Gems&Jewellery

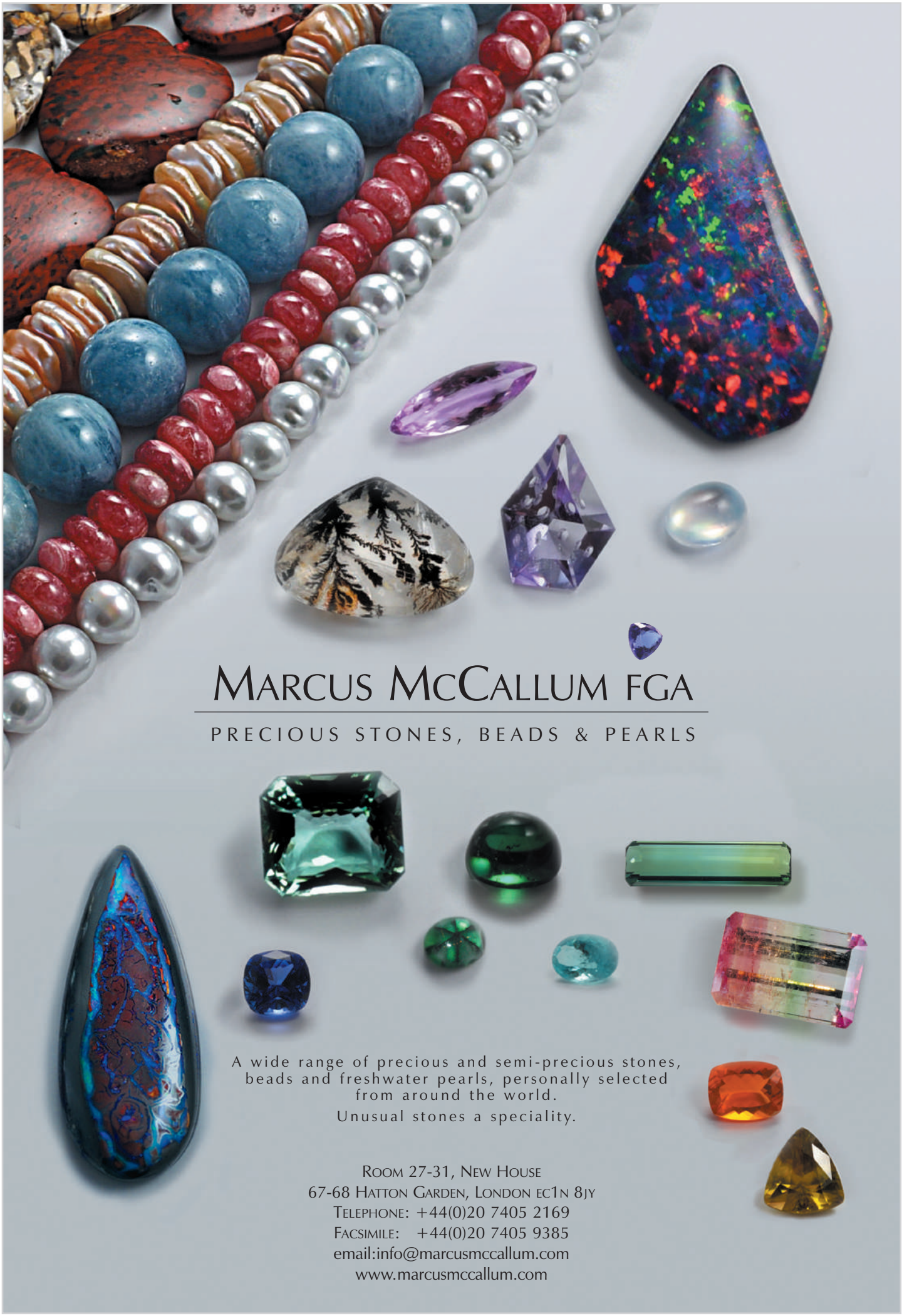
Autumn 2011 / Volume 20 / No. 3

Synthetic star alexandrite

Hong Kong Show

Gem-A Graduation

The Gemmological Association of Great Britain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Editorial

Gems&Jewellery

Autumn 11

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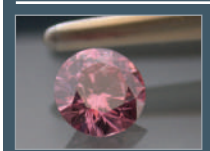
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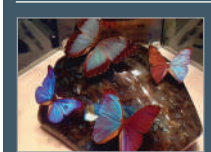
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Information highway robbery

The year 2011 marked the twentieth anniversary of *Gems & Jewellery*, a magazine with a unique blend of gem- and jewellery-related coverage which we hope sets it apart from the usual run of regurgitated press-release trade mags (see page 35). I'm sometimes asked whether there is a need for a publication like ours in these times of web-based information overkill — some people suggest that the web provides everything you want, just like Alice's restaurant in the Arlo Guthrie song. In some ways I agree. The web is the most amazing resource and accessible receptacle for knowledge in human history so far. But we all know that not all the information out there is reliable, and by some e-version of Gresham's Law, inaccurate information seems to replicate itself far too quickly over multiple web pages at a rate faster than the accurate information. Sensible people know that and do their best to take what they read with a pinch of salt. And there is still the printed word to provide sense and reliability when we need it.

At least, there was. There is an interesting transformation going on: the direction of traffic flow of information on the information highway is being reversed and the written word is increasingly mirroring the web. We see this with some newspapers where there are brief cover paragraphs introducing a topic ending with 'Read more on page X'. You need to turn the pages rather than click a mouse, but the approach is the same: newspapers are now copying the structure and navigation of the web rather than vice versa. On a more worrying level, there is an accompanying trend that journalists, even those writing for major and traditionally 'trusted' newspapers and magazines (even trade mags), seem to think that a Google search is enough to give them the information and the authority that they need to earn their fees.

So, of course our publications are needed. The unique blend of peer-reviewed *The Journal of Gemmology*, the less formal *Gems & Jewellery* and our highly popular MailTalk email-based forum combine to create a unique and balanced blend of information providers for gemmologists and gem enthusiasts worldwide. Gem-A's motto is 'Understanding gems', and our aim is to pass on that understanding in an accurate and reliable way, something we will continue to do for the second twenty years of *Gems & Jewellery*.

Jack Ogden
Chief Executive Officer

Cover Picture

Fibrous hematite and goethite aggregates in quartz from Minas Gerais, Brazil, by Michael Hügi. This epigenetic inclusion in quartz consists of radial red hematite fibres surrounded by greenish fibrous iron hydroxide, probably goethite. Overall winner of the 2011 Gem-A Photographic Competition and winning entry for Natural category. See page 30.

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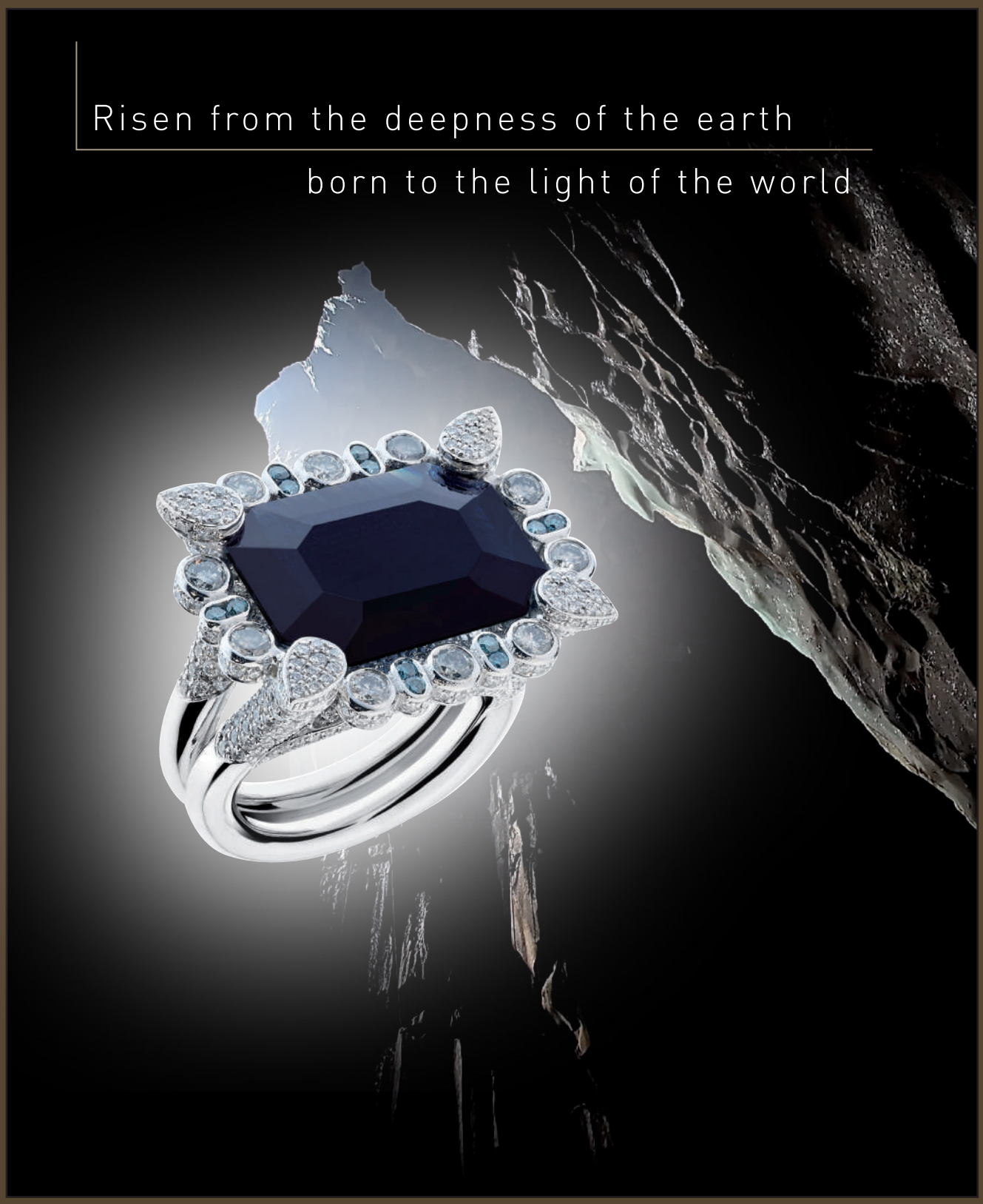
Risen from the deepness of the earth

born to the light of the world



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Design Susanne Asbeck

Composite malachite plates

Gagan Choudhary

Gagan Choudhary reports on some unusual composite plates submitted to the Gem Testing Laboratory of Jaipur.

The Gem Testing Laboratory of Jaipur, India, regularly receives some unusual and interesting materials for identification, some of which have been discussed in past issues of *Gems & Jewellery* (see 'A different kind of composite', Spring 2010, 10–12 and 'Another interesting composite — diamonds and rock crystal', Autumn 2010, 20–21). Recently we encountered numerous types of composites which are new to the trade, and at the beginning of 2011 we received an attractive circular plate which consisted mainly of malachite (**1**). Subsequent to certification, the depositor showed us two more pieces of this material (**2**) and it is these three items on which this account focuses.

Visual characteristics

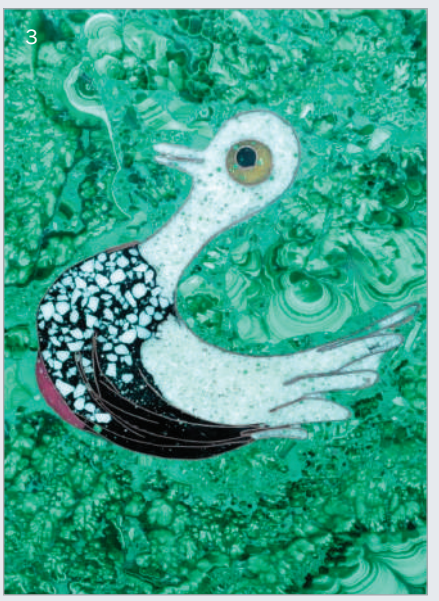
The circular plate (1) weighed approximately 958 g and measured 27 cm in diameter. The other plates were oval and fancy shaped. The oval and round plates were coated with a metallic layer at their rims. This metallic rim was too thick to be simply paint and appeared to be a foil or sheet of some brassy metal. All three plates were green with banded patterns in light and dark green; the colour and appearance were distinct enough to identify the plates as mainly malachite.

The oval plate had a figure of a bird at its centre (**2** and **3**) which consisted of white and black components. The black areas also contained some minute white crystals, visible to the unaided eye (**3**) which prompted us to

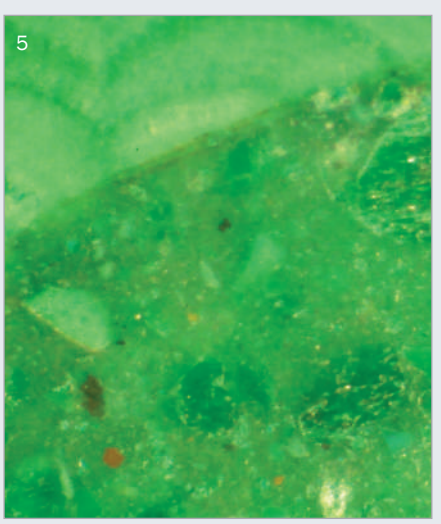
This plate weighing approximately 958 g proved to be made up of small fragments of malachite bonded or cemented together.

Gems and Minerals

Composite malachite plates (cont.)

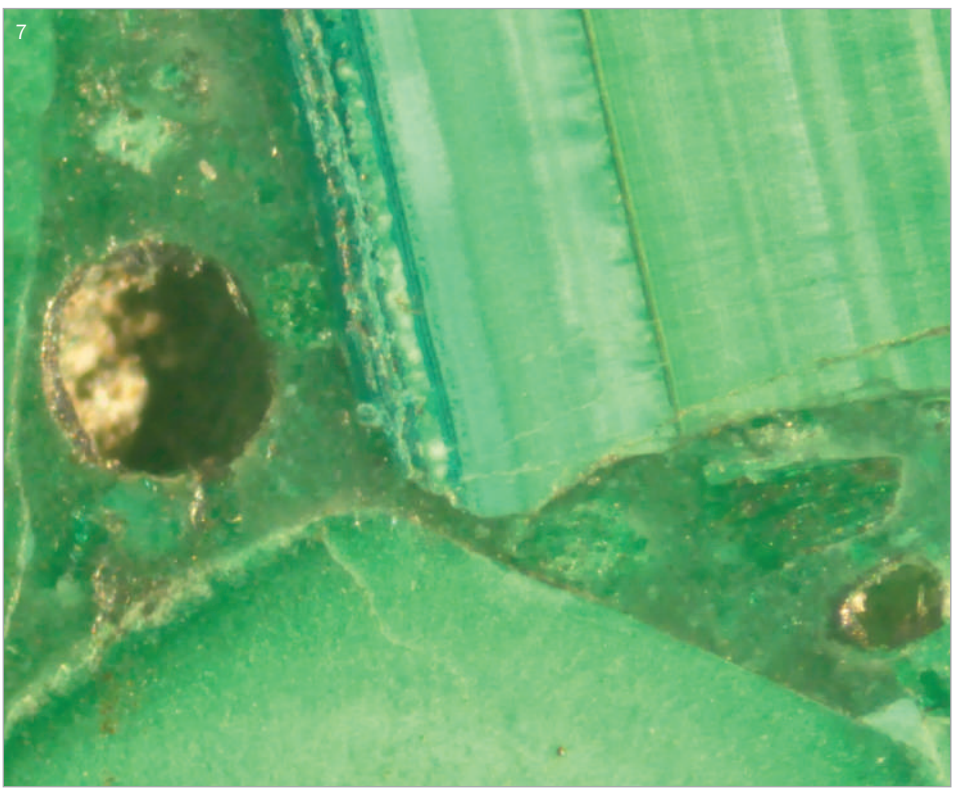


2: Three plates of the same material. The owner revealed that they had been manufactured in Africa.
3: Detail of the image of of the bird in the centre of the oval plate; the black and white sections contain small white crystals, visible to the unaided eye.



4: This distinctive banded pattern displaying botryoidal structure and radiating minute elongated crystals is typical of malachite. Note the area between two portions of curved wavy bands (centre, top) which displays tiny randomly oriented crystals along with hemispherical cavities; these are the location of gas bubbles intersected during polishing. Magnified 25x.
5: Detail of the boundary of a malachite fragment where the banding ceases abruptly against a large patch of minute randomly oriented crystals of malachite. Such features are indicative of a composite nature. Magnified 45x.
6: Areas containing smaller crystals with botryoidal banding and gas bubbles. Magnified 30x.

Composite malachite plates (cont.)



7: In this view of the plate, the straight banding contains minute elongated crystals oriented perpendicular to the direction of banding. Also note the large hemi-spherical cavities and some randomly oriented crystals. Magnified 40x.

look in more detail under the microscope. It was impossible, however, to identify the black and white areas with the equipment available.

Microscopic examination

When magnified, malachite's distinctive banded pattern and botryoidal structure was seen to consist of radiating minute elongated crystals (**4**). In some areas, this botryoidal banding terminated at uneven boundaries. Between two large areas of botryoidal banding some randomly oriented minute crystals were visible along with hemi-spherical pits (**4** and **5**). These pits are indicative of gas bubbles which have been intersected during the process of cutting and polishing, and had originally been trapped in a polymer used to bind the individual pieces of malachite. Similar features were visible all over the plate (**6**), which also contains some areas of straight banding with minute elongated crystals oriented perpendicular to the direction of banding. Such structure is associated with many polycrystalline materials such as malachite or chalcedony. However, in nearby areas, large hemispherical pits/cavities were present, along with some randomly oriented crystals (**7**).

Gemmological and spectroscopic properties

The refractive index (RI) of malachite areas in the plate was determined as approximately 1.70 by the distant vision method, with a strong birefringence blink, typically associated with carbonate minerals.

The malachite areas were inert under the ultraviolet lamp (both long wave and shortwave), but showed a weak chalky blue fluorescence under long wave due to presence of polymer cement. No absorption features were visible under a desk-model spectroscope and the large size of the plate precluded obtaining any Fourier transform infrared (FTIR) and energy dispersive X-ray fluorescence (EDXRF) data due to the specimen size limitations of these instruments.

