

Gems & Jewellery

Mar/Apr 2016 / Volume 25 / No. 2



Tucson 2016

Preseli bluestone

Burma Bill:
An Interview with Bill Larson



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Preseli bluestone

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Cover Picture

40.34 ct kunzite from the Oceanview mine. See Bill Larson's interview for an insight into his gem-hunting world, pages 10–12.

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All change for Spring

It seems that Spring has finally 'sprung' here at Ely Place, and with it we are ushering in a host of changes. The biggest announcement is that Alan Hart FGA DGA has been appointed Gem-A's new CEO. Alan has had a long and illustrious career at the Natural History Museum, London, starting his career there in 1981 as Assistant Minerals Scientific Officer, progressing to his current position of Principal Curator of Gems and Minerals and Head of Earth Sciences Collections. The response from members and the trade has been extremely positive, and I'm sure you'll join us in giving Alan a warm welcome when he arrives on 1 June.

There are also several other staff changes at Gem-A: Natalie Harris FGA DGA, formerly Membership Secretary, has now moved to the Education team, where she will take up the post of London Education Co-ordinator. Her replacement is Kim Foxwell FGA DGA, formerly Reception and Enquiries Manager. If you have any questions regarding your membership please contact Kim, she'd love to hear from you. For those of you familiar with the faces in the Education team, Pavet Amrit will be taking up the role of ODL Support and Student Welfare Officer in September. Finally, we would like to welcome Ann Davis, who will be handling reception — I'm sure many of you will meet her when you stop by Ely Place.

The Gem-A Council has also seen some changes: Miranda Wells has been appointed chair of the Council, with Kerry Gregory and Paul Greer as vice-chairs. See Gems News on page 6 for more information.



...we had a highly successful Tucson show, with hundreds of friends, colleagues and new faces turning up to meet staff...

We had a highly successful Tucson show, with hundreds of friends, colleagues and new faces turning up to meet staff at both the AGTA Tucson GemFair and the Tucson Gem and Mineral Show — see Kerry Gregory's article on page 14. Gem-A's Big Gem Bash saw a great turn-out and was well-received by all who attended. A great networking event, many attendees have said that it was their favourite social event of the Tucson calendar — make sure you book early for next year's shindig! Staff also attended International Jewellery Tokyo (see Natalie Harris's report on page 18),

which proved a great opportunity for our Japanese members to come and meet some of the staff.

I wish you all the very best over the coming months.

Until next time,

Georgina Brown, Deputy Editor

Gem News



ALAN HART APPOINTED NEW GEM-A CEO

Gem-A is thrilled to announce the appointment of its new CEO — Alan Hart FGA DGA, current Head of Earth Sciences Collections at the Natural History Museum,

London. A former member of the Gem-A Council, Alan holds a wealth of experience in the gem and mineral trade. He started his career at the Natural History Museum in 1981 as Assistant Minerals Scientific Officer, progressing to his current position of Principal Curator of Gems and Minerals and Head of Earth Sciences Collections. Alan currently leads the Earth Sciences Collections' team of 25 people, and is chair of the Museum's Collections Committee and various science executive boards, providing strategic and operational goals to improve standards, best practices and operational efficiencies, whilst delivering major projects that improve care and access to the Museum's collections.

Alan said: "I am truly excited at the prospect of being the CEO at Gem-A. Having been associated with Gem-A for many years and having worked alongside many of the staff and the Trustees, I am fortunate in knowing that they are as passionate about their work as I am. I want to ensure we continue to thrive by using all of our collective expertise to

continue as the centre of excellence that is leading the way in delivering the highest quality gemmological education and training." Alan continued: "I am a great believer in lifelong learning; there is always something new to learn, new avenues to explore and new people to learn from for everyone, so to me our Membership programme is instrumental in building that collaborative community from which everyone can benefit."

Alan will join the Association on 1 June 2016, and looks forward to meeting many of you at the AGM, Conference and at other events throughout the year.

Several changes have also occurred within the Gem-A Council: Miranda Wells FGA DGA succeeds Nigel Israel FGA DGA as chair of the Council. Miranda, Head of Gemmology at Birmingham City University and course director of the BSc (Hons) Gemmology & Jewellery Studies degree, has been a member of the Council for four years. Joining Miranda as vice-chairs are Kerry Gregory FGA DGA and Paul Greer DGA. Nigel remains a member of the Council.

