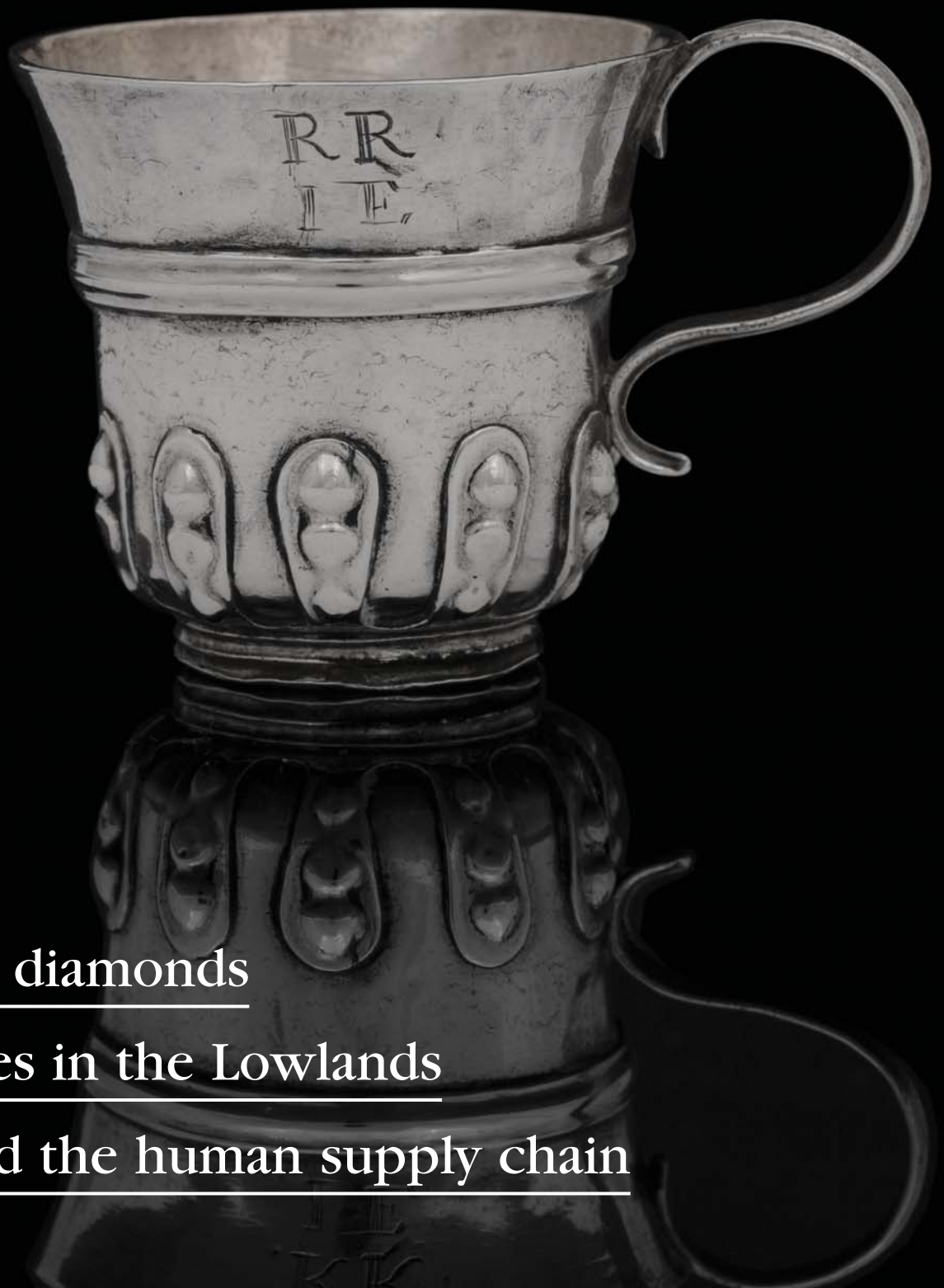


Gems & Jewellery

June 2014 / Volume 23 / No. 5



Synthetic diamonds

High times in the Lowlands

Ethics and the human supply chain



Gem-A
THE GEMMOLOGICAL ASSOCIATION
OF GREAT BRITAIN



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Gem-A Conference 2014 ...Book now to reserve your place

SATURDAY 1 AND SUNDAY 2 NOVEMBER

Business Design Centre, Islington, London

Gem-A will bring together a range of globally-renowned speakers and international delegates to discuss a variety of important issues within the gem and jewellery trade, from both a scientific and trade perspective. The Gem-A Conference audience will, as always, be a diverse mix of members of the gem trade, gemmologists, gem enthusiasts and gem students from all corners of the globe.

The Saturday Conference will be followed by a dinner open to all delegates.

Guest speakers include:

- ⊗ Edward Boehm GG CG ⊗ Thomas Hainschwang FGA ⊗ Craig Lynch GG
- ⊗ Bruce Bridges ⊗ Alan Hart FGA DGA ⊗ Dr Menahem Sevdemish FGA
- ⊗ Terry Coldham FGAA ⊗ Dr Ulrich Henn ⊗ Chris Smith FGA
- ⊗ Brian Cook ⊗ Richard Hughes FGA



MONDAY 3 NOVEMBER

Seminars

Gem-A Headquarters, 21 Ely Place, London EC1N 6TD

Guest seminar hosts:

- ⊗ Richard Drucker FGA GG, President of GemWorld International Inc.
- ⊗ Mikko Åström FGA and Alberto Scarani GG, GemmoRaman

MONDAY 3 NOVEMBER (EVENING)

Graduation Ceremony and Presentation of Awards

Goldsmiths' Hall, London

Guest speaker:

Tim Matthews FGA DGA, CEO of Jewelry Television (JTV)



Image (top) courtesy of Business Design Centre.

TUESDAY 4 NOVEMBER

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Gems&Jewellery June 14

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Any opinions expressed in *Gems&Jewellery* are understood to be the views of the contributors and not necessarily those of the publishers.

One might think whilst reading these pages that life at Gem-A is just one conference or show after another, and glamorous trips around the world. In a way you would be right; not so long ago I calculated the amount of time I had been out of the UK this year. Next year I'm declaring my residence in a tax haven as I reckon I could manage only 90 days in the UK! Joking aside, it is hard work and I have to thank the Gem-A team for all the effort that goes in to planning exhibitions and manning stands at weekends. Someone recently asked me why the gem and jewellery industry insist on having events at the weekend. The insinuation was that until, like other professions, we can run events during the week and take them seriously enough to take time out of our businesses, we will not be a serious profession. That may or may not be true, but these events provide crucial opportunities to meet people and share knowledge. From our point of view it's the best way to spread the gemmological message. If you don't get to visit one of the many shows or conferences held around the world, do try.

Nomenclature: I threatened you with this a couple of issues ago, and having spent roughly 15 hours in CIBJO steering committees harmonizing the *Blue Books*, I can tell you it is not a subject to be taken lightly. If you turn to my report on page 14, you may be surprised at some of the results. However, I can tell you that these are not just a bunch of arbitrary rules; we at Gem-A expect our members to adhere to the nomenclature laid out in these books in order to uphold good practice within our industry. This may of course necessitate some amendments to our own course notes.

Good practice and ethics in our industry are, in my view, critical to the survival and flourishing of our business, as you will know from the last few issues. As custodians of 'good practice' (what is that by the way?) we can all do our bit. We have to educate our staff, our suppliers and our customers. We must disclose and, if we don't know, say so, and then follow the advice of Willie Hamilton and the Company of Master Jewellers: "Just Ask". The ethical argument will be discussed at our AGM on 12 June at our Ely Place Headquarters when Vivien Johnston, our new Ethics manager and chair of the Jewellery Ethics Committee UK, will talk about the evolution of this process and challenges within the UK market. I hope to see as many of you as possible — email events@gem-a.com to book your place. See page 11 for Vivien's article on 'Ethics and the human supply chain'.

By the way, if anyone fancies taking on the travel aspect of this job then be my guest! You will rapidly become an expert in hotel rooms, conference facilities and exhibition halls. Don't hold your breath for any sight-seeing though...

James Riley
Chief Executive Officer

Cover Picture

An early eighteenth century silver tot cup. Maker's mark only for William Scott of Banff, circa 1700. Photo courtesy of Bonhams. See Recent Events, page 18.



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Gem news

Edward Asscher elected president of WDC

The board of directors for the World Diamond Council (WDC) has elected Edward Asscher, a fifth-generation diamantaire who heads the Royal Asscher Diamond Company of the Netherlands, as its new president.

The vote for WDC officers took place during the first formal meeting of the organization's 20-person board. Asscher will serve as president for a single two-year term, following which he will be succeeded by the sitting vice president. Andrew Bone, the head of government and industry relations for De Beers Group, was elected the WDC's vice president and Ronnie VanderLinden, the representative of the US coalition and the president of the Diamond Manufacturers and Importers Association of America (DMIA), was elected treasurer.



Asscher (left) who was born in 1946, began working at the family-owned Royal Asscher Diamond Company in 1970. He served as president of the International Diamond Council from 1990 to 2008, is a past president of the International Diamond Manufacturers Association (IDMA), and is vice president of the European Council of Diamond Manufacturers. Outside of the diamond industry, he is a past president of the Dutch Liberal Party and served as a senator in the Dutch Parliament from 2007 to 2011.