Conclusions

The composite nature of the plates was not hard to establish and with careful examination using a 10x loupe and a light source the presence of bubbles in the cement could be detected. On discussion with the owner of these plates it was revealed that they had been supplied from Africa, but the exact location was confidential. He said that balls and spheres were also being manufactured in addition to plates. These plates made from bonded malachite are interesting materials for collectors as well as others, but their composite nature should always be kept in mind if repair or cleaning is required.

Acknowledgement

Thank you to Meenu Brijesh B. Vyas for bringing the material to the author's notice. Thank you also to Abhinav Jhalani and Ankit Jasoria (owner of the samples) for providing additional information.

All photographs and photomicrographs by Meenu Brijesh B. Vyas.

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Gem news from Gary Roskin

Gary Roskin FGA presents a selection of gem news and comments from his Roskin Gem News Report. This time, we see diamonds from past Argyle Pink Diamond Tenders, as well as some extraordinary gems and jewels from this year's Las Vegas jewellery shows.

Argyle's Pink Diamonds Tender

One of the most outstanding annual gemstone events has come and gone without too much fanfare. After all, it is an invitation only event, for an estimated one hundred attendees. Of course, we are talking about the Argyle Pink Diamonds Tender. The 2011 event was the 27th annual silent bid auction, where the best quality Fancy Pink diamonds from Rio Tinto's Argyle diamond mine in Western Australia are offered for sale.

I have been very lucky over the past 14 years to have been invited to the Tenders, not as a buyer, but as a trade journalist/gemmologist to report on each year's crop of pinks. It's a story that hasn't really changed much over the years in terms of the event and the quality of diamonds, and so after 12 or 13 annual reports on practically the same thing one has to question why we keep writing about it.

As the mine most likely enters its last decade of commercial value, we are constantly reminded of the finite quantity of such amazingly saturated pink and red diamonds. On the other hand, one also gets what I call 'the Tucson effect' — seeing so many Fancy Pink diamonds, all in the same place at the same time, makes one start to believe that there will always be plenty, that maybe next year they'll find even more so the price will go down and I can perhaps afford one or two. Fat chance.

The latter scenario is furthest from reality; in approximately ten years there will be no more of these beauties, and if you can afford one now you'd better get it soon — values will only continue to rise.

I think that my coloured diamond supplier friends cringe a little when they read these articles I write. Don't get me wrong, I know they enjoy the details, but I think they would prefer me not to speculate on how the values will increase or the supply will soon be gone. After all, they still want to buy a few of these beauties before they are gone. Every year the prices go up and they have to bid higher the next time. But hey, it's not my fault. I am

1: Here's a pair of Fancy Intense Purplish-Pinks: a round brilliant and a radiant cut. Both stones were graded 'imperfect', but this hardly matters as the matching colour is so beautiful and rare.
2: Fancy Vivid Purplish-Pink round brilliant — you can't get much better than this. Compare the saturation level of this to the round cut in (1). You'll see that while the Fancy Intense is quite nice, the Fancy Vivid is outstanding. Photos Gary Roskin.

3: Pair of noteworthy Fancy Vivid Purplish-Pinks. The visible inclusions in the radiant cut and the crossed, coloured graining features seen in the emerald cut are mostly overlooked since the rare colour is the main attraction.
4: Now here's a gem: a Fancy Deep Purplish-Pink. The colour in this particular diamond is not as evenly distributed as the others shown in this report.
5: An unmistakable natural unenhanced Kashmir sapphire, showing the classic milky velvet vivid medium-dark blue colour, courtesy of Edward Boehm of Rare Source, Chattanooga, Tennessee. Photos Gary Roskin.

certain that the bidders would still see the big picture, even if I didn't write about it.

I digress. As a gemmologist I will never get tired of looking at these magnificent gems, and I would be terribly remiss if I didn't once again thank everyone at Rio Tinto for giving me the opportunity to attend the evening, to take pictures, write my reports and share them with all of you, the gemmologists and gem enthusiasts who do not get that opportunity to see these amazing stones close up and personal.

It's funny, when in the Tender room you only have an hour and three-quarters or so to examine and photograph all of the pink diamonds. So you start passing up the stones of lesser saturation as if they were not worthy of your time and yet I couldn't afford even one of them. They're probably only (only!) $50,000 to $75,000/carat, in comparison to the more saturated diamonds at approximately $100,000 to $250,000/carat and the Fancy Red or the 'Hero' stones, valued at anywhere from between $300,000 to a cool $1 million/carat. I'm only guessing at the price — only Argyle and the buyers know for sure. The losers, those dealers who did not win a stone, know that the stones went for more than what they bid, and this is how I can come up with a somewhat reasonable guess, but it is only a guess.

Photos **1**–**4** are close-up images of stones from past Tenders. If you'd like to see this year's stones, you can see Argyle's images of the 2011 Tender in the Trade News section of the *Roskin Gem News Report.*

Gems and jewels from Las Vegas

There were some absolutely fabulous gems seen at this year's Las Vegas jewellery shows. Many were labelled natural/unenhanced — a trend (as mentioned in the last issue — *Gems & Jewellery*, Summer 2011) that we see growing.

Lastly, what's better than finding some outstanding examples of what Mother Nature can produce, such as an exquisite sapphire (**5**), award-winning beryls (**6**),

Gems and Minerals

Gem news from Gary Roskin (cont.)

6: Beryls from Jeffrey Bilgore, New York. On the left is whopping aquamarine weighing over 40 ct, whilst on the right is a 11.80 ct morganite.
7: Suite of heated Tanzanian zircons showing strong birefringence and strong doubling of back facets.
8: A natural colour 17.80 ct lavender jadeite double cabochon from Edward Boehm.
9: Faceted rainbow moonstone, showing the lamellar twinning growth commonly seen in transparent labradorites.
10: 'Red emerald' bracelet.

heated zircons (**7**), a natural lavender jadeite (**8**) or faceted moonstones (**9**).

Last but not least: a controversial topic. Shown is a fabulous bracelet set with 3.05 ct of diamond accents and red gems (**10**). The red gems are natural beryls. The owner, Ray Zajicek of Equatorian Imports, Dallas, Texas, labels the 36.74 ct of red gems as 'red emerald'. While I certainly understand the philosophy and marketing behind the moniker of the gorgeous piece, I personally wouldn't be one to label a gem in this fashion. Following this logic, I also have a problem with other labels I've seen, including 'pink emerald', 'green tanzanite' and 'green amethyst'. Did I miss any?

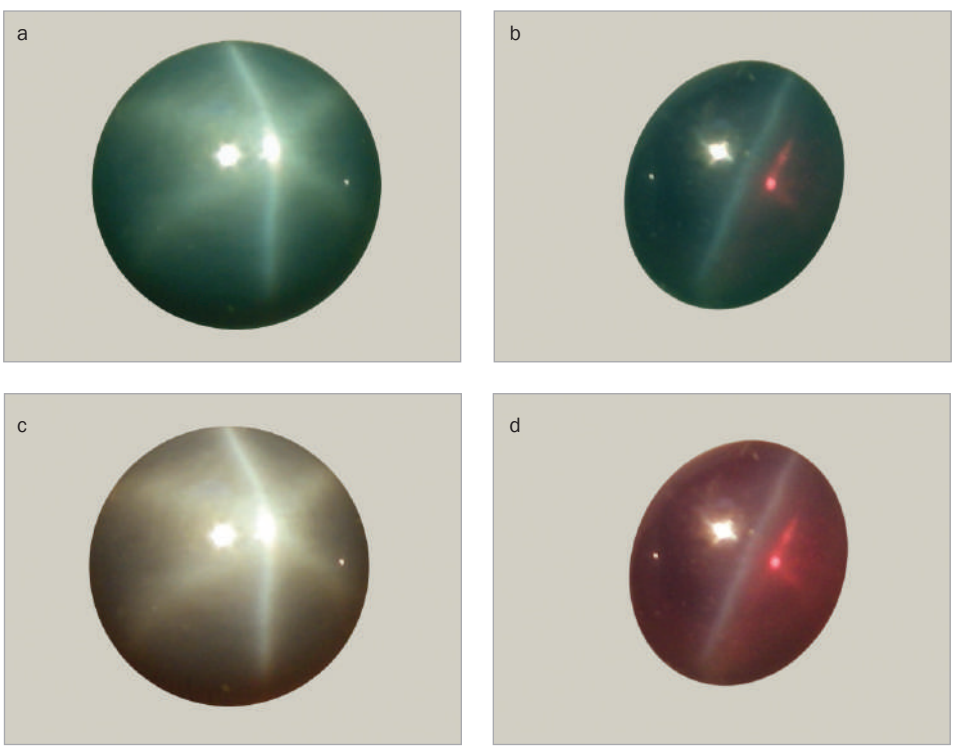
About the author

Gary Roskin GG FGA is the author of *Photo Masters for Diamond Grading* and hosts the online gem news magazine *The Roskin Gem News Report*. For more information visit www.roskingemnews.com.

Synthetic star alexandrite

Karl Schmetzer and Alan Hodgkinson investigate chatoyancy in synthetic star alexandrite.

Asteriated natural chrysoberyl is considered one of the rarest phenomenal stones by collectors, and asteriated four-rayed natural alexandrite has been reported only in one short description in the gemmological literature. Thus one of the authors (AH) was extremely surprised when he inspected the cabochon yield of one rough Czochralski-grown synthetic alexandrite produced by Kyocera in Japan. The two samples obtained (from the same piece of rough) showed an ordinary cat's-eye alexandrite (as expected) but also a six-rayed star alexandrite (**1**).



1: Synthetic asteriated alexandrite (a and c, 2.62 ct, diameter 8.0 mm) and synthetic alexandrite cat's-eye (b and d, 1.55 ct, 7.0 x 6.0 mm) produced by Kyocera in Japan. Shown in daylight (a and b) and incandescent light (c and d). Photo by K. Schmetzer.

Synthetic alexandrite produced by Kyocera showing chatoyancy appeared on the market in the late 1980s with the trade name 'Inamori synthetic alexandrite' or 'Inamori created alexandrite' (Kane, 1987; Koivula et al., 1988). When cut as cabochon in the proper direction the material normally showed a well-centred light band, but it is briefly mentioned that "when the cabochons were viewed under a strong, single incandescent light source down the long direction, asterism was observed" (Kane, 1987).

The production of synthetic chrysoberyl and alexandrite cat's-eyes is described in numerous patent applications, many of them published in the 1980s (for detailed references see Schmetzer, 2010). One major process is assigned to Sumitomo Cement Co. Ltd. and involves a two-step growth procedure. The first step includes the production of homogeneous single crystals containing titanium oxide as dopant. Such specifically-doped crystals can be grown by any known technique suitable for the crystal growth of chrysoberyl. In the second step annealing of the crystal at elevated temperatures in an oxidizing atmosphere is performed. During this process elongated particles, most probably rutile needles, are precipitated and these exsolved particles are responsible for the chatoyant effect of the material when it is cut as a cabochon.

A process assigned to Kyocera Corporation describes the production of chrysoberyl cat's-eyes with a similar first step growth process using a specific dopant. In contrast, a subsequent heat treatment step is not mentioned (Isogami and Nakata, 1986). The following substances are listed as possible dopants: titanium oxide (TiO_2),

Gems and Minerals

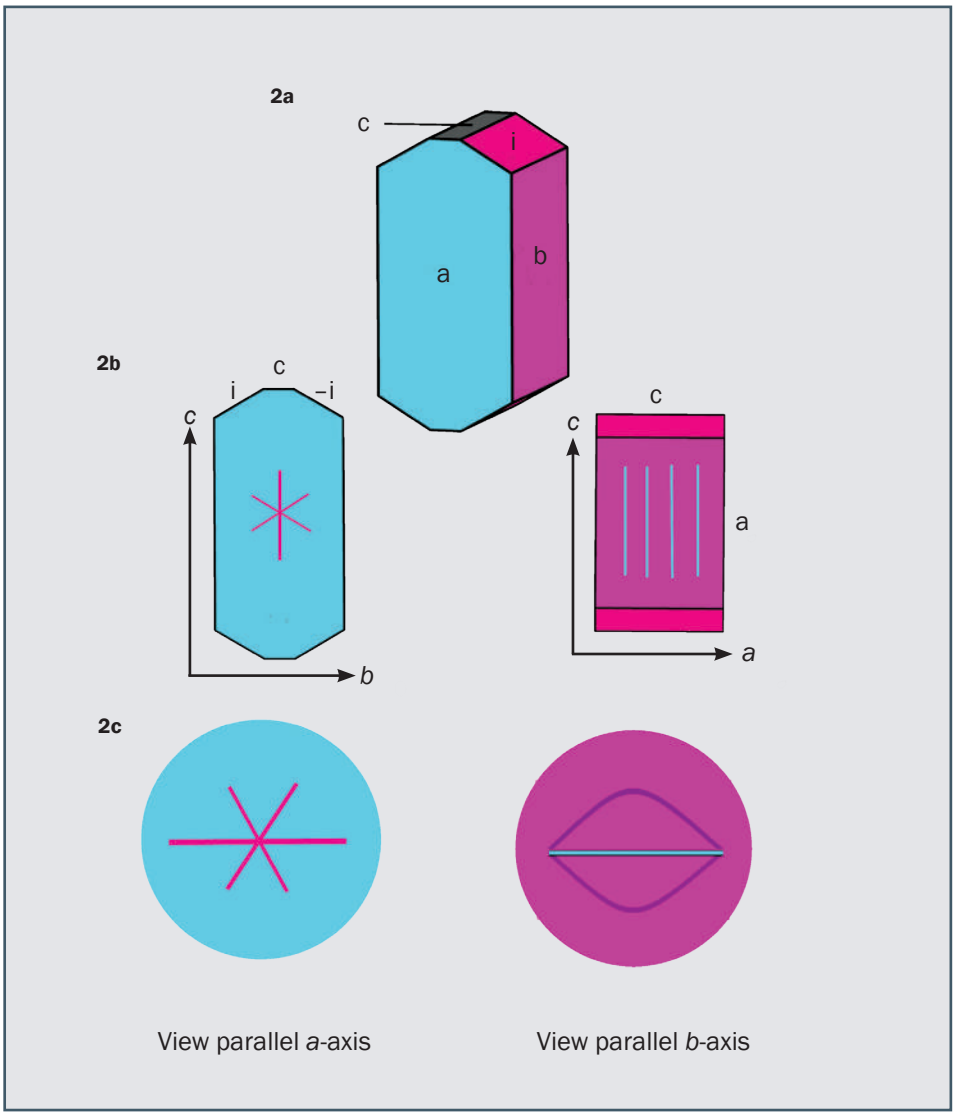
Synthetic star alexandrite (cont.)

germanium oxide (GeO_2), zirconium oxide (ZrO_2) and tin oxide (SnO_2). In addition, a second colour causing substance, e.g. vanadium and/or chromium and/or iron oxide, is added to the nutrient used for crystal growth. In the patent documents cited above describing both major processes for the production of chrysoberyl cat's-eyes, no information about the crystallographic orientation of the particles responsible for the light bands seen in the cabochon-cut gem materials is given.

The two cabochon-cut samples examined by the present authors both showed six-rayed asterism, but with a very different appearance according to the orientation of the curved surface and the base of the cabochons. Both specimens had been cut by one of the authors (AH) from a rod-shaped rough of 18.84 ct that was originally purchased in 1988. The first sample showed a well-centred six-rayed star consisting of a somewhat stronger and sharper light band intersected at about 60° by two more diffuse and slightly weaker appearing light bands (**1a** and **c**). The second sample revealed a strong cat's-eye, but in addition to this light band, two extremely diffuse and weak light bands were observed. These two light bands intersect the stronger light band at the girdle of the cabochon and were observed on its surface close to the girdle. They were almost invisible when observing the sample in an orientation with the light band of the cat's-eye running through the centre of the cabochon (**1b** and **d**).

Chemical analysis by LA-IMP-MS (performed by A.-K. Malsy at Gübelin Gem Lab, Lucerne, Switzerland) gave the following trace element contents (in wt%): TiO_2 0.58, V_2O_3 0.11, Cr_2O_3 0.23; Fe_2O_3 was below the detection limit. These analytical properties indicate that titanium oxide was applied as dopant to create chatoyancy and asterism in these synthetic alexandrites.

The crystallographic orientation of a faceted or cabochon-cut biaxial gemstone can be deduced when the position of both optic axes is determined or otherwise known (Schmetzer, 2010, 2011). This was performable for both of the synthetic alexandrite cabochons described in this note in the immersion microscope under crossed

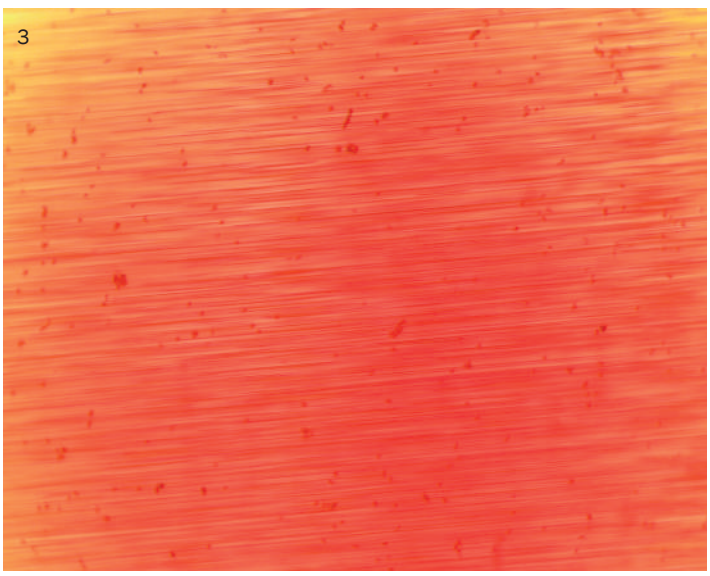


*2a,b,c: Schematic outline of the orientation of elongated particles and light bands in synthetic alexandrites produced by Kyocera in Japan. 2a: clinographic projection of a chysoberyl crystal showing the three pinacoids **a**, **b**, and **c** with the prism **i** as external crystal faces; 2b: view on the base of the cabochons, which are orientated parallel to the **a** (left) and parallel to the **b** pinacoid (right). Three series of needle-like particles or channels are present within numerous structural planes parallel to the **a** face, the needles are orientated parallel to the c-axis as well as parallel to the **i** and **–i** faces; 2c: a somewhat stronger light band is produced in each of the cabochons by the particles with an orientation parallel to the c-axis, and two somewhat weaker, more diffuse light bands are produced by two series of particles within the **a** plane and parallel to **i** and **–i**; the three light bands intersect in the centre of the cabochon (left) or at the girdle (right).*

polarizers by means of interference figures. It was understood that the base of the sample showing the well-centred six-rayed star was almost parallel to the **a** (100) pinacoid (i.e. perpendicular to the *a*-axis), and that the base of the sample with well-centred cat's-eye was almost parallel to the **b** (010) pinacoid (i.e. perpendicular to the *b*-axis). A schematic drawing might be helpful to understand this particular orientation of the two cabochons (**2**).