DAVID EPSTEIN TO OFFER FREE CONSULTANCY

David Epstein of Brazil-based gem merchants and buying agents Precious Resources will be offering free consulting to aspiring gem dealers when he semi-retires this July. Included in the consultation is a study of the aspirant's preparation, status and goals, help in planning the best strategies and tactics and also some action plans to achieve those goals.

Precious Resources is a buying agent for fine Brazilian rough and cut gems with its own lapidary workshop and laboratory. Founder and owner David Epstein and his team help professional buyers from around the world by sourcing single stones, discount lots and by making special cuts. The company also consults on how, when and where to sell what is bought through them, aiming to "solve gemstone buying and marketing problems".

Contact David on davidse123@gmail.com or visit www.gembuying.com.

DIAMOND CERTIFICATES FOR \$100 FOUND IN HONG KONG

The Gemological Institute of America (GIA) and the FBI are investigating fraud by a New Delhi-based business, which had posted lab-grown diamonds with natural diamond GIA certificates for sale online. It is believed that the scam emanates from Hong Kong and China, where natural diamond grading reports issued by international gemmological institutes are being sold for \$100.

It is compulsory for Chinese traders and jewellers to grade diamonds at specific local laboratories. Thus, diamond grading reports issued by labs such as GIA are of no use when diamonds are sold in China; the certificates therefore are imported into India and other countries from China and Hong Kong.

The World Federation of Diamond Bourses (WFDB) has been informed that a vendor on the world's leading online global wholesale trading platform, Alibaba, has offered synthetic diamonds inscribed with the numbers of genuine GIA graded natural

diamond reports. The seller on Alibaba, a New Delhi-based company which deals in synthetic and simulated gems only, claims to be able to supply 10,000 carats of synthetic diamonds per week and, on its website, that it has a "stock of more than 25,000 certified diamonds".

The fraudulent practice was exposed by Diamond Intelligence Briefs, which published a list of CVD synthetic diamonds, sized between 0.5 and 1.00 ct, "presumably inscribed with real GIA diamond report numbers and being traded with genuine GIA natural diamond certificates (or, possibly, also with sophisticated fake certificates carrying the real number)". The list is now on WFDB's website.

SINKANKAS SYMPOSIUM 2016 POSTPONED

Following the death of its organizer Roger Merk, the 14th Annual Sinkankas Symposium, which was to have been held on 9 April, has been postponed. A tribute symposium will instead be held on 9 April 2016, which will

LOTUS LAUNCHES INCLUSION DATABASE

Bangkok-based gemmological laboratory Lotus Gemology has introduced an inclusion search engine. Called Hyperion — named after the Greek God of watchfulness, wisdom and light — the database is limited to the lab's specialities: natural and synthetic ruby, sapphire and spinel.

Available to the public for education purposes only, the gallery of around 500 or more images is easy to use and allows visitors to browse based on the gem type, its origin and enhancement. Click on the chosen specimen and with the close-up image, all relevant details are given. Lotus also provides a bibliography of the literature of gemstone inclusions.

Visit www.lotusgemology.com/index.php/library/inclusion-gallery to access the gallery.



feature selected topics from past Sinkankas Symposiums, with an emphasis on some of Roger's favourite topics. The 14th Annual Symposium, on the subject of sapphire, will now be held on Saturday 8 April 2017 at the GIA HQ and Robert Mouawad Campus in Carlsbad, California.

The event will be dedicated to Merk — who conceived the symposiums, which began in 2003 with quartz — in recognition of his dedication “to educate and inspire mineralogists, gemmologists and the public”. Speakers will include recognized specialists in fields ranging from geology and mineralogy to history, treatment, cutting, collecting and selling, who will make presentations on sapphire.

IIDGR OFFERS DIAMOND GRADING SERVICE

The International Institute of Diamond Grading & Research (IIDGR), part of the De Beers Group of Companies, has launched a diamond grading service from its UK laboratory. After nearly 10 years of providing grading services to Forevermark clients and De Beers Diamond Jewellers, IIDGR will now offer grading services to the UK market.