"I am looking forward to continuing the work of both my predecessors, to whom we all are grateful," Asscher said. "The board and I will give new energy to implement the

Kimberley Process, which has been so successful in preventing conflict diamonds getting into the trade. Consumers must remain able to maintain confidence in our products, and the wellbeing of all who are involved in the diamond trade must be the focus of our mission. That is the legacy which I want to be able to pass on to the next generation of young adults who work in the diamond industry, wherever in the world."

Multiple awards for Jewelry Television® CEO

Tim Matthews, CEO of Jewelry Television (JTV), has been awarded the top three diplomas attainable in the gemstone industry: the designations of Fellow of the Gemmological Association of Great Britain (FGA) for passing the Gemmology Diploma, Diamond Member of the Gemmological Association of Great Britain (DGA) for passing the Diamond Diploma and Graduate Gemologist (GG) from the Gemological Institute of America (GIA).

In what may be an unprecedented achievement, Matthews completed all the required coursework, research, laboratory

exercises and exams to earn each of these distinctions in just over a year. This required overlapping coursework starting in the summer of 2012, then completing his GG program in August 2013, the DGA program in December 2013 and the FGA program in January 2014. These designations signify the maximum level of educational achievement available in the gemstone industry.

"Tim Matthews is setting the standard for continuing education and meeting the elite expertise expectations of our customers," said Donna Burns, JTV's chief service officer. "As the largest retailer of loose gemstones in the world, it is our mission to create a culture that conveys the highest

standards of industry knowledge."

Matthews said he tackled the challenge of being a full-time student while holding down his day job because, "our global business requires us to be more knowledgeable than ever. Completing the FGA, DGA, and GG requirements will reinforce the message that JTV values education and encourages learning at all levels of our business."

New world record set by Sotheby's

Last month's sale of Magnificent Jewels and Noble Jewels at Sotheby's in Geneva established a new world auction record for a jewellery sale by achieving a total of \$141,492,079. The auction on 13 May was 88.7% sold by lot and established seven new auction records as buyers from 30 countries competed throughout the day, with colourless and coloured diamonds proving to be the top lots.

The pinnacle of the sale was the 'Graff Vivid Yellow' — a rare 100.09 ct VS2, cushion-shaped, fancy vivid yellow diamond ring that was sold to an anonymous buyer who was present in the room for \$16,347,847, a new world record for a yellow diamond.

The second top lot was a 70.33 ct, D flawless, type Ila, cushion brilliant-cut diamond with 'excellent polish and symmetry' as determined by the GIA. This diamond sold to an anonymous private bidder for \$14,201,354. A new world auction record price per ct was achieved by the sale of a 25.32 ct, D, IF round brilliant-cut diamond graded by GIA as type Ila with excellent polish, cut and symmetry, which sold for \$6,246,702, or \$246,710 per ct.

A marquise-shaped, 12.07 ct, internally flawless, fancy pink diamond ring was purchased by London jeweller David Morris for \$7,256,816, establishing a new world record at auction for price per ct at \$601,228. Another auction record was set for price per ct with a 10.11 ct, VS2, fancy light pink, round brilliant-cut diamond that sold for \$3,973,944, or \$393,071 per ct.

Gem-A events

Gem-A AGM

Thursday 12 June — 17:30–20:00

Gem-A Headquarters,

21 Ely Place, London EC1N 6TD

Vivien Johnston will give a talk on the importance, necessity and evolution of ethical jewellery and gemstones in the UK.

Field Trip to Idar-Oberstein

21–28 June

Gem-A, in collaboration with Deborah Mazza and Sharon Dale, have organized a fantastic line-up to Idar-Oberstein, from 21 – 28 June 2014. Gem-A will take you 'closer to the source', allowing you a unique opportunity to visit museums, mines, the German Gemmological Institute, lapidaries and much more.

For more information visit www.gem-a.com/news--events/events/gem-a-field-trip-to-idar-oberstein.aspx or contact events@gem-a.com.

Gem-A Conference 2014

Business Design Centre, Islington

1 and 2 November: Conference

3 November: Seminars

4 November: Natural History Museum visit

Early bird bookings now being taken!

Contact events@gem-a.com for a booking form.

Gem Central evenings

Gem Central evenings take place once a month, at the Gem-A Headquarters from 18:00–19:30. Booking is essential.

Organic or imitation?

Monday 16 June

Join our gemstone challenge and test your skills.

All Gem Central evenings (except Specialist evenings, priced separately) are free for Gem-A members and Gem-A students; £5 for non-members.

Gem-A Workshops

Our range of introductory 'Understanding' workshops are ideal for jewellers with no gemmological background, or for anyone who needs a refresher. The intermediate 'Investigating' workshops are for gemmologists and jewellers with gemmological knowledge.

Understanding gemstones

Thursday 28 August

Gem-A Headquarters, London

This one-day workshop will provide you with the perfect introduction to the fascinating world of gemstones, and is perfect for retail staff. Covering all aspects of the most popular gems (ruby, sapphire, emerald and others), you will learn about origin

Show Dates

Gem-A will be exhibiting at the following shows:

International Jewellery London (IJL)

Stand J31, Olympia London

31 August – 2 September

Hong Kong Jewellery & Gem Fair

*Booth 3M046, Hong Kong Convention and Exhibition Centre
15 – 21 September*

and lore, as well as the more practical aspects of their physical properties, including care and caution advice.

Gem-A/NAG/BJA Members and Gem-A Students: £100, Non-members: £120

Understanding practical gemmology

Friday 29 August

Gem-A Headquarters, London

This one-day workshop focuses on the practical aspects of gemmology, and covers the effective use of all the readily available instruments and testers that you are ever likely to need. The 10× lens, polariscope, spectroscope and refractometer are all looked at in detail, and, under the guidance of our expert tutors, you will quickly learn the basic principles and techniques needed to use them efficiently. Previous practical experience is not necessary. By the end of this workshop you will be able to use the equipment correctly and have an appreciation for their value in testing. *Gem-A/NAG/BJA Members and Gem-A Students: £100, Non-members: £120*

The Gem-A Photo Competition is now open!

Submit your photographs for the 2014 Photo Competition and you could win a year's FREE Gem-A Membership. There are four categories under which an image may be submitted:



Last year's winner by Michael Hügi FGA

Natural – Must be a digital photograph (including photomicrography) with minimal post-production work (may include basic cropping, contrast and minor hue/saturation adjustments).

Treated – Digital photograph (including photomicrography) with significant post-production work (such as background manipulation, HDR and contrast masking).

Synthetic – Computer-rendered 3D models of gemstones, crystals, crystal structures, images from microtomography, etc.

Melange – This category covers any gem-related image that doesn't fit in the above and may include such things as photos of a spectrum, a scanning electron microscope image, mining, cutting, etc.

The subjects may include any type of gem material (including organics), crystals or cut stones, and internal or other features of these. Jewellery settings may be included, even wearers, but the gem or gems must be the main subject. In the case of categories 1, 2 and 4, the original photo as taken, with no cropping or manipulation whatsoever, must also be submitted to us.

Please submit all entries to editor@gem-a.com by Friday 19 September 2014, taking care to read the Rules of Entry first. For more information and for Rules of Entry, please visit www.gem-a.com/membership/photographic-competition.aspx

Letter from the President

Synthetic diamonds: transparent or invisible?

Harry Levy discusses the need for full disclosure of natural and synthetic diamond.

Editor's note: In this open letter to the trade Harry Levy, Gem-A President, discusses what is probably the most important issue facing our trade right now. There will be those who disagree with his stance and some of what he says, but we cannot ignore the realities of life. I suspect that with Ronnie VanderLinden (an advocate of synthetics and the role they have to play in our industry) taking a leading role in both the WDC and the US diamond associations, the trade will come to terms with them sooner rather than later. But think on this: with the main diamond producers predicting significant drops in production of natural stones in the next 25 years, and a scenario where mines will be exhausted in 50 years, we will need an alternative. With diamonds, as with everything else, it's about sustainability.

At the time of writing many in the diamond trade regard, or perhaps hope, that synthetic diamonds are a passing phenomenon, and if we don't discuss or talk about them, they will simply go away. This tactic could work if everybody else did this, but unfortunately, while we bury our heads in the sand (and expose other parts of our anatomy), others will push the product unhindered.

Israel has banned synthetic diamonds from being brought to the Exchange floor — the excuse given is that they may be confused and changed. In my 50 years of Bourse membership I have rarely known stones being confused or changed. I know several cases where stones get 'flicked' and disappear into thin air, never to be found again — showing the honesty of some of our members. The Israeli Bourse is free to advocate what they want — they have acknowledged that synthetic diamonds are a legitimate product — but the action ultimately means that they are supporting the trade in natural diamonds, and hindering the trade in synthetic diamonds.

In the past few months there have been meetings in Antwerp and India designed to prevent synthetic diamonds getting into the supply chain. We are advised to print statements on our invoices, to the effect that all the goods sold are (guaranteed to be) natural, and also untreated. I wonder how many undisclosed HPHT diamonds circulate in the supply chains. At best this scheme is a case of the blind leading the blind. I can fully trust my supplier for his honesty, integrity and ethical standards, but his knowledge of gemmology is no greater than mine. A synthetic diamond will get into the supply chain when one person buys a synthetic diamond and knowingly sells it as a diamond without disclosure. Should this be discovered further down the supply chain, we are advocating that we punish those people who show a purchase invoice containing such a message as their defence that they bought the stone in good faith. This is not an excuse that would stand up in any court, it is hearsay evidence, and the seller can be regarded as acting without due diligence. Printing such disclosure solves little as it is a positive

statement which may prove to be a lie. Without such a statement the seller may be accused of ignorance, and with it he will be probably accused of fraud.

The simple solution is to call diamonds 'natural diamonds' if the seller can defend this disclosure.

Calling a diamond a 'natural diamond' is another long standing 'bogey' in the diamond industry. For years we have had the 'defence of the diamond', in that a diamond is regarded as a natural diamond if used without further qualification. This is a trade ruling not known to consumers. Many still argue that simply using 'diamond' refers to natural diamond. Unfortunately synthetic diamonds are also diamonds, the only difference is their origin, and this does not stop them from being called diamonds. I am not advocating that synthetic diamonds should be sold as 'diamond' but they need disclosure, meaning that slowly, natural diamonds are beginning to need disclosure too.

Trade leaders are scared to be seen to recognize synthetic diamonds as a legitimate product, and must show the trade that



they are there to defend the natural product. They fear that should anything happen to the diamond trade as we know it, they will be blamed and held responsible for any decline in trade.

Synthetic stones have been sold for many years with few problems. Most disclose this fact, although there are a few who cheat — but these don't tend to be regulars in the trade. It is simply wrong to believe that cultured pearls drove out natural pearls and conclude a similar thing will happen to diamonds. Cultured pearls became popular because natural pearls became hard to find. This came about because of over-fishing of the oysters and pollution from oil production in the Persian Gulf. Today natural pearls are rarely found; they fetch very high prices and can usually be found only in up-market jewellery stores and auctions. At present there is a debate to drop the term 'cultured' for pearls, call cultured pearls simply 'pearls' and qualify the term for natural pearls and sell these as 'natural pearls'.

A similar thing will not happen to synthetic diamonds as there are too many natural diamonds around, and there are excellent prospects of finding many more through mining. A problem will arise in detection of smaller stones, however — those below 10 points. Here positive detection will be difficult; the synthetic product will be better looking than the lower grades in the natural stones and will be considerably cheaper when compared to similar-looking natural stones. I envisage consumers will eventually demand some sort of guarantee and certification of 'natural' status for larger stones. The demand for such certificates will outgrow the demand for grading reports.

So far all the attempts at solutions advocated by the trade have looked down the distribution chain. Debates about terminology and how to disclose will probably go on for some years yet, but we should now look at the second stage of our work. We must look up the supply chain to get a better understanding and control of synthetic diamonds. We must identify the synthetic diamond

producers, not the cutters and distributors. They must organize themselves, and I am sure none will want to sell their product other than as synthetic and man-made.

Going further up the chain we must identify those who produce the machines that make synthetic diamonds. I don't know if we will get resistance on this point as being trade secrets, but it is essential that we know who these people are and know those who buy these machines. Perhaps some machines are produced in-house by the creators of synthetics themselves, and they will probably wish to keep them for themselves; but it is a huge engineering process to produce such machines. Exactly how they are used to produce stones can remain as trade secrets — we are not after recipes.

If those producing and selling natural diamonds continue to ignore synthetic diamonds, they will ultimately drive the business underground and harm themselves and everybody else involved. To protect the trade in naturals, trade leaders should produce arguments as to why natural stones are better than synthetic ones. One powerful argument is that natural diamonds are limited; all the stones have already been produced by nature and so one aspect of value is rarity. Quartz is very abundant, hence it is cheap. In comparison, the supply of synthetic diamonds is limitless. Natural diamonds have aesthetic, emotional and historic value; synthetic diamonds have none of these.

I suppose some in the trade will regard this letter as mischievous, or even as treason to my colleagues. This is not my intention. I hope all will look again at their own prejudices and help us overcome the present polarizing situation.

To allay another fear, we are not helping these producers to sell their products; we are protecting the trade in naturals by giving as much information as possible to consumers for them to make an informed choice. If we continue to hide synthetic diamonds we will give the impression that they are somehow 'better' than natural ones. Being transparent will help everyone; being invisible will help no one.

Gem-A Shop

Don't miss this month's SPECIAL OFFERS on instruments and books from the Gem-A Shop.

Visit www.gem-a.com/shop.aspx

Support your local gemmologist

Grenville Millington FGA investigates a mystery blue stone and explains his method for calculating RI.

Gemmologists are used to hearing statements such as: "I know it's an alexandrite, but I just want to make sure." In other words, the owner has been told or always believed the gem to be of a certain identity, although they have no way of proving this for themselves. Another example I remember hearing is: "I've been in the trade for over 20 years so I think I know a ruby when I see one." This was accompanied by a mounted red stone, which the manufacturer left with me just to make sure. In fact, it was a synthetic ruby.

Recently I was presented with a ubiquitous polythene bag holding a large gent's ring. Through the polythene the ring looked like it was a silver mount set with a light- to mid-blue stone of somewhat garish colour. Because of the size, synthetic blue spinel (imitation aquamarine) instantly came to mind.

The client, who usually deals in and presents me with expensive natural stones, asked me for my opinion on the ring. He then gave me two emeralds and three blue sapphires for testing, plus the ring in

the bag. I was given several days to look at these items, and you can guess which one I looked at first.

The ring was heavy, weighing 30.1 g. When examined in daylight (always the best light in which to look at gems) the white mount had no punch marks inside but showed slight yellowish colouring on worn areas under the rhodium plate and so, coupled with the excessive weight, I presumed that it was 18 ct white gold (I might be known as a gemmologist but I've handled gold for just as long). In scrap gold alone it would be worth around £500 — maybe the stone was worth looking at after all!

As previously mentioned, the stone looked like synthetic blue spinel, but it also had a look of treated blue topaz commonly seen today — not quite the 'Swiss blue' and not quite the 'London blue' (1).

The stone was approximately 16 × 14 mm and had a 'chequerboard' style of faceting. Although the mount showed definite signs of wear, there were only slight abrasions to the facet edges. I placed the ring under the halogen lamp and reached for the Chelsea Colour Filter — a pink result would mean synthetic spinel, and a brown colour (the same colour as a manila envelope) would possibly mean treated blue topaz. The stone appeared green! Which light- to mid-blue stones appear green under the CCF? Aquamarine and certain types of glass imitation aquamarine came to mind. Next I used the refractometer, and this gave a negative reading, meaning the refractive index of this stone was beyond the instrument's normal range. Far from



1: Large ring mount weighing 30.1 g.

being negative for me, this was rather positive, leading me to believe the stone might be a CZ or YAG, or some other synthetic/manmade material. All I had to go on for now was the fact that the refractive index (RI) was over 1.785 (it says 1.79 on the label of the RI liquid, but I have never been able to get it to show more than 1.785).

The polariscope showed the stone to have a strain pattern, suggesting single refraction. Long wave ultraviolet (UV) produced a very dull green, whilst the short

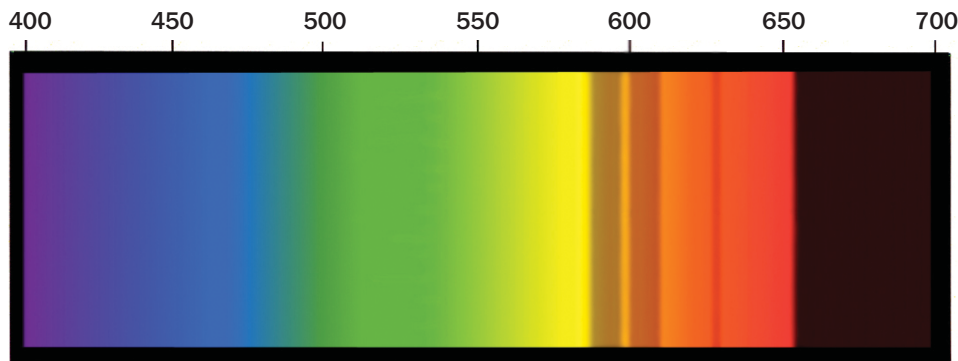


3: Microscope focus knob with protractor tacked on.

wave UV produced a dull, slightly chalky green. The spectrum seen is shown in 2.

The spectrum was definitely a positive result, but unfortunately my personal handbook of spectra did not include it (only light blue CZ was shown with rare earth lines across the yellow section at 570–600 nm). I needed an RI and so the microscope had to be put to use (I should say that an examination of the stone under the microscope alone yielded nothing except the lack of doubling of back facet edges).

In order to obtain the RI using a microscope, the procedure needs to be carried out several times and the average taken. The three results obtained for the



2: Absorption spectrum of blue stone.

blue stone were 2.14, 2.10 and 2.22, giving an average RI of 2.153. I was thus more than reasonably confident that this stone was a CZ. I had not examined a specimen of this colour tone before (hence the lack of spectrum data in my personal handbook). A quick look on the internet showed that this colour CZ is listed as 'Swiss blue' and is quite popular for those who trade in it. I could buy 15 pieces this size for US\$120, plus tax and postage, which would work out at around £6 per stone. You may recall that the scrap gold price for the mount was around £500. What was going on?

When the client returned to collect his gems I conveyed to him that it was my opinion that the stone in the ring was CZ. The client questioned whether it could perhaps be a sapphire, to which I replied that it was highly unlikely, based on colour alone. My client informed me that the owner of this ring paid £15,000 for it, having been told it was a rare sapphire. Let us pause here whilst you read that last sentence again. Sometimes we forget

that there are people out there who have no knowledge whatsoever of the gem or jewellery trade and have to rely completely on what they are told.

My client thought that the stone could actually be a treated blue topaz, and told me that that was why he brought stones to me for checking. The moral of the tale may well be 'support your local gemmologist,' or 'sign-up for a gemmology course'. For those wishing to sign up, check out Gem-A's range of courses and workshops at www.gem-a.com/education.aspx.

Using a microscope to determine RI

I have used the microscope method to determine RI for many years, but recently I've developed a protractor and adhesive putty method that is quite easy to carry out (3).

By applying a large protractor to the focusing knob of the microscope and an adapted paper clip to the head/pod, I can get a good, approximate result by measuring



4: Paperclip with 'double' pointer (left), showing line of vision is set for all readings (right).

Hands-on Gemmology

Support your local gemmologist (cont.)

the apparent depth of a stone. To do this you focus on the uppermost point (the table surface), then focus down to the lowest point, such as the culet, and measure how far the microscope body has moved. The downward movement of the body that is equal to the apparent depth of the stone is converted into degrees of a circle indicated on the protractor. Having tried this out I know that (on this microscope, at least) 20° is equal to 1 mm. I can also measure the actual depth of the stone with a Leveridge gauge. After converting the degrees to millimetres it is a simple matter of dividing the real depth by the apparent depth to find the RI. It is essential with this type of test to carry it out fully more than once and take the average; three is usually sufficient as, unlike the focal length of a microscope optics lens, the eye's lens is variable.

The larger the protractor the better and, although I only use the usual 180° protractor, the 360° circle would be easier to use as you can start anywhere around the circle; with the 180° version it has to be positioned in such a way that the movement of the microscope body is facilitated by the 180° of the protractor. Adhesive putty secures the protractor to a focusing knob and also allows a bent wire paperclip to be held by the appropriate part of the head. Due to parallax, the wire of the paperclip should be twisted to form a 'double' pointer to enable you to look along exactly the same line of sight each time (4).

Before first use on an unknown stone, you will need to work out how many degrees your focusing knob moves through to give a 1 mm movement in the microscope body. To do this, measure the actual depth of a handy gem or object under these conditions using the degrees conveniently marked out on the protractor (and using the average of several attempts) and compare this figure to that obtained by physical measurement, such as with a Leveridge gauge. To determine the actual depth with the microscope, you will need to place a flat plate or glass slide across the darkfield area, and perhaps use an overhead light. Place a gem table-down on the plate and

5: Olive-green stone with RI over 1.79.



set the focus to the upturned culet point and note the reading. Then remove the gem carefully and rack the focus down to the top surface of the plate or slide (if using a glass slide ensure the focus is on the upper surface, not the lower surface — put a thumbprint or two on the top surface to provide something to see) and note this reading. The number of degrees turned by the focus knob that is equivalent to the millimetre body movement up or down the rack and pinion can then be worked out. I use the Olympus JM microscope, and my figure was nice and round at $20^\circ = 1$ mm. I've only tried this method on this microscope, so I cannot say how universal this figure might be. Readings can be made along the top edge of the protractor to about half a degree, which is accurate enough, and then repeated.

Example: the £15,000 CZ

Reading taken with focus on the uppermost facet surface was 35° and the reading

taken with the focus moved down to the furthest point (culet) was 121° , giving a difference of 86° . Divide the difference by 20 ($20^\circ = 1$ mm), which gives an apparent depth of 4.3 mm. The measured depth of the stone was 9.05 mm. To find the RI divide the measured depth by the apparent depth ($9.05/4.3$), which gives the RI 2.10. Repeat twice or more to gain an average.

Shown in 3 is the method being used on a mounted stone that, like the CZ, showed a negative refractometer reading (5). The results for this olive-green stone, which gave nothing away with its colour, were similar to the blue stone: this was also a CZ.

The method is not limited to gems with RIs over 1.79 of course, but there is no point using it if a refractometer can be used. If the setting of a mounted stone prevented refractometer contact then this method is extremely useful provided you can obtain an actual depth measurement. Failing that, you can support your local gemmologist and take it there!



Ethics and the human supply chain

Vivien Johnston, owner of Fifi Bijoux and Gem-A's new Ethics Manager, discusses the role of ethics in the gem and jewellery trade.

Across the jewellery industry there is a lot of thought being given to ethics and how to apply Corporate Social Responsibility (CSR) and best practice to our industry.

As a jeweller who has applied ethical sourcing criteria to my brand, I have experience of putting supply chain controls in place. It was as head of design for a commercial jewellery brand (until 2006) that I first became aware of some of the practical challenges of sourcing materials. I worked back from the brand's direct manufacturer to understand how they, in turn, sourced their gemstones and other components, and this helped me to understand the complexities of trying to achieve transparency.

What became apparent was that, even though the company I worked for was relatively small, its supply chain was nonetheless global and had far-reaching implications.

The reality of some of the conditions in manufacturing, gem production and gold mining sadly often reflect the horror stories we hear and imagine; child labour, vast environmental damage and horrific working conditions. Being in desperate poverty puts people in vulnerable positions, where they can easily be exploited. Manufacturing can also be challenging, with some factories still failing to meet even the most basic health and safety expectations.

I was concerned that these problems posed a threat not only to the reputation of the brand I was working for (which did try to avoid doing harm), but to the reputation of the profession as a whole.



Sapphire mines in Ratnapura, Sri Lanka.
© Fifi Bijoux.

What's particularly important is that the desperate reality for some of those who produce the raw materials is so far removed from the consumer's perception of luxury, prestige and exquisite craftsmanship that jewellers are renowned for. Customers trust their jewellers and, in turn, jewellers trust their suppliers. When we find out that major human rights abuses or extreme poverty is uncovered, it turns a beautiful craft into something that we find shameful.

The 'misterie' in our history

Ethics might be a hot topic right now, but is by no means a new one for jewellers. To give some historical context, in the sixteenth century the art of jewellery-making was sometimes known as the 'misterie of goldsmiths'. In 1576 the Goldsmiths' Company laid out a statute that prohibited the sale of fake gems in gold, or real gems in base metals. What's interesting is that the statute stated that it was prohibited to buy articles through the trade without knowing who the seller was! (Forsyth, 2013) This could perhaps be the earliest documented 'chain of custody' policy for jewellers and goldsmiths. It speaks volumes about the direct relationship between the goldsmith and his suppliers and to the intrinsic knowledge that the value of jewellery was dependent on reputation and consumer perception.



What is the true cost of a gemstone?

Ethics

Ethics and the human supply chain (cont.)



'Bahia' Limited Edition Collection design featuring 18 ct gold, diamond and gold rutile, by Fifi Bijoux. © Abby Wright.

Yet, somewhere in this 'global village' of gem cutters, dealers, goldsmiths and refiners the human element got lost. The route to market for a finished jewellery product, taking into account all of its components, is extremely complex. It is daunting, but it is possible for even the smallest change to make an incremental difference. Over time, even a minimal modification in business practice can mean vast improvements for those most vulnerable to poverty (and the social and environmental problems which typically result from it).

Emerging business models

In 2006 I set up my own business, a small luxury jewellery design company called Fifi Bijoux. I wanted to use my own brand to test out how far into the supply chain I could reach; to pilot a business model based on values of maximizing positive impacts for producers. This ideal would carry right through to the miners who produced the gold, gems and diamonds.

In order to do this I needed to think about the distribution of profit more evenly across the supply chain. This balance of profitability between the other ideals, planet and people, is often referred to as the 'triple bottom line'.

Sometimes phrases like 'triple bottom line' or 'CSR' can become abstract, an ideology which everyone can agree to in principle, but which falters at implementation. Supply chains are, after all, not static. They change depending on the needs of a business at any given time. Whatever the scale of business, the supply chain still needs to be able to react to the market; it needs to be fluid and something progressive, based on humans and not just transactions, and which is something to be part of and not something that's remote.

Dig in

When a jeweller decides to 'dig in' to their supply chains, there is probably going to be something in there that made them wish they hadn't. There will most likely be a loose connection to militia, child labour, or at least one incidence of sickening poverty.

What I have found though, is that for every supplier who works in horrific conditions, there are others that a retail business would be only too happy to broadcast as 'good news' stories. Without transparency, you have no way of knowing.

There can be, quite literally, 'hidden gems' within supply chains. Once the investigating starts, all kinds of amazing stories turn up and this often reignites a fascination for this incredible industry and the people who make it; a story that can be passed on to customers. Whilst it is imperative to address unacceptable labour or environmental problems as they become apparent, it is equally important to celebrate the triumphs of your suppliers too.

Grading tools

In the same way that a lab can offer an independent assessment of the quality of a gemstone, so too can similar grading tools



A beautiful acorn and oak leaf pendant made from 9 ct ethical gold. © Fifi Bijoux.

be applied to how well businesses meet the expectations of consumers. There are lots of existing systems in other industries and some of these might also be suitable as a reference for jewellery. We already have systems for responsible gold sourcing for members of the London Bullion Market Exchange. There are also programmes designed to address small scale gold mining, such as the Alliance of Responsible Mining's 'Fairmined' system, and the Fairtrade gold system.

Rough diamonds are governed by the Kimberley Process of course, whilst polished stones have no such global governance as yet. Coloured gems may be less prone to issues around conflict, but we still know that poverty is prevalent in this fragmented sector. Child labour, rush mining and disputed mineral rights are just some of the present challenges.

There are still some who believe that if we don't speak of it, the problems will cease to exist or won't permeate consumer consciousness. I believe this is wishful thinking and is often more borne out of a sense of frustration than a lack of will to make improvements.

Governance

Small, independent businesses have a different perspective to a large corporation — sometimes being small is an advantage.

For example, small businesses can be nimble or effect change far more quickly than a large corporation (albeit perhaps with a smaller target). A new economic factor will increasingly surface — the triple bottom line. This creates a huge opportunity. Supply chains are not static; they are human. In seeking to understand and measure the progress a business makes with its suppliers, it's in a position to create a positive impact with them.

For all the corruption, abuse, poverty and tragic circumstances which are inherent in the mining sector in the developing world, in jewellery there exists a unique pride and sense of camaraderie.

So could this pride be used to enhance business? Could it empower staff to strengthen relationships with suppliers? Would it actually be rewarding to be part of a process which builds capacity, and which improves livelihoods (in a measured way)? Would these actions even give the supplier an advantage over his or her competitors, as they become more efficient or even require less micro-management? Ultimately, could this become a competitive business advantage to attract added interest to the business or to bring new customers into stores? Could jewellers feel proud of the progress they make as a small business, and be able to give credible assurances to their customers? As someone who has tried it, I can answer a resounding "yes". My favourite moment of the design process is when I'm talking to a client about the materials (and those who produce them) and I see a light come on in their eyes, as suddenly the design becomes more than a piece of jewellery... it comes alive.



'Bahia' finished product.
© Collectif Argos, Paris.

Make a simple start

This is a journey. The beginning is to make it a simpler process for those jewellers who want to give assurances to their customers and for suppliers who are keen to access wider markets, in order to build strong, sustainable livelihoods for themselves and their communities. I've been working with the Jewellery Ethics Committee UK (JEC-UK) for the past few years and I've been extremely encouraged by the dedication of the CEOs of Gem-A, British Jewellers' Association and the National Association of Goldsmiths to promoting a dialogue about ethics. Improving transparency by getting to know more about your suppliers and having the right support from trade associations with a shared, clear objective is a very good place to start.

Ultimately, what's required is a credible assurance scheme, created especially to address the needs of small and medium enterprises (SMEs), and which reaches the consumer. This is something JEC-UK is developing for SMEs in the UK and has already acquired initial funding for. It will deliver a simple structured framework for SMEs to use as a tool to assess their own CSR strengths, to create a step-by-step action plan to improve and ultimately stitch together approved suppliers for a sourcing database.

I believe the industry can go beyond an 'audit and compliance' method and embed transparency deeply within its future. Additional methods such as 'peer to peer' learning, supplier engagement, critical thinking and education are all useful tools. After all, this is about continual measured improvements, not a one-time fix. This is a dedication to integrity and to honouring the exquisite materials and craftsmanship of a profession.

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Recent Events

CIBJO's Russian Spring

The Men from U.N.C.L.E. and All the Presidents Men... as witnessed by Gem-A's CEO James Riley FGA DGA.

May-time means CIBJO and this year year, with much trepidation, delegates from all around the world gathered in Moscow. This venue had been planned for some time and, while there might be some who would criticize (and subsequently boycott) the event due to political tensions, the jewellery trade is (for the most part) not about politics, and as the President, Gaetano Cavalieri, mentioned in both the opening board meeting and his opening address to congress, it is not for sale either.

These principles are the result of the people who come to CIBJO and have often, for many years, been strong supporters. In the UK we have two stalwarts in Richard Peplow, CIBJO Vice-President (and also my uncle) and our very own President, Harry Levy (known fondly to us all as 'Uncle Harry'). Now these two individuals might be rather different to Napoleon Solo and Illya Kuryakin, but nevertheless they are no less deadly in their business than Mr Waverley's men. Perhaps the Russian authorities felt so too, as Harry had visa problems — more of which later. So, I had my physical uncle, my gemmological uncle and, of course with Gaetano, my very own godfather...

This annual congress brings together the best of the trade. It is easy to be delusional about these things, but with 21 countries being represented — forgive me, the most important 21 countries when it comes to jewellery — if you are not involved then you have no grounds for complaint. As many of you will probably be fed up of hearing, CIBJO has social consultative status at the UN, and as an NGO is recognized by the UN as being one of the most influential and professional, with the ability to canvas grass roots opinion and effect change through the member organizations.

It was interesting to note that at the opening ceremony Gaetano roundly criticized those who would seek to make change and develop legislation to suit their own ends. Clearly this was aimed in part at the Precious Stone Multi Stakeholder Working Group — a body of individuals seeking to influence, among others, the Organization for Economic Co-operation and Development and who have convinced both the US and UK governments that they are representative of our trade. Fortunately the latter has seen the light. CIBJO has not been consulted on their much vaunted, but hitherto uncirculated, report. Gaetano made clear that CIBJO was there to represent all areas of the trade and not to assist legislation or activities which might disadvantage the most vulnerable in our trade. Change is both inevitable and necessary but Gaetano hit out at what he called ill-conceived legislation which did not consider its impact on local populations and economies. Governments make mistakes, but it is important to recognize those mistakes and put them right.



Dr Gaetano Cavalieri, CIBJO President, addressing the congress.

This whole issue of CSR, ethics and best practice was at the heart of the message that this congress sought to deliver. It might mean assisting our fellow man to put food in front of his child at the end of every day, or ensuring that what we do is sustainable for generations to come, or purveying our goods in good and proper manner to our customers whether they be trade or retail consumer. As we were in Moscow, Nick Paspaley of Paspaley, the leading producer of South Sea Pearls, commented that our business is like caviar. Not so many years ago one would have been served with so much caviar that by the end of the week one would have been sick of the sight of it. Today it is scarce, expensive and arguably of inferior quality. Paspaley spoke of the balance in aqua culture — an oft ignored indicator of our planet's health when compared to the rainforest in my view. If we cannot achieve sustainability of supply then we are in a dying business.

Overproduction and pollution will kill the very thing which brings our livelihood. The quality of the product will fall, making it less desirable, and we will descend into a spiral from which it is hard to escape. We don't want pearls to become like caviar. To that end, during the congress, Laurent Cartier of the Swiss Gemmological Institute (SSEF), demonstrated two new websites called 'Sustainable Pearls' and 'Sustainable Coral', which look at these issues and provide useful information. A new CIBJO Coral Commission has also been formed to look at how this precious resource is marketed and managed. The message from CIBJO is clear: sustainability, transparency and disclosure.

The Commissions are the heart of CIBJO and fall under three separate sectors: A, B and C — Gemstones, Manufacturing and Retail. Rumours of an after hours sector 'D' cannot at this time be verified! Before the congress many of the Commissions have steering groups and this year saw the culmination of the harmonizing of the famous *Blue Books* on gemstones, diamonds and pearls. This is not as easy as it sounds, as each area has its own special requirements. Every year the books are updated to cover new treatments or gem discoveries. The key issue is that everyone has to agree and the English language is not always as specific as one would like...

One issue was the definition of 'gemstone'. Traditionally one has described it as being a precious stone. This leads, of course, to horrible and misleading terms such as 'semi-precious'. In addition to this, if one looks up 'stone' in the Oxford English Dictionary (OED) it says: 'hard non-metallic mineral'. So if a gemstone is a precious 'stone', how do we classify pearls, amber, jet or even haematite? After much discussion the following was agreed upon: 'Gemstone: Natural inorganic or organic material/substance used in jewellery or *objet d'art* due to a combination of properties that provide them with beauty, rarity, and relative durability.'

Hopefully this will be submitted to the OED for their consideration. Nomenclature is always a thorny issue. We have mentioned before Fei Cui and the descriptors for jade. In an attempt to resolve these discussions a special working group has been set up to agree these terms.

It's not all had work at the congress though. We were fortunate enough to be able to go to the Bolshoi theatre and see Rimsky Korsakov's *The Tsar's Bride* which John Henn will be reporting on in next month's issue of *The Jeweller*.

Once the main event got underway the first important discussion was about the hot topic: synthetic diamonds. Dr Andrey Katrusha highlighted the volumes of synthetics that it is now possible to produce and the relatively low cost of set up. A CVD or HPHT are both in the region of \$350,000. His firm is currently able to grow stones of up to 10 ct, ten at a time. With a production time of



Greg Valerio of Fairtrade International (left) and Gaetano Cavalieri (right) sign the memorandum of understanding.

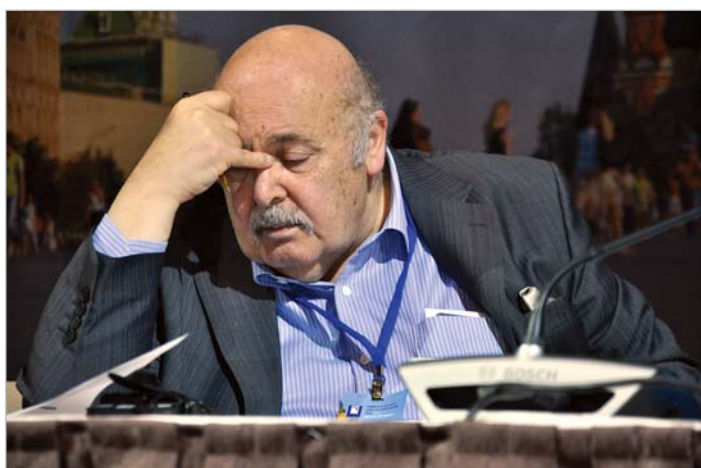
just ten days, CVD multiple machines can produce jaw-dropping amounts. Current synthetic production for industrial and gem quality stones is currently estimated at 6–8 billion ct.

This was followed by Simon Lawson of DTC and Ken Scarratt of GIA, who covered the detection methods and the new DTC melee sorter and the GIA GemCheck. Both of these devices are screening devices for further testing and not actual detectors.

Day two covered the issues of CSR and ethics with presentations by our own Vivien Johnston, Greg Valerio of Fairtrade — with whom CIBJO signed a memorandum of understanding — Gay Penfold from Birmingham City University, Marylyn Carrigan of Coventry University and Willie Hamilton from the Company of Master Jewellers. There was a presentation by Moya Mckeown and Chris Green of Carbon Expert, who over the last few months have been measuring CIBJO's carbon footprint in order to facilitate a carbon offset with an aim of being carbon-neutral. This laudable aim is something we should all be thinking about as part of our CSR, particularly with regards to sustainability.

Amongst other suggestions during the congress was the setting up of a jewellery 'Oscars' and even a jewellery 'saint's day'. I thought we had St Dunstan for that? Next year the CIBJO express will call at the former Brazilian capital of Salvador de Bahia; at the heart of the Brazilian gem trade, it promises to be an interesting trip.

So what happened to 'Uncle' Harry Levy? Unfortunately the authorities were not happy with his visa and refused to let him leave the country. A general alert went out and Gaetano mobilized support through the Minister of Finance, Head of Immigration and numerous other Russian dignitaries who had assisted with the conference. Harry was confined to his hotel for four days before going before a judge and finally being let out of the country. Our thanks go to Gagik Gevorkyan and Artak Udumyan from the Russian Jewellers' Guild for looking after Harry and organizing an excellent conference.



Harry Levy at the Diamond Commission meeting at the CIBJO Congress.

Recent Events

Nothing cuckoo about Switzerland

James Riley FGA DGA reports on the Swiss Gemmological Society's conference which was held on Sunday 4 May – Tuesday 6 May in Flüeli-Ranft, Switzerland.

As Andrew Fellows describes on pages 18-23, the Scottish Gemmological Association's conference in Peebles was yet again an excellent event. Why then would I happily leave early and turn my back on good whiskey, beautiful scenery and convivial company for the second year running? Last year it was CIBJO in Tel Aviv, and this year was a long overdue promise to attend the Swiss Gemmological Society's conference.

Fortunately I had a travel companion in Michael Krzemnicki, although I realized that I ran the risk of hearing the same presentation within 48 hours! I arrived at the Hotel Paxmontana after an hour and a half drive from Basel — the final few kilometres being up a narrow winding lane. I wondered what I had let myself in for, but being greeted with a beer by Brian Cook improved things greatly! I have to confess that there are few venues and places I visit in this job which one can say are truly exceptional. This is one. I woke to the sound of cowbells and a true picture postcard view of lush green meadows, dotted with myriad wild flowers, with the snow-capped Alps in the distance. What could be better? And then there was the outstanding array of speakers and delegates to look forward to.

The theme of the conference was tourmaline and having attended a one-day conference in Vicenza on tourmalines a couple of years ago, I did think that there was not much more to be said on the subject. How wrong I was! The great Henry Hänni opened proceedings with an overview of the different tourmaline groups. It could of course be argued that this stone is not so rare — it occurs in numerous localities

and varieties around the world. I recently saw a large specimen from Devon in the Natural History Museum, London. However, these different nuances are what makes it special and a vastly underrated gemstone.

Alexander Wild of Wild & Petsch gave an overview of the market and highlighted that values are increasing. We all know about Brazilian Paraíba tourmaline and the Paraíba-like varieties from Mozambique etc. which can command eye watering prices — €100,000 per ct for the stone I mentioned last month at the Basel show. However, stones such as the mint green Afghan material, which is very scarce and crucially not heated, is now commanding prices of up to \$1,500 per ct. This would have been unheard of for any tourmaline before the arrival of Paraíba.



James Riley and Peter Bosshart, Swiss Gemmological Society member.

Africa is a major source of this gem and Uli Henn gave us a tour of the deposits found in Mozambique, Malawi, the Congo and Rwanda. Michael Hüggi spoke of his visits to Indicolite mines in Namibia. In 2016 he plans a field trip there — one not to miss.

Also not to be missed was Brian Cook's excellent report on the Paraíba mines with an update on the current situation. I won't spoil this, as Brian will be reprising part of his talk at the Gem-A Conference in November, as well as speaking about rutilated quartz.

Catherine de Vincenti showed us the spectacular uses to which tourmaline has been applied in jewellery over the years. With prices of the big three coloured gems continuing to rise in the finer qualities, this was a useful reminder (if any were needed) of the place this stone could and should have, if only both retailers and consumers were better educated.

Finally, Dr Paul Rustemeyer shared his passion for tourmaline by talking about their formations, what gives rise to their colour and how often the crystal is eroded and will then grow again with new material. The photographs of his specimens, which have been sliced and then animated to show how the crystal has grown, are simply jaw-dropping. Paul has written three books on the subject — if anyone ever wants to do a tourmaline exhibition then he is your man.

Thankfully field trips to Burma have become possible again following the relaxation of sanctions. Walter Balmer described his trip with Michael Krzemnicki and Laurent Cartier earlier this year to Mogok. What is apparent is the large number of mines and the now almost industrial scale of mining, albeit with very low yields. This observation was echoed by Daniel Nyfeler of Gübelin, who gave details of Burma sapphires and particularly the Baw Maw mine. The rate of excavation over the

last 12 months is staggering. Walter is planning a field trip to Burma next year — something which, if you ever get the chance, is not to be passed up.

Walter Muff gave an overview of the Swiss diamond market and Rene Lauper on the pearl market — which contained some very interesting statistics. For example, seawater cultured pearl production is half the value it was 20 years ago — approximately \$400 million. The drop has of course been in Akoya pearls, with strong growth in South Sea and Tahitian pearls. Henry Hänni demonstrated many of the latest techniques in pearl identification and the fact that it is now possible to insert a chip into the pearl when the bead is inserted into the mollusc. Pearls were rounded off by Laurent Cartier who shared some of his PhD thesis on the DNA testing of pearls, by which means one can not only tell which species of mollusc the pearl came from, but owing to small regional variances it is possible in some

cases to pinpoint the locality from which the mollusc originated. This exciting research is right at the cutting edge of the available technology and will, I'm sure, be of great use in the future, in the battle to achieve sustainability in pearl production and in ensuring that species do not become extinct.

Diamonds were of course a hot topic, not least because of the synthetic debate — see the letter from Harry Levy on page 6. Jean Pierre Chalain of SSEF gave details of its new Automated Spectral Diamond Inspection machine. This can process up to 10,000 stones per hour using Raman and UV to separate out the less than 3% of type Ila and type lab, which require further testing with FTIR or low temperature photo luminescence. Thomas Hainschwang spoke about the challenge of identifying these HPHT and CVD-grown synthetics, especially in melee sizes. The consensus seems to be that there should be no problem in

detection and the threat is currently very small, but that the potential for large numbers in the future is huge.

Finally Frederick Schwarz gave an interesting presentation on the crown jewels of the Netherlands. Many of these survived the Nazi occupation and, like the British crown jewels, add a new dimension to the history of the country.

If anyone fancies an alternative to the British conferences then you won't get much better than this. True, it helps if your French and German are good, but with many of the presentations in English it's a truly cosmopolitan event. Besides, it's amazing how much you can follow if you know something about the subject. After Spain in January and now this, my gemmological Spanish and German are getting quite good! Thank you to Michael Hügi, Christoph Brack and all at SGS for making me so welcome, and I haven't even mentioned the cable car to get to dinner...

rock, gem & bead shows 2014

5th/6th July	Rock Gem 'n' Bead	Newcastle Racecourse, Newcastle Upon Tyne
2nd/3rd August	Rock Gem 'n' Bead	Kempton Park Racecourse, London
9th/10th August	Rock 'n' Gem	August Royal Welsh Showground, Builth, Wells
16th/17th August	Rock Gem 'n' Bead	Pavilions of Harrogate, Harrogate
20th/21st September	Rock Gem 'n' Bead	Newark Showground, Newark
25th/26th October	Gem 'n' Bead	Newton Abbot Racecourse, Newton Abbot

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Recent Events

High times in the Lowlands

Andrew Fellows FGA DGA reports on this year's SGA Conference, held over the weekend of Friday 2 May – Monday 5 May.

The 2014 annual Scottish Gemmological Association's Conference was held at the Peebles Hydro Spa Hotel, in the small town of Peebles, situated in the Lowlands of Scotland.

Following registration and a drinks reception, the conference kicked off with its first speaker, Malcolm Appleby. Malcolm got the evening off to a rousing start with a talk about his life as a silversmith, accompanied by a slideshow depiction of many of his works. After starting his career as a gun engraver at the family business of John Wilkes in Soho, Malcolm quickly gained access to the Royal College of Arts, where he was amongst the first to fire gold onto steel, a feat which had previously only been achieved accidentally, and never used as a design feature. Malcolm discussed how he had followed his own path, and has never been afraid to produce pieces that reflect his personality and love of all things natural, even when producing commissioned pieces for well-known personalities such as Margaret Thatcher.

After Malcolm's talk, guests retired to their rooms (or the bar), prior to the first evening's buffet-style meal — providing a chance to catch up with past acquaintances.

The next morning we awoke to a beautiful Scottish morning, with sun and mist visible over the hills and valleys. The first speaker for the day was Dr Michael Krzemnicki, director of SSEF in Basel, Switzerland, with his talk entitled: 'The quest for Kashmir sapphires and Burma rubies — origin determination'.

Origin determination in gemstones is an area that will always play a major role in the gemstone market — increasingly more so with the greater level of analysis possible from most well-equipped labs. This area is not solely reliant on high tech equipment, however. Most origin determination is down to expert opinion based on scientific observation — there can be a difference between the final locality decided upon between labs. The most important part of the observation process is comparison to



'The Brenton Jewel' — platinum and gold, engraved and set with sapphire and multi-coloured diamonds, 2014. © Malcolm Appleby. Photography © Philippa Swann.

known samples. From this an educated theory as to locality can be made, based on the weight of evidence.

On the instrument side, Michael listed several that have proved useful in his work — the Raman spectroscope being high amongst these. Analysis of colouring elements, by way of UV-Vis spectroscopy, could be used to separate sapphires from Kashmir, Myanmar, Ceylon and Pailin, as all gave different peaks. For example, a line at 450 nm is never seen in true Kashmir sapphires due to the lack of Fe³⁺ ions.

After running through several examples of how standard equipment could give probable origins (with experience), Michael closed by saying that the labs were now capable of origin determination on heat treated corundum, as long as the inclusions remained useable and identifiable.

Before the morning coffee break Gem-A CEO James Riley FGA DGA set forth the initiatives that Gem-A hopes to implement over the coming months, which include advanced diamond grading on-site, a pearl



Photochromatic glass imitating a gemstone. The stone is light yellowish in normal light (left), dark bluish grey after exposure to a strong light source (middle) and slowly fades back after a few hours in the dark safe (right) showing brownish hues before returning into its original light yellow colour. This stone which was sold as an 'extraterrestrial stone of heaven' is actually a very common artificial glass product, normally used for sunglasses or sun-protecting windows of buildings. © M.S. Krzemnicki, Swiss Gemmological Institute.

course and a Corporate Social Responsibility course which will spearhead ethical trading in the gem market. He reported that strong success in the past few years has put the Association in a good position to take gemmology forward, and reiterated his pledge to bring the latest developments and techniques to students and the gemmological community at large.

Saturday's third speaker was Gordon McFarlan, director at Bonhams, who posed the question with his talk: 'Is there such a thing as Scottish silver?' Silver from sources outside of Glasgow and Edinburgh is traditionally termed as 'provincial', and



A George II Scottish silver coffee urn by Alexander Johnston, Dundee 1742. Image courtesy of Bonhams.



An early eighteenth century silver tot cup. Maker's mark only for William Scott of Banff, circa 1700. Photo courtesy of Bonhams.

covers in excess of 20 small areas of Scotland. Nowadays the majority of surviving pieces are spoons but, despite their often diminutive size, they can command a premium price at auction (one from Stonehaven recently sold for in excess of £4,000). Most of these provincial pieces didn't survive according to Gordon, because the pieces themselves weren't seen as being valuable in their own right, but were rather a store of wealth. Those that did survive are now keenly sought by collectors. Gordon further regaled the audience with tales of silver items being bought in England (Birmingham was amongst the sources mentioned), then moved to Scotland and re-marked for sale there. He showed an interesting slide of a hallmark, where the producer had followed the guidelines that stated that the letter for the year (ABC) should be stamped on the piece. The producer/assayer had taken the ruling literally and stamped just that... ABC!

After a brief break for lunch the conference schedule proceeded apace, commencing with the intriguingly titled 'Archaeogemmology: A Multidisciplinary Approach To Antique Gems', with Dr Çigdem Lüle GG FGA, who is special projects manager at Gemworld International. Çigdem began by introducing a new approach to, and combination of, studies termed 'archaeogemmology'. This new way of looking at gemmology combines its usual aspects with elements of geology and archaeology, in an attempt to determine the mineralogical and geographic origin of gems. As Çigdem said, spices have been traded for over 50,000 years along well-documented routes, so why not gems? Carnelian, glass, and ceramic beads were found in tombs in Turkey dating back to well before Christ, and the trade in obsidian has been going on for at least as long. If these can be traced back to their origin, as Çigdem maintains, then this could potentially open up a whole new area for consideration!

Following on from Çigdem's archaeological take on gemmology, Robert Weldon, manager of Photography and Laboratory Publications at GIA, took listeners back to the cradle of civilization with an



A Roman carnelian ringstone, circa first to second century AD, later set in Victorian ring in gold, silver and diamonds. Hadrien Rambach Collection, London. Image courtesy of Christie's, New York.



The Buddha Blue. 13.73 ct Sri Lankan Blue Sapphire with unusual cutting style, probably fashioned between the thirteenth to fifteenth centuries AD. Somewhere in the Rainbow Collection, USA. Photo courtesy of Stuart Robertson.

entertaining look at the gems and wildlife found in East Africa in his talk entitled: 'An update on East Africa's unique gemstone treasures'. With over 40 different gem materials found in this locality ranging from garnets and apatites through to the diamonds of the Williamson Mine, Robert showed how the geological events that created the Rift Valley had given rise to an amazing assortment of treasures.

Recent Events

High times in the Lowlands (cont.)



Irradiated blue topaz (left) as it was sent to an SSEF client and how it was returned (right) after a few weeks. The brownish colour of the topaz is due to a coating with rust, perhaps because it fell into the client's barbecue. © M.S. Krzemnicki, Swiss Gemmological Institute SSEF.

Starting his tour in Kenya, with stories of the late Campbell Bridges and the discovery of tsavorite in 1966, Robert showed how this area is a cornucopia for gemmologists through his photographs of gemstones, stunning scenery and wildlife. Colour change garnets and vanadium-coloured chrome tourmalines (a little confusing!) were shown as highlights of Kenya. From here the tour continued to Tanzania, home of the famous tanzanite. Images of yellow garnets, Mahenge spinels and corundums from Winza (which can fetch up to \$100,000 per ct for the larger stones) were shown as Robert took us through the region. In Mozambique cuprian tourmalines and rubies from the Montepuez region were shown, again interspersed with flora and fauna from the area, before the whistle stop tour concluded with a visit to Ethiopia and its famous opals. Robert's concluding images were of these, showing the beautiful 'finger' structure that makes some of them so appealing.

Rounding off Saturday's talks was a brief discussion from gem and jewellery expert, author and lecturer, Antoinette

Matlins, about the ever-present issue of lead glass-filled rubies, and how they could damage retailers' reputations if not fully disclosed and handled correctly. Antoinette underlined the importance of vigilance and care with regard to these stones, stating that the vast majority start off as scrap that would otherwise be unusable. The treatments applied to remove impurities, inclusions and other unwanted materials reduce the corundum to a friable material likened to a sponge, which then 'soaks up' the lead glass filler, leaving a credible imitation of a natural ruby. To conclude, Antoinette ran through the key identifying features which would enable any gemmologist to pick up on this form of 'treatment', which include the usual bubble, colour flash and changes in lustre.

As has become the norm on the Saturday evening, delegates reconvened in the ballroom in the early evening for the traditional Scottish ceilidh — a three-course meal followed by traditional Scottish dancing and, for those less skilled on the dance floor, less energetic dances. The revelry carried on into the early hours,

and always cements this conference as a firm favourite, with its eclectic mix of old and new, serious and social.

Sunday began with the usual morning ritual of discussions over breakfast, ranging from the previous day's talks, to the evening's entertainment. For those clear-headed enough, we were then treated to a round-up of recent research findings and gemmological oddities from SSEF, courtesy of Michael Krzemnicki. His first 'find' was jadeite from Kazakhstan, which, through petrographical analysis, he showed as being an omphacite on growth from calcium metamorphosis containing chromite grains and cosmochlor.

Smaller stones to pass through Michael's hands included an unusual brown star sapphire cabochon from Thailand, which had suffered damage to the rear. Upon examination, this damage showed clear areas of the now prevalent lead glass filling, highlighting how far into the corundum market this treatment has spread.

Another rare stone to be highlighted as a treasure was a 140 ct colour-change garnet, of the pyrope-spessartine isomorphous series. This large garnet showed colour action due to both chromium and vanadium traces, which created the strong colour change effect — an effect that was also enhanced by the stone also displaying an element of the Usambara effect, a rare visual effect whereby the length of the light path through the stone influences colour, and one more customarily seen in certain green tourmalines!

Other notable pieces that passed through the lab included the Hutton-Mdivani jadeite necklace, reported as having a high level of transparency and lustre, and which was sold in Hong Kong by Sotheby's for \$27.4 million in April.

It wasn't only these rare and unusual (and in most cases expensive) stones that were bought to the delegates' attentions. Michael also presented two stones with interesting stories: the first involved a topaz pendant with diamond surround which, while originally blue, had taken on a distinctly brown appearance. Careful analysis and questioning of the owner revealed the true

cause of this dramatic colour change: the pendant had accidentally fallen into a barbecue, and the charcoal had deposited a thin film of soot on the stone. Once cleaned this layer was removed, returning the stone to its original colour — a simple and quick treatment, and you could say the effect was either 'rare' or 'well done'!

The second stone shown was puzzling, with suggestions that it could have extra-terrestrial origins due to a very dramatic colour change, far beyond anything ever seen before. When viewed in daylight this faceted oval showed a deep brown to black colour action, whilst maintaining a high degree of translucency/transparency, but when locked away overnight or kept in a darkened environment the stone became colourless and transparent — a very marked photochromatic colour change effect, never seen in the gem trade before. Careful analysis (perhaps with just loupe and refractometer, tools available to any gemmology student) helped reveal the true nature of the stone as being a faceted section of photochromatic glass, the type seen in some sunglasses. One can only speculate what trade names this could be marketed under, but suggestions of 'sunstone' were made!

The final talk of the conference was provided by the Chairman of the SGA, Alan Hodgkinson FGA, and was centred on the unique effects and properties of zircon. Covering the different types and localities, Alan showed how the constants (RI, SG and birefringence) differed, but not as would be expected. RI reduces as the uranium and/or thorium impurities break down the structure, but there comes a point at which a reducing RI, accompanied by a reducing birefringence, experiences a 'blip', and the birefringence suddenly increases before reducing again. Alan recounted how the initial works on zircon were carried out by Basil Anderson (amongst others) using modified equipment. Self-combustible RI fluids, in conjunction with a sphalerite-tabled (blende) and the rarely seen diamond-tabled refractometer, allowed results accurate to four decimal places to be captured using the minimum deviation method. This also required

specimens to be cut into specifically angled prisms, which would be impossible for the average gemmologist, but which facilitated accurate results. Alan also discussed how the natural breakdown of tetragonal zircon eventually forms a combination of amorphous silica and monoclinic zirconia, resulting in a biaxial gem. The metamict nature of this zircon forms similar structures to a diffraction grating, which can be 'repaired' to a certain extent by heating. Alan's talk was certainly an interesting review of the unusual properties of this gem.

Sunday afternoon featured workshops and seminars, with Gem-A tutor Claire Mitchell FGA DGA presenting a review of testing procedures based around readily-available gem materials (both rough and fashioned) which are regularly distributed to students worldwide. Split into two sessions, Claire expertly guided the attendees (both qualified and novice alike) through the nuances of gem testing, highlighting pitfalls and standard test results alike.

Other workshops included one centred on spectroscopy with John Harris FGA,

principal of J&K Harris and founder of GemLab, and Ewen Taylor, an independent valuer. This highly educational session consisted of a short introductory presentation of the anatomy of a spectroscope by John, whose expert knowledge of spectroscopy was evident. Ewen then followed with an enthusiastic explanation of new computer spectroscopy software on the market. By using a specially designed spectroscope attached to the computer, a gemstone can be tested by applying different light sources which then appear on the screen as wavelengths and peaks, which correspond to various wavelength numbers. Using this method a catalogue can be built up over time of known gemstones, allowing new graphs to be matched to existing profiles, thus aiding identification. The workshop then continued by working through various coloured gemstones pairs using the hand-held OPL spectroscope. Delegates then proceeded to apply the spectroscope software under the guidance of Ewen in order to test a CVD type IIa and a HPHT type Ib diamond.



The Hutton-Mdivani jadeite jade necklace, certified by SSEF and which sold for US\$ 27.4 million at Sotheby's Hong Kong in April 2014. © Luc Phan, Swiss Gemmological Institute SSEF.

Recent Events

High times in the Lowlands (cont.)

Thanks to Ray Rimmer FGA DGA who attended this workshop and provided the information.

Another useful and interesting workshop was presented by Robert Weldon, and concerned the use of Adobe Photoshop in 'finalizing' images of gemstones and inclusions. This workshop was eagerly anticipated, as recording accurate images of gemstones is notoriously difficult for most people, given the problems of reflection, refraction, and various other optical effects caused by gemstones, and the depth of field needed to maintain clearly focused images.

Other workshops held were 'Grading and Valuing Pearls' by Dr Çigdem Lüle and Stuart Robertson GG, research director at Gemworld International; 'The 20th Century and its Jewellery' by David Callaghan FGA, honorary vice-president of Gem-A; 'Unusual Gemstones' by Claire Mitchell; 'Corundum: Natural, Treated, and the Lead-Glass Debacle' by Antoinette Matlins and 'Scottish Jewellery and Gemstones' by Alistir Tait, principal of Alistir Wood Tait jewellers.

Sunday evening was rounded off with the annual visit to the Kailzie Gardens for the final meal of the conference and, as always, the restaurant was taken over

by SGA Conference attendees. The food was of the usual high standard we have all come to expect from the conference, and it was close to midnight by the time the coach returned us, well-fed and happy, to the hotel.

Monday morning was a time for farewells, with people departing for homes in all corners of the globe, or for the highly anticipated gold panning field trip. The small band of hardy adventurers who went on this trip to the Leadhills area enjoyed beautiful Scottish scenery, reasonable weather and, according to several of those present, did find tiny flecks of gold...



First Prize — Kathleen Lee



Second Prize — Wesley Zwiep



Third Prize — Louise Cardosi Campbell

Gem-Set Jewellery Design Winners 2014

Awards were presented to the winners of the Scottish Gemmological Association's annual Gem-Set Jewellery Design Competition on Sunday 4 May at Peebles Hydro Hotel.

The competition is designed to encourage the use of gemstones in the work of jewellery students studying at the

Scottish Art Schools and Further Education Colleges. Entrants were challenged to design and manufacture an item of wearable jewellery around one or more gemstones (natural, synthetic or imitation), but the gemstone had to be the focus of the piece. All winning entrants received a collection of gemstones.

First Prize was awarded to Kathleen Lee, Second Prize to Wesley Zwiep and Third Prize to Louise Cardosi Campbell, all from Glasgow Kelvin College.

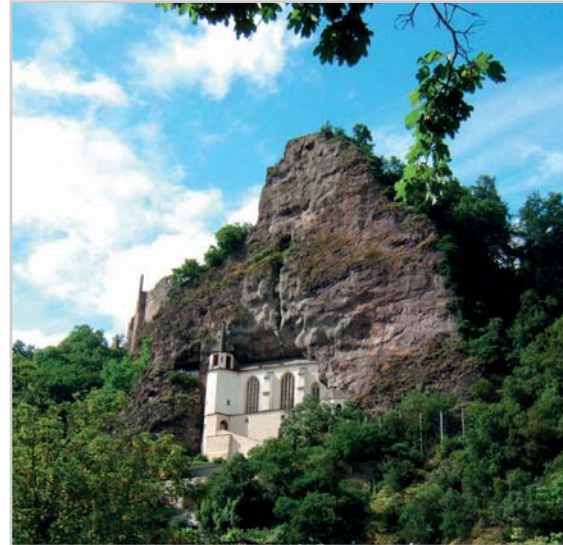
For further information about the competition or the winners please contact info@scotgem.co.uk



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The price is inclusive of the coach to Germany, 7 nights accommodation (single or twin room), breakfast and dinner, and entry to museums, institutes and field trips.

For more information or to book contact events@gem-a.com.

Price	Single room (1 person)	Twin room (2 people)
Member (Gem-A, NAG, BJA and GIA Alumni Association)	£1,455	£1,245
Non-member	£1,745	£1,495
<i>All prices quoted are per person</i>		

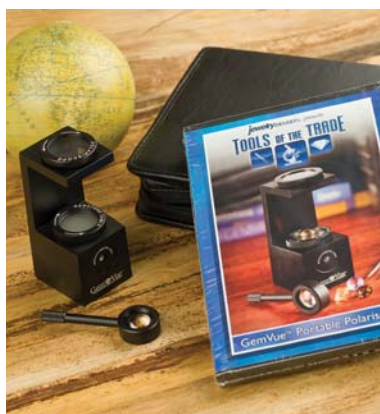
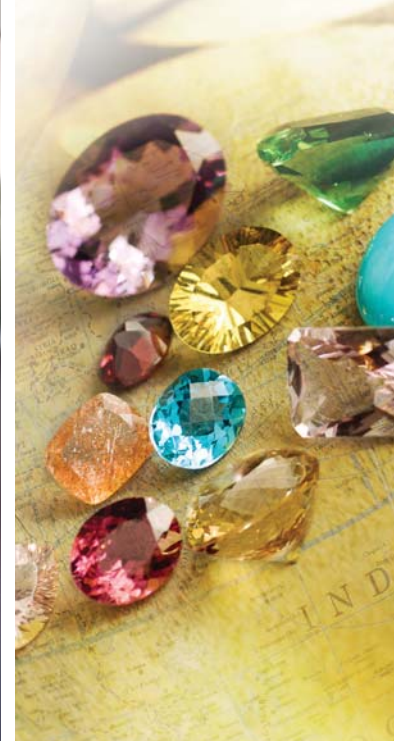
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