It is generally accepted that light bands of asteriated or chatoyant gemstones are produced by series of parallel orientated

Synthetic star alexandrite (cont.)



3 and 4: Views perpendicular to the a-axis of asteriated synthetic alexandrite showing structural details of the a plane; this plane contains three series of elongated particles which are responsible for the light bands seen in the alexandrite cabochons; the individual needles, however, are, in general, not resolved with the magnification of the gemmological microscope. Immersion, the a-axis runs almost north-south (3) or east-west (4), 60 ×.

tiny needle-like inclusions or channels, with the light bands always perpendicular to the needle-axes. The information about the orientation of the two alexandrite cabochons, in addition to this general condition, indicates that three series of tiny needles or channels (responsible for the three light bands) should be present, with all needle axes in the **a** plane of the chrysoberyl crystals.

A microscopic examination of both cabochons showed that only the **a** pinacoid reveals any structural features (**3** and **4**), but individual needles were only resolved (with the magnification of a gemmological microscope) in a direction with the needle axis parallel to the *c*-axis of the chrysoberyls. These needles, as well as smaller needles in this direction (below the resolution of the microscope) are responsible for the more intense and somewhat sharper light bands of the samples. According to theoretical considerations and due to the orientations of the two other, somewhat more diffuse light bands in our alexandrites, two additional series of tiny needles or channels must be present within the **a** plane with an orientation parallel or almost parallel to the **i** and **-i** {011} prism faces (again, see **2**).

In natural chatoyant chrysoberyl and alexandrite, the tiny needles or channels responsible for the light bands of these sometimes very attractive cat's-eyes, are — according to numerous samples from different occurrences examined by the present authors — always found in an orientation parallel to the *a*-axis. This information is useful to separate natural chatoyant alexandrites from synthetics with an orientation of the needles parallel to the *c*-axis of the chrysoberyl crystals. In a few asteriated natural chysoberyls examined by one author (see Schmetzer, 2010), in addition to a dominant series of needles or channels parallel to the *a*-axis, additional series of elongated particles are present with an orientation more or less parallel to the **i** and **-i** prism faces. With this particular orientation, a rectangular four-rayed star is visible in natural gemstones. However, because these three needle axes (parallel to the *a*-axis and within the **i** and **-i** planes) are not within one single crystallographic plane, six-rayed asterism cannot be obtained for such samples.

All photos and drawings by K. Schmetzer.

Further reading

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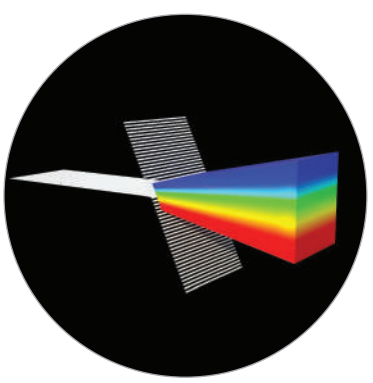
The finest gems: are they the best medicine?

Anita Shenoi investigates the use of gemstones in colour therapy.



Diffraction of light into its spectral colours.

No-one would deny the aesthetic enticement of a blood-red ruby, a gorgeous green emerald or a deep blue sapphire. The sky-high prices that some are prepared to pay for gems of the finest hue are true testament to this fact. But rather than being an excessively indulgent fancy, could our quest for perfect colour be driven by some deeper biological need?

The very fact that we see in colour at all provides us with a starting point for consideration. Sophisticated chromatic sensitivity is closely linked to our survival as a species. However, while we may understand how colour perception can protect us from danger, we may not understand its importance at a cellular level. This article explores how colour affects us and why, rather than merely being life-enhancing, it is life-essential. Moreover, it gives us clues as to what lies behind our passion for those perfect vehicles of light and colour.

Investigating the effects of coloured light

Most people are well aware of how daylight affects living organisms. The natural cycles of light and dark directly influence our circadian rhythms which govern hormones, cell regeneration and brain activity. Any disruptions to these can result in severe ill effects; at best fatigue and depression, at worst stunted growth and even premature death.

We may be less aware, however, of how coloured light affects biological processes. I reviewed research on the medically proven effects of coherent red, blue and green light and considered whether this may help to explain why the gemstones which correlate with these colours are said to have therapeutic value.

Red Light

In medieval times it was believed that the treatment of smallpox involved draping both the patient and the infirmary room in red to block out daylight. In 1893 Danish professor and 1903 Nobel Prize winner Niels Ryberg Finsen demonstrated that the healing effects of this ancient practice were very real[1], as deep red would block out the intense blue and ultraviolet radiation which exacerbated pox symptoms.

Since the invention of the laser in 1960, the potential of using red and infrared to heal has been more widely researched and exploited. In the late 1960s, Low Level Laser Therapy was shown by Endre Mester at Semmelweiss University, Budapest, to successfully treat non-healing ulcers, and the role of red light in dermal regeneration went on to be investigated.

Estonian biologist Professor Tiina Karu has suggested that colour purity is central to the healing effect of laser light, its monochromatic quality being retained and transmitted in biological tissue. Human cells are not normally capable of photosynthesis but stimulated with monochromatic light; mitochondria (our cellular power houses) will harvest this precise optical energy and use it according to local need[2].

The obvious choice: ruby

Ruby has traditionally been used in gemstone therapy to alleviate problems associated with the muscular system, among other uses[3]. But why choose ruby rather than another other red stone? It is believed that that the specific crystal structure of red corundum offers the most concentrated vibrational energy of red light and is therefore the best stone to convey its healing properties. The gem rays pass through the body and influence cellular behaviour in a similar way to infrared rays. Knowing that the first lasers were made with ruby and that human cells respond to monochromatic light, we can see how modern science has made discoveries that may substantiate this belief.

Blue Light

Neonatal jaundice was once a common and lethal affliction of the prematurely born. During the evacuations of the London Blitz, however, nurses made an accidental discovery that would end up saving generations to come. It was found that babies who had been left to sleep in churches under deep blue stained glass windows did not succumb to the disease. Later research[4] demonstrated that short wave blue light penetrated the capillaries and broke down the substance bilirubin — the substance responsible for the blood poisoning associated with jaundice. As a result, all maternity intensive care units are now equipped with deep blue lamps. Since the early twenty-first century, more efficient, fibre-optic blankets have been developed that emit light at a wavelength of 425 – 475 nm — the optimum wavelength range for rendering bilirubin harmless[5].

The therapeutic value of blue light is not limited to the above. Blue light at a wavelength of 415 nm has an antibacterial effect, useful in the treatment of acne and other skin disorders. Recent research by George Brainard at Jefferson Medical College has also revealed that the ganglia in our eyes[6] show maximum sensitivity to clear blue at 468 nm — the typical colour of a bright blue sky. Further research linking the effect of blue light and our circadian rhythms has sparked the use of bluish light in factories and offices to increase wakefulness and productivity, while treatment with blue light from LEDs has been successfully shown to stabilize Alzheimer patients[7].

The obvious choice: blue sapphire

In gemstone therapy, blue sapphire has traditionally been used to treat disorders of the vascular and nervous system, the sense organs and the brain. Like ruby, it is believed that the structure of corundum gives the most concentrated vibrational energy of the blue ray and is therefore the best stone to convey its healing properties. Similarly, it seems that what we now know about the action of blue light on the capillaries gives credence to the idea that sapphire, as a transporter of such light, has a therapeutic effect on the vascular system. Likewise, we see a correlation between the documented brain-stimulating effects of blue light and the idea that sapphire is beneficial to the nervous system and brain.

Green Light

The efficacy of green light is beginning to be realized with the emerging use of green light lasers in the treatment of prostate cancer. Green laser has proved to be much more effective for soft tissue vaporization and coagulation because green light is highly absorbed by oxyhaemoglobin, but not by water[8]. This means patients treated with green laser experience fewer post-op effects and complications than with other surgical methods. In the treatment of Barret's oesophagus (an abnormality of the gullet) specific illumination with wavelength 514 nm has been clinically demonstrated to eradicate early-stage neoplastic lesions[9].

Colour therapists have long noted the stress-relieving and anti-depressant effects of green light, acknowledging it as the 'master colour'. According to a study published in the *American Journal of Psychiatry* in 1991, just two hours of daily exposure to green light was as effective at treating symptoms of depression caused by seasonal affective disorder as daily exposure to white light, and was more effective than red light[10]. Interestingly, Karl Ryberg states that the human eye has pronounced sensitivity for the mid-range wavelengths of the 'optical window' (the visible spectrum), peaking at 550 nm — lime coloured light[11].

The obvious choice: emerald

In gemstone therapy, emerald has traditionally been used to treat disorders of organs in the torso. Of the green stones, emerald is believed to give the most concentrated vibrational energy of the green ray, and optimal colour and clarity are deemed most important for its healing effects. As research into the medical benefits of green light continues, perhaps there will be more interest in the therapeutic use of emerald as a vehicle of such light. Indeed, while emerald is not employed in green light laser (for which neodymium-doped yttrium aluminium garnet or Nd:YAG is used), it is used in the exciting new field of quantum medicine. This is a branch of complementary medicine that uses low-dosage electromagnetic radiation in the diagnosis, treatment and prevention of disease, and where researchers are working on ways of delivering light-energy radiation directly to affected tissues via machines using 'excited' gem substances. English electronics engineer Jon Whale has designed a machine called the Lux IV, which uses electronic transducers incorporating gem crystals, including emerald[12]. Gems deep inside a chamber in each lamp are electronically excited by a precision electronic instrument. The frequencies used promote rapid healing and have proved successful in the treatment of disease and injury.

Gems and Minerals

The finest gems: are they the best medicine? (cont.)

Conclusions

The above overview does not attempt to judge the efficacy of gemstone treatment, nor does it try to equate its proposed healing effects with those documented for specific wavelengths of coloured light. However, it does present findings which cause us to draw parallels and consider the therapeutic value of gemstones in the light of new science. It perhaps also stimulates us to consider why we find gemstones so desirable. Could our fascination with them actually be linked to an inherent need for light and colour, in much the same way as we have an inherent need for vitamins and minerals? And can we explain our passion for a certain gemstone the way we might explain a food craving?

Naturally, an attempt to scientifically establish these correlations requires extensive, high level research. Moreover, if the therapeutic effects of gemstones can be conclusively pinpointed, a whole host of new research questions emerge. How can we determine the specific medicinal effect of red corundum as opposed to red spinel, for example? Are the medicinal properties due to the colour wavelength in isolation, or are they the result of this combined with the specific crystal structure? As previously mentioned, an era of quantum medicine is dawning and we are only just starting to find out how to explain certain effects, many of which have been known through ancient intuitive practices (the use of high quality coloured gemstones in a form of colour acupuncture was practised in the Indian Vedic tradition some 4000 years ago), but generally dismissed as myths in modern time. As this era unfolds, gemmologists may increasingly find themselves working not with jewellery but with cutting-edge medicine. Sounds incredible? Only the future can tell.

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About the author

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The Hong Kong Show

The September Hong Kong jewellery show is one of the major events on the international gem and jewellery scene — the largest international gem and jewellery show. This year there were some 3500 exhibitors from 46 countries showing off their goods to over 50,000 visitors from more than 150 countries. To get that in perspective, that is around 1000 more exhibitors than at the JCK Show in Las Vegas in June, and getting on for 3000 more exhibitors than at the IJL Show in September.

The rise of Hong Kong and China as major markets is hardly news anymore and an increasing number of people from the UK — from newly graduated Gem-A students to major international names — are looking eastwards to seek business away from the somewhat stagnant waters of the current UK trade.

Markets

The statistics for the gem trade in China and Hong Kong are not easy to determine, but the trend can be seen in the figures that are available. The gold imported into China in September (the month of the jewellery show), was a record 56.9 tonnes: a six-fold increase over 2010. Hong Kong retail sales of jewellery, clocks, watches and similar valuables that same month were 50% up in value compared to 2010.

That said, September's 2011 Hong Kong Show seemed to be a weird blend of increased optimism but more sluggish business. Chinese buyers were being very cautious at the show, despite there being plenty on offer, competitive prices between sellers and no great hurry to place orders: a buyer's market. Gem dealers from around the world headed to Hong Kong dreaming of making big bucks by catering to the insatiable Chinese demand, but the Chinese buyers were more canny and more proactive. There is evidence for this, from the presence of an official Chinese delegation at the Facets Gem Show in Sri Lanka just prior to the Hong Kong Show to Chinese buyers visiting mines in Africa and elsewhere.

Diamonds

The huge range of diamonds on show in Hong Kong, from 1 point dust to multi-carat whoppers, certainly doesn't demonstrate the rarity of this crystalline carbon, but the market is there and booming. Coloured diamonds seem to be in increasing demand generally, and China seems to be helping to drive this market. Coloured diamond prices are rising and several major companies (including Tiffany's) are launching coloured diamond collections. At the end of the diamond colour spectrum, if we can call it that, is black diamond which still seems to be popular. Most is treated of course, and there are numerous substitutes including opaque black CZ.

Coloured gems

As far as the Chinese market is concerned, coloured gems are increasingly popular in all varieties, from mass market to unique collectors' gems. Red tourmalines are still the most popular of the coloured gemstones on the Chinese market, although the 'big three', sapphire, ruby and emerald, are in high demand. The British Royal Wedding actually created a noticeable increase in demand for Ceylon sapphires in China, where fine quality large blue sapphires are now much sought after. Tanzanite is also becoming popular, as is the Brazilian green opal. First discovered a couple of years ago, the opal is a translucent green gem somewhat similar to jade in appearance and was exhibited by its producer, Lorenzo Jewelry Ltd, in Hong Kong this year. It is expected to do well in China. Incidentally Taiwan has seen a surge of interest in coloured gemstones recently, with female self-purchasers being a significant part of the market.

The trend for using the origin of coloured gemstones as part of their marketing package continues to grow and was evident at the show. I wrote about this trend in an article in the UK trade press recently and linked the phenomenon with that found in restaurants: "You can't see bangers and mash on a menu these days without knowing the name of the pig and the town where it lived, or the breed of potato that

Shows

The Hong Kong Show (cont.)

Left: Hong Kong Jewellery Show 2011. Copyright UMB.
Right: A visit to the jade market is a must for all those visiting Hong Kong. Photo Ian Mercer.

accompanies it. Jewellery is no different; customers yearn for a story, and gems are fertile ground for this — particularly now that coloured gems sales are growing." This creates all sorts of fun for gem dealers and gemmologists as pecking orders develop in pricing — in some cases based on actual variations in quality — but mostly decided with little justification other than some mineralogical version of racism. This is not new — some 90 years ago the French were arguing that only red corundum from Burma should be allowed to be called 'ruby'. The problem is that it is all self-sustaining; 'Paraíba' tourmaline from Brazil is more celebrated than its Mozambique cousin, 'Paraíba' is therefore more expensive and so buyers want to know the country of origin when buying to ensure they are paying the right price. Similarly Namibian mandarin garnets are more sought after than those from Nigeria.

Cultured pearls

Hong Kong is, of course, pearl world. This is a rapidly developing market that jewellers, gemmologists and valuers/appraisers need to keep up with. The main development recently has been the increasing production of beaded freshwater cultured pearls in China; research has allowed the large production of beaded freshwater cultured pearls up to 16 mm in diameter and with regular shape and good lustre. These can also be produced in a variety of what are described as 'natural' colours, including purple, a pinkish purple and a golden colour, in addition to standard white. Expect such pearls to enter the market in large numbers over the coming few of years.

Ordinary freshwater cultured pearl prices have risen by almost a third over the last year, while output will drop significantly over the next couple of years. The reasons are several fold: the Chinese Government is limiting the areas allowed for pearl cultivation and production costs (mainly labour costs) have risen. The prices for the smallest freshwater cultured pearls have doubled since mid-2009.

Must visit

The Hong Kong show is a must for those who wish to buy coloured gems or simply want to see the extent of the market and better understand values and qualities — it is all there. If there is a limited budget and you have to make the choice, should you visit Hong Kong or Tucson? Tricky question. The numerous seminars and after-show events in Tucson make it a tremendous place to network, but Hong Kong is a city you should visit at least once and, if you are looking for jewellery as well as loose gems, then Hong Kong wins. In any case I'd advise any gem dealer or jeweller to try to visit one international gem or jewellery show each year, perhaps rotating through Basel, Hong Kong, Las Vegas and, if coloured gems are a significant part of your business, Tucson. As one young and aspiring UK-based gem dealer said to me, if you can't visit the Hong Kong Show with a modest budget and make enough money to cover at least your flight and costs, you are in the wrong business.

J.O.

The Hong Kong Show (cont.)

Painting on pearls

The September Jewellery Show in Hong Kong was again a huge showcase for pretty well everything in the gem and jewellery world, from the finest of the fine gems to the cheapest of synthetic stones, from loupes to refining equipment (see previous two pages). It is hard to highlight any one product or designer, but one novelty did catch our eyes. Toshiyuki Sugihara FGA of the Renaissance Gem Co. of Osaka, Japan, has produced a small range of individual cultured pearls painted in a traditional manner with coloured Japanese lacquer — his Maxine range. These look spectacular when mounted in jewellery. Shown here is an unmounted example called 'Feast of Wisteria'. Wisteria, a beautiful flowering plant, is much admired in Japan where it is believed to bring long life and good luck. The lacquer is traditional maki-e Japanese lacquer combined with some gold leaf. The lacquer is hard and the painted design is said to be resistant to wear.