The grading standards and systems

developed by IIDGR are underpinned by the technology developed by De Beers through decades of research. The twenty-first century processes integrate technology into the grading system by design. Exclusive machines allow digital benchmarking to enhance human skills and established diamond master sets.

IIDGR has an agreement with the London London Diamond Bourse (LDB), which will provide a walk-in window service at its Hatton Garden offices for LDB members.

SIGNET LAUNCHES RESPONSIBLE SOURCING PROTOCOL

Signet Jewelers Ltd has introduced a Responsible Sourcing Protocol for Diamonds (D-SRSP), with the aim of increasing transparency and integrity of the global supply chain.

The protocol was developed with input from the WFDB and other international diamond bodies. WFDB President Ernie Blom commented: “We believe this is an extremely important development and we are pleased to have been involved. Signet is leading the way in requiring its suppliers to map their supply chains, mitigate risks and ensure complete transparency. This is critical in strengthening consumer confidence and, we hope, will lead

other companies to follow this lead.” Blom continued, “We believe it is an excellent example of the industry working together to create an unimpeachable standard of cooperation that puts to bed any claims that the proceeds from diamond sales are being used for illicit purposes and will have a positive impact for WFDB members. The industry knows it must take steps to assure consumers that it has nothing to do with any human rights issues or illegal labour practices in diamond-mining states. It also fits in perfectly with the themes of the World Diamond Congress to be held in Dubai in May, of transparency, responsibility and sustainability, and it will be on our agenda.”

PJ WATSON'S VIVIAN WATSON RETIRES

Fine diamond and gem-set jewellery manufacturer and wholesaler PJ Watson has announced the retirement of Managing Director Vivian Watson after almost 50 years in the industry. He will remain on the board for two more years.

Watson joined his father in Hatton Garden in 1967 and now passes on the baton to a fourth generation family member, his son John, whose main role will be to continue to travel to source the fine gemstones on which PJ Watson's renown has been built. The company was the first UK manufacturing jeweller in the UK to import Canadian diamonds and the first to recognize the advantages of Far East production — to sit alongside its own British-made products. ■



Vivian Watson of PJ Watson.

Events

AGS Conclave 2016

13–16 April 2016

Hyatt Regency Crystal City, Arlington,
Virginia, USA

Gem-A will once again be joining members of the American Gemological Society (AGS) for their annual conference,

AGS Conclave, from 13–16 April. Over the course of four days, Gem-A will take part in this celebration of all things gemmological, sharing its educational courses, membership services, instruments and publications with its American friends. We will also have a booth in the networking area where staff members will be on hand to share information on our courses, instruments and membership offerings. Visit us at Booth 10 in the Regency Foyer.

Scottish Gemmological Association (SGA) Conference 2016

29 April–2 May

Peebles Hydro Hotel, Peebles, Scotland

The annual SGA Conference will be held at the Peebles Hydro Hotel in Peebles, Scotland. Featuring talks from a host of internationally-renowned speakers, this is a very popular event in the gemmological calendar. Visit www.scottishgemmology.org/conference for more information.

GEM CENTRAL

Whether you are a student in gemmology who wants more practical work, a gem and mineral enthusiast who would like the opportunity to handle other collections, or a member of the jewellery trade who is keen on examining some of the new synthetic treated stones on the market, Gem Central evenings are for you. Gem Central is a regular practical gemmology evening for Gem-A members and students, giving attendees the opportunity to investigate and explore a variety of gem materials.

Gem Central meetings take place once a month, from 18:00–19:30 at Gem-A headquarters, 21 Ely Place, London EC1N 6TD.

Gem Central with Kerry Gregory — Hidden gems: realizing the value in scrap

14 April 2016

Kerry Gregory FGA DGA has worked in the jewellery industry for over 16 years and has taught gemmology for a number of these. Her current role as Manager of Gemstones and Specialist Jewellery for the UK's largest pawnbroking business makes her well-equipped to lead a Gem Central around the value of gemstones in scrap. Join us for a hands-on evening identifying these hidden gems.

Gem Central: Gemmological Instruments Spring Takeover

12 May 2016

Back by popular demand! Gemmological Instruments will once again take over Gem Central for an evening of networking, education and discounts. Doors will open at 18:00 for a welcome reception and at 18:30 we will be joined by a special guest for a short presentation.

There will be 20% off of ALL gemmological instruments on the night so make sure to register your attendance with events@gem-a.com to ensure your place is reserved.

rock, gem & bead shows 2016

23rd/24th April Rock 'n' Gem Show Newark Showground

14th/15th May Rock Gem 'n' Bead Bath & West Showground

4th/5th June Rock Gem 'n' Bead Kempton Park Racecourse

9th/10th July Rock Gem 'n' Bead Newcastle Racecourse

30th/31st July Rock Gem 'n' Bead Royal Welsh Showground

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All Shows open

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Admissions

Kempton Park Racecourse - Adults £5.50, Seniors £3.00 • Children £1.00 (8-16 years) under 8s free
All other R&G Shows: Adults £4.50, Seniors £2.00 • Children £1.00 (8-16 years) • under 8s free

For a list of all shows, directions, maps and exhibitors attending each show, go to
www.rockngem.co.uk info@rockngem.co.uk

And the winner is...

Olga Gonzalez FGA DGA reports on the AGTA Spectrum Awards, held on Saturday 6 February at the Marriott University Park, Tucson, Arizona.



1: Brian Cook's 'Numinous' pendant necklace.
Image Brian Cook, Nature's Geometry.



3: Naomi Sarna's 18 ct white gold, diamond and freshwater baroque cultured pearls pendant.
Image Naomi Sarna.

The American Gem Trade Association (AGTA), a leading force in ethical promotion of gemstones, held a presentation of awards for the winners of the 32nd annual AGTA Spectrum and Cutting Edge Awards during the AGTA Tucson GemFair 2016. The awards celebrate the most creative designers and lapidary artists, utilizing coloured gemstones and cultured pearls in their work. The Spectrum Awards showcase the best of the best in jewellery art objects and other gem-set designs, whilst the Cutting Edge Awards illustrate what is paramount in gemstone cutting and design today. From traditional faceting to whimsical shapes, the preeminent cuts are highlighted to peers. Notable Spectrum award winners come from a range of the 'Best of' categories, such as: Best of Show, Best Use of Colour, Fashion Forward, and Objects of Art, while Cutting Edge winners showcase the finest in lapidary work, from Pairs & Suites to Phenomenal and Innovative Faceting categories.

The winner for the most coveted category, Best of Show, was an exquisite suite of Paraíba tourmalines carved into nautilus shells by Allen Kleiman of A. Kleiman & Co. At 58.07 ct, the shells are a monochromatic light blue. Like the rest of his gems, the stones were found in mines and recut to showcase their unique beauty, heightened with the carving of a classic motif not usually seen in lapidary work.

Brian Cook of Nature's Geometry stepped into the spotlight and turned heads with his Wheel of Light 'Numinous' pendant necklace (1), winning the Fashion Forward award. The 24 ct yellow gold pendant features an 825 ct quartz, Paraíba tourmaline, hauyne, ruby, spessartite, garnet, golden rutiled quartz and fire agate beads. These stunning gemstones come together to create a single, breathtaking work of jewellery. With rings of gems, the design reflects the unique multi-faceted personality of Brian: miner, geologist, lapidary and designer.

Another showstopper was a stunning pair of blue-green tourmaline earrings (2) by the infamous queen of colour, Bella Campbell of the Campbellian Collection. Known for her unique coloured stone combinations, the designer reiterated her signature look by creating a gorgeous pair of 18 ct yellow gold and 17.05 ct tourmaline drop earrings, highlighted with 4.14 ct of emerald.



2: Bella Campbell's tourmaline earrings.
Image Bella Campbell.

Naomi Sarna, a returning favourite, won two categories with first place in Best Use of Pearls with her 18 ct white gold, diamond and freshwater baroque cultured pearls pendant (3). Naomi also took home the Gem Diva Award with her 18 ct white gold petal brooch featuring white, yellow, pink, brown and green diamonds accented with multi-coloured amethysts and sapphires.

For gemstone purists, the Cutting Edge Awards are where the excitement is at. Kleiman's Best of Show Paraíba also took home first place in Carving. This is only the second time that a Cutting Edge entry has won Best of Show, an exciting feat for Kleiman.

On the more unusual side there was also a lot to see. John Dyer won first place in the All Other Faceted category with his 21.96 ct multi-faceted cushion-cut Imperial topaz (4). When asked about cutting the gem, John said: "This gem was cut from a large crystal which we purchased in Brazil directly from the miner. Imperial of this colour is very rare on the market today and so it was one of the most expensive pieces of rough we have ever purchased. The risk involved was also significant because some Imperial topaz has internal stress that causes the crystal to crack as it is being cut. Fortunately, this one did not seem to have any stress and cutting it went fairly smoothly, if somewhat slowly, due to the careful planning for maximum beauty and yield." ■



4: John Dyer's 21.96 ct multi-faceted cushion-cut Imperial topaz.
Image courtesy of John Dyer & Co.

Burma Bill – a collector's life



Bill in Burma

One of the key speakers at the 2016 Gem-A Conference will be Bill Larson, president and CEO of Pala International. To whet your appetite for what promises to be a riveting talk, he offers an insight into his particular gem-hunting world.

When did you start to develop an interest in gems and minerals?

Somewhere around the age of six years old I started picking up agates on the pebble beaches of various lakes in Minnesota. I found several that, when I broke them with a larger rock, had small 'vugs' or geodes, including tiny transparent quartz crystals, that fascinated me. From seeing those I was hooked on crystals.

What were you particularly drawn to then and how did that preference develop and broaden?

We moved from Minnesota to California when I was eight years old and by then my parents had picked up an interest in the same mineral hobby that I was starting to enjoy. My father found that Fallbrook, where we had moved to, was very close to the small town of Pala, where there had been gemstone mines at the turn of the century. These mines were abandoned in the 1950s and '60s so we could go and dig in the dumps. From these collecting trips I became fascinated with the various pegmatite minerals — tourmaline especially, because we could find beautiful small crystals of various colours — and also morganite, beryl, quartz crystals and kunzite. So, like most people in our mineral hobby, one tends to love the things that you can collect personally. I just happen to be lucky that I was in a gem-producing area as I grew up.

At the age of 12 I wrote to the Colorado School of Mines (CSM) to ask about their programmes and I was (eventually) lucky enough to obtain a complete scholarship, paid for by what was then a superior oil company. I completed a professional degree above the normal bachelor degree, with a minor in geochemistry. I had one real job in Alaska as a geologist, then was drafted and came back to San Diego County and did small successful mining projects with mineral collector and museum curator Josie Scripps while waiting to go into the army. Once in the army I taught jewellery making and gem cutting in the special services at Fort Ord. I started giving lectures at CSM and that continued — GIA was close by in Santa Monica and I was often asked to talk about mining.

Describe your gem and mineral collection today? How big/important is it?!

My collection today consists of pieces I collected, exchanged for and purchased over the past 60 years. I believe I have several thousand specimens in around 22 different specialties that I collect. I am especially fond of localities. Obviously one such suite is San Diego minerals and gems, since I live here and mined here. Another collection I am very proud of is my rather fine English suite, some of which I exchanged with the Natural History Museum in London in the 1970s.



12.79 ct Brazilian tourmaline slice in the necklace and loose tourmaline slices.



40.34 ct kunzite from the Oceanview mine, San Diego County, USA.

What is the history of Pala International and what was your aim for it?

Pala Properties International was started by Ed Swoboda and myself in 1967. The thought was to start mining and purchasing minerals. Ed owned the Stewart Mine. My father knew Monty Moore who owned the Tourmaline Queen Mine, the Pala Chief Mine and the Oceanview Mine. Mr Moore agreed to lease (very inexpensively) and later to sell us his three different mines. We combined the four mines into Pala Properties International. Luckily we were successful almost immediately at the Stewart Mine (one needs to remember dynamite was sold at the hardware store without government certifications, insurance, etc., and mining expenses were in the hundreds of dollars not thousands per month so success was very low budget). When we moved up to the Tourmaline Queen Mine, within a year we had a strike that was the famous Blue-Cap Pocket, which put us on the map internationally.

When did you start travelling for gemstones, where to and what for?

I started my trips to Africa in 1971, meeting the renowned miners John Saul and Peter Morgan in Nairobi and Jerry Russou in Johannesburg, among many others. This

gave us access to great rough. I had to compete with the Idar Oberstein dealers, but they became friends as I was selling them tourmaline rough so often that I would start in Idar, seeing what they had new, and then fly into Africa.

We came across many gem materials before they were well known in the USA markets. For instance in 1972 Pala International was one of the first to bring tsavorites into the USA. I remember having to wait upstairs in a tiny alcove at Tiffany for an appointment to show gemstones. Harry Platt opened the door two hours later, but once he saw I had fine tsavorites he welcomed me, and this started a good business between us. This lasted until the late 1990s when Tiffany was less interested in coloured gemstones than the 'Blue Box'.

I was to make more than 40 trips into Africa over the next 40+ years — my last trip being in 2012 as the keynote speaker during the first Arusha International Gem and Mineral Show and Conference.

In 1974 I took my first trip into Asia, starting in Sri Lanka and ending in Hong Kong. I was completely excited with what I saw in the way of gemstone mining, rough materials, gemstones and markets. From this time on I went more often to Southeast Asia than Africa, although I combined many trips into both.

My favourite place became Burma when Dr Eduard Gübelin invited me to join the first group of westerners to be invited into the fabled Mogok gem district in 1993. One of my strengths was having knowledge of different fields of gemstones, knowing fine crystals as well as gem rough and cut stones. Captain John Sinkankas was my lifelong friend (we met when I was 15) and he taught me that poor cutting rough could be wonderful crystals — similarly, damaged crystals could have fine cutting value. This principle proved to be the most profitable knowledge I ever received. This was especially useful in Africa and later in Burma. Burma was well known to often ask prices on cut stones that are higher than Tiffany's, but they didn't understand that bad rough could be very valuable as crystals... until the internet changed that forever.

What do you specialize in these days?

Over the decades Pala International became very well known for unusual and rare gemstones, starting off of course with tourmaline. However our largest sellers for the past 20 years are sapphire, spinel, ruby and garnets — especially demantoid from Russia as Pala got involved with two successful mining ventures in the Ural mountains. This is followed by anything fine quality, from A (alexandrite) to Z (zircon). We love colour, so we go after what is being produced, or what might be able to be improved by recutting.



Mining demantoid in Russia.

Pala has prospered from a variety of great people. Josh Hall as vice president is still helping jewellers daily; Jason Stevenson is a geologist gemmologist who also helps jewellers find difficult-to-source gems, along with my two sons Carl and Will Larson. We have had illustrious employees, like Richard Hughes, who helped us set up Palagems early on, and his brother David, who produced one of the best newsletters in the industry. Edward Boehm came to work for one year and stayed seven.

Tell us about your experience appraising collections, such as Eduard Gübelin's.

One interesting honour is being asked to appraise collections. A couple stand out: Dr Gübelin asked me and my son Will to come to Lucerne and work for four days looking at his gem collection. I was quite familiar with it, but he had taken the time to computerize — as I remember — 2,700 gems with the descriptions, locality, carat weight, etc. All I had to do was place a value I would consider paying for each gemstone. It was a great experience for me and Will to look at his beauties and in the end I was able to advise Bill Boyjian regarding the purchase of this collection for GIA, my calculations being approximately the final value. Now in hindsight it was a bargain... but also a great home.

Another honour came when Dr Raquel Alonso-Perez asked me to appraise Harvard Museum's gem collection a couple of years ago. To be able to hold the Hamlin necklace



Carl Larson in an excavator scoop at the Mountain Lily Mine.

and all their rare New England gems was a thrill. Last year I was invited back to appraise their finer minerals. This was another thrill — they again did the hard work of cataloguing, I just had to value each great piece including the most famous Colorado wire gold. Priceless, but we came up with defensible numbers.

Are there any future plans for Pala International that we should know about? Will you ever retire from the business?

In future, Pala hopes to continue mining. We have tried at the Esmeralda Mine in Mesa Grande — unsuccessfully — and are currently working the Mountain Lily Mine in Aguanga, California, famous for beautiful emeraldite coloured tourmaline, blue topaz and morganite. We are in approximately 300 feet and have found most of the old workings, but no good pockets yet — wish us luck! ■

All photos Mia Dixon.



Bill and Erica Van Pelt judging jewellery at the German Award for Jewellery and Precious Stones, Idar-Oberstein, in 2015.

SAVE THE DATE!

The 2016 Gem-A Conference will be held from Saturday 5–Sunday 6 November.



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Argyll Street, London W1F 7LD.

Tucson 2016: a gem of a show

Kerry Gregory FGA DGA talks Tucson, two-step and terrific gems.



1: A 6.26 ct rhodochrosite from Barker and Co.
Photo Barker and Co.

It's been six years since the first and only time I went to the Tucson show. This year, after much saving and sacrificing of holiday time, I paid for myself to experience it again. For me, Tucson can be summed up perfectly in one quote from Shirley Mitchell FGA DGA, independent valuer and committee member of the Institute of Registered Valuers: "Tucson is more than a gem and mineral show, it is an education like no other — from seeing and learning about rare gems to new treatments and synthetics, meeting existing friends and making new friends, Tucson is an experience that you should not miss!" This really is what Tucson is all about: stones, education, networking, socialising and friendship.

STONES

For me, Tucson has to be about the 'rare' or the 'fine'. You can easily drown yourself in the thousands of 'standard' stones on offer — ruby, sapphire, emerald, tanzanite, quartzes of every colour, garnets, tourmalines, topaz — all are piled high everywhere you look, making you doubt how 'rare' these stones actually are when there are such vast quantities on show in just one place. If you're buying stones Tucson is certainly the place to go, whether you're a dealer, manufacturer, retailer or just a lover.

I see these materials all day long, but what I don't see are very fine or very rare stones, so it is a real treat to be exposed to some of the world's best quality gemstones: untreated, beautifully cut and in colours so saturated you almost want to eat them. What really excites me is something I haven't seen before, or the rare stones. No doubt I am very behind the times, but this was the first time I have ever seen faceted pearls. On paper they sound like they would be horrendous, but I loved them, looking to me like iridescent spherical quilts.

When I was here six years ago I bought a 0.60 ct faceted transparent rhodochrosite.

This time I saw a few really fine pieces with intense colours, like this 6.26 ct stone from Barker and Co. (1). It certainly seemed like there was more of this material in larger sizes in evidence this year. Rich Barker of Barker and Co. was positive about this year's show and the trade in general, stating: "Sales were decent, but what was most exciting is that everyone thought things were picking up, and we made several deals that will be stretching out over the year that should be really good."

As an ODL tutor I rarely get the chance to meet with all my students, so I also took the opportunity whilst at the show to catch up with some of them — a great feeling to be able to meet them in person. One, Gabriel Mattice, Exotic Gemstone Acquisitions and Collections at Pala International, said about their business: "Because we deal in very rare goods, our collectors look forward to Tucson because they know we keep special things aside, such as this amazing 7.00 ct cushion-cut Russian demantoid garnet, cut specifically to allow the entire spray of this incredible chrysotile beauty" (2). I was amazed by this stone — a gemmologist's dream — and a truly beautiful stone with a really 'spoddy' (nerdy) inclusion! Another



2a



2b

2: (a) The 7.00 ct cushion cut demantoid garnet and (b) the phenomenal horsetail inclusion.
Photos Gabriel Mattice, Pala Gems.



3: 'Red ember' almandine garnet, shown (a) with full backlight, (b) with no backlight and (c) with half back-light. Photos Renata Lafler, JTV.

of my students, Renata Lafler, Director of Gemstone Advancement and Education at JTV, said: "I am always on the hunt for gemstones and mineral specimens that will educate and excite our employees, customers and guests. As a bonus, our acquisitions from Tucson this year are being included in our forthcoming publication on gemstones, *The Sisk Gemology Reference*. At the top of my list is a really special American gemstone, a 'red ember' almandine garnet from Massachusetts (3).

"These gorgeous red crystals glow like hot coals in their graphitic schist matrix when backlit. The plate of garnets we acquired (11 inches × 6 inches) took nearly 15 hours of careful preparation before it was ready for sale. A close second was a 263+ ct faceted Bolivian colourless calcite (4) that was absolutely breath-taking to behold... and lose my breath I did when it sold before I could make an offer!" Renata raises an important point here; some of the stones you see in Tucson are so rare and so fine, if you see one you want you have to put

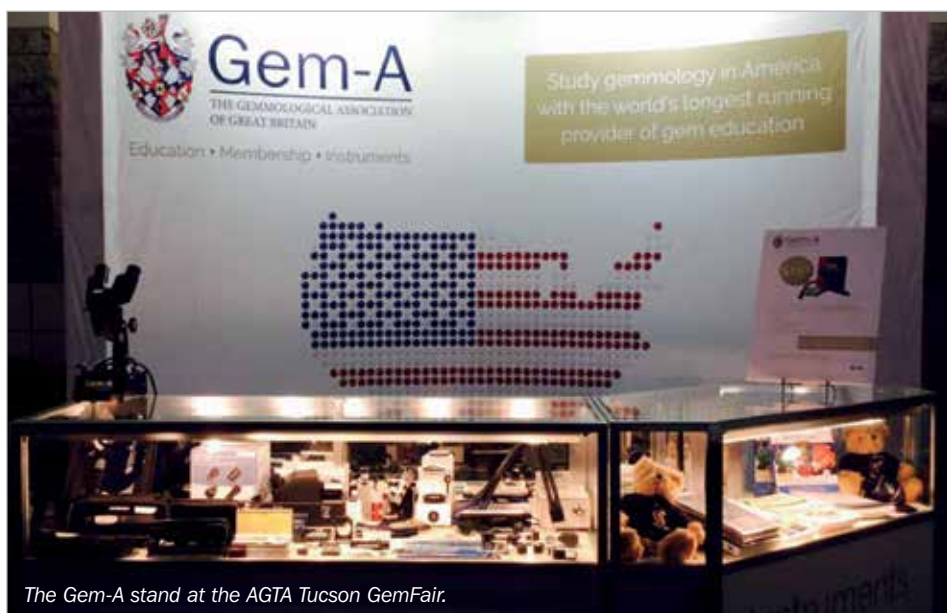


4: 263+ ct faceted Bolivian calcite.
Photo Renata Lafler, JTV.

your money where your mouth is quickly, or someone else will snap it up. Both of these women, experts in their fields, are very intimidating to teach — they know so much and have so much experience I keep feeling they are teaching me!

EDUCATION

On to the next important part of Tucson: education. Aside from the education you get from just walking the shows and seeing the array of material (exposure to material is invaluable for any gemmologist, you just can't learn from books, internet and images), there is also a wealth of conferences, seminars and workshops you can attend. One of the great benefits of the AGTA GemFair is the range of free seminars available. Unfortunately I was able to attend only one of these, 'Ruby Treatments: From Oiling to Diffusion...', presented by Bryan Clark and Wendi Mayerson from American Gemological Laboratories (AGL). Bryan and Wendi gave an overview of ruby treatments on the market, with detailed images of what to look for, followed by a hands-on microscope session showing what we should be looking for. Although it was a whistlestop tour, in that hour I learnt so much, and as we all know how much classes like this can cost you, it really is a great resource.



The Gem-A stand at the AGTA Tucson GemFair.

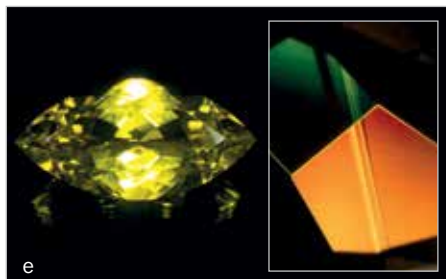
...it is a real treat to be exposed to some of the world's best quality gemstones: untreated, beautifully cut and in colours so saturated you almost want to eat them.

SOMEWHERE IN THE RAINBOW



I love to be challenged, and enjoy pitching my gemmological wits against unknown stones in non-traditional trials. Sean Milliner, curator assistant at Somewhere In the Rainbow, had the perfect challenge for me: six stones (pictured), ranging from the slightly unusual to the very rare, that you had to guess the identity of. The stones were suspended between two thin films of silicone, so you could look at them in the light, with a loupe, use UV, but you could not remove them. The Hodgkinson Method — being able to identify doubly (DR) and singly refractive (SR) materials using visual optics (VO), was invaluable in this instance. Test yourself here — answers at the end of the article.

- (a) A lively blue stone with a high lustre, