount of £15.00 may be deducted by those booking by 31 August. Tickets for the Gem Party are £40.00 plus VAT.

Cancellation Policy: Cancellations received prior to 30 September incur a cancellation fee of £10.00. We regret that no refund can be given for cancellations received after that date.

For the most up to date information on the conference, please visit our website at http://www.gem-a.com/membership/conferences.htm.

Events and Workshops

The following events have been arranged to coincide with the Conference. *Please note that numbers are strictly limited, so early booking is recommended to avoid disappointment.*

Monday 19 October

Practical use of the spectroscope 10:30 to 13:00

Following a brief introduction by Gem-A Tutor John Harris, participants will have the opportunity to examine with the spectroscope a carefully chosen selection of gemstones of similar colour and appearance. A demonstration of a microscope-spectroscope set-up will be given, and its application to photographing spectra discussed. To be held at the Gem-A London headquarters.

Tickets: £25.00 + VAT

Monday 19 October

Graduation Ceremony 18:30 to 21:00

The graduation ceremony will be held at the prestigious Goldsmiths' Hall in the City of London, where graduates will be presented with diplomas and prizes gained in the 2009 Gem-A examinations. The ceremony will be followed by a reception.

Tickets: £12.50 + VAT

Tuesday, 20 October

Private Viewing of the Crown Jewels with a Guided Tour by David Thomas MVO 16:00 to 18:00

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

Tickets: £40.00 +VAT

Tuesday, 20 October

Gem Discovery Club* 18:30 to 20:00

The Gem Discovery Club is a weekly practical gemmology evening for Gem-A members at Gem-A's London headquarters. Once a month, club members have the opportunity to examine items from the collections of gem and mineral specialists. Details of the upcoming October specialist evening will be published on our website by early September.

Tickets: £5.00

** No additional fee is charged for current Gem Discovery Club members, but those wishing to attend should notify Gem-A in advance.*

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

Friday 16 October

Pearls — Nature's Gift

A chance to indulge your love of pearls. From the origins of natural and cultured pearls, marine and freshwater, to the treatments and simulants in the trade today.

For further information and a booking form visit our website at www.gem-a.com/education/short-courses-and-workshops/gemstone-workshops.aspx or call us on +44 (0)20 7404 3334.

Cover photograph

A digital image of a diffraction spectrum taken from a crystal of neodymium pentaphosphate which has been computer manipulated to produce the radial pattern to illustrate the radiating energy. Photo by John Harris.

Photography credits

Cover: Photo courtesy of John Harris. Page 2: Courtesy of John Dyer & Co. Page 3: © CW Sellors. Page 4: © Bob Maurer.

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Tel: +44 (0)20 7404 3334 Fax: +44 (0)20 7404 8843 Email: information@gem-a.com
UK Registered Charity No. 1109555

Speakers

Blue john

Brian Dunn FGA
Independant Valuer
Colour conundrum — Gemstone valuing problems

Now an independent valuer, Brian Dunn had many years' experience valuing for Asprey and Garrard. He has served on the CAG Valuations Committee, acting as Chairman for three years. In his presentation, Brian will give a personal view of some of the problems involved in valuing coloured gems. He will show and discuss jewellery set with a wide range of gems, from the usual to those rarely seen commercially.

Thomas Hainschwang FGA
GEMLAB Laboratory
Optical and spectral characteristics of 'exotic' natural fancy colour diamonds

Thomas Hainschwang founded the GEMLAB Laboratory in 1996. From 2005 to 2007 he worked as Research Gemmologist at GIA GemTechLab in Geneva, with main responsibility in coloured diamond research and analysis. In 2007 he re-launched GEMLAB and is now the managing director of the lab. Thomas's presentation will give an overview about the optical and spectral characteristics of very rare and exotic coloured diamonds, about which only little has been published. These include chameleon diamonds, ABC diamonds, caiman-jaw diamonds, 480 nm band diamonds, CO_2 diamonds and others. While such diamonds are uncommon, some of the most attractive coloured diamonds emerge from these groups, such as the yellow to orange diamonds coloured by the 480 nm absorption.

John Hall
Rio Tinto Diamonds
Beyond Rare: Argyle Pink Diamonds

John Hall is the General Manager, External Relations, at Rio Tinto Diamonds. Rio Tinto's Argyle mine in the Kimberley region of Western Australia is the world's only consistent supplier of pink diamonds. Even so, a million carats of rough diamond mine output produces on average just one carat with the colour and quality to warrant inclusion in their famous pink tender. John's presentation will provide a background to the mine and its diamonds, and explain how these 'beyond rare' diamonds are marketed.

John Harris FGA
Gem-A Gemmology Tutor
Chasing Rainbows

Gem-A Gemmology Tutor since 1986, John Harris is renowned for his work with the specroscope and his oustanding photography of spectra. In his presentation, John will review methods using the direct vision hand spectroscope to enable the operator to stabilize the image and work with hands free to examine other optical properties linked to gemstone spectra. A similar set up can also be used to capture the spectrum image by photography and build a comparison database which will be discussed briefly. Various gemstone spectra will be displayed, some rarely seen by the average student and others of an unconventional form. Emission spectra of light sources in relation to calibration and transmission spectra of filters used in gem testing will be discussed.

Alan Hodgkinson FGA DGA
President of the Scottish Gemmological Association
Putting the 'Gee' back in Gemmology

Alan Hodgkinson has spent a seasoned fifty years in the jewellery industry, focused on gemstones and gemmology. A former gemmological councillor, Alan has spent the last 38 years lecturing at home and abroad on gemmological techniques and methods for those with limited resources, and is the current president of the Scottish Gemmological Association. Alan will be talking about the many amazing colours and colour effects seen in gemstones — from the 'traffic light sequence' in alexandrite to coatings.

Harry Levy BSc MSc FGA
Gemstone Dealer
Buying Coloured Gemstones

Harry Levy has been a gemstone dealer for over 40 years. He is Vice President of the London Diamond Bourse, a member of the Board of the International Diamond Council and past Chairman of the CIBJO Diamond Commission. Harry will be giving the do's and don'ts of buying coloured stones and some of the tricks that can be played on you when buying abroad.

Antoinette Matlins PG
Author and lecturer
After 75 years, the Chelsea Colour Filter still proves its worth

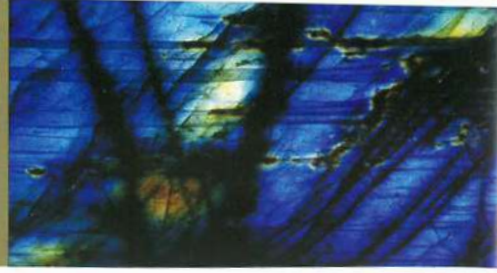
Antoinette Matlins is an internationally respected gemmologist and well-known author and lecturer. In her presentation, Antoinette will review how to use the Chelsea Colour Filter properly, when to use it (this may surprise many), what the results indicate, and how to combine the information provided by the CCF with information provided using other simple techniques. Learn how simple testing procedures can provide important indicators related to identification and treatments that may be easily missed with more sophisticated testing.

Please bring a Chelsea filter with you, and an incandescent torch, or let us know if you will need one provided for your use during the presentation. You may also bring your own gemstones with you to examine.

Dr Karl Schmetzer
Independent scientist and consultant
Colour-change garnets – causes of colour, colorimetry and extent of colour change

Karl's presentation will be based on garnet samples collected from Madagascar which are all members of the pyrope-spessartine solid solution series with minor to major contents of iron (almandine) and minor contents of vanadium and chromium. Based upon the visual appearance in daylight and colorimetric data, the samples were divided into seven groups. The chromaticity coordinates were calculated and the data plotted in the CIELAB 1976 colour circle. The extent of colour change, calculated from colorimetric data for daylight and incandescent light in the CIELAB colour space, will be discussed in the context of a framework of simple categories such as faint, moderate, strong and very strong.

The Venue



Labradorite

The Conference and Gem Party are to be held at the Hilton London Kensington, 179-199 Holland Park Avenue, London W11 4UL.

Directions

From Heathrow airport, catch the 15-minute Heathrow Express into London Paddington. Allow an extra eight minutes from Terminal 4. From Paddington station, taxis are available 24 hours a day to take you directly to the Hilton London Kensington Hotel.

The nearest underground stations are Shepherd's Bush Central and Holland Park, both within walking distance of the hotel. If you are travelling to the Hilton London Kensington by car, the hotel's secure, covered car park is located on the lower-ground floor, offering 80 self-parking spaces. The parking fee is £30.00 for 24 hours for residents and £37.00 for 24 hours for non-residents. Note that there is no day-pass system allowing multiple exits.

For detailed directions and maps, visit: http://www1.hilton.com/en_US/hi/hotel/LHRHITW-Hilton-London-Kensington-hotel/directions.do

Accommodation at the Hilton London Kensington

A limited number of rooms have been reserved at the Hilton London Kensington for delegates during the conference. Please book directly through the Hilton (Tel: +44 (0)20 7603 3355 Fax: +44 (0)20 7602 9397), or on our Hilton conference booking webpage at http://www.hilton.com/en/hi/groups/personalized/LHRHITW_AGEMA/index.jhtml

Booking Form

Event	Price (all prices are exclusive of VAT))	Date	No. of tickets	Total
Conference	£130.00. An early-bird discount of £15.00 may be deducted by those booking by 31 August	Sun 18 October		£
Gem Party	£40.00	Sun 18 October		£
Graduation Ceremony	£12.50	Mon 19 October		£
Spectroscope Workshop	£25.00	Mon 19 October		£
Viewing of Crown Jewels	£40.00	Tues 20 October		£
Gem Discovery Club	£5.00	Tues 20 October		£
			Add 15 % VAT to the Total	£
			Total	£

Your details

Name: .....

Address: .....

.....

Email Address: ..... Gem-A Membership Number: .....

Name of Guest (if applicable): .....

Please indicate any special dietary requirements: .....

Payment Details (Please tick boxes as applicable)

☐ Cheque (must be drawn on a British bank in sterling and made payable to Gem-A)

☐ Credit/Debit Card

Amount £ ..... Card Type: ☐ Visa ☐ MasterCard ☐ Switch

Card No.: ..... Last three security code nos.: .....

Start Date: ..... Expiry Date: ..... Issue no.: .....

Name on Card: ..... Cardholder's Signature .....

Completed form to be returned to: **Gem-A, 27 Greville Street, London EC1N 8TN, UK. Fax: +44 (0)20 7404 8843**

Journal Files

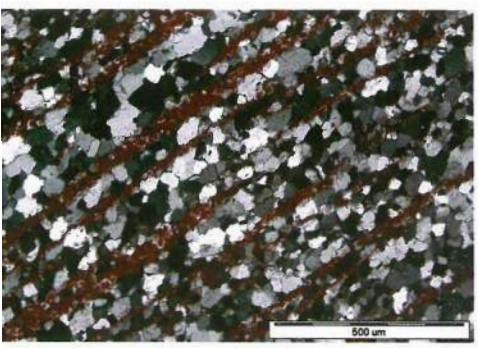
ummaries of three articles to appear in *The Journal of Gemmology* explaining the interest, elevance and importance of the information given. The full articles may be viewed by em-A members only at www.gem-a.com/publications/journal-of-gemmology/the-journal-nline.aspx

Ukrainian jaspilite*

he attractive features of jaspilite make suitable for jewellery and ornamental bjects, and for recognition outside its ative Ukraine.

spilite, a decorative rock from the Ukraine, has been used locally a variety of ornamental items and even jewellery. The natural auty of the material, with its wide range of textures and colours, ainly reddish tints, has led to the promotion of jaspilite as the tional gemstone of Ukraine, but the stone is still largely unknown rldwide. In 'Jaspilite — the gemstone of Ukraine' P. Baranov and Shevchenko of The National Mining University, Dnepropetrovsk raine, and W. Heflik, L. Natkaniec-Nowak and M. Dumanska-owik of The University of Science and Technology, Krakow, Poland scuss the source, nature, appearance and the potential uses of this aterial.

Jaspilites are relatively rare iron- and silica-rich metamorphic cks of volcanic or sedimentary origin. They are known from stralia (the Hamersley Basin in the northwest of Western Australia) e USA (Jasper Hill, Marquette Iron Range, Michigan and Diamond l, Chittenden Co., Vermont), and, the source discussed here, the ivoy Rog Basin in the Dnepropetrovsk region, Ukraine. Jaspilites rm an important raw material for the metals industry, due to their gh iron content, but the diverse colours, textures and appearances some samples make them suitable for decorative uses. The main ck-forming constituents are quartz and iron-ore minerals such hematite, magnetite and goethite. Subordinate phases include rbonates, amphiboles, feldspars and apatite.



Red hematite in matrix of quartz; detail of texture in parallel-striated jaspilite. Thin section, cross-polarized light.

'The Pearl of the Seas': a box made of jaspilite, labradorite and silver, gilded in places. Designer Peter Baranov, made by Maxim Netecha and Vladimir Konstantinov. Length 14 cm.

Various categories based on colour and banding have been distinguished and these range through the straight and wavy banded versions to 'landscape jaspilites' where inclusions and structures provide the appearance of scenic landscapes. Shaping and polishing provide a wide variety of decorative appearances, including those made possible by varying textures, with some areas polished, others ground to a matt finish. The predominant colour is red, due to hematite, but bands can include yellow and blue, sometimes giving tiger's-eye and falcon's-eye effects respectively.

Ornamental examples of the use of jaspilite include cameos, vessels, mounts and boxes, but use in an architectural context has also been suggested, such as the concept of a 'Jaspilite Hall' inspired by the Malachite Hall at the Hermitage in St. Petersburg.

The authors conclude that the attractive decorative properties of Ukrainian jaspilite deserve wider recognition and that the considerable reserves of the material mean that a global market might be achievable. In the meantime, a wide range of jaspilite items are exhibited and sold at the 'World of gemstones' exhibition, held in Dnepropetrovsk every month.

* A summary of 'Jaspilite — the gemstone of Ukraine' by P. Baranov, S. Shevchenko, W. Heflik, L. Natkaniec-Nowak and M. Dumanska-Slowik. *The Journal of Gemmology* (in press).

Journal Files

The origins of nephrite jade*

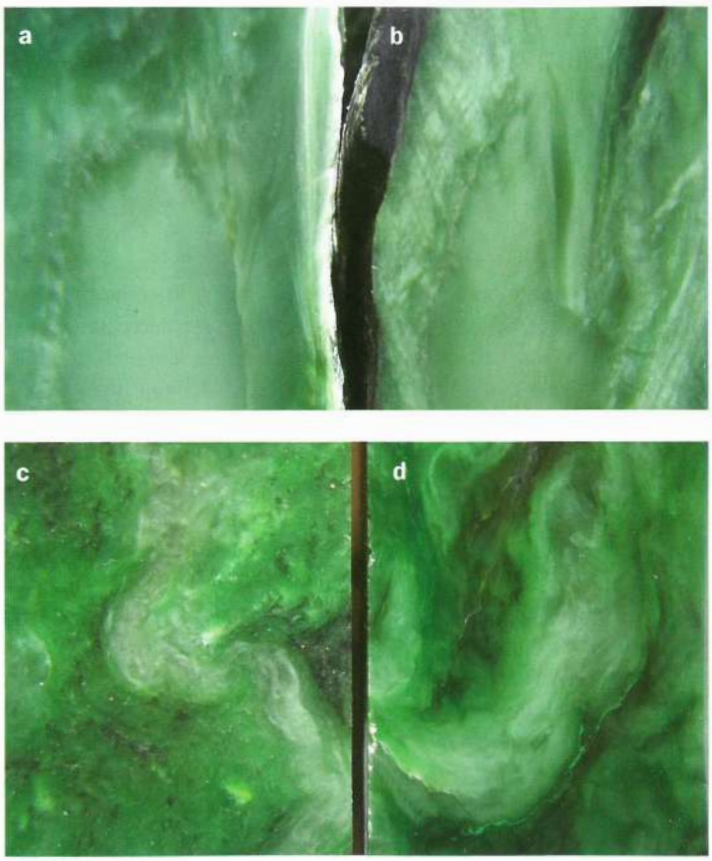
A new approach to origin determination will shed light on the historic trade in this material.

Nephrite Jade is a gem material celebrated for its toughness and fine green hues, and also for the antiquity of its use. Although rare, it is known from several parts of the world, with Pacific rim sources including New Zealand, Australia, New Caledonia, China, Korea, Japan, Russia (Siberia), USA (Alaska and California) and Canada (British Columbia). Most cultures in these regions have greatly prized the material, leading to historic trade networks which archaeologists and anthropologists are keen to reveal. To allow this, effective methods of origin determination are required.

There have been various approaches in the past to origin determination for nephrite jade. The material from different sources can have typical features, such as texture, colour and inclusions, but these cannot be relied on as wholly diagnostic of individual sources (see the examples illustrated right). Other provenancing approaches have included major and trace element compositional analysis and Mössbauer spectroscopy, but again the structural and compositional similarities between all nephrite jades have prevented so far the establishment of clear criteria for source determination based on trace element 'signatures'. For example, chromium is widely variable in both nehrite and jadeite jade types, but its variability within, and amongst, several nephrite fields has not been fully investigated.

Geologists researching the age of mineral deposits have used the radioactive decay of certain elements over time. Individual chemical elements can exist in various forms called isotopes. An unstable isotope of one element will decay to a more stable isotope of another element over a predictable time-period. For example, an unstable potassium isotope (^{40}K) will decay to an argon isotope (^{40}Ar) and thus the ratio of the amount of these two isotopes in a mineral can be used to calculate the age of its deposit. Nephrite and jadeite jades have too low a potassium content to allow precise dating by this method, but an alternative is based on the decay of a rubidium isotope (^{87}Rb) to a strontium isotope (^{87}Sr).

As different deposits will be of different ages, the authors' hypothesis was that strontium isotopes may permit nephrite jade source determination. The presence of some ^{87}Sr in most minerals at the time of their deposit complicates the age determination, but preliminary data provided by the authors show that nephrite jade deposits around the Pacific Rim indeed appear to have distinctive strontium signatures with only slight overlap with the New Zealand deposits.



Nephrite jades of similar appearance from the Pacific Rim: (a) East Sayan Mountains, Siberia, Russia, (b) Olderog Creek, North Westland, New Zealand, both with particularly uniform textures; (c) South Westland, New Zealand; (d) Cassiar, British Columbia. These examples do contain microscopic inclusions which are sometimes an aid to source characterization, but they do not necessarily allow a unique distinction. Photos by R.J. Beck.

*Summary of 'A signature for nephrite jade using its strontium isotopic composition: some Pacific Rim examples' by Dr Christopher J. Adams and Russell J. Beck FGA. The Journal of Gemmology (in press).

Rubies and sapphires from Marosely, Madagascar*

ince the early 1990s Madagascar has become an increasingly important source for orundum, with numerous ruby and sapphire deposits being discovered, and more kely to be found. This paper, by Laurent Cartier of the University of Basel, focuses n samples from a less well-known corundum deposit first discovered in 2005 at larosely in south central Madagascar. This is an eluvial deposit, the corundum aving been concentrated by gravity as the host rocks weathered away.

For the study 35 rough corundum samples acquired at the mining e and weighing from 0.1–2.0 ct were examined using a variety of mmological techniques ranging from refractive index determination d microscopy to chemical analysis by laser ablation inductively upled mass mass-spectrometry (LA-ICP-MS).

The corundum rough from the Marosely deposit ranges from rplish red to blue, with most being purple. All are fragments of ystals and few samples show any crystal faces.

mmological properties

mmological properties of Marosely corundum samples:

	Range	Mean
G	3.96–4.05	3.99
l ω	1.762–1.767	1.764
	1.769–1.775	1.772
– ε	(−0.007)–(−0.010)	−0.008

Under the microscope a variety of solid mineral inclusions were served, primarily zircon, mica and rutile, and negative crystals. ost specimens also had patchy colour zoning and, typically, the rims crystals were redder and more Cr-rich than the centres. Where eochroism was present, the ordinary ray (ω) colour was purplish d or bluish violet, the extraordinary ray (ε) mostly orangey red. One mple had considerable pleochroism with reddish pink (ω) and angey-pink (ε). Nearly all stones were inert to short-wave ultraviolet diation with only one, a chromium-rich sample, showing weak d fluorescence. This stone also showed strong fluorescence with g-wave UV radiation. Only a few of the stones show no reaction

The variation in colour of the ruby and sapphire from Marosely, Madagascar. From left to right: violetish blue sapphire (0.363 ct), pink sapphire (0.164 ct), ruby (0.208 ct).

when exposed to long-wave UV light with, as expected, the strongest fluorescence being seen with the chromium-rich, iron-poor stones.

As the samples were mostly chemical intermediates between ruby and sapphire, their compositional variation makes comparisons with other corundum deposits difficult. LA-ICP-MS analysis of seven samples of varied colour was carried out. This type of analysis to determine trace element presence is being increasingly used in origin determination research. Results for ultra-trace element concentrations proved less revealing, emphasizing the need for a combinatory approach with other analytical methods in advancing corundum origin determination efforts. But further calibration and quantification of different deposit types and occurrences is still required to enlarge the dataset and fulfil the potential of LA-ICP-MS as a more potent tool in determining the origin of specific corundum samples.

* A summary of 'The ruby and sapphire of Marosely, Madagascar' by Laurent Cartier. *The Journal of Gemmology* (in press).

Trade associations

Gem dealer Harry Levy brings us up-to-date on what is happening with the various trade associations, their recent congresses and issues of representation from different sectors of the trade.

May was the month of congresses, with CIBJO meeting in Istanbul on the 3–5 May and the International Coloured Stone Association (ICA) in Panyu City, China, on the 5–10 May. One may wonder why these two important congresses were held so close together in time, yet so far apart in distance. The was no conspiracy by either group to thwart the other. Simply CIBJO had booked to hold its conference in Macau immediately after the Macau International Jewellery and Watch Fair in early March. These arrangements did not materialize and CIBJO took up the offer from the Turkish jewellers and the dates they could organize were in early May. ICA could not rearrange their meeting at the last moment. A few did manage to attend both.

CIBJO

CIBJO, which is also now known as the World Jewellery Confederation, represents all aspects of the jewellery industry, from mining to the end consumer. The Conference in Istanbul was opened by the Turkish Prime Minister, Tayyip Erdogan, a rare honour for any trade congress. He gave a fine and informative welcome speech, and spent nearly two hours with the delegates at the opening ceremony.

The Congress was important in that new sets of Statutes and Bylaws were proposed, discussed and unanimously passed. The important change was to reflect the status of the Associate Members within CIBJO. Traditionally CIBJO is an association of national associations but over the years other groups started attending CIBJO congresses and putting in sponsorship money. These were bodies such as the Gold Council, De Beers, laboratories, organizers of trade fairs and other commercial entities. Although the new Statutes acknowledge these changes and give these bodies voting rights, they introduce a somewhat complicated voting system heavily weighted to the original national associations.

Terminology

The CIBJO Diamond Commission reaffirmed that the only term to be used for non-natural diamonds was 'synthetic', and the Pearl Commission now differentiates between sea water cultured pearls – the Japanese Akoya – and Chinese freshwater nucleated pearls. (See Harry's Letter on page 42 for his views on terminology.)

An important addition was a larger Board of Directors, reflecting sizes and geographical locations of national associations, and including representatives from other organizations such as the ICA and the miners. Much of the CIBJO work will be done by the President's Council, the Executive Committee and the Board of Directors, between congresses.

The Coloured Stone Commission presented the new *Ruby and Sapphire Guides* for retailers, and the Gemmological Commission presented the first draft of the *Gemmological Laboratory Book – A Guide for the Management and Technical Operations of Gemmological Laboratories*. The Precious Metals Commission presented the updated version of the *Precious Metals Book*, which is now part of *The Blue Book*.

The CIBJO Marketing and Education Commission presented the *Retailers' Reference Guide: Diamonds, Gemstones, Pearls and Precious Metals*. This is a fully illustrated book with information abou the above products and is intended to enable retailers to answer many questions from consumers in jewellery outlets. The guide will not be printed but will be available online.

ICA

The ICA represents miners, cutters, gemstone dealers, trade reporters, laboratory and educational bodies, but not jewellery manufacturers and retailers. There has been an ongoing debate within the ICA for many years on whether to open up the Association to these two last groups. Objections have been raised by those withi the ICA supply chain that if, say, retailers had direct contacts with cutters then there would not be any need to use stone dealers and they will come out of the distribution chain.

As a matter of interest, the distribution chain starts with miners, then rough stone dealers, cutters, gemstone dealers, jewellery manufacturers and designers, wholesalers, and retailers. For many years this chain held with no one jumping over an intermediary link, but in recent years this chain has started to break up. It remains to be seen how the ICA will develop.

I did not attend the ICA Congress, but I understand it was a grea success, with well over two hundred delegates and the opening ceremony was attended by over one thousand people, many of them

Around the Trade

al Chinese dignitaries and non-ICA Chinese involved in the gem d jewellery market. There were many presentations including one our own Dr Jack Ogden (see 'Two weeks in China' p. 28).

Andrew Cody, an opal dealer from Australia and President of the A for the last two years, was replaced by Wilson Yuen from Hong Kong as the new President. The coloured stone industry is suffering from the downturn in business in the present economic climate, so I am sure the ICA will continue in its endeavours to promote coloured stones.

The diamond trade

One Congress that has not taken place this year is that of the World Diamond Congress (WDC). It was due to be held in St Petersburg n Russia, but due to the economic situation this has now been ancelled. The WDC was set up as the trade support to the Kimberley Process (KP) to eliminate conflict diamonds. It consists f leading lights in the diamond industry, representatives from IBJO, NGOs, Governments, and others involved with the diamond ndustry.

One sad piece of information is that Ian Smilie, the driving force ehind Partnership Africa-Canada and influential conflict diamond GO leader, has resigned his position with KP and WDC. His main eason was disillusionment with the KP and the way its members perated the system. He was honest, sincere and articulate. He will e greatly missed within the trade.

The President of the WDC, Eli Izhakoff, assures me that should nything important occur he will convene a meeting.

The World Federation of Diamond Bourses (WFDB) and nternational Diamond Manufacturers (IDMA) meet every two years, ut in the intermediary year they have a meeting of the Presidents. his has been scheduled to meet later this year in Russia.

A piece of local news to the UK; the London Diamond Bourse nd Club (LDBC) changed its name to the London Diamond Bourse (LDB) at its AGM in April. The LDBC was reconstituted in 994 through the merger of two Hatton Garden-based diamond xchanges, the London Diamond Bourse (members dealt in olished goods) and the London Diamond Club (members dealt in ough diamonds). It was then logical to name the new association s the London Diamond Bourse and Club to retain the historical nk with both exchanges which had both been formed in the 940s. One amusing story to emerge was that in regular VAT nspections of the company books Customs Officers would ask o see the bar receipts, thinking that it was a social and drinking lub. The LDB continues to be one of the 28 diamond exchanges ffiliated to the WFDB.

"... it is difficult to understand ... whether there is a surplus of rough diamonds or a shortage."

The diamond trade has suffered in the current economic limate like other trades, but it is difficult to understand, reading ne trade press, whether there is a shortage of rough diamonds or a surplus. There was a letter from the President of the WFDB, Avi Paz, to reduce the quantity of rough that could be sold, as there was too much rough on the market, yet cutter after cutter complains that they cannot obtain the quantity of rough they need. Perhaps there is the wrong sort of rough on the market. This is not as daft as it sounds; there is a enormous quantity of rough available on the market to produce small stones, hence the huge redundancies in Surat in India of diamond cutters and polishers. But there is a continued demand for single stones of about the carat sizes.

"Perhaps there is the wrong sort of rough on the market."

Many diamond dealers burnt their fingers on the larger, 5 ct plus, stones. Rapaport in their price list showed an increase in price in this range of stones; dealers invested and traded in such stones, and this trade generated its own momentum. It transpired that not many end users were buying such stones, as many of them were at this time valued at over a million dollars per piece. When dealers realized this, these prices began to tumble and many dealers are holding stones costing many thousands of dollars which they can only sell with very large losses, if at all.

An attempt is being made by the diamond trade leaders to reduce or, better still, cut out the memo business. In the UK we have two types of memorandum business, i.e. when a trader borrows a stone from another. The first is when this is done on a specific enquiry and we refer to this as 'approbation' or 'appro'. The second is when one trader offers to leave a quantity of goods with another trader or retailer in the hope of selling stones when the latter has an enquiry; this is known as 'consignment' or 'sale or return'. I assume it is this trade that is being proposed to be dropped. The leaders argue that when money is tight sections of the trade are expected to finance those lower in the distribution chain; they fail to get paid for long periods and the chances are that companies will cease trading with large liabilities.

This would be a good thing for the trade, but in hard times, I am reminded of the story of two salesmen meeting in the bar after a long day at a trade show. One complains that trade was very slow and the other exclaims: "Even those who never pay have stopped buying."

We live in difficult times.

In the news

Two weeks in China

Gem-A CEO Jack Ogden gives a summary of his recent trip to China with a particular focus on the 2009 ICA Congress in Panyu

The Scottish Gemmological Conference (see pages 12 to 21) led straight on to the East and a trip that seemed to consist of pairs – two gem conferences, two trade exhibitions, visits to two of Gem-A's teaching centres in China, and to two in Hong Kong – plus a series of meetings with local representatives, tutors and trade organizations.

China is of vital importance to Gem-A, and this is a significant year – it is the twentieth anniversary of Gem-A's courses being introduced into China. The importance of gemmological education to the jewellery industry and how it will have to adapt to new challenges of the twenty-first century was the subject of two presentations I gave in China. The first was at the 2009 International Colored Stone Association (ICA) Congress in Panyu, a multi-day conference which was a vital venue for gem dealers and others who wish to expand their business into China, or source gems in China. A brief overview of that Congress follows.

ICA Congress

During the first day of ICA Congress a series of presentations underlined the extraordinary growth of the Chinese jewellery industry and the growth in the home market for jewellery. Some 50% of the jewellery on the world market was now made in China and annual growth in jewellery turnover in China was running at about 25%. Branding was a significant feature. The industry had strong regional characteristics; jewellery manufacture was largely sited in Panyu, synthetic manufacture in Wuzhou, and the less costly coloured gems cut in Dung Guan and Hai Feng. The retail diamond market had grown considerably with, again, regional features – Shanghai preferred quality, Beijing size. China also has huge potential to be a market for coloured stones, but consumers were still largely uninformed about these other than, of course, jadeite and nephrite. A Coloured Gemstone Survey carried out earlier this year in 16 cities and with 1314 consumers, revealed that just less than half of consumers owned coloured stone jewellery. As Johnson Sin of the Hong Kong Jewellery Manufacturers Association pointed out, if the coloured gem industry was to expand in China, integrity and quality would be two crucial factors. Few retailers actively promoted coloured stones and consumers drew much of their information from fashion magazines and TV. Younger consumers were more likely to appreciate coloured gemstones than older ones, and were also more influenced by design factors in jewellery. Zhao Feng, director of the Gems and Jewelry Trade Association of China, focused on the market for ruby and sapphire in China, noting that this really only began to take shape in the early 1990s and that there had been rapid growth in recent years. Good profit margins were achievable. Interestingly, as visits to two trade shows in China (Guangzhou and Shanghai) and conversations with those in the industry confirmed, a popular coloured stone on the Chinese market was now tourmaline – something that may explain the rising price of this stone globally. Wu Yi Bin, president of Sinojewel, attributed the present popularity of tourmaline to his company's promotion of the stone, and in particular the much publicized sale of a piece of jewellery set with a fine quality rubellite tourmaline, made by Sinojewel, that was sold in a department store in Beijing in 2008 for the equivalent of almost £50,000 – a new Chinese record for a single piece of coloured stone jewellery other than emerald, ruby or jade.

Gem training within China was taken very seriously. Dr Yang Lixin of the National Gemological Training Centre of China explained that this centre provided both vocational training and education for consumers. Short courses had been started in the mid 1980s and higher level courses in the 1990s. In 1997 a laboratory technician certificate was introduced and now anybody working in a lab and whose name appeared on reports had to have this qualification. Similarly, anyone issuing gem and jewellery valuations had to be a Certified Public Valuer of Gems. Chinese valuers encountered similar challenges to their western colleagues. In a talk about Jewellery Appraising in China, Gua Tao of the Zhonghengyu Valuation Co. referred to the difficulty of valuing such things as huge pieces of ruby rough, the Olympic Medals and a two metre high jadeite statue of Buddha. There were also sales associate qualifications, and other qualifications for gem testers, diamond testers and precious metal testers. Of course, there were other gemmology qualifications available in China, including, as Dr Yang Lixin noted, Gem-A's Diploma. This was also underlined by Lorenzo Yih, President of Lorenzo Jewellery International, who said that China "needs more experts with internationally recognized qualifications". This aspect of education was pursued by me in a paper on gemmological education in China. This year is the twentieth anniversary of of the introduction of Gem-A courses to China. Gem-A now has five teaching centres in China and three in Hong Kong. Organizations such as Gem-A can offer courses, but the real prompting must come from the industry and industry organizations, for example ICA and CIBJO. There was little point in such organizations debating nomenclatures and

Gem-A News and Views

Diamond cutter at the Guangzhou Mickey Weinstock & Co. diamond cutting factory in Panyu. The factory is well known for the very high quality of the cutting. © Gem-A

ethical disclosure at length without backing this up with a 100% commitment to encouraging gemmological education. There could not be a successful gem industry without expert and enthusiastic gemmologists. Robert Weldon from GIA Carlsbad explained the key concepts of the online versions of GIA gemmology courses, and how they had to be "fresh, relevant and interactive". In acknowledging the current economic challenges, he reminded participants that the GIA had been founded during the Great Depression.

The second day of the Congress session included some presentations on gemstones found in China. Dr Dietmar Schwarz of the Gübelin Gemmological Laboratory compared emeralds from Dabdar (Xinjian) and those from Colombia. The former revealed three-phase inclusions that could easily be mistaken for those characteristic of Colombian emeralds. Vincent Pardieu, Field Gemologist for the GIA Laboratory, Bangkok, also discussed these Dabdar emeralds, which included some fine-quality stones, and those from Dyakon, Yunan. These latter tended to be of a lighter green colour and not of great quality – analysis revealed that they were rich in vanadium, low in chromium. Dr Adolf Peretti, Director of the GRS Laboratory, Bangkok, considered gems outside China, discussing the rubies from Winza, Tanzania, and Paraíba and other copper-bearing tourmalines. The gems of Sri Lanka were the subject of a presentation by Sarath Weerawarnakula who expressed the importance of Sri Lanka throughout history as a gem source. He provided an update on mining activities in the country and that they were still mainly directed at alluvial deposits, and that largely untapped primary deposits might be found in the central highland complex. He also expressed his hope that the opportunity for peace after the long period of strife in Sri Lanka might allow an increase in gem discovery and exploitation.

The above are only brief summaries of a just a few of the presentations offered during the Congress. There were also visits to the Worldmart complex of jewellery shops, including gem dealers, and a visit to the Guangzhou Mickey Weinstock & Co. diamond cutting factory in Panyu. Mickey Weinstock, after successfully marketing diamonds to the expanding Japanese market in the 1980s, had turned his attention to China and, using Belgian expertise, established a diamond cutting factory that focused on the finest quality cutting.

New Director of SSEF

We are pleased to announce that Dr Michael S. Krzemnicki has been appointed head of SSEF – the Swiss Gemmological Institute. He succeeds Professor Dr Henry A. Hänni who retired at the end of May.

Professor Hänni is renowned worldwide as an eminent gemmologist and mineralogist. Over the past twenty years Professor Hänni and his team have shaped the SSEF laboratory and transformed it into a leading gemmological institution. After his retirement, Henry will maintain his close links with SSEF and will continue to support the laboratory with his vast knowledge and experience.

Michael Krzemnicki gained his Master's degree in mineralogy in 1992 and his PhD in 1996 in Basel, Switzerland. He joined the SSEF in 1998, the year in which he was awarded the Diploma in Gemmology and became an FGA. Michael, who is well-known internationally as an expert in gemmology and mineralogy, presented the Gem-A's Herbert Smith Memorial Lecture in Hong Kong in 2008.

Dr Michael Krzemnicki (left) and Professor Dr Henry Hänni

Gem-A News and Views

What you've been talking about on MailTalk

Recent posts on MailTalk, the email-based forum that allows you to share comments and ideas with other members.

- Is there any simple way you can re-polish the top of an opal cabochon that has become dull with wear to bring back the lustre? Or do I have to send it to a lapidary?
  Various methods of polishing the stone were suggested, many with the warning that opal can easily be damaged, particularly by heat. A novel idea, which we suggest you treat with some caution, was to use the type of cushioned nail file that has three different surfaces on it; one to take out any abrasion on the surface, a second to even out any finer abrasion and the third which can be used as a buffer to give the final polish.
- Can anyone tell me how glass-filled rubies react in an ultrasonic cleaner?
  Numerous tests have been carried out by laboratories, but the basic advice was that the glass filling can degrade in the ultrasonic cleaner and when immersed in pickle. Use of a buffing wheel during normal polishing of jewellery set with these stones can erode the filler.
- Does anyone know of any documentation of the existence of colour-changing gems on record before alexandrite?
  This question drew an enormous response giving references in literature from Pliny to Tavernier to Kunz. But it also resulted in lively debate about luminescence and the appearance of stones in different lighting conditions as well as actual colour change.

For information on MailTalk and details of how to join go to www.gem-a.com/membership/mailtalk.aspx

Gem-A brings Rough Diamond Training Day to Beijing, China

Over a hundred Chinese officials attended a special diamond course in Beijing brought to them in April by Gem-A. The course was presented by Dominic Mok Wai-Kei FGA DGA, Gem-A's senior diamond instructor in Hong Kong and Principal of the Asian Gemmological Institute (Hong Kong). The course was one of several events celebrating Gem-A's twenty years of educational presence in Mainland China.

The audience was composed of Chinese Kimberley Process Certification Scheme (KPCS) officials of the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), the designated authority of KPCS implementation in China. During the two-day course they were introduced to the world diamond industry and the essentials of diamond identification, with a special focus on rough diamonds. Said Liang Weizhang, director of ATC CIQ Guangzhou, the coordinator of this training event: "The Gem-A instructor with his up-to-date information, photos, videos and samples, made this an unforgettable experience for the Chinese KP officials."

After the course, Wang Weiping, Deputy Director General of the Inspection and Quarantine Clearance of AQSIQ thanked Gem-A for providing the course which he believed would usefully enhance the technical capacity of KPCS monitoring of rough diamonds.

Dominic Mok Wai-Kei FGA DGA, Gem-A's senior diamond instructor in Hong Kong and Principal of the Asian Gemmological Institute (Hong Kong), with the plaque presented to Gem-A on the occasion of the KP training event in Beijing.

On behalf of Gem-A, Dominic Mok expressed his appreciation of AQSIQ for facilitating the KPCS in China and protecting the integrity of the diamond industry. Furthe cooperation between AQSIQ and Gem-A would be explored.

Gem-A AGM

The 2009 Gem-A Annual General Meeting held on Monday 22 June at the National Liberal Club, London SW1, was chaired by James Riley, newly appointed Chairman of the Board. The retiring Chairman, Prof. Alan Collins, was thanked for his substantial contribution to the Association as Chairman of the Board and previously as President.

Prof. Alan Collins was re-elected and Steven Collins, Brian Jackson and Cally Oldershaw elected to serve on the Council. Dr Tony Allnutt was re-elected and Janice Kallischer elected to serve on the Membership Liaison Committee. David Lancaster retired in rotation from the Membership Liaison Committee and did not seek re-election.

The AGM was followed by a presentation by Rui Galopim de Carvalho of the Gemological Laboratory in Portugal (LABGEM) entitled 'Lalique's gems: As seen in the collections of the Calouste Gulbenkian Foundation'. A report of the presentation will be published in the October issue of *Gems & Jewellery*.

Gem-A News and Views

Pink

The 2.61 ct intense pink Argyle Amour™. Courtesy of Argyle Pink Diamonds.

According to Rio Tinto, the pink diamonds from the Argyle mines in the Kimberley region of Western Australia are 'Beyond Rare'. This was stressed by Rio Tinto CEO Tom Albanese at a very special viewing of the Argyle Pink Tender 2009 held at Asprey London in June. A billion tons of the earth had been shifted over the last 25 years to produce just a handful of these stones.

The 42 stones on show ranged from the remarkable fancy intense pink heart shape of 2.61 ct named the Argyle Amour™, to several stones of just over the half-carat mark. The 2009 offering included three other heart shapes plus some unusual cuts for fancy coloured diamonds, including radiants, octagons and a kite shape. As befitting the venue and clientèle at Asprey, the diamonds although exhibited as loose stones, were accompanied by a selection of suggested designs showing how they might be mounted to best effect. These designs are by Corinna Pyke FGA DGA.

The Argyle mine is the world's only consistent supplier of pink diamonds, producing some 90% of those on the market. These are offered on annual 'tenders' and with 2009 celebrating 25 years of this process, it is fitting that the Argyle Amour™ was the most valuable heart-shaped diamond ever produced from the mine. The two other 'named' stones in the 2009 tender were the round purplish-pink 1.25 carat Argyle Shalimar™ and the 1.10 carat oval red Argyle Scarlett™.

Despite being the world's main producer of pink diamonds, the average yield at the Argyle mine is of low quality rough with only some five percent of the mined diamonds being gem quality. Of these more than three quarters are brown and less than one percent pink. As Rio Tinto explain, a million carats of rough diamond mine output produces on average just one carat with a colour and quality to warrant inclusion in the tender. The tenders each year follow invitation-only viewings in London, New York, Tokyo, Perth, Antwerp, Hong Kong and Geneva, and typically include around 40–50 carats of diamonds that achieve prices that range from US $100,000 per carat to in excess of US$1,000,000 per carat. Naturally, there were no price guides at the viewing, other than the modest statement that "A pink diamond is worth at least twenty times more than the equivalent white diamond."

Rio Tinto's recent tender of 287 ct of equally rare blue diamonds from the Argyle Diamond Mine earlier this year set record prices that greatly exceeded the company's expectations. This first ever collection of blue and violet diamonds was aptly known as the 'Once in a Blue Moon' collection.

For more information on mining, the organization and gemmology see www.argylediamonds.com.au

Some images are available at http://www.argylediamonds.com.au/photo_library.html and an article on 'Discovery and Mining of the Argyle Diamond Deposit, Australia' by James E. Shigley, John Chapman and Robyn K. Ellison from *Gems & Gemology*, Spring 2001, can be downloaded at http://www.argylediamonds.com.au/docs/gems_and_gemology.pdf

Sample design for a necklace to incorporate the Argyle Amour™ by Corinna Pike, for Asprey London.

You can learn more about the Argyle pinks from John Hall of Rio Tinto Diamonds during his presentation at the Gem-A Conference 2009 to be held on Sunday 18 October at the Hilton London Kensington.

See the centre page pull out for further information.

Over the Counter

Many items of jewellery and the stones they contain are not what they appear to be at first glance. Retailer Kerry Gregory tells us about one such piece.

Anna's brooch

When Anna, one of my favourite customers, came along to our recent valuation day, I knew she'd have some interesting items. As well as buying from us, she often shops in Bath and often calls in to show us her most recent acquisitions. On this occasion she brought out, amongst other things, a three-strand string of ruby beads, a '60s style multi-gemstone brooch and a floral spray brooch.

Nick, our valuer on the day, worked his way through her numerous items with no issues until he got to the floral brooch, when he called me over for a second opinion. At first glance the brooch appeared to be a Victorian silver and gold brooch, the leaves set with ruby, sapphire, emerald and rose cut diamond melée, and the flowers made from carved rubies.

However, on close inspection it was clear that the brooch was a modern reproduction piece that had been cleverly aged to look old. There is a large amount of this type of jewellery on the market, mainly from India but also China and Thailand. The clues to its age were the quality and mode of manufacture, which were not as good as you'd see in a genuine period piece, and the cutting styles of the stones which were all very regular, not what you'd expect from Victorian stones.

The melée stones were indeed natural rubies, sapphires, emeralds and diamonds, but the dark pink carved flowers weren't rubies as first suspected. Through a loupe I saw bubbles, very obvious in one stone but less so in the others, and also what appeared to be trichite (hair-like) inclusions commonly seen in tourmaline.

I took the brooch to my office to have a closer look. Everything about the stones screamed tourmaline — the colour, the lustre, the slight dichroism noticeable with the naked eye and the inclusions. So what on earth were the bubbles doing there?

The bubbles were there for a very simple reason, but one that highlights the importance of observation above all else. The stones had been glued into the settings and the bubbles were in the glue, not in the stones.

At this point I was convinced by the observation alone that I had tourmalines, but being the good girl I am I wanted to prove it conclusively. However due to the setting and the carving it was going to be impossible to get an RI reading.

In the UV light box the melée rubies glowed red, and the diamonds had variable fluorescence and the pink flowers were inert meaning they were unlikely to be ruby, although it was not conclusive.

On the polariscope the stones showed a doubly refractive reaction and interference colours , so this ruled out spinel and glass. Using a conoscope I got a clear uniaxial interference figure, so that ruled out topaz both natural and coated.

Now here is the bit I wanted to show off about to my colleagues, but couldn't because they wouldn't understand! I recently attended the fantastic Scottish Gemmology Conference (thanks for a great weekend again folks!) where I attended a polariscope workshop held by one of my personal heroes, Alan Hodgkinson. I decided to try out the advanced techniques I learnt, without a chaperone. Using the top of a clear plastic stone box as a makeshift retardation plate, I was able to get a uniaxial negative reading, I was amazed how easy it was, thank you Alan.

I was now down to two possible stones, ruby and tourmaline, which were easily separated by the spectroscope; there was no discernable spectra in any of the pink flowers. I know I could have done this test earlier, but it was much more fun to test out my new knowledge and leave this one until last.

Once we knew what all the stones were, we were able to put a value on the piece. We decided that it would be vastly

Over the Counter

Left: The glue with bubbles is visible beneath the stones.

Right: The interference colours in the tourmalines seen through the polariscope.

overvalued if we calculated the price based on making up a one-off piece at normal retail trade prices. It would have been rather like valuing a car based on pricing all the individual parts from a dealer; you would never replace the item in that way and it would cost you far more if you did. This is how an awful lot of very cheap jewellery gets over valued at present in my opinion.

The only way you could realistically replace the brooch would be to buy a similar piece from an importer who carried this type of item, or pick one up at auction if you're lucky. So we calculated the cost using a gram price for the metal, priced the stones at very low wholesale prices, added a nominal charge for the manufacture because these pieces are made in their thousands and costs are very low, and applied a retail mark up.

The customer was not disappointed that the brooch wasn't antique; she buys jewellery because she loves it and wants to wear it. She was delighted with the service and impressed with the care we had taken to ensure we did the job properly.

Photos by Kerry Gregory.

Visit Gem-A at IJL 2009

- FREE TWO-HOUR SEMINARS
- SHOW SPECIALS
- GEM-EMPATHY AWARD
- LAUNCH OF CORPORATE MEMBERSHIP

Gem-A at stand G400

New! — Corporate Membership

Gem-A's exciting new corporate membership is to be launched at IJL 2009 and will provide a host of tangible benefits for members of the UK gem and jewellery trade. To learn more about Corporate Membership visit the Gem-A stand — leave a business card and you could win a free-year's membership.

Latest books and instruments

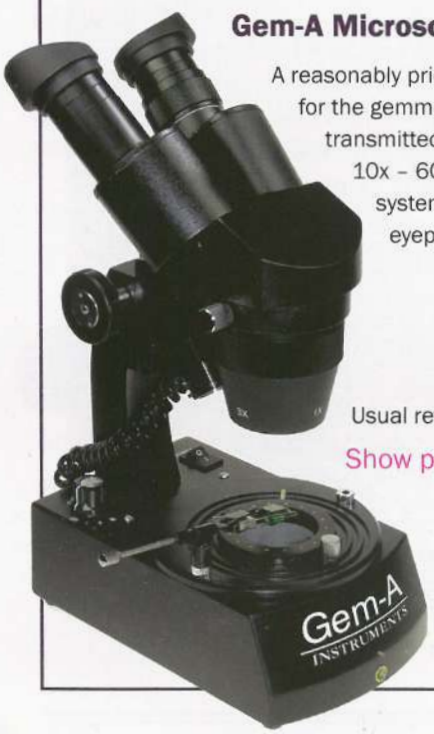
A wide selection of gem testing instruments and books will be featured by Gem-A at IJL. Our team at stand G400 will include gemmologists to advise on the best equipment to suit your needs.

Gem-A Education

The past year has seen the introduction of the popular new Open Distance Learning programmes with interactive online facilities, giving students the flexibility to study at home or in their work place. Take the opportunity to learn about the latest developments in gem and diamond education and to see the new course materials at the Gem-A stand.

Find out about our latest one-day workshops and opportunities for staff training, either at your own premises or at the Gem-A London headquarters, specially designed to meet your own requirements.

Show Specials



Gem-A Microscope

A reasonably priced microscope ideal for the gemmologist, it has darkfield, transmitted and overhead lighting, 10x - 60x magnification, turret system including 10x and 20x eyepieces. Mains 110/220V.

Usual retail price £445.00 + VAT

Show price: £356.00 + VAT

Gem-A Flip Light

Essential for anyone examing coloured gems and diamonds is good lighting. So it is not surprising that this mains-operated Daylight Lamp has been our best seller for the past two years. The bright 13 watt lamp (75 watt equivalent) is ideal for colour grading diamonds and for coloured stones — ideal for valuers and stone dealers.

This handy light source comes completed with a carry case. Mains 220V.

Usual retail price £44.00 + VAT

Show price: £35.20 + VAT

Gem-Empathy Award

Gem-A is delighted to announce its third annual Gem-Empathy Award, to recognize the exhibitor at IJL whose gem-set jewellery best combines innovation and design flair with a knowledgeable and sympathetic understanding of the materials. The judges will base their decision on a single piece or collection of jewellery that makes captivating use of one or more gemstones. The criteria for the award will include accurate gem descriptions as well as creativity, imagination and attractiveness.

The winner of this year's award will receive publicity in Gems & Jewellery as well as a free full-page advertisement. The winner will also be offered a free place on a one-day Gem-A workshop of their choice or free attendance at the 2009 Gem-A Conference. Plus free Corporate Membership of Gem-A for 2010.

Our Gem-Empathy Award judges visit all IJL stands, anonymously, but if you have a particular piece or range that you would like to bring to our attention in advance, let us know – contact Mary Burland at Gem-A giving your name and stand number: mary.burland@gem-a.com.

The 2008 Gem-Empathy Award winners were Tivon Fine Jewellery, chosen for their fine array of coloured gems and accurate descriptions. Said Ariel Tivon: "Last year's Award was a big confidence booster. For us it was an affirmation that what we had strived for was a worthwhile pursuit and that people appreciated our efforts. It gave us further confidence to develop even more fantastic creations. We developed a distinct and very attractive diamond range with the aid of an Italian designer called Antonio Rossi (the collection bears his name). We also made some magical new coloured gemstone pieces, all the while raising our game in terms of quality, design, marketing and service." He continued: "I think everyone needs a pat on the back at some point to say, 'Job well done. Keep going!' Not only have we kept going but I believe we are even more diverse than in the past."

Dr Jack Ogden (left) and Olga Gonzalez of Gem-A presenting to 2008 Award to Ariel and Israel Tivon of Tivon Fine Jewellery.

Free Two-Hour Seminars by Gem-A

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

Please note that each session is *limited to 15 delegates* and so it is recommended that you book your place in advance. You can do this by emailing Paveet Amrit at paveet.amrit@gem-a.com or Doug Garrod at doug@gem-a.com

Both of Doug's presentations will be held in the Mall Room on the first floor at Earls Court 2.

Sunday 6 September: 10:30 am to 12:30 pm

An Introduction to Gem Testing

In this hands-on session we will look at a logical sequence of testing techniques for the recognition of gemstones. We will start with observation followed by the use of various gem testing instruments. You will also learn not only how various features of a gem can aid identification, but also how these features affect a stone's appearance – an essential selling tool in the retail jewellery environment.

Tuesday 8 September: 10:30 am to 12:30 pm

Not Natural!

During this practical session we will explore some of the imitation, man-made and treated gemstones that may be encountered in the jewellery trade today, concentrating on diamonds, emeralds, sapphires and rubies. Throughout the course you will have the opportunity of examining these materials for yourself with the use of a microscope.

Gem and Jewellery History

England's largest diamond

Continuing the story of the Pigot diamond, once the largest diamond in England, which was sold at Christie's in 1802, rejected by Napoleon, bought by the Pasha of Egypt and then given to the Ottoman Sultan before disappearing without trace.

Part 2: From Pall Mall to the Pyramids

The Pigot diamond, the largest diamond in England, was an oval brilliant cut of 47.38 old carats (47.66 modern or 'metric' carats) that was disposed of by lottery in 1800. The expressed value was in excess of £20,000 and the joint winners were four young men who had shared in the purchase of the lottery ticket. Part One of the story, in the April 2009 issue of *Gems & Jewellery*, ended with the supposition that the four lucky fellows probably awoke after a night of celebration with the worrying thought that if the Pigot family had been trying unsuccessfully to sell the diamond for almost forty years, how would they ever be able to realize its value and take their individual shares?

We do not know who came up with the answer, but in February 1802, less than a year after the lottery, James Christie announced that he would be auctioning the Pigot diamond in his Great Room in Pall Mall on Thursday 10th May at 12 o'clock. That of course was the auction house founded by James Christie (1730–1803) in 1766 and which continues to auction fine jewellery and other works of art today.

Representation of the Pigot diamond based on the drawing, ca 1820, by Philippe Liebart, Rundell's diamond setter and designer, who knew the stone well. He showed it in a simple silver display mount, as reproduced here.

A report in *The Times* written the day after the auction, tells us that "The sale of the Pigot diamond drew a very numerous and fashionable company to Christie's rooms in Pall Mall. The sale of so rare an article gave Christie an opportunity of exerting those powers of eloquence and poetic fancy in which he is so liberally gifted." Here is an example of Christie's eloquence and poetic fancy as quoted by *The Times*, characteristic but hardly subtle flattery of his audience: "Unfortunate, indeed, were the owners of this jewel of high price in its being brought to the market where its worth might not be sufficiently valued, where the charms of the fair needed not such ornaments, and whose sparkling eyes outshone all the diamonds of Golcondah."

Another reporter of this eloquence was a German visitor to London, Christian Augustus Gottlieb Goede. He recalls: "I attended [Christie's Auction House] when the famous Pigot diamond was to be disposed of by this celebrated orator, and his rooms were so well and fashionably crowded, that I had difficulty to find a place. He opened the business of the day by a lively, pleasant, witty exordium, in which he traced the history of the diamond, from its original discovery to the present day, when the fall of the hammer was to decide its future fate. The adventures of this jewel were certainly not devoid of entertainment: it had travelled a great way, and was intended to shed its lustre on the British crown; it had been an object of much parliamentary debate. These and other incidents were combined by this flowery orator, with a degree of pleasantry and humour which could scarcely have been exceeded. Nor did he forget to compliment the English ladies, whose "Superior charms robbed jewels of their value, and whose simplicity of attire disdained the aid of foreign ornament". This speech was several times interrupted by the plaudits of the company; by the ladies in particular, with whom, as may be conceived, he is a great favourite."

Goede, like others, reported the price fetched "... as only £9,500 to a jeweller in New Bond-street; a sum much below its intrinsic value." The purchaser was a Mr Parker of Parker and Birketts in Princes Street, London. The famous jewellery firm Rundell & Co. purchased a part share, and this may have been the plan from the

Gem and Jewellery History

start since one newspaper at the time of the auction noted that Parker was "supposed to have acted by commission".

In any case, Rundells had acquired their share in it by 1804, the year in which they had been appointed Royal Goldsmiths to George III. As the late Shirley Bury pointed out, if they offered the diamond to that monarch, there is no evidence for it. They probably realized the auction price was too well known. So in 1804 it was offered to Napoleon, even though England was by then at war with France. The story of the offering of the Pigot diamond to Napoleon has been dealt with in detail by Ian Balfour in his *Famous Diamonds* and needn't be repeated here, although it should be noted that Napoleon didn't purchase the stone, presumably because he became aware that it came from England. Thus, *The Times* for 26 November 1804 was premature when it noted that "The Pigot diamond is said to have been purchased by Bonaparte, and is to adorn the necklace of the Empress — Purchased by Bonaparte! He must surely have found some difficulty in robbing before he condescended to buy."

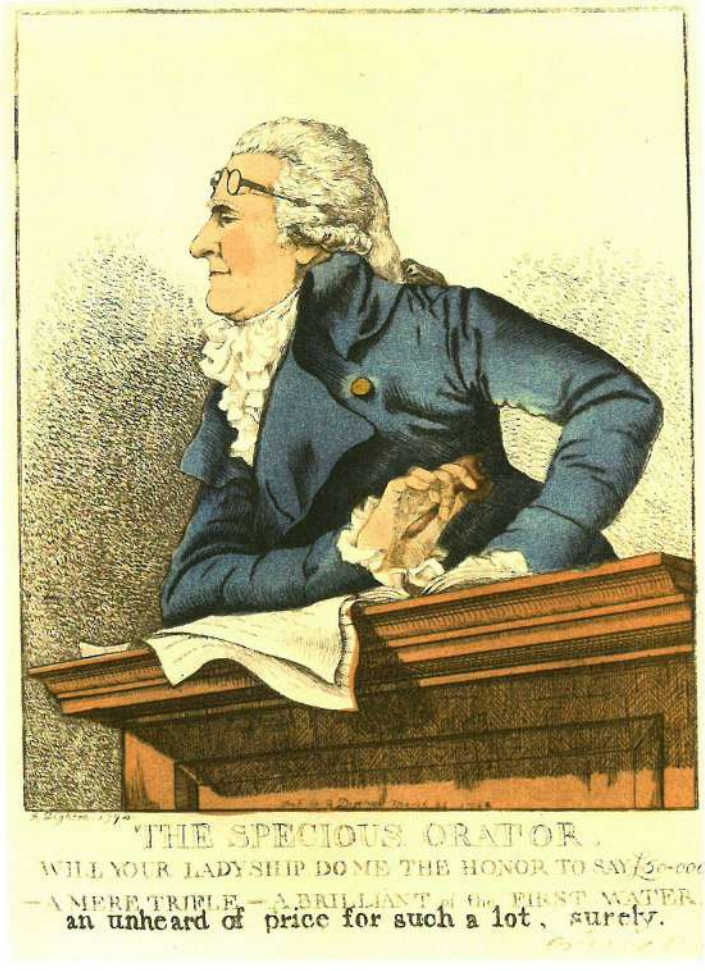
By this time Parker was becoming impatient with a lack of a sale and so, as a later report says: "A lawsuit was contemplated, when the jury might have recommended the stone to be cut in half, which would have reduced its value to less than £9,000 in point of weight, and probably would have rendered the forms of inconvenient sizes for cutting into any other saleable stones. During the discussion Messrs. Rundell, Bridge and Rundell made an offer [to Parker] of 8000 guineas, which was accepted." Rundells were now the sole owner.

The diamond finally arrived back in London, but not until 1816, after Napoleon had been defeated at the Battle of Waterloo. There are various references to the diamond over the following years. In a letter written in May 1818 John Griscom describes a visit to Rundells where he was shown "Three cut diamonds in a small morocco case, valued at £50,000. The largest of these was the famous Pigot diamond, which was worth £30,000." Its presence in London was also noted in 1821 in William Bingley's *Useful Knowledge: Or A Familiar Account of the Various Productions of Nature*.

But soon a new potential buyer was found. This was Mohammed Ali, Pasha of Egypt, who had been born in the same year as Napoleon, and, ironically, his rise to wealth and power had ultimately been set in motion by Napoleon Bonaparte's invasion of Egypt in 1798.

Mohammed Ali paid £30,000 for the diamond., the sale being negotiated through Samuel Briggs, British Consul in Alexandria. The date of the sale is often given as 1830, but Briggs himself is supposed to have dated the sale to 1822, and another report says that "In 1823 he [Mohammed Ali] caused the Pigot diamond to be purchased for him of Messrs. Rundell and Bridge, of London, for 30,000L sterling."

Mohammed Ali didn't intend to keep the stone for himself; it was a gift for Mahmoud II, the Ottoman Sultan in Constantinople (modern Istanbul). This was one of many presents from Mohammed Ali to the Sultan and it has been suggested that the purpose of these gifts was to excuse Mohammed Ali from supporting the Ottomans against the Greeks who were then fighting for independence.



A satirical print of James Christie, 'The Specious Orator', selling a diamond. The caption says: "Will your ladyship do me the honour to say £50,000 — a mere trifle — a brilliant of the first water — an unheard of price for such a lot, surely." This illustration, by the painter Robert Dighton, is dated 1794 — eight years before the Pigot appeared at Christie's. Photo courtesy of Christie's.

But the Pigot diamond then disappeared from history. We don't even know if it left Egypt. One popular legend says that the stone was ordered to be crushed after its owner's death, but as this 'owner' is named as Ali Pasha of Albania, there seems to be some confusion. In any case, Ali Pasha was beheaded in 1822, too early for him to have been the owner. There have been various attempts to identify the Pigot with other surviving diamonds, including the 'Spoonmaker's diamond' which is one of the treasures of Topkapi Palace in Istanbul, even though this is an 86 carat pear-shape.

Perhaps one day we will know the fate of the Pigot diamond, possibly even locate it, but if we do its history rather than it size will be its claim to fame. Ian Balfour's list of the world's largest cut diamonds includes well over a hundred stones, but all these are at least twice the weight of the Pigot even though, two centuries ago, this was the largest diamond in England.

Jack Ogden

Stone Scoop

Gemiscellany

Holy Chic

The gulf between what gemmologists (and some dogmatic dealers) consider proper terminology and disclosure, and what others would like to be able to say about their wares may never be bridged to everyone's satisfaction. An impartial view is that sellers should be able to market their goods in terms that best helps their sale, providing that customers are absolutely clear about what they are getting.

This type of thinking leads to such inventive expressions as 'birth marks' for gem inclusions — not long ago most still called them 'flaws'. Then there is 'Midnight blue' for those inky, almost black sapphires. When I first suggested the 'Midnight blue' terminology in the 1990s I meant it as a joke — so should I be amused or honoured that it is now being used? I am not belittling the terminology problem; it does become a serious matter when we have to ponder such things as how much colour-change a chrysoberyl has to exhibit to be fairly sold as an alexandrite.

Perhaps the greatest test to the trade's ingenuity is how they can put a positive but fair spin on gem treatments. Calling then 'enhancements' is one way, but might that not imply to the average consumer that an enhanced ruby, say, is somehow intrinsically better than a non-enhanced ruby, even if the former was once an ugly piece of purplish flawed corundum, the latter a fine 'Burma'? I thought of people marketing treated gemstones recently when I came across a quote by the celebrity hairdresser 'Teasie Weasie' Peter Raymond: "My aim has always been to make beautiful women even more beautiful and to bring out the beauty of plain women by adding that little bit that God seems to have overlooked."

That would translate beautifully into the gem treatment industry: "Our aim has always been to make beautiful gems even more beautiful and to bring out the beauty of other stones by adding that little bit that God seems to have overlooked." I am being slightly facetious, but I won't place bets against such a statement being made. You could brand anything with that sort of language and make it really sound tremendous.

Rock Gospel

Talking of God, there was a recent press announcement (shared over Gem-A MailTalk) about a piece of rock crystal found at Clear Lake, California — what they term a "Lake County 'Diamond'" — which bore "a clear image of the Virgin Mary and Child". The stone was luckily found by someone best placed to recognize its importance — the Rev. Dr Douglas Van Dyke DD. I have no wish to offend anyone's faith by querying this identification, after all, I haven't seen the stone, but it does raise the question as to whether we should be curious to re-evaluate the internal and surface features of other gems. A glance through photos of internal characteristics taken by such as John Koivula or the late Dr Gübelin, reveal many images that the faithful might be able to interpret. In the Christian sphere alone we have various inclusions in the form of fishes, nails and, of course, the 'angel hair' rutile in quartz. And haloes around inclusions.

If we expand to the iconography and scripts of other faiths, the possibilities are boundless — especially if someone couples this approach with crystal healing.

I'm glad I'm getting near retirement age.

Fish or Foul

The mention of fish-shaped inclusions brings me to an internal feature which even the most abundantly faithful should have doubts about. Not long ago UK valuer Adrian Smith encountered a large piece of supposed amber which had a most unusual trapped specimen — a seahorse. As amber is the hardened resin oozing from

'Amber' with seahorse inclusion. Photo by Adrian Smith.

Stone Scoop

a tree, the imagination runs riot trying to work out how a marine creature calmly swimming in the sea one minute might suddenly find itself launched into the air only to land in the sticky resin. There are possible explanations, of course, such as the supposed case many years ago of a golfer being killed by a red mullet falling out of the sky, but all in all, it is hard not to concur with Adrian's opinion that the object was a novel although rather bizarre fake.

Heigh Ho

All proof, of course, that the world is full of gullible people, and people trying to take advantage of them. Gem-A was recently telephoned by a member of the public wanting reassurance that a gem he had bought "straight out of the mine, from the miner" in a remote part of Africa was worth what he had paid for it. I explained that we don't provide valuations, but he persevered, explaining in detail all about the stone and how he bought it.

As he spoke it became evident that the stone he had purchased from the miner, straight out of a muddy hole, was brilliant cut. When I interrupted him to point out that the only case of gems being mined ready-cut was in the mining scene in Walt Disney's 'Snow White and the Seven Dwarfs', he said words to the effect "Oh dear, I didn't think of that." Sadly not a unique case by a long shot. I didn't add that £5000 a carat was a bit steep for a garnet, because we don't do valuations.

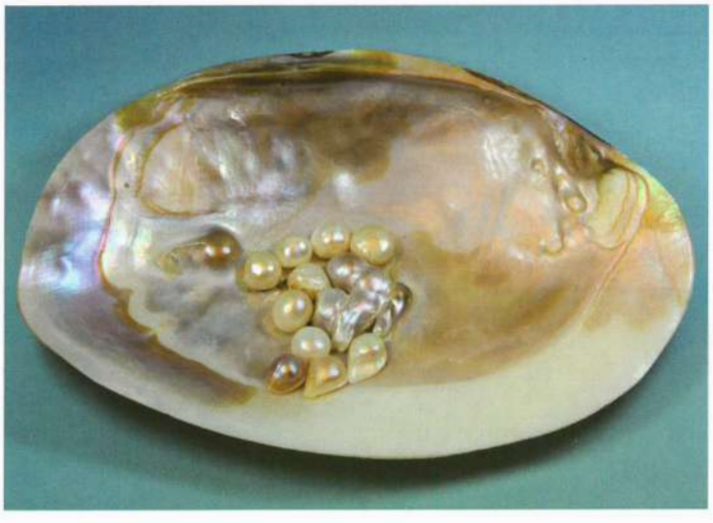
Shell Shock

Another rather bizarre fake came my way recently. Dubai is keen to build on its celebrated pearling history and it is not surprising to find that the Dubai Museum, cleverly incorporated into the old fort in central Dubai, includes various exhibits and tableaux related to its pearling heritage. Nor is it surprising to find the museum shop cashing in on this too. However, the shells with 'pearls' *in situ* for sale are Chinese freshwater mussel shells, not Persian Gulf oysters, and the 'pearls' are cultured. These are presumably rejects because the cultured pearls have developed irregularly and attached to the shell making them essentially worthless — and certainly not a suitable homage to the Dubai pearl tradition. Nevertheless, in one shell being sold the 'pearls' had been glued to the shell.

But how can we blame Dubai museum for being a bit inaccurate with regard to pearls when the Financial Times earlier this year authoritatively stated that "Natural pearls from oysters have already been extinct for 100 years due to a combination of over harvesting and pollution."

Diamond Spokesman

Pollution and other environmental concerns are also leading to greater encouragement of bicycle use. Indeed, the Miami Herald



Two reject Chinese freshwater mussel shells with cultured pearls as sold in Dubai as souvenirs of Dubai's pearling heritage. The pearls are glued in place in the lower picture. © Gem-A

in March reported that Hollywood Boulevard in Miami, Florida, has a new bicycle rack in the form of a 6-foot high diamond ring made of gilded concrete with glass for the diamond. Local jeweller, Eric Morningstar of Morningstar Jewelers, who had contributed half the $5000 cost, was quoted as saying: "It's going to add a lot of aesthetics and appreciation for the arts and culture."

That, naturally, raises all sorts of questions about what is meant by 'culture' in the context of gilded concrete diamond rings, but this brings us back to terminology ...

Jack Ogden

Salesroom News

The Star of Josephine

An exceptional stone that set world record prices at auction not only for a fancy vivid blue diamond, but also the price per carat for any gemstone. Claire Mitchell tells more about this magnificent stone.

A rare fancy vivid blue, internally flawless, cushion-shaped diamond weighing 7.03 ct was sold at Sotheby's Magnificent Jewels sale in Geneva on 12 May. Bidding was reported to be heated and lasted over 15 minutes. Realizing US$9.48 million, a price per carat of US$1,349,752 , the stone beats two world records at auction. The renowned Hong Kong collector and connoisseur Joseph Lau Luen-Hung was the successful bidder and has exercised his right to name the diamond, which is to be known as the 'Star of Josephine'.

The diamond was cut from the 26.58 ct rough stone which was recovered in 2008 by Petra Diamonds at the Cullinan diamond mine in South Africa, the world's most consistently reliable source of blue diamonds. Other outstanding diamonds from this mine include the Cullinan, the largest gem diamond ever found at 3106 ct rough.

As the diamond was from a South African mine, it was decided that it should be cut in South Africa. The cutting was done in Johannesburg but under the direction of technicians from the London-based company Monnickendam Diamonds Limited*, who were responsible for the design and creation of the finished diamond. Neil Holness of Monnickendam said: "Detailed discussions involving the techniques and procedures that would extract the full potential from the stone took place over a period of several months. A strategy was finally agreed and the cutting and polishing began, which took seven weeks to complete." As there were many inclusions in the rough, it was laser sawn in four different planes. The stone is not a traditional brilliant cut as extra facets have been added; the pavilion facets are cut to enhance the natural refraction from the blue colour. The result is indeed a stunning stone of outstanding beauty.

In addition to the Star of Josephine, four smaller stones were cut from the rough with a combined weight of 3.50 ct.

Prior to sale, the diamond had been exhibited by Sotheby's in Hong Kong, Paris, New York and London. I was fortunate enough to be able to examine the diamond in London, just before it was due to leave for the sale in Geneva. Displayed in a very simple split four-claw platinum ring, it was indeed a very exceptional stone of extreme beauty and delicious colour.

Two further diamond highlights in the Magnificent Jewels sale included an exceptional type IIa fancy intense pink pear-shaped diamond of 5.29 ct which sold for US$2,048,508 and a magnificent marquise modified brilliant-cut fancy vivid yellow diamond weighing 18.13 ct which achieved US$1,065,152.

* Jeffrey Monnickendam is to be the speaker at the Gem Discovery Club Specialist Evening on Tuesday 4 August when he will be telling us more about the cutting of the Star of Josephine (see page 44 for more details).

(Top) The Star of Josephine. © Sotheby's.
(Left) The 26.58 ct rough blue diamond with other diamonds from the Cullinan mine. Photo courtesy of Petra Diamonds.

A stickpin of Royal interest that was presented by Queen Victoria is to be included in Bonhams' Annual Scottish Sale in August.

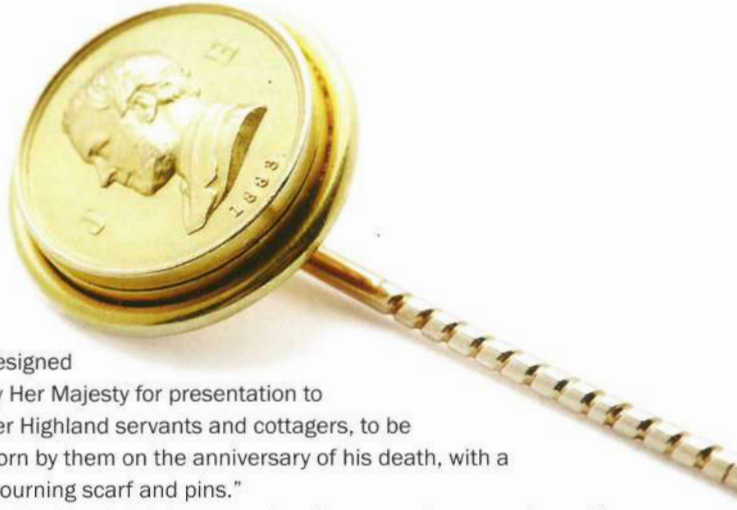
In memory of John Brown

A gold stickpin given by Queen Victoria containing a likeness of her servant John Brown is to be auctioned by Bonhams on 18 August at their Annual Scottish Sale held in Edinburgh, and is expected to fetch up to £700.

Known during his lifetime as the Queen's 'Watchdog', Brown was a constant presence at the side of the Queen in the years following Prince Albert's death.

The gold disc has a portrait in profile of Brown, flanked by the initials JB and with his year of death, 1883, beneath. On the reverse is 'From VRI' in cypher. The disc is in a stickpin mount in a case retailed by Rettie & Son, Aberdeen.

Lytton Strachey's 1921 biograph of Queen Victoria states that following Brown's death in 1883 an Aberdeen jeweller was commissioned for "A Brown memorial brooch — of gold, with the late gillie's head on one side and the royal monogram on the other — was designed by Her Majesty for presentation to her Highland servants and cottagers, to be worn by them on the anniversary of his death, with a mourning scarf and pins."



The Royal Archives contain reference to items purchased from Rettie in 1883 though unfortunately the records do not specify what those pieces were.

Above: The memorial stickpin. Disc 18 mm diameter in stickpin mount. © Bonhams.

Auction Houses

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

Bonhams	**www.bonhams.com**
London, Knightsbridge	020 7393 3900
London, New Bond Street	020 7447 7447
Edinburgh	0131 225 2266
Los Angeles	+1 323 850-7500
New York	+1 212 644 9001
San Francisco	+1 415 861-7500
Christie's	**www.christies.com**
London, South Kensington	020 7930 6074)
London, King Street	020 7839 9060
Amsterdam	+31 (0)20 575 5255
Dubai	+971 (0)4 425 5629
Geneva	+41 (0)22 319 1766
Hong Kong	+852 2521 5396
Milan	+39 02 303 2831
Beverly Hills	+1 310 385 2600
New York	+1 212 636 2000
Fellows & Sons	**www.fellows.co.uk**
Birmingham	0121 212 2131
Lyon & Turnbull	**www.lyonandturnbull.com**
Edinburgh	0131 557 8844
Glasgow	0141 333 1992
London	020 7930 9115
Sotheby's	**www.sothebys.com**
London, New Bond Street	020 7293 5000
Geneva	+41 (0)22 908 4800
Milan	+39 02 295 00201
New York	+1 212 606-7000
Hong Kong	+852 2524 8121
Woolley & Wallis	**www.woolleyandwallis.co.uk**
Salisbury, Wiltshire	01722 424500

Correspondence

What to call non-natural diamonds

The controversy as to what to call non-natural diamonds continues. CIBJO in the Diamond Commission meeting at its Congress in Istanbul re-affirmed that the only permissible term is 'synthetic' (see Around the Trade, pages 26 and 27). The International Diamond Council (IDC), representing most of the diamond industry, re-published its rule book allowing the terms 'synthetic', 'laboratory grown' and 'laboratory created'. Since both of these positions will be available on the internet, consumers may be confused as to why there is this divergence of views. The position is further complicated in that CIBJO and IDC signed an agreement that they will both adhere to the same nomenclature.

At the CIBJO conference it was proposed that CIBJO forms a team to meet with one from the IDC to try to resolve this difference. At the time of writing, although dates and venues have been suggested, the meeting seems unlikely. Both have put themselves into an entrenched position, and if no agreement is reached it would be interesting what would happen to the paper signed by both groups.

The trade understands that all man-made products are deemed to be artificial, but this is further split into imitation and synthetic. I will not repeat the difference.

Some of the synthetic crystal growers do not want to call their products 'synthetic'. They argue that the main types of synthetics are the Verneuil stones and the ones they produce are 'better' in that they imitate the natural counterpart more accurately. It was elegantly put by one dealer that they want to differentiate between those synthetics that have curved lines from those that have straight lines. These grown crystals are more difficult to produce, cost much more than flame fusion stones and sell at much higher prices. Thus, whereas a Verneuil spinel or corundum sells for a few cents a carat, a crystal-grown emerald can cost several hundred dollars per carat. These are arguments put forward by people such as Gilson and Chatham, and now Gemesis and Apollo for man-made diamonds.

They further argue that the consumer, unaware of the trade distinction between imitation and synthetic, regards anything designated as a synthetic as a fake or imitation product. Thus a synthetic diamond is on par with synthetic leather or synthetic cream. But unlike a mere imitation, a synthetic diamond is structurally and chemically very similar to a natural one, and the terms used should reflect this.

An argument to counter here, is the one commonly put that since synthetic diamonds can be differentiated from natural ones they are not the same. But here again we have to understand how language operates. The term 'the same' does not mean identical, but there are accepted linguistic conventions, for us to be able to understand that two objects can have sufficient, but not necessarily all, properties for us to call them similar and designate them by the same term. Thus we have the term 'sapphire' for all blue corundums, but we can further divide them into Burma, Kashmir, Ceylon, Australian and so on.

In the case of synthetic diamonds, the difference is the matter of their origin from natural ones. Another point often made is that natural diamonds took many millions of years to make. We have no proof for this assertion; they could have been made in a few moments or months or years. All we can say is that they have been in the ground for many millions of years. What we call things is a matter of convention and if we want to introduce a new term it can take an indeterminate amount of time as to when it becomes common usage. For example, to claim that man-made diamonds should not be called 'diamonds' is not a wrong assertion, but implies the one making this claim has not understood how language works.

Those wishing to restrict the trade to the single term 'synthetic diamonds', have argued that the producers of such stones want to confuse the public into thinking that their products are somehow indistinguishable from natural ones and thus the public will think that the products are the same. In my meetings with the synthetic diamond producers, this is the last thing they want to do. They realize sales of their stones, especially the larger ones, will be limited. Very few people will wish to buy their beloved a synthetic diamond, although they may buy one because of a price differential and thus cheat.

The problem will be with the much smaller stones, especially those produced by the CVD method. These could be mixed with parcels of natural stones and it would be too difficult and expensive to separate them. This is already happening with small yellow stones, where it is difficult to distinguish the natural ones from those that have been treated and from the synthetics.

In recent months I have argued in meetings and in the trade press that the problem of nomenclature of synthetic stones is not a problem between man-made stones and natural ones, but rather a problem in the artificial group. We have divided these into imitation and synthetic, but we now need a further division in the synthetic group between the flame fusion stones and the crystal grown ones. Since all the nomenclature issues are being dealt with by those mainly involved in the natural gem trade, it is up to them to introduce

Correspondence

a term or terms to make this new division, or let the synthetic producers come up with some suggestions.

Logic and pragmatics, and in a sense justice, dictates that we now solve this problem. The diamond industry has advocated such a division, not, as has been suggested, because they have a secret agenda to promote man-made stones, but rather to keep the synthetic producers happy to continue to distinguish their products from the natural ones. It is bizarre to suggest that diamond producers will jeopardize a multi-billion dollar business to produce and sell a limited number of synthetics.

CIBJO continues to advocate saving the consumer, as if they are fickle and cannot understand that man-made, laboratory grown, laboratory created or even cultured diamonds are natural products. Once the public realizes that there are non-natural diamonds on the market, they will demand that their invoices and grading reports and certificates state that the stone they are buying is natural or real. This too will be opposed by CIBJO because they still believe that the term 'diamond' on its own means the natural product. Again such advocators do not realize how language operates; a generic term no longer works if more than one type can be designated by the same term.

Harry Levy
Levy Gems, Hatton Garden, London EC1

Events and Meetings

Gem-A Conference: SHOWING COLOUR

Sunday 18 October
The Hilton London Kensington

To celebrate 75 years since the introduction of the Chelsea Colour Filter, presentations will look at colour in gems, its causes and effects.
See centre page pull-out for full details.

Gem Party

Sunday 18 October
The Hilton London Kensington

A party, to include dinner, to which all members, students and their guests are invited, will follow the Conference.
See centre page pull-out for details.

Gem-A Graduation Ceremony

Monday 19 October
Goldsmiths' Hall, London EC2

Presentation of the Diplomas and prizes gained in the 2009 Gem-A Examinations and reception.

Nature's Treasures II The Wonder of Gems and Minerals

The Flett Theatre, Natural History Museum, London
Sunday 13 December

A day of short talks for anyone with an interest in minerals and gemstones. *See page 9 for further details.*

The Gem Discovery Club Specialist Evenings

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

Tuesday 4 August 2009
The cutting of the Star of Josephine
JEFFREY MONNICKENDAM
(A report of the sale of this exceptional blue diamond is given on page 40)

Tuesday 15 September 2009
Ivories: Past Uses, Present Bans and Identification
MAGGIE CAMPBELL PEDERSEN FGA

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

Regional Events

Midlands Branch

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

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

Friday 25 September
An introduction to gem dealing – with some practical work
JASON WILLIAMS

Friday 30 October
Amber - talk and practical session
VANESSA PATERSON

Sunday 1 November
Training day:
Gemstones in Jewellery

Friday 27 November
Adventures with the Microscope
DOUG MORGAN

Saturday 28 November
Anniversary Dinner
To be held at Barnt Green Cricket Club

North East Branch

Contact: Mark Houghton
01904 639761
email: markhoughton@hotmail.co.uk

Meeting to be held at the Ramada Jarvis Hotel, Wetherby.

Wednesday 7 October 2009
Colour as applied to gemstone identification
JOHN HARRIS

South West Branch

Contact: Eve Symes
012 2531 1640
email: eve@vidan.co.uk

Sunday 9 August 2009
African Braai
A BBQ with an African theme, including a African gemstones for you to identify .

Scottish Gemmological Association

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

Tuesday 8 September
An Update on the Coloured Gemstone Market
TRACEY JUKES
To be held at the British Geological Survey, Edinburgh

Tuesday 17 November
Computer Modelling for the Jeweller
DAVID WEBSTER
To be held at the North Glasgow College

THE SCOTTISH GEMMOLOGICAL CONFERENCE
30 April to 3 May 2010
The Queen's Hotel, Perth
Keynote speaker: DR DIETMAR SCHWATZ

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Gem-A

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