J.O.

Wisteria Feast, lacquer painted cultured pearl from Renaissance Gem Company, Osaka, Japan. Copyright Renaissance Gem Company.

Shows

The Munich Show

Claire Mitchell reports on The Munich Show — one of Europe's oldest national and international mineral and fossil shows which has just celebrated its 48th successful year, with 1250 exhibitors from 56 nations.

As large as it is diverse, the Munich Show is divided into four separate sections: Mineralworld, Gemworld, Fossilworld and Stoneworld. The Gem-A stand was ideally located in the Gemworld hall, with many quality gem and jewellery dealers from around the world. As well as dealers selling their wares, the show also featured several hands-on activities, including gold panning, soapstone carving, gemstone hunting, jewellery making and rock splitting for fossil preparation — we were disappointed that we did not have time to experience all of these!

The theme for this year's show was Europe minerals, with a dedicated pavilion area displaying some of the finest and rarest mineral specimens from Europe. Contributions included samples from museums and private collections, including the Natural History Museums of London and Vienna and the Museum of Mining in Freiberg, Germany. Notable samples on display included some spectacular silvers, tasty fluorites and two very fine sapphire crystals from Scotland. The display dedicated to the famous Wittelsbach diamond (now re-cut and called the Wittelsbach-Graff) brought a touch of drama and gem flair to the show.

The Gem-A stand, Piero Manuelli (left) and staff from Istituto Gemmologico Ligure with Lorne Stather and Claire Mitchell (second and third left) from Gem-A.

Another outstanding display (although not to everyone's taste) was the flying jewels exhibit, designed by Robert Jakob and Markus Klein to compare the beauty of both geological and biological objects. They have brought together mineral specimens and visually complementary exotic butterflies, moths and other insects to create an astounding vision of how the patterns and colours in both these areas can be as one (pictured left). This exhibit was truly breathtaking in its beauty and the concept thought-provoking.

On the face of it the Munich show may not seem like the most logical venue for Gem-A to exhibit, but with the growing popularity of the Gemworld area at the show and the combination of gem dealers, museums, collectors and public interest from all over Europe and the rest of the world, this is the ideal place to be.

We would like to thank all those who extended a warm welcome to us at the show. It was a real pleasure to meet with both old friends and colleagues new, and we would also like to extend our very special thanks to all those who generously gave donations to Gem-A's teaching collections. We look forward to seeing you all again next year.


Butterflies arranged on labradorite, showing a complementary display of iridescence. Photo Claire Mitchell.

Graduation Ceremony

Gem-A graduates from around the world gathered at Goldsmiths' Hall on Monday 7 November to receive their diplomas and awards.

Attending a graduation ceremony — whether you are graduating or not — is always an unforgettable and moving experience. For students it marks the culmination of their years of study, where their eagerness to succeed pays off and they can be proud of their achievement.

This year's ceremony was presided over by Gem-A President Professor Andy Rankin, accompanied by Gem-A Chief Executive Jack Ogden, James Riley, Chairman of the Gem-A Board of Trustees and Jeffrey Monnickendam, of Monnickendam Diamonds, who presented the graduates with their diplomas and awards and addressed the graduates after the presentation.

Following the presentation of diplomas, Alan Hodgkinson, President of the Scottish Gemmological Association, was awarded an Honorary Lifetime Membership of Gem-A, in recognition of his outstanding services to gemmology. Our congratulations go to Alan, and to all the graduates of 2011. The ceremony was followed by a reception for graduates and their guests.

A full report of the Graduation Ceremony will be published in *The Journal of Gemmology*, 2011, **32**(5-8).

Jeffrey Monnickendam addressing the graduates and their guests.

Alan Hodgkinson (left) and Jeffrey Monnickendam.

Alan Hodgkinson awarded Honorary Lifetime Membership

During the Graduation Ceremony Alan Hodgkinson was awarded an Honorary Lifetime Membership of Gem-A in recognition of his tremendous contribution to gemmology for over fifty years.

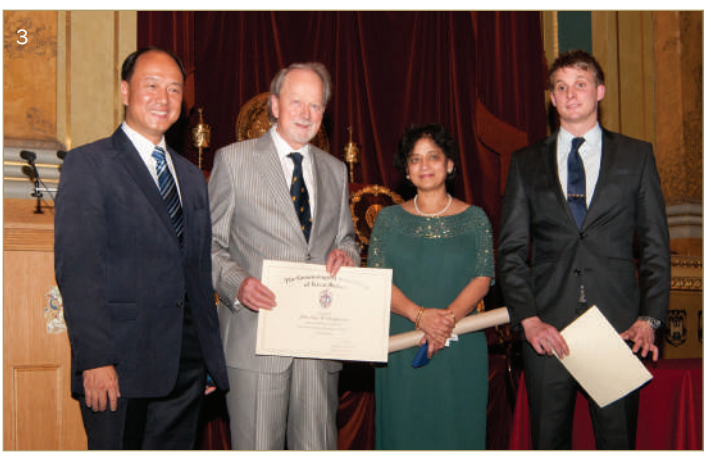
Alan entered the jewellery trade in 1957, working for David Henderson of Aberdeen. He gained his Diploma in Gemmology with Distinction in 1961 and in 1979 qualified for the Gem Diamond Diploma. Alan is a Freeman of the Worshipful Company of Goldsmiths and an Honorary Member of the Canadian Gemmological Association.

Alan is best known internationally for his innovative practical gem identification techniques using traditional gem testing equipment and for his book *Visual Optics*. For many years Alan was President of the Scottish Branch of Gem-A, and is now Honorary President of the Scottish Gemmological Association which was formed in 2008.

In 2000 Alan Hodgkinson was honoured to be presented with the Antonio C. Bonanno Award for Excellence in Gemology — the first recipient of the prestigious award. Alan was presented with the award at the Accredited Gemologists Association Gala Dinner held during the Tucson Gem Fair in that year.

Recent Events

Graduation Ceremony (cont.)



Above left: Graduates assembled on the stairs at Goldsmiths' Hall.
Above right, top: (From left to right): Dominic Mok of the Asian Gemmological Institute and Laboratory (AGIL) and Alan Hodgkinson with prize and award winners Dr Gowry Simon (Hirsh Foundation Award and Anderson Medal) and David Lawrie (The Mok Diamond Practical Prize).
Above right, bottom: Prize and award winners (from left to right): Robin Hansen (Christie's Prize for Gemmology, Tully Medal and Anderson Bank Prize), David Lawrie (The Mok Diamond Practical Prize), Julie Gowans-Poli (Deeks Diamond Prize), Alan Hodgkinson and Julia Griffith (Bruton Medal).

See next issue for a full report on the 2011 Gem-A Conference

Highland Fling

Brian Jackson and Dr Maria Alferova report on an eight-day gem excursion in Russia, undertaken by a group of Scottish Gemmological Association members. Described as 'awesome' by all who took part, the programme covered 4000 km between the two centres of Moscow and Ekaterinburg.

Fersman Mineralogical Museum

The adventure began with a visit to the world famous Fersman Mineralogical Museum, founded in 1716, where outstanding Russian gem minerals are displayed (**1**). Of particular interest are the exquisite specimens of pink and blue topaz, beryl (including emerald), tourmaline and the biggest alexandrite crystal group ever found. The displays are organized by crystal chemistry and it was a delight to unexpectedly encounter gem crystals as one wandered around the exhibits. There are separate displays of lapidary objects including some amazing Fabergé masterpieces, such as stone figurines and carvings. The stunning centrepiece of the mineral gallery is an enormous Russian malachite vase whilst elsewhere there are many objects carved from Russian gem materials, including rhodonite, lapis lazuli, charoite, jaspers and malachite. There is a section devoted to cut gems including the synthetic materials for which Russia is well known.

All too soon we had to leave for a boat tour along the Moscow River. Later we found some free time to explore the attractions around Red Square including the fairytale-esque St. Basil's cathedral, Lenin's tomb and the changing of the guards — all against the background of the chiming of the clock contained within Spasskaya Tower.

Also visited was the Izmaylovskiy Kremlin near the hotel, where there is a live market (Vernisage) selling an assortment of goods, including antiques, clothes, traditional handicrafts, militaria, as well as museums

1: Fersman Mineralogical Museum, Moscow.
2: Alistir Tait holding a superb emerald crystal in matrix sourced from the Malysheva mine at the Urals State Geological-Mining University museum. Photos Brian Jackson.

of vodka and bread. Many stalls were selling amber, including natural, treated and fake, some of which contained giant scorpions. There were a few stalls selling gems and minerals.

State Treasury

The second day began with a must-see visit to the high security State Treasury in the Kremlin. The half-hour queue was worth the wait as the specimens in the Diamond Fund made one's mouth water. Nowhere in the world are there permanently displayed so many enormous, famous and historical diamonds (such as the Orlov), as well as coloured gems, royal and modern jewellery, and huge platinum and gold nuggets.

In the Field

Highland Fling (cont.)

3: Figure of an emerald miner made from gem materials at the Pelepenko Museum, Ekaterinburg.
4: Abandoned and flooded opencast Lipovka nickel mine where gem-quality tourmaline can be found in pegmatite veins. Photos Brian Jackson.

Lomonosov Moscow State University (MSU)

Also visited was the impressive 'palace of science' — Lomonosov Moscow State University (MSU). Located in one of Stalin's seven skyscrapers on the Moscow river bank, MSU is one of the oldest and largest educational establishments in Russia. Within the MSU there is a Geological faculty-based Gemmological Centre with education, laboratory and gem certification facilities. The director, Yury Shelementyev, gave an illustrated talk on developments in diamond cutting, showing how light-return can be maximized. We were then treated to a workshop on the Russian rough diamond grading system by Maxim Viktorov. Samples of the different grading categories were handed out for us to examine.

ALROSA diamond cutting plant

At the ALROSA diamond cutting plant we saw computerized laser scanning tomography of rough diamonds and how yield could be maximized; various types of cutting, bruting and polishing. We were then lucky enough to see a selection of recently finished products which included some very fine natural fancy coloured yellow diamonds at around 10 ct.

This cutting plant was the last of our Moscow-based activities and so we caught the train from Kazanskiy railway station to Ekaterinburg. It is worth noting that Moscow metro stations are architecturally stunning pieces of art in their own right; decorative stone such as rhodonite is lavishly used at the Mayakovskaya station.

Urals State Geological-Mining University Museum

After arriving in Ekaterinburg we stopped at the Urals State Geological-Mining University Museum, where we were given a guided tour of the displays. The highlight was the 'Golden Room', a veritable treasure house of outstanding specimens from the emerald mines, which had been previously housed at the Malysheva emerald mine office museum. The collection contains huge emerald and alexandrite crystals (**2** and **3**).

Malysheva mine

A two-hour drive took us to the so-called 'field of miracles' (or 'field of fools' as it is also known; historically the specimens were so abundant that even a fool could find them). The field is now covered in waste but dumps of the Malysheva mine and processing plant that worked until 2007–2008 are still productive. During the last period of working an alexandrite rough crystal of over 90 grams was recovered from these same dumps. All members of the group found fragments of beryl, chrysoberyl, phenakite and molybdenite crystals. Subsequently we were taken to one of the faceting workshops in Malysheva town that ceased working after the mine closed. Here we were able to buy crystal specimens of chrysoberyl and green beryl. Cut stones were available for purchase at our next stop: the Zarechniy certification centre and mineral museum. However, it is worth noting that in accordance with Russian law, natural rough emeralds and alexandrites of a certain colour and quality belong to the so-called 'first group gemstones', which also contains natural rough diamonds, rubies and sapphires. It is forbidden to own or trade these stones unless they are certified in an approved certification centre. Certified gemstones of the 'first group' should be faceted and sealed in an individual pack along with its certificate. This procedure allows them to be legally bought, sold and exported.

Highland Fling (cont.)

Zarechniy certification centre and mineral museum

The museum houses a regional collection of stones, containing some fine emerald specimens from the emerald mines, green gemmy vesuvianite and spessartine from the Asbest mine, and an exceptional single crystal of crocoite from the type locality at the Berezovskoye gold mine.

We also visited the Lipovka lithium-bearing pegmatites, the source of pink and polychromatic tourmaline (**4**). These pegmatites are hosted in altered ultrabasic rocks that, in Soviet times, were mined for nickel. Nowadays Lipovka comprises a chain of worked-out and flooded quarries. Pegmatite veins can be seen in the exposed quarry benches, and there are dumps that still produce pink tourmaline and beryl (only after a week-long bout of hard work). We found schorl, beryl and garnets but no pink tourmaline. Two Russian collectors, who were camping at the site, showed us pink and polychromatic tourmaline that they had collected.

On the way back we made an unscheduled detour to a newly-created tourist mine near the site of the original discovery of crocoite at Beresovsk (**5**). A mine shaft had been sunk three years ago and over the subsequent two years tunnels were driven into ore-bearing ground to expose crocoite. We were the first visitors to this tourist mine which is essentially an underground museum. It is not yet completed but it is hoped that it will open formally within a year. Descending 20 metres via a series of ladders, we were escorted through the passages where we were treated to an Aladdin's cave of shining bright red veins and pockets of crocoite crystals (**6**).

Also visited was the demantoid mine at the Chusovaya river. Here we were shown the mine working, how the rock is processed to remove the demantoid and also given freedom to collect from the dumps. The mine is worked opencast and although an exploration licence has been granted the owners still await an extraction licence. The demantoid occurs in veins that run subvertically and longitudinally in a serpentinised ultrabasic rock. The veins consist of tremolite, chrysotile, brucite and chromite, along with the bright green demantoid. There is also brown andradite that can be treated to produce green demantoid. The garnet is separated from the serpentinite by shockwaves, which are produced by repeatedly discharging large capacitors. The shockwaves loosen the garnet at the grain boundary with the rock and the resulting fraction is separated using three sizes of sieves — the finest gems are recovered from the smallest sieve fraction (**7**). Rounded grains of demantoid were common within the dumps but tended to have a radial structure along which it separated into thin slivers. Grains without this structure were the best cutting material. All members of the group collected good bright green specimens.

5: Kitted out for going underground at the Beresovsk crocoite mine. Photo Louise Johnson.
6: Crocoite seam at the Malysheva mine. Photo Louise Johnson.
7: Maria Alferova sifting through separated sieved fractions for demantoid. Photo Brian Jackson.

All in all the trip was a monumental success — so much so that we are considering doing it again soon. Meanwhile, look out for an SGA trip to Sri Lanka in 2013.

Gem-A Calendar

January

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COOL THINGS FROM DEAD STUFF: KERATINS AS ORNAMENTS
By Maggie Campbell Pedersen
Gem Discovery Evening
Gem-A's London Headquarters
6:00 to 8:00 pm
Maggie Campbell Pedersen is a Fellow of the Gemmological Association of Great Britain and an Associate of the British Institute of Professional Photography. An internationally respected expert on organic gem materials, Maggie will look at the use of keratins such as horn, hair and claws in jewellery.

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GEM DISCOVERY EVENING (TBA)
Gem-A's London Headquarters
6:00 to 8:00 pm
Please visit www.gem-a.com/news--events/gem-discovery-evenings.aspx

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SGA BURNS SUPPER
Scottish Gemmological Association
Back by popular demand, the annual Burns Supper will be held at the Tusitala Restaurant, Edinburgh. For more details and to book, please visit www.scotgem.com/Burns%20Supper%202012.htm

27

AGM, BRING AND BUY SALE AND QUIZ NIGHT
Gem-A Midlands Branch
To be held in the Earth Sciences Dept, Birmingham University, Edgbaston.
7:00 pm
Come along and bring anything you wish to sell — 10% of sales go to Branch funds. Great fun to be had by all. For further information contact Paul Phillips at gem-a-midlands-branch@hotmail.co.uk.

31 January to 4 February

AGTA TUCSON GEM SHOW
Tucson Convention Center
260 South Church, Tucson, Arizona

Gem-A will be exhibiting at Booth #29 (upper gallery) at the AGTA show, so if you will be visiting Tucson do come along and say hello. Gem-A CEO Dr Jack Ogden and Diamond Tutors Doug Garrod and Claire Mitchell will be at the booth and look forward to meeting you.

February

7

GEM DISCOVERY EVENING (TBA)
Gem-A's London Headquarters
6:00 to 8:00 pm
Please visit www.gem-a.com/news--events/gem-discovery-evenings.aspx

24

FELDSPARS
By Brian Jackson
Gem-A Midlands Branch
To be held in the Earth Sciences Dept, Birmingham University, Edgbaston.
Brian Jackson, Curator at National Museums Scotland, Edinburgh, will talk on his fascination for feldspars, with a bias on Scottish minerals. Pre-talk topic on Metamorphic Rocks by Paul Phillips begins at 6:15 pm. For further information contact Paul Phillips at gem-a-midlands-branch@hotmail.co.uk.

28

OPTICAL PHENOMENA
By Brian Jackson
Scottish Gemmological Association
To be held at The British Geological Survey, Edinburgh, 7:00 pm.
Brian will repeat his highly successful workshop previously held at the Perth SGA Conference and the 2011 Gem-A Conference for the benefit of those members who did not manage to attend the earlier events. Free for SGA members, guests £5.

For the latest information on Gem-A

Gem-A Calendar

March

3
NATURE'S TREASURES 4
Oxford University Museum of Natural History, Parks Road, Oxford
10:00 am – 4:30 pm
An event for anyone with an interest in minerals and gemstones. Students from schools and universities are particularly encouraged to attend. The day will include a programme of short talks as well as a number of displays and demonstrations. See page 37 for more information.

5
ALLURE OF GEMS*
Gem-A one-day workshop
Gem-A's London headquarters
The perfect introduction to the world of gemstones, ideal for those new to gemmology.

11
PRACTICAL TRAINING DAY
Gem-A Midlands Branch
10:00 am – 4:00 pm
To be held at Barnt Green, Worcestershire. Cost £25.00. For details contact Gwyn Green at gwyn.green@talktalk.net.

12–16
DIAMOND GRADING AND IDENTIFICATION COURSE*
Gem-A Headquarters London
See page 36 for details.

19
INTRODUCTION TO PRACTICAL GEMMOLOGY*
Gem-A one-day workshop
Gem-A's London headquarters
Learn the basic principles required for effective gem testing under the guidance of an experienced Gem-A tutor. This is an ideal workshop for those desiring a 'taster' class of longer-term gemmological study or a perfect refresher course for those with some existing knowledge.

19
RUBY, SAPPHIRE AND EMERALD*
Gem-A one-day workshop
An informative day looking at natural, treated (including glass-filled ruby), simulated and synthetic gems.

28
SMASHING DIAMONDS
By Jeff Harris
Scottish Gemmological Association
To be held at The British Geological Survey, Edinburgh, 7:00 pm.
Diamond geologist Jeff will discuss the mineral inclusions found inside diamonds, and will show how inclusions can indicate the chemical environments, pressures and temperatures present during the stone's formation. Using this information, Jeff shows how we can start to piece together information about the conditions of diamond formation within the Earth. Free for SGA members, guests £5.

30
GEOLOGY AND ITS RELATION TO GEM FORMATION
By John McInnes
Gem-A Midlands Branch
To be held in the Earth Sciences Dept, Birmingham University, Edgbaston.
John McInnes will talk about geology, with an emphasis on the minerals of Scotland. Pre-talk topic on Diamond Formation by Paul Phillips begins at 6:15 pm. For further information contact Paul Phillips at gem-a-midlands-branch@hotmail.co.uk.

*For the latest information on Gem-A workshops go to **www.gem-a.com** or email **events@gem-a.com**

events go to www.gem-a.com

Hands-on Gemmology

The polariscope

Kerry Gregory champions the usefulness of the polariscope in hands-on gemmology.

At the recent NAG Institute of Registered Valuers' Conference I delivered a workshop entitled 'Crossed Polars – The practical use of the polariscope for jewellers, valuers and anyone else working with gemstones who currently uses theirs as a bookend'. Rather a long title I am sure you'll agree, but perfectly suited.

I am often surprised by the number of gemmologists who do not, or very rarely, continue to use their polariscope after completing their Diploma in Gemmology. In fact, I wonder how many gemmologists actually own a polariscope, let alone use it. With this in mind I designed a hands-on workshop, using examples of real life situations to show how working jewellers, valuers and gemmologists can use the polariscope to identify stones quickly and more accurately. After the workshop I was pleased to note how many of the delegates said they would dust off their polariscopes and actually use them. Even more encouraging was the delegate who went straight from my class to the Gem-A equipment stand and purchased one.

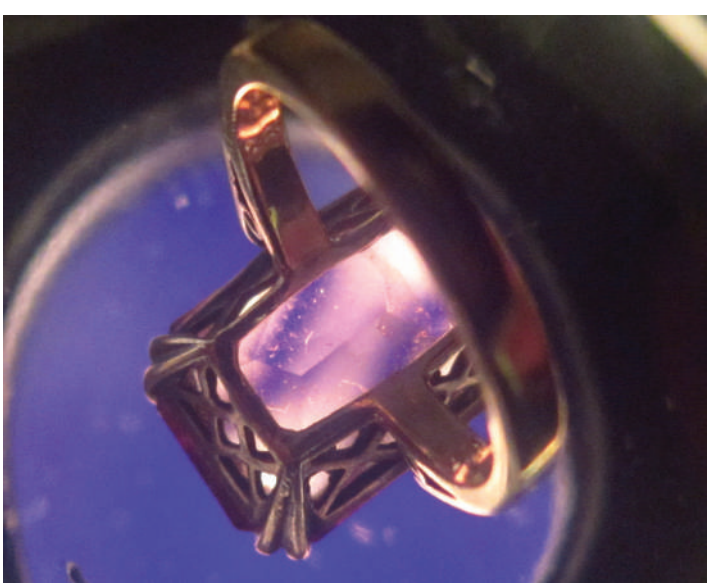
I find the polariscope an invaluable tool. It is always the first piece of equipment I use after a thorough observation with a loupe, and because it is so quick and easy to use I use it as routinely as I do my loupe — never do I test a stone without giving it a spin on the polariscope. Although rarely used for identification, when used with intelligence alongside other testing equipment it can certainly cut down a great many possibilities when deciding upon the identity of a stone. It can often assist in avoiding costly errors, and sometimes help you decide where and what to look for next.

In a matter of minutes the polariscope can tell you a whole wealth of information, not just if the stone is singly or doubly refractive (which is the extent of many people's use), but can also inform you of the nature of the material — is it singly refractive, amorphous, doubly refractive, or doubly refractive polycrystalline? If it is doubly refractive it can tell you whether it is uniaxial or biaxial and, with advanced use, if it is optically positive or negative. It can tell you whether or not a stone has inclusions and the nature of these inclusions, sometimes even helping to spot diagnostic inclusions such as curved growth lines in Verneuil synthetic sapphire, as well as showing if the stone displays pleochroism and consequently the pleochroic colours under uncrossed polarising filters.

So how is this of use to us in the real world? I will start with a ring (**1**) which greatly annoyed me (or, more correctly, the member of staff who bought it greatly annoyed me). Firstly, the ring is clearly hallmarked 925 and so is silver, but rather than reading the hallmark the staff member just saw 'any hallmark' and, coupled with the yellow colour of the metal, assumed that the ring was gold. Secondly, because the stone was brown she assumed that it was smoky quartz. A quick look with a loupe confirmed the identity of the metal, whilst a spin on the polariscope showed the writhing snakes characteristic of glass. If we assume we know the identity of something (and therefore we take shortcuts and don't interpret data intelligently), our findings can corroborate our assumptions even when incorrect, which can be very misleading, dangerous and expensive. In this case the staff member was misled by her assumptions and the incorrect interpretation of a hallmark. It was expensive for her because she paid out on gold scrap and not silver scrap for the item, and dangerous because she then had to face me after making a mistake based on laziness and complacency.

1: The mystery ring with the brown stone.

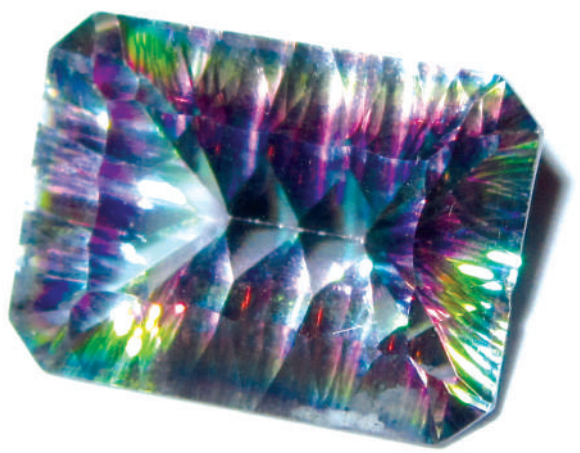
Something I often see many people do (and I have to admit to having been guilty of a lot in the past, until I learnt some hard lessons), is trying to make data fit assumptions that have been made about a stone. When the stone does not give the expected



2: The mystery ring in (1) on the polariscope.

Hands-on Gemmology

2



3

3: Concave faceted iridescent stone, thought to be mystic topaz. Photo Kerry Gregory.
4: Spinel ring thought to be synthetic sapphire. © Daren Daniels.

results we doubt our data, rather than doubting the assumed identity of the stone — in our eyes the stone is not 'behaving'. While there are always anomalies, stones generally behave as they should. If they don't, rather than thinking "It's not doing what it should" and continuing with the same identity assumption, what we should do is believe our data and ask why this stone is 'misbehaving'. Either it is an incredibly rare example that no one has come across before, or, more likely, the stone is not what we assumed it was in the first place, or it has been treated in some way. An example of this is a concave faceted iridescent stone (**3**) that I gave to a group of gemmologists in a general testing session. The stone looks like a mystic topaz, and approximately a third of the group assumed that it was, somehow managing to identify it as such. Correct use of the polariscope would have avoided the mistake: the stone displays a "bull's-eye" interference figure when viewed down the length of the stone.

Another example of gemmological assumptions occurred during a workshop session. A young lady in my class was viewing a ring on the polariscope and commented that it wasn't doing what it should. The ring, a gift from her grandmother and originally made by her grandfather, was a 1950s 18 ct white gold dress ring with pavé-set diamond shoulders and a central purple stone (**5**). She had been told the stone was synthetic sapphire, and so to her it was 'misbehaving' on the polariscope and didn't look like it was doubly refractive. I looked at the stone in the light and ended up doing what no gemmologist should do: blurted out my initial thoughts on the identity of the stone — that it was spinel.

I then looked at the stone on the polariscope and identified it as natural (as soon as the stone was on the polariscope you could see crystal inclusions, which turned out to be doubly refractive crystal inclusions). However, the stone itself showed a singly refractive reaction. These pieces of data confirmed my assumption. In the lunch hour I borrowed the ring and asked Alan Clark on the Gem-A stand to pop it on his refractometer for me, and sure enough it was a spinel. I was very excited as it demonstrated perfectly what I had been trying to show about using the polariscope. Just as excited was the young lady, whose 'cheap' synthetic sapphire had just become a rare (and considerably more expensive) natural colour-change spinel. For all you valuers out there that is a difference of £10 per ct for the synthetic sapphire and around £300 per ct for the spinel.

Acknowledgements

The author would like to thank Jules Proctor for the use of her ring in this article and Darren Daniels for the photograph. Thanks also go to Alan Clark for obtaining the RI of the stone for me, and to Richard Drucker and Margaret Gilmore of Gemworld, Jason Williams of G F Williams and Richard Lake of Marcus McCallum for help with prices. Finally thank you to Alan Hodgkinson for inspiring me about the polariscope in the first place.

About the author

Kerry Gregory works in jewellery retail and appraisal and is a Gem-A Open Distance Learning tutor. An active member of Gem-A, Kerry is particularly interested in gem identification through the use of basic gemmological instruments. To contact Kerry, email kerrry@gemmologyrocks.com.

Around the Trade

Gemmology: a science or an art?

Harry Levy discusses the problems of classification in gemmology.

I have always written my column with a strong educational motive, perhaps to give an aspiring gemmologist aids to answering questions, or to give other readers a wider context in which subjects can be considered.

There is an old Chinese saying: "Give a man a fish, you feed him for a day, teach a man to fish, you feed him for a lifetime." My adaptation is: give a man a fact, you give him a spot in the universe, teach a man to think, you give him the universe.

Unfortunately most of our educational systems are geared to teach facts, and a good student is one who can reproduce these facts in an exam. There is a story that there was a Cambridge lecturer who delivered extremely boring lectures and it was said that the lecture went from the teacher's notes straight into the students' notes, but passed through the heads of neither. I have tried to go outside these parameters. When I have spoken about factual events I have tried to put them in a wider context and related things that superficially do not seem to be connected. When I have spoken about more theoretical topics I have tried to do these in an argumentative format, stating points I may disagree with, but then showing why I think they are wrong, and arguing for the points I think correct. One of my lecturers at college used to say: when answering an exam question, try to show off. For example, if you are asked to give the refractive index of spinel, most will just do that, but imagine if you could add the few words that spinel is singly refractive and thus shows a clear demarcation line on the refractometer, as opposed to a doubly refractive stone which can show a somewhat fuzzy line. Unfortunately orthodoxy is applicable not only to religion but also to almost everything we do, but most especially in academia.

Most of us know the difference between science and art, but would perhaps be challenged to define the difference. One gloss would be to say that science tries to explain the world in an objective way — the observer is neutral. In art we try to explain the world in a subjective way — the observer is paramount. This is a somewhat romantic answer. In reality we look at science to explain how the universe works. The methodology is observation and an accumulation of facts, we try to explain these facts in a theory, and then test and use the theory to predict future events. We go from a deductive process to an inductive one. In an arts subject we bring in notions of beauty and appeal more to the heart than the head.

For example, history was for many years regarded as an arts discipline, but people realized that it gathered facts (observation), analyzed and tried to explain why these events occurred (theory), and then tried to be predictive by claiming what would be needed for these events to occur again. It has the exact methodology of a science. So now it is classified as a science in some universities, and in many of these as a social science.

Gemmology has all the trappings of a science: it involves observation, use of scientific theories, and lots of measurements — the raw data in any science. Where it differs from physics and chemistry is that the raw data can be classified in identical units in these latter disciplines, but not so in gemmology. All atoms or molecules of a given substance in the sciences are regarded as identical, but this is not the case in gemmology — no two bits of sapphire are exactly the same. We can give an exact number to the specific gravity of gold when it is purified, but cannot do this for our gemstones. They crystallize with impurities and thus their properties vary even if by minute amounts. Garnets from different localities look different and have different physical properties. It depends on our degree of interest as to how we differentiate between the different types of garnet. We take a number of physical characteristics as necessary for a substance to be called a garnet, and then look at other properties to distinguish the garnet as pyrope, tsavorite, demantoid and so on.

A similar thing happens with snow and white. Eskimos who live with snow most of their lives find it necessary to differentiate between different types, so they have different names for different types of snow. They also differentiate between different types of white and have different names for these. We in the diamond trade have found a need to differentiate between different shades of white (more correctly a lack of colour), and thus have given letters to make these differentiations in our diamond grading systems.

Language also plays a large role: many of us take language for

Around the Trade

When does a pink sapphire become a pink ruby? Photo Gem-A.

granted, having never thought of how and why it works, and not realizing that it is necessary for us to establish any sort of order and understanding of the universe we inhabit. I am Harry Levy, this proper name describes me for those who know me, although there are other Harry Levys. I am also a man — this is a universal term that again picks me out, but I need certain properties to be called a man. These are not necessary for me to be called Harry Levy, a name that could also be applied to a dog or a car.

We have many things that we call dog, and we differentiate between different types of dogs as poodles, Alsatians, terriers and so on, and call a specific dog Fido. The reason we have these classifications is because language would become impossible and far too large if we gave a proper name to each object in the universe. This problem of particulars and universals is a very old problem in philosophy. For example, Plato talked about Forms and Ideals. In an ideal world there would be a unique table and all the tables in our world were copies, but not identical and not as perfect as the 'Ideal table'. The philosophy of Plato was to explain the imperfect world we inhabit, but it is also an explanation of how language works. When I say I live in a road, you will understand what I am saying and have your own image of a road, but it could be very different from my image of my road. If I tell you I live on James Road, I convey no further information to you, unless you wish to visit me. I have replaced a universal term with a specific one.

The problem of defining our gemstones has arisen on Gem-A MailTalk. (If you do not subscribe to this, I again urge you to join, you will learn much gemmology there.) For example, when does a pink sapphire become a pink ruby, or a chrysoberyl become an alexandrite, or a beryl become an emerald? There is no magic formula to determine the answers for us. It comes down to a matter of convention and the interest we have at the time.

If we wish to use a sapphire for its hardness properties we call it corundum, whereas in jewellery we call the blue variety sapphire, and the red one ruby. Marketing showed that the pink variety was not that popular, so it was called pink sapphire. Others challenged this and claimed it should be called pink ruby.

I recall a CIBJO Congress when this became an important point, because pink sapphires were fetching far higher prices than pink rubies. We were presented with a number of pink corundums and asked to vote on what to call them. One argument is that red corundums are called rubies, while all other colours should be called sapphire preceded by the colour. But then we were asked to determine where the colour red became pink, and others argued that pink rubies were pale red rubies.

So definitions become a matter of convention, although based on some necessary and sufficient conditions that the stone can be called by the generic term in the first place. The problem comes down to having these conventions approved by the whole gemmological community and the traders.

As I said above gemmology has all the trappings of being called a science, but when looked at closely it does not possess some of the properties that conventional sciences have. For example, we refer to a diamond as having a certain colour. Unlike weight, which can be measured relatively precisely, colour is less easy to assess. The colours of two stones may seem the same, but they fall in a range between two similar (but not identical) colours. Gemmologists wish to try to turn the subject into an exact science, but traders who wish to sell stones generate an aura by calling their gems works of art, having romance and an air of mysticism about them. There is an ongoing tension between these two positions.

At the time of writing I am off to Hong Kong where I will attend a number of trade meetings. One will concern pearls. At present we classify pearls in three categories: pearls (the natural variety), cultured pearls and fake or imitation pearls.

A powerful group of pearl dealers want the unqualified term 'pearl' to be used to refer to cultured pearls. We would still have the three types, but the categories may be renamed to the following: natural (or real) pearls, pearls (the old cultured ones) and imitation pearls. Those advocating the change claim that most pearls now sold are cultured ones and that consumers know this — if they want natural ones they ask for natural pearls, and those selling natural pearls refer to them as just that, so they are merely reflecting the existing market situation. The traditionalists claim that such a move is wrong and will cause too much confusion for the consumer. They further claim that this argument could be extrapolated to coloured gemstones and diamonds, where synthetic stones will be sold without the disclosure that they are man-made.

Unfortunately for the traditionalist, we have permitted all cultured South Sea pearls to be sold simply as South Sea pearls for many years now. Perhaps some of our readers may wish to write to the editor and express their views on this.

Gem-A News and Views

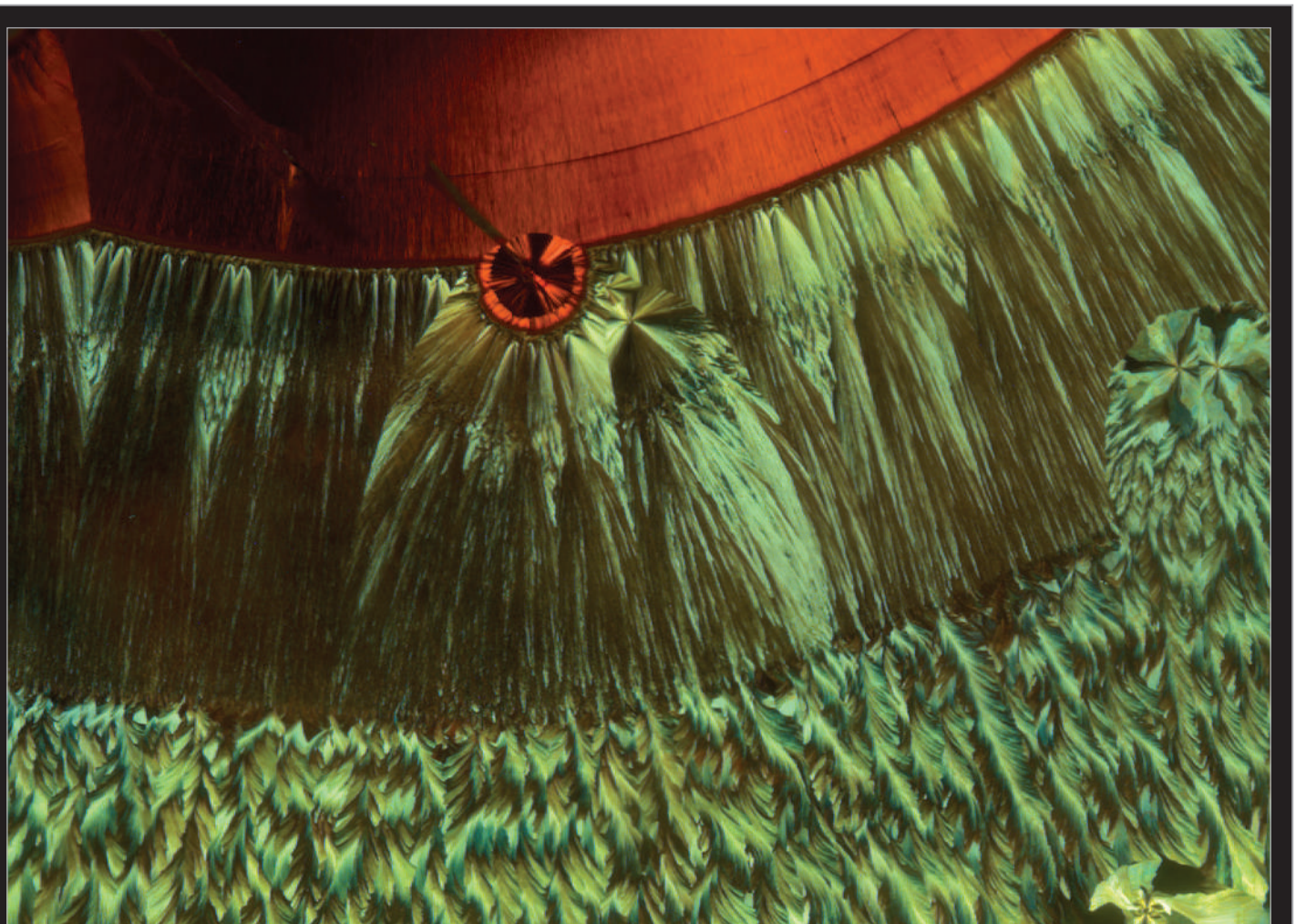
Photo competition

Back in the Spring issue of *Gems & Jewellery* we reinstated our annual photo competition for members, this time with four aptly-named categories for entry: Natural (for photos with no enhancements), Treated (for photos that had been enhanced using computer software), Synthetic (for graphics created through photo manipulation software, such as 3D models of crystal structure, etc) and Melange (for photos featuring a mixture of enhancements).

Our congratulations go to **Michael Hügi**, the overall winner for the best photo and the winner of the Natural and Treated categories, and to **Keiko Kon**, winner of the Melange category. No winner was selected for the Synthetic category, but entries by **Conny Forsberg** and **Luc Genot** were deemed Honourable Mentions. The winners receive an A3-size version of their photo and a copy of *Gemstones* by Keith Wallis. Keep an eye out for Gem-A's 2012 competition!

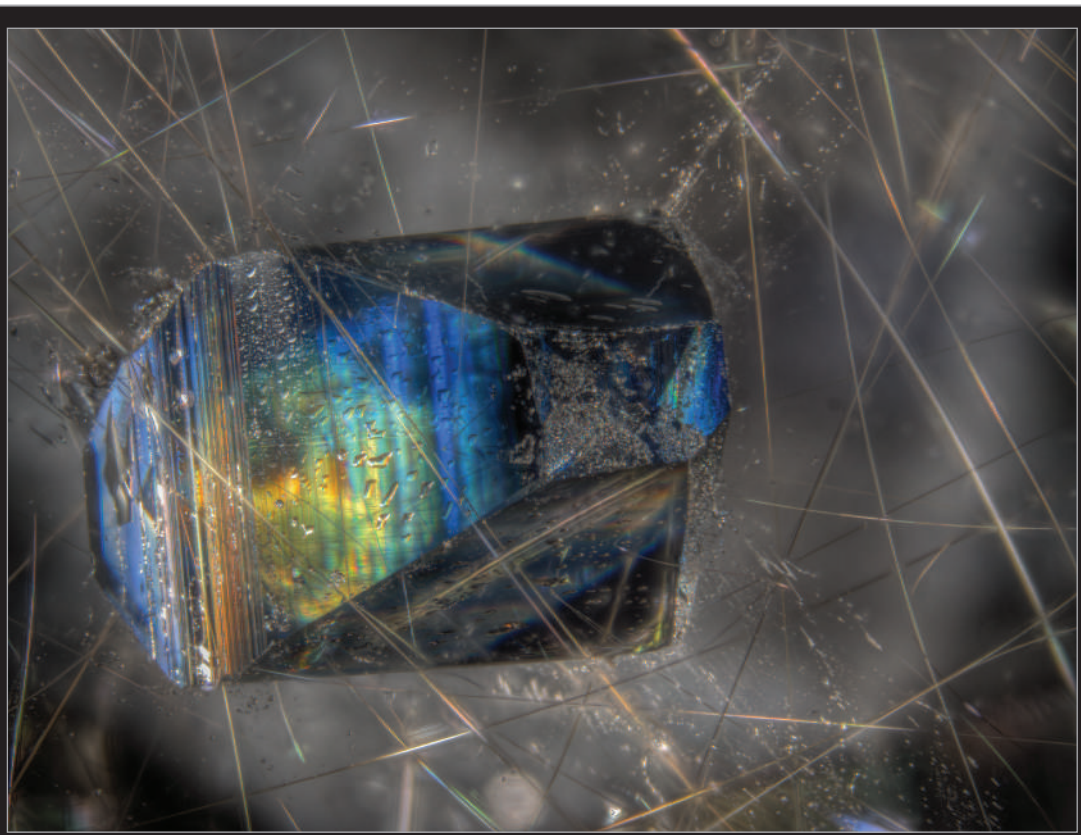
Gem-A would also like to thank the judges: Maggie Campbell Pedersen, Gary Roskin and Jack Ogden, for taking the time to judge the competition.

Michael Hügi, overall winner and winner of the Natural and Treated categories. Photo Jack Ogden.



Overall winner and winner of Natural category: Fibrous hematite and goethite aggregates in quartz from Minas Gerais, Brazil. © Michael Hügi.

Gem-A News and Views



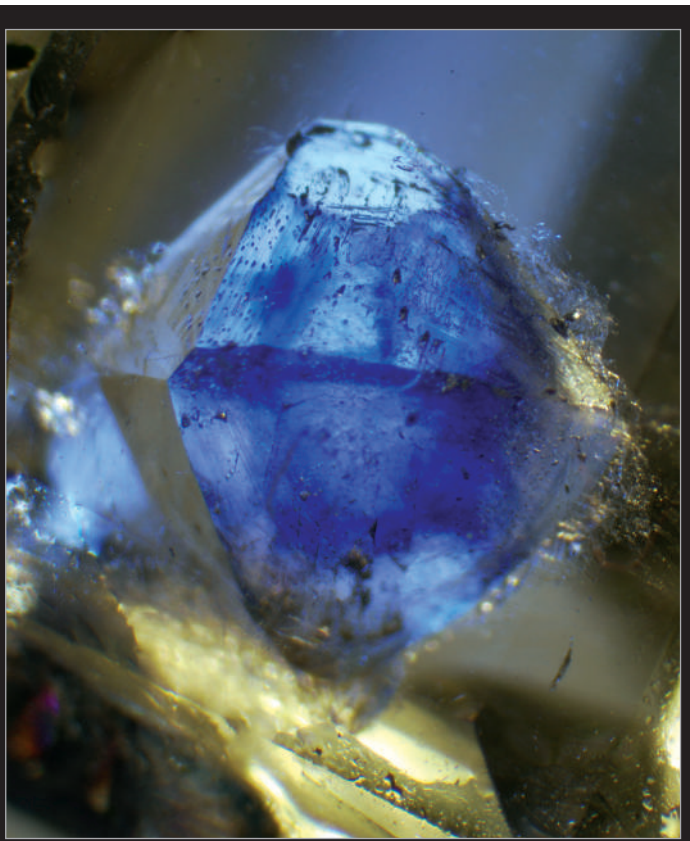
(Left) Winner of Treated category: Blue anatase crystal and rutile fibres in quartz from Minas Gerais, Brazil. Treated with HDRI-processing. © Michael Hügi.

(Right) Winner of Melange category: Cut cultured pearls in round slices. © Keiko Kon and Gem Science Academy of Gemology, Tokyo.

Gem-A News and Views

Photo competition (cont.)

(Above) Honourable mention: Inclusions of tourmaline needles, rutile platelets and garnet in quartz from Tsiroanomandidy, Madagascar. Treated with DOF method and assembled with the program Helicon Focus. © Luc Genot.



(Right) Honourable mention: Violetish blue fluorite octahedron in faceted quartz, Madagascar. © Conny Forsberg.

Gem-A Photographic Competition 2012

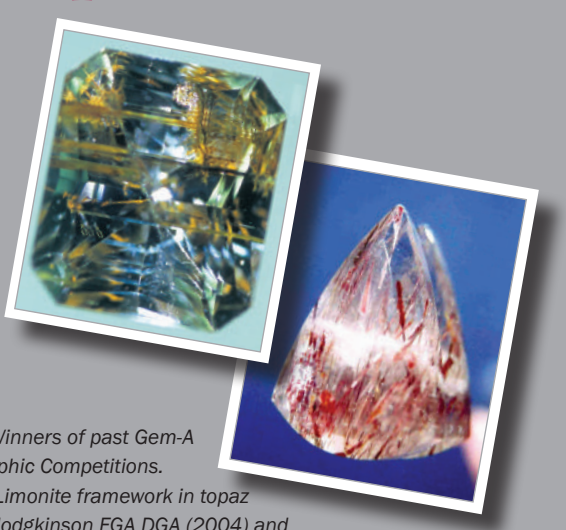
The competition is now open!

To enter

Please send a low-res version of your photo to editor@gem-a.com. Full details of the competition, including copyright information, can be accessed at www.gem-a.com/membership/photographic-competition.aspx or call Amandine on +44 (0)20 7404 3334.

Closing date: 29 June 2012.

Winning entries will be announced at the Gem-A Conference 2012 and feature in the Autumn issue of *Gems & Jewellery*.



Photos: Winners of past Gem-A Photographic Competitions. (Centre) Limonite framework in topaz by Alan Hodgkinson FGA DGA (2004) and (right) lepidocrocite inclusions in quartz by Luella Dykhuis FGA DGA (2005).

In the news

Gem Empathy Award

Each year at International Jewellery London (IJL) Gem-A presents the Gem-Empathy Award, presented to the IJL exhibitor displaying, in the opinion of the judges, a single piece or collection of jewellery that makes captivating or innovative use of gemstones. The judges look for accurate and ethical descriptions in exhibitors' products, as well as creativity, imagination and attractiveness. The winning exhibitor of 2011 was Susanne Asbeck of Nomades, from Bonn, Germany (see page 2). In the opinion of the judges, Susanne's jewellery fully met the remit of the competition. They were particularly impressed with Susanne's enthusiasm for the gems used in her jewellery. It is important to note that the Gem Empathy judges are anonymous; the exhibitors are unaware that they are being judged and do not know that the people asking probing questions about their work are anything other than normal show visitors.

Susanne Asbeck (fourth from left), with Amandine Rongy, Gem-A PR and Marketing (second from left), Jack Ogden, Gem-A CEO (second from right) and Sarah Kitley, IJL Marketing Manager (far right).

Social media

Visit our **Facebook** page at: www.facebook.com/pages/Gem-A/247527936175

The **LinkedIn Group** can be found by going to www.linkedin.com and searching for the 'Gem-A Graduates' group.

Gem-A is also on **Twitter**: @GemAofGB.

As with most organizations, social media is becoming an important part of our communications with members and students, as well as important for communication between members and students themselves. It can be said that Gem-A's popular MailTalk network was an early form of social media. Adopted by Gem-A in 2004, it is now considered by many to be the best international gemmological communication forum. Open to all Gem-A members, access options range from receiving individual emails as they are sent to receiving a daily digest of emails, or to simply logging in and checking posts when you wish.

Facebook

Gem-A's Facebook page was launched in September 2010, eventually taking over from the old Gem-A Facebook group. The Facebook page is open to all with an interest in gemmology and has proved to be a great way to quickly announce and share photographs of events, as well as to swap opinions and ideas. Being open to all, it has encouraged a growing number of budding gemmologists and those connected with other organizations to become familiar with Gem-A's work.

LinkedIn

Gem-A's LinkedIn page has a more specific use: it is strictly limited to graduates of Gem-A's Foundation and Diploma in Gemmology and Diamond Diploma. One of its main functions is to publicize job vacancies and internships in the gem and jewellery industry. At present the jobs are predominantly UK-based, but we are looking to encourage more

Gem-A News and Views

In the news (cont.)

international participation. Those offering positions do not have to be Gem-A members although those who are not members must post vacancies through Gem-A. Please be aware that any gem-related job vacancies are posted as a service to our students and members and that publicizing vacancies does not imply that Gem-A endorses or has any knowledge of the company advertising the vacancy. Applicants are advised to make all necessary checks themselves.

For those who are not currently using social media the above may make little sense. We will provide more guidance for you over the coming issues. However, you do not need to be a signed-up Facebook user to see the Gem-A page — so dip your toes in the water and have a look.

Above: Gem-A's popular Facebook page where photos and announcements of events are regularly posted by Gem-A and by members.

Tailored seminars travel back in time

Above: The inside of a Greco-Roman gold snake ring shows the small squares of gold used to reinforce the solder join holding the coils in place. Photo Jack Ogden.

In addition to its well-known and wide range of gemmology courses, short courses and workshops, Gem-A also provides specially tailored seminars and short courses for individual companies and small groups. Over the years special programmes have been arranged for various UK-based companies and have proved valuable for their training. In September an unusual topic was presented, specially drawn up for the Ancient Art Department of Christie's auction house in London. The day covered ancient goldsmithing techniques, forgery identification and basic gemmology with a focus on the stones most likely to be found in old jewellery. Christie's in London holds regular auctions of ancient and Islamic art and they are often offered jewellery purporting to be ancient. The seminar provided the nine attendees with a refresher course in the archaeological aspects and some hands-on microscopic examination of ancient gold. The goldsmithing and forgery aspects were covered by Jack Ogden, a specialist in such matters, and the gemmology parts by Claire Mitchell, Gem-A Instructor.

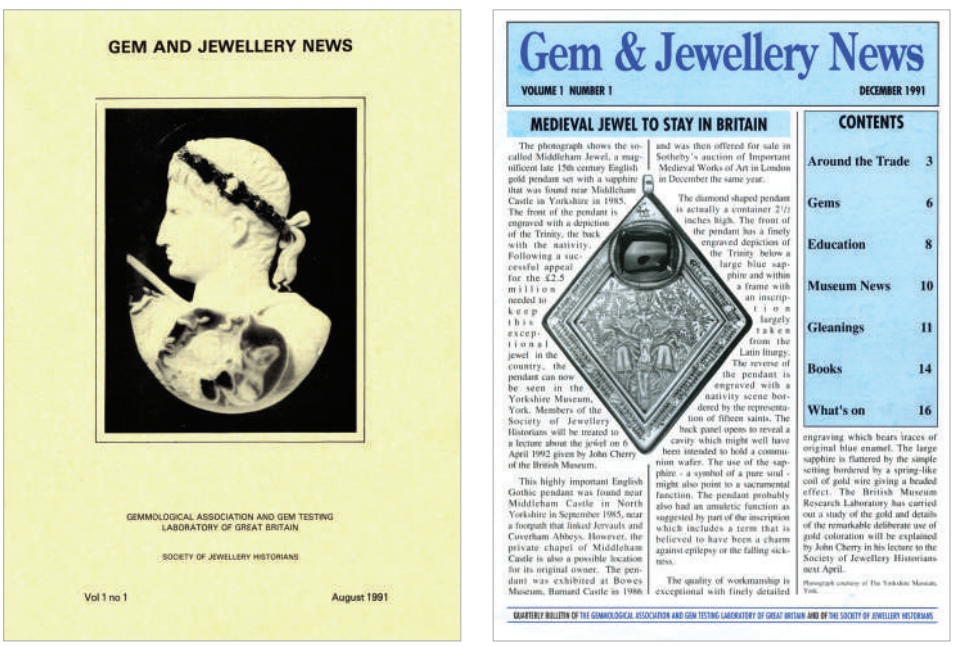
The potential for offering similar seminars in London and New York in the Spring is being investigated.

Twenty years of publishing

Jack Ogden celebrates twenty years of *Gems & Jewellery*.

Twenty years ago, in 1991, the bulletin *Gem & Jewellery News* appeared for the first time. This was heralded as the beginning of co-operation between the Gemmological Association and Gem Testing Laboratory of Great Britain (GAGTL, as it was then) and the Society of Jewellery Historians (SJH), both UK-based organizations with international membership. Both organizations published academic journals, *The Journal of Gemmology* and *Jewellery Studies* respectively, but felt that their members needed a more frequent and less formal source of information, especially as the newsletters and bulletins earlier produced by the SJH alone had proven difficult to sustain. Those were the days before the internet became a dominant force and so a published, hard-copy bulletin was the obvious answer. The Editor of the new publication was to be Michael O'Donoghue, with the editorial board consisting of Roger Harding (the then Director of Gemmology for GAGTL), Alan Jobbins, Harry Levy and Jack Ogden. The production editing was to be carried out by Mary Burland at GAGTL.

The mock-up produced in the summer of 1991 by Michael O'Donoghue demonstrated the range of articles that the publication was intended to carry, from notices of exhibitions, conferences, auctions and trade shows, to notes on old jewellery patents, a comment on emeralds from the Panjshir Valley in Afghanistan, Harry Levy's revelations of a more pleasant side to HM Customs and Excise with regard to gem imports, a note on a fancy cut carletonite, and announcement of the opening of two refurbished galleries at the British Museum — one of which included



Above left: The mock-up of Gem & Jewellery News*, produced in August 1991, and, above right, the first issue, printed in December 1991.*

the magnificent cameo of the Roman Emperor Augustus which graced the front of the mock-up.

The coverage was judged a good balance and one which served the two organizations' needs well, but it was unanimously agreed that a more colourful appearance was warranted. When volume 1, number 1 appeared in December 1991, it had blue highlights and title throughout, although coverage on the Augustus cameo had been usurped by news on the Middleham Jewel, a magnificent late fifteenth century gold and sapphire pendant which was now to stay in the UK, following a successful appeal for £2.5 million. It is now in the Yorkshire Museum.

Over the following years, *Gem & Jewellery News* admirably met its original remit, covering relevant news and events. Looking back through the issues is like reading a history of gemmology, as well as a history of Gem-A during that period; documented is the launch of the Diamond Correspondence course (1991), the launch of January as well as June Gem-A exams (1992), the growth of Gem-A's education in China, the start of Gem Discovery Club (1994), the purchase of the X-ray machine by the lab in 1995 (primarily for pearl testing), the introduction

Gem-A News and Views

Twenty years of publishing (cont.)

of the Brewster Angle Meter (1999), and so on. Arguably the most consistent contributor over the years has been Harry Levy: *Gem & Jewellery News*, volume 1, number 1 (1991) included 'Around the Trade' by Harry Levy, as does this issue. Harry has hardly missed an issue in our twenty years.

December 1994 saw Alan Jobbins and Jack Ogden retire from the Editorial Board, while Catherine Johns joined to continue Jack Ogden's Society of Jewellery Historians' interests — interests augmented by Corinna Pike, who joined the Editorial Board in 1996.

In 2004 *Gem & Jewellery News* increased to A4 size and was printed in full colour for the first time — a move steered by Terry Davidson, then Gem-A CEO. It was renamed *Gems & Jewellery*. Following Jack Ogden's appointment as Gem-A CEO at the end of 2004, there were some changes in format, while 2005 saw the agreement between Gem-A and The Society of Jewellery Historians dissolve — it was felt that it was time that the two organizations moved to publications devoted to their own members' interests. Gem-A then started to publish the quarterly *Gems & Jewellery*, essentially continuing the format of the previous publication and continuing to cover both jewellery history and gemmology, in accordance with Gem-A's mission.

Today the magazine has a worldwide readership and forms a popular and valuable part of Gem-A's membership package. It continues to evolve and options for its future growth are continuously discussed, including the potential for making it available to a wider audience. At the end of 2010 Mary Burland, production editor since its inception, retired from Gem-A, although she still provides some help and oversight to the new production editor Georgina Brown.

Contact us

Are you interested in writing for *Gems & Jewellery*? Have you recently been in the field, worked in a lab testing stones, studied some interesting specimens or just have something new to report? If so we'd like to hear from you!

Submit an article with pictures (300 dpi minimum plus credit/copyright info) to editor@gem-a.com and you could be published in the next issue of *Gems & Jewellery.*

NATURE'S TREASURES 4

Oxford University Museum of Natural History
Parks Road, Oxford OX1 3PW

Saturday 3 March 2012
10:00 am — 4:30 pm

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

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

The stimulating programme of talks will include:

Morning session:

- Derek Siveter
  Re-creating 3D models of fossils
- Richard Pattrick
  Nuclear waste: we have a problem
- David Palmer
  Minerals at the nano-scale: exploring our crystalline world

Afternoon Session:

- Bill Perkins
  Minerals, mining and mess: cleaning up after mining for metals and coal
- Courtenay Smale
  Williams Caerhays Mineral Collection - rescued from near-oblivion
- Jack Ogden
  The lore and the profits: gems, myths and the jewellery trade over 2000 years
- David Pyle
  The wonders of volcanoes

The event will also include the opportunity to talk to the speakers and others about careers in the geosciences and gemmology, and to view the several displays planned for the day, including those by BGS, Gem-A, The Mineralogical Society, RockWatch, The Russell Society, Richard Tayler and Andy Tindle.

Fee: £20.00 (under 16s £10.00) including refreshments and a sandwich lunch.

For further details and to register: http://www.minersoc.org/pages/meetings/nature4/nature4.html or contact Kevin Murphy at kevin@minersoc.org

Anglesite on iridescent gossan, Mona Mine, Parys Mountain, Anglesey; photo courtesy of R. Starkey

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

Organics

Carbon-14 dating

Maggie Campbell Pedersen discusses the uses of Carbon-14 dating in organics.

In order to identify or value an item of jewellery or a carving it is often necessary to know its age, yet this is sometimes very difficult to ascertain. We can deduce a certain amount by considering style, iconography, provenance and workmanship, and by comparison with other items of known provenance and age. All this, however, is not actual proof of the age of an item, but more a presumption — nor are iconography and workmanship of any use if we are dealing with the raw material, e.g. a whole elephant tusk. Furthermore, good fakes and imitations can be baffling, even to the most expert eyes. There are many tales of museums proudly displaying artefacts which on testing turn out to be copies or fakes, or indeed, an item that was thought to be of recent production and of no consequence can turn out to be much older and more valuable than originally thought. Clearly, it is in environments such as museums that the age of an item becomes especially important.

All living organisms contain carbon. Organics are therefore unique amongst gemstones in that they can (unless they are over a certain age) be 'carbon dated'. Amber and jet are excluded from this, but most others such as tortoiseshell, ivory, coral, and so forth can be tested using this method. Using Carbon-14 dating (often written as C14 or 14C), we can ascertain the approximate age of materials, from two or three years old to approximately 60,000 years old. Most of the carbon contained within an organism is stable, but a minute percentage — the so-called 'Carbon-14' or 'radiocarbon' — is radioactive and unstable. Plants or animals absorb C14 throughout their lives by photosynthesis or through the food chain, but cease to do so when they die. The C14 then starts to degrade.

Dating is based on the degradation of the amount of C14 present in a sample. Knowing that it has a 'half-life' of 5730 years (thus the length of time it takes for the Carbon-14 content to halve, halve again, and so forth) it is possible to judge the age of the item. By 60,000 years the radiocarbon content is negligible, so C14 testing ceases to be viable. Ivory, for example, consists mostly of calcium phosphate, with a small amount of protein called collagen. The C14 is found in the collagen. Interestingly, mammoth ivory that has been buried in the permafrost for several thousand years may yield collagen that is so well preserved that it is easier to date than more recent material. The degradation process of the C14 content does not alter, despite the fact that it has been deep frozen for thousands of years.

The calculation of age according to the C14 readings is not completely straightforward however, as various events over the years have influenced the carbon presence in the atmosphere, affecting the results. During the 1950s, whilst atomic bombs were being tested, it was realized that vast amounts of C14 were created and being released — at its peak the amount doubled — with the consequence that until the test ban treaties came into force, natural levels of carbon were raised. Allowances are therefore made for that period and readings taken today are calibrated to allow for the distortion.

Ivory netsuke. C-14 testing could establish how old the ivory is and whether it predates trade bans, but not the date of carving.
© Maggie Campbell Pedersen.

C14 tests can also easily be contaminated. It is best to take a sample from slightly inside an item as any oils, waxes, resins or colours on the surface may alter the test results. Although the sample taken is relatively small, it means that the C14 test is a destructive one, and it would not be sensible to use on small, fine objects, or on those of extreme rarity or value, unless dictated by very special circumstances.

Another drawback to the test is that it cannot be done on the spot. Any item for testing must be sent to a specialist laboratory, where the testing will take five to six days and is obviously not without cost.

Finally, of course, C14 only tells us when the animal died — not

when an item made from the animal's teeth or horns (for example) was carved. There have been known occasions in history when stockpiled ivory has been carved, and the tusks used may have been one hundred years old before they were worked. Similarly, it cannot necessarily differentiate between a piece of work by a master carver and a later forgery, if the latter was carved using old material.

Despite the disadvantages, C14 is an important test. Experts can at times be divided in their conclusions about the age of an object, and as to whether or not it is authentic. C14 testing can be the solution to this — an example being the Vierge Ouvrante, or 'Opening Madonna', a rare medieval ivory and bone triptych in the Walters Art Museum in Baltimore, USA. When open, it displays scenes from the Passion of Christ, and when closed is in the form of a Madonna. The authenticity of the large carving was the subject of much discussion among experts, but the questions were finally answered with the help of C14 dating — the carving was found to be authentic but with later repairs to one of the three panels.

C14 dating is also very useful in animal conservation and the fight against poaching, as it is possible to ascertain whether materials such as ivory or tortoiseshell, raw or worked, are the result of recent kills.

The author is indebted to Dr Thomas Higham, Deputy Director at the Oxford Radiocarbon Accelerator Unit, University of Oxford, for help with this article. A version of the article, concentrating on the age of ivories, appeared online in 'Organic Gems' at www.maggiecp.com.

About the author

Maggie Campbell Pedersen is a Fellow of the Gemmological Association of Great Britain and an Associate of the British Institute of Professional Photography. The author of *Gem and Ornamental Materials of Organic Origin*, Maggie is also the editor of 'Organic Gems', online at www.maggiecp.com.

Journal Files

The Journal of Gemmology

Summary of an article to be published in *The Journal of Gemmology*.

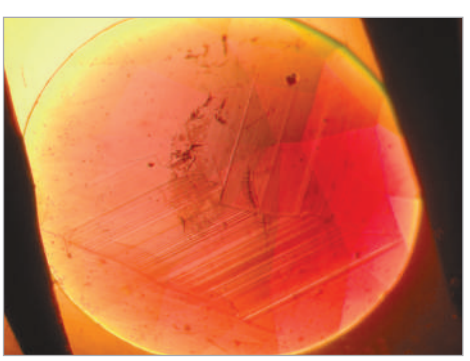
Growth and origin*

A summary by Jack Ogden of the article 'The measurement and interpretation of growth patterns in chrysoberyl, including alexandrite' by Dr Karl Schmetzer.

Determining the origin of gems has largely relied on the examination of inclusions and trace element analysis. As the number of economically viable gem sources grows, these traditional methods of origin determination may need to be supplemented with other means of discrimination. Crystals of gem materials from different locations can differ in their form, thus the form of a crystal can sometimes indicate its origin. Even when a gemstone is cut and all outer evidence of crystal form removed, the original crystal form can sometimes be determined on the basis of internal growth patterns. The determination of such internal growth patterns with optically uniaxial gemstones such as ruby, sapphire, emerald, amethyst and citrine was described by Kiefert and Schmetzer in a series of articles in *The Journal of Gemmology* in 1991†. The present article considers the procedures for identifying growth planes, growth zones and twin planes in optically biaxial gemstones. Chrysoberyl was chosen as an example.

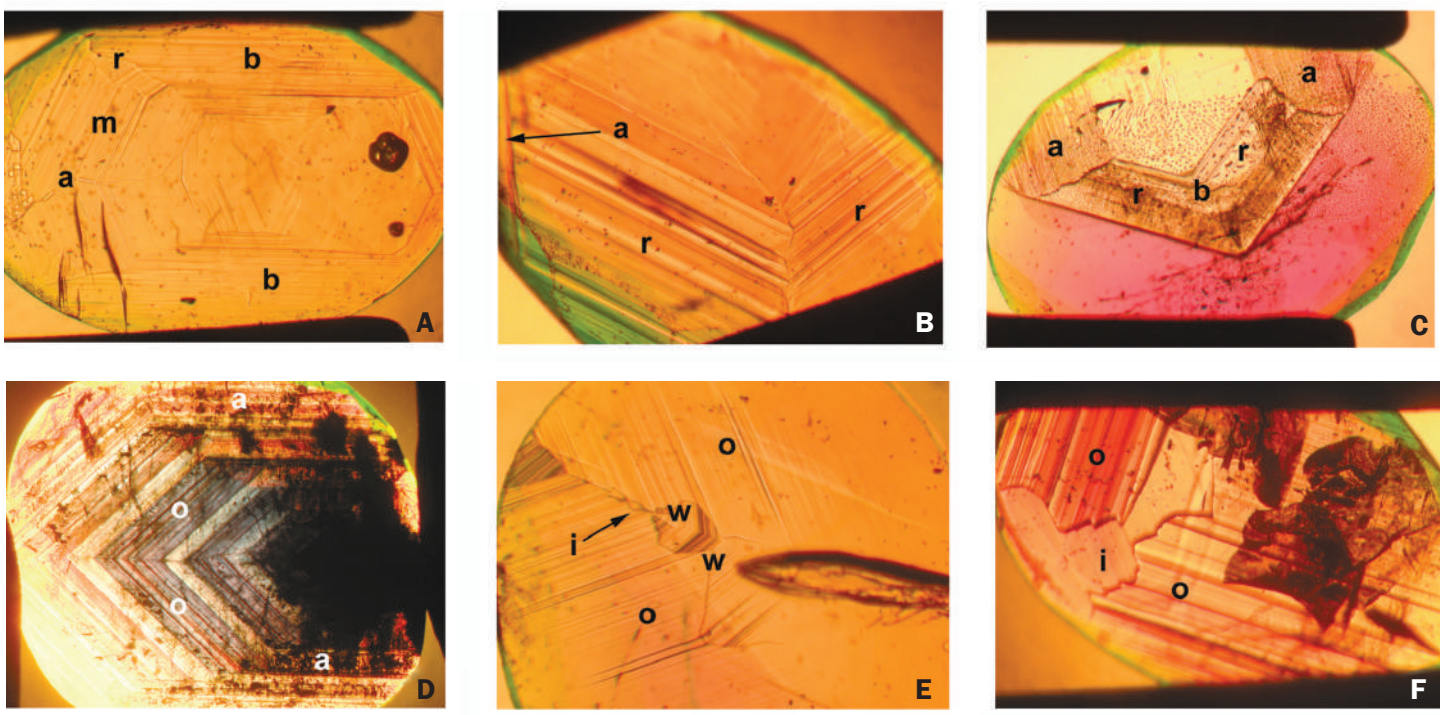
In optically uniaxial gemstones, the determination of the growth pattern is relatively straightforward. The crystallographic *c*-axis is parallel to the optic axis and a growth plane can easily be determined by measurement of its inclination to the optic axis. With optically biaxial gemstones, however, neither optic axis need be parallel to any one of the three crystallographic axes and the determination of growth pattern is very much a trial and error process. To observe structural properties and their orientation it is necessary to rotate a faceted sample through an angle of 360° in a number of different orientations in the sample holder. Each orientation and rotation helps to solve part of what is, in effect, a three-dimensional puzzle. To make such measurements using an immersion microscope, a special sample holder with two rotation axes and a 360° dial attached to the vertical rotation axis is used, in conjunction with an eyepiece with crossed hairs and a 360° dial.

With chrysoberyl, including alexandrite, the optic axial plane is always located in the plane formed by the crystallographic *a*- and *c*-axes. The position of an optic axis in this plane is found by placing the stone in the sample holder in different initial orientations and rotating the stone 360° in each position under crossed polarizers. The observation of pleochroism helps to determine which crystallographic axis is more or less parallel to the rotation axis of the sample holder. Limited information can be obtained by the identification of a single growth plane or a series of parallel growth planes, but it was found that recognition of



Growth structure in alexandrite from Hematita, Minas Gerais, Brazil. Immersion, 20 ×.

Journal Files



(Above) Examples of growth structures in alexandrites from three major natural sources (Urals, Russia; Hematita, Brazil; Sri Lanka). Top row: (A) Brazil, 50 ×; (B) Sri Lanka, 40 ×; (C) Sri Lanka, 30 ×; bottom row: (D) Russia, 30 ×; (E) Russia, 50 ×; (F) Sri Lanka, 35 ×. All photos in immersion.
(Below right) Clinographic projections showing the positions and labels (a, n, w, etc) of the 13 important faces that were seen in natural alexandrites from all major sources worldwide.

one or several characteristic growth zones could help identify alexandrites from different sources. The common presence of twinning in chrysoberyl crystals can help such determination.

Growth patterns in alexandrites from all major commercial sources, e.g. Russia, Brazil, Sri Lanka, Madagascar, Zimbabwe, India and Tanzania, are being compiled and, in combination with trace element content, will be a useful factor in origin determination.

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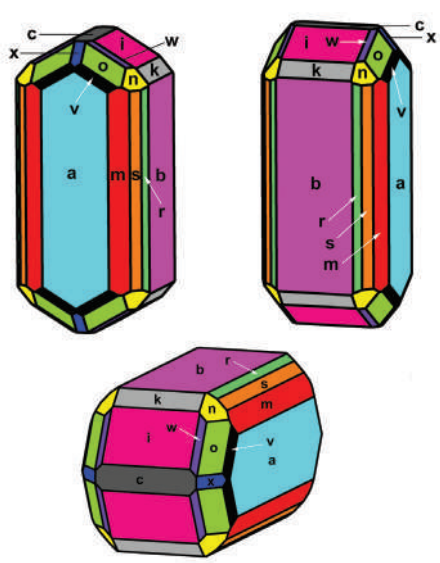
† Kiefert, L., and Schmetzer, K., 1991a. 'The microscopic determination of structural properties for the characterization of optical uniaxial natural and synthetic gemstones. Part 1: General considerations and description of the methods.' *The Journal of Gemmology*, **22**(6), 344–54
Kiefert, L., and Schmetzer, K., 1991b. 'The microscopic determination of structural properties for the characterization of optical uniaxial natural and synthetic gemstones. Part 2: Examples for the applicability of structural features for the distinction of natural emerald from flux-grown and hydrothermally-grown synthetic emerald'. *The Journal of Gemmology*, **22**(7), 427–38
Kiefert, L., and Schmetzer, K., 1991c. 'The microscopic determination of structural properties for the characterization of optical uniaxial natural and synthetic gemstones. Part 3: Examples for the applicability of structural features for the distinction of natural and synthetic sapphire, ruby, amethyst and citrine'. *The Journal of Gemmology*, **22**(8), 471–82

* A summary of an article appearing in *The Journal of Gemmology*, 2011, **32**(5–8): Karl Schmetzer, 'The measurement and interpretation of growth patterns in chrysoberyl, including alexandrite', 129–44



All photos and crystal drawings by Karl Schmetzer.

Wildcats and jewels

Use of the Coat of Arms is one of Gem-A's special Membership privileges for FGAs or DGAs. There is history behind the symbols from which it is composed, and some simple rules about how it can be used.

Some nine hundred years ago Medieval rulers and knights began to adopt specific symbols to distinguish friend from foe on the battlefield. Through the centuries these developed into the Coats of Arms that came to be used as insignia for privileged individuals, cities and organizations and which were granted, designed and used within specific and controlled guidelines. Gem-A's Coat of Arms was first granted to the Gemmological Association of Great Britain in 1966 and was conferred by a grant of arms made by the Kings of Arms under the royal authority. The Gem-A Coat of Arms is composed of a shield, crest and motto, and the components of these were thoughtfully chosen to combine Heraldic tradition with Gem-A's prime position as a gem teaching organization of international renown.

The Coat of Arms is available free of charge in JPG format in various sizes and in full colour, greyscale or black and white. These representations must be used in full as supplied and with no integral text or other part omitted or amended. To request a JPEG or to get further information please email information@gem-a.com.

Crest

The crest is in the form of a lynx. This species of wildcat is traditionally renowned for its keenness of sight and, with perhaps just a touch of humour, was employed here as a perfect symbol for gemmologists and gemmology students. In its paws it holds one of the oldest heraldic emblems, an 'escarbuncle' — a symbol of supremacy, as well as representing a brilliant jewel with light radiating from it (its tips are jewels of many different colours). We like to think of Gem-A as the central jewel, with gem education and knowledge radiating from us — the jewelled tips are our graduates and members worldwide. Gemmologists, represented by the lynx, also hold Gem-A, the central jewel, reminding us that Gem-A is an organization not only formed by, but run for, our Members.

Shield

The shield is the focal part of the Coat of Arms. In its centre is a gold jewelled book representing the study of gemmology. Above this is a rose-cut diamond within a circle, suggesting the examination of gems under magnification. To each side are octahedral diamond crystals indicating gems as found, and below is a pearl-set ring representing gem-set jewellery.

Motto

The very apt Latin motto 'Omnemque pretiosum lapidem' is taken from the first Book of Chronicles, 29.2 and simply means 'All kinds of precious stone'.

Use of the Coat of Arms

After nine hundred years a Coat of Arms is still a privilege. The Gem-A Coat of Arms may be used by members of Gem-A who have FGA or DGA status or Corporate Members, providing that nothing, including the positioning or scale of the image, implies that they or the company they work for represent or are endorsed by Gem-A. However, in accordance with the Scottish law of heraldic arms, Scottish Fellows and Diamond Members must use the special Scottish Grant of Arms. Please contact membership@gem-a.com for more information. There are other specific exceptions: the Coat of Arms may not be used on any gem testing or diamond grading report, or where an individual or business provides gem education but is neither a Gem-A Accredited Teaching Centre (ATC) or Gem-A Approved Practical Provider (GAPP). The Coat of Arms may also not be used in a business context where the individual or business is not directly involved with gems or jewellery. Should the user's membership cease, or the Fellow or Diamond Member cease to be employed full time by the company using the Coat of Arms or Logo, the privilege to use of the Coat of Arms ceases immediately.

Toy story

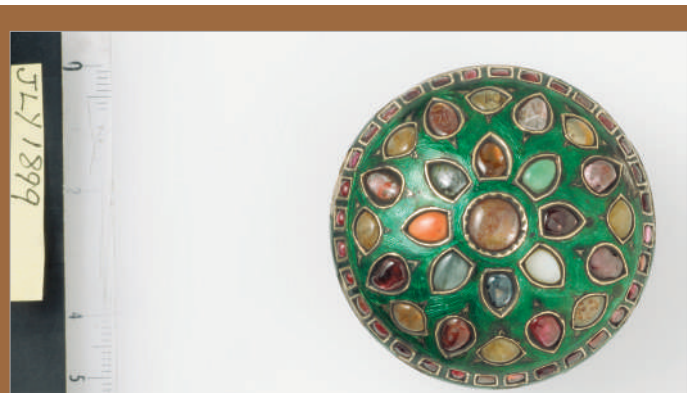
Jack Ogden reports on an eighteenth-century gem-set enamelled yo-yo.

We've talked about the ups and downs of the gem trade over the years, but this must surely be one of the more unusual gem-set objects we've ever encountered. It is a gem-set, enamelled and gilded silver yo-yo made, most probably, in Rajasthan, North India, in the eighteenth century. The gems are, in alphabetical order: cat's-eye, coral, diamond, emerald, pearl, ruby, sapphire and topaz. The condition of the enamel suggests that it saw some use during its day.

This interesting and perhaps unique object is part of the Nasser D. Khalili Collection of Islamic Art and the information is taken from the catalogue of part of that collection — *The Gems and Jewels of Mughal India* by Pedro Moura Carvalho (Nour Foundation, London, 2010). This lavish and scholarly catalogue of 155 objects also includes a chapter on gems and their settings, which covers the gems used in Mughal objects, their nature, origin and contemporary documentation.

The yo-yo has been described as one of the world's oldest toys, although apparently it was originally used as a weapon. For information on the history of the yo-yo have a look at http://www.spintastics.com/SSThistyo.html.

Yo-yo set with cat's-eye, coral, diamond, emerald, pearl, ruby, sapphire and topaz. Nasser D. Khalili Collection of Islamic Art, Copyright Nour Foundation. Courtesy of the Khalili Family Trust.



Above: Photos showing the two separate enamelled and gem-set yo-yo casings. From Nasser D. Khalili Collection of Islamic Art, Copyright Nour Foundation. Courtesy of the Khalili Family Trust.

Fabergé

On 17 October the Hermitage Foundation UK, the UK support group for the Hermitage Museum, St Petersburg, held an evening reception at the London residence of the Russian Ambassador. On display were life-size photos of 20 pages, extracted from an album of 57 pages of design drawings from the Fabergé studio. These drawings show almost 1300 designs for tiaras, necklaces, pendants and brooches. The individual design drawings had been cut from sketch books and glued into the folio-sized album.

The recently 'discovered' album is in poor condition — the leather covers are falling apart and many of the drawings have lost their glue and are falling off the pages. Major conservation and restoration is required, for which The Hermitage Foundation is fundraising.

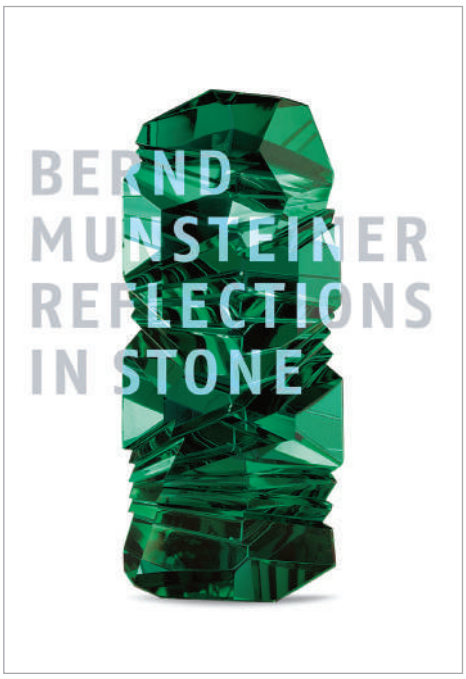
The Foundation is also collecting sponsorship for a new Fabergé museum, set to open in the nearby General Staff Building, a fabulous yellow and white Neo-Classical building by Rossi which faces the Winter Palace across Palace Square, St. Petersburg. It formerly contained the Imperial Ministries of Finance and Foreign Affairs. It is currently undergoing a complete renovation and is due to open in 2014, the 250th anniversary of the foundation of the Hermitage by Catherine the Great.

J.O.

Above: A design for a spectacular necklace in diamonds and green gems as shown in one of the sketches in the recently discovered Fabergé design album. Photo courtesy of the Hermitage Foundation UK. Copyright The Hermitage Museum.

Book Shelf

Cut art



Bernd Munsteiner: Reflections in Stone, 2nd Edition.
Edited by Wilhelm Lindemann. Arnoldsche, Stuttgart, 2011.
Text in German and English.
Hardback, 224 pp, 219 colour illustrations.
ISBN: 3-89790-203-9
Price: £45.00

Bernd Munsteiner, one of the world's best known gem artists, began to focus on natural mineral forms in his sculptures in the 1960s — the first contemporary artist to do so. Initially Munsteiner used agate, but then moved on to transparent stones, celebrating not only their transparency and colour but seeing the beauty in their unique characteristics — what the gem trade typically disparaged as flaws and impurities. Over his forty-year career, Munsteiner has worked on a spectacular scale, including an 850 kilo rutilated quartz and the 35 cm high Dom Pedro Ondas Maritimas, cut from a piece of Brazilian aquamarine weighing 10,395 ct. However, among jewellers and jewellery collectors, Munsteiner is perhaps better known for his more conventionally-sized gems in a wide variety of gem materials, cut with the combination of accuracy and gracefulness that characterizes his work. The volume, containing superb photographs of 140 examples of his work, is a beautifully produced tribute to the artist, bearing witness to his extraordinary skill and innovation.

Included in the volume are essays on the man and his art. There is a brief history of gem cutting, as well as some photos of the cutting of the larger works.

J.O.

Exhibitions

Akelo's treasures

Bentley & Skinner celebrate 25 years of a Roman master goldsmith.

During November 2011 Bentley & Skinner (Bond Street Jewellers) Ltd gave London a golden opportunity to view and purchase the work of Akelo, master goldsmith. Akelo hails from Corchiano in the province of Viterbo, Italy, a land once inhabited by the ancient Etruscans. Today much of the manufacture of jewellery has migrated to India and the Far East, yet Italy, steeped in its history of superior artistry, still remains the seat of master craftsmanship. Akelo's life vocation has been to rediscover the lost techniques of Etruscan goldsmiths and to endow his creations with the spirit and symbolism of their ancient counterparts. The result is a breathtaking collection of sumptuous jewels and objets d'art in gold, 70 of which were displayed at Bentley & Skinner (Bond Street Jewellers) Ltd. Best known as a treasure trove of fine and rare antique pieces, Bentley & Skinner is also a connoisseur of modern jewellery design from around the world, supporting the true fine jewellery tradition, particularly when craftsmanship and design follow the old parameters. In its elegant rooms at 55 Piccadilly, a tale of enduring artisanship was told.

Akelo's work is noteworthy primarily for his mastery of the ancient art of granulation; a technique involving adhering tiny gold spheres to a gold background to form decorative patterns and motifs. Dating back to 2500 BC, the technique was later perfected by the Etruscans in the sixth and seventh century BC, but disappeared from use for centuries until its revival during the Victorian era, brought about by the discovery of ancient jewellery at Pompeii and Herculaneum in the late eighteenth and early nineteenth centuries. Even Castellani, a jeweller revered for his archaeological style and fine craftsmanship in gold, was unable

1: 'SABIK', formed from gold, topaz, moonstone, garnet, sapphire and ruby and showing examples of granulation. Photo © Akelo.

to decipher the traditional methods used in granulation which have eluded generations of goldsmiths and scholars. The technique is twofold in complexity: individual grains of gold are first crafted into perfect spheres of uniform size, which must then be joined imperceptibly to the desired background or base. Conventional methods of goldsmithing cannot be used — soldering the grains would create a visible bond, whilst welding would cause the grains to melt.

Through years of detailed study, experimentation and dedication, Akelo has uncovered the long-buried methods used by the Etruscans and developed his own secret adhesive solution. In this exhibition, an ornate gold and gem-set rectangular box entitled 'SABIK' (**1**) exemplified his exquisite execution of this technique. The lid is decorated with layers of openwork rings, gold sheet discs and a ruby-set handle, while the lid and base are embellished with infinitesimal spheres of granulation in geometric arrangements, applied with such skill that they seem to float above the gold ground. The box is decorated with filigreed circles and wirework borders and set throughout with bright cabochon sapphires, garnets, moonstone and topaz.

The exhibition also included gold and gem-set earrings, pendants, necklaces and bangles. Akelo's pieces are nurtured into being by skilled and patient handicraft. His self-made gold, at just under 22 carat, has a lively yellow golden hue that glows in the sunlight. One pendant necklace, entitled 'AZHA' (**2**), is adorned with twisted filigree vine shoots and sculptured grape leaves, finely articulated in gold. The gold sheet pendant is embellished with round glistening cabochon sapphires and rubies, tantalisingly resembling fruit of the vine. A blood-red cabochon ruby sits at the centre of a filigreed rosette, injecting the pendant with life.

An affinity with nature is reflected throughout Akelo's collection, as is a concern for ancient mythology. He ties both motifs together, combining structural and decorative characteristics of the earthly and divine worlds in perfect harmony. Using 'fine dust' granulation, Akelo juxtaposes phytomorphic and zoomorphic motifs with geometric motifs, creating elegant ornamental patterns. Carnelian pendants, engraved with classical scenes or carved as cameos, are encased in wearable gold frames.

2: 'AZHA' necklace, formed from gold, garnet and sapphire. Photo © Akelo.

Uniting ancient themes and techniques with modern sensibilities and means, coloured gemstones (such as amethyst, emerald, iolite, rose quartz and tourmaline) with radiant gold, and function with ornamentation, Akelo's exhibition pieces appeal to jewellers, gemmologists, collectors and jewellery historians alike.

Akelo's work has previously been exhibited at the Museum of Art and Archaeology at the University of Missouri-Columbia, the Museum of Fine Arts in Boston, the Newark Museum, the Museum of the Gemological Institute of America, the Aaron Faber Gallery and the Fiera di Vicenza.

A selection of the exhibition pieces can still be viewed at Bentley & Skinner. For enquiries or to order a catalogue, please telephone +44 (0)20 7629 0651.

Sabrina O'Cock

About the author

Sabrina O'Cock is currently Jewellery Specialist at Auction Atrium, having previously worked at Bentley & Skinner and Christie's. Sabrina is an FGA and DGA and graduated from University College London with a BA in Italian and History of Art.

Stone Scoop

Pocket full of poesy

Jack Ogden takes a look at colour and poetry in gemstones.

True blue

Look at the three shades of blue shown above — which of these three comes closest to what you would consider the colour of the 'best' sapphires? Which looks most like the sky on a bright day? A small test here at Gem-A showed that most thought the 'best' sapphire was colour **b** or **c**, or something in between. The bright sky was unanimously colour **a**. The interesting thing is that if you ask most gemmologists or jewellers to name the best colour for sapphire they will say 'cornflower blue', and probably associate that colour with Kashmir sapphires. It is actually colour **a** that is 'cornflower blue'; a precisely defined shade of azure — a light blue. Its colour coordinates, if you are interested, are RGB 100, 149, 237.

I wonder if historically 'cornflower blue' meant something more like colour **b** or **c**, when sapphires were first compared with actual cornflowers? Cornflowers themselves are not much use as a guide because their colours vary, but we do have a description of the 'best' sapphires, written in 1852. This tells us that "Fine varieties of the sapphire have an extremely lovely blue colour, like a bright sky or the blue cornflower." That certainly suggests that the sapphires most revered back then were more like colour **a**, and in line with our modern colour definition.

Maybe we need to be more wary about the sapphires we describe as 'cornflower blue'. We also need to consider the almost instinctive mental link most of us have between 'cornflower blue' and the sapphires from Kashmir. That 1852 description, and some other old comparisons of the finest sapphires with cornflowers, predate the discovery of the Kashmir stones.

I always did like those pale Sri Lankan sapphires ...

Seeing red

Between proper disclosure of gem treatments and no disclosure at all comes a wide variety of what we might term 'quasi-disclosure', ranging from the abominably ignorant to the highly ingenious. On sale at IJL in September were some standard glass-filled rubies labelled simply 'rubies', but on request a 'mini-cert' was provided which had words to the effect of: "Heat treated. Traces of glass residue in fissures." The sellers were stretching the meaning of the word 'trace' even more than their customers' gullibility.

Rhyme and reason

Today it is often pointed out that while the precious metal components of UK jewellery have to be hallmarked to aid customer confidence, gems set in those metals are devoid of any kind of official control. This is not a new situation, as demonstrated in the 330-year-old volume titled *Money masters all things, or Satyrical poems*, published in London in 1678. This book consists of a large number of short satirical poems on various trades and professions (including lawyers, of course). One on goldsmiths (Poem 66) explains that while silver or gold objects — plates, candlesticks, etc — bear a reassuring hallmark which largely prevented fraud, there were no such safeguards with gems. It is amusing and historically interesting, but, of course, totally scurrilous (I've modernized a couple of old spellings, but changed nothing else).

Poem 66

The Goldsmith when he shows and sells his Plate,
Cannot with ease impose or put a Cheat
On you because it's to be understood
Tis by the Standard try'd and mark'd for good.
But when you come amongst his Rings to gaze,
Diamonds and Rubies, Emeralds, Topaz,
Carbuncles, Hyacinths and many more,
Which he can show amongst his Radiant Store;
Pendants, Pearl Necklaces and Jewels too,
All which do make a splendid, glorious show;
To value these the Buyer wanteth skill,
So Goldsmith sets the Price down as he will;
If Money in his Heart bears rule then he
Will prize then it a very high degree.
Or if he's pleas'd to take mod'rate Gain,
As he will tell you yet tis very plain,
Let the Price which you do pay be what it will,
If afterwards you're forc'd to pawn or sell,
They'll say they gotten Water, and are foil'd,
So that the sparkling Lustre of 'ems spoil'd;
When as in truth they're not a Penny worse
Than when you bought 'em first. But O the curse
Of Money whose Delutions have the power
To make her Lovers right or wrong pursue her.
The things for which you Twenty Pounds have given
Perhaps they'll have the Face to bid you Seven;
Their Conscience says where Money does come in,
To swear, dissemble, lie, and cheat's no sin.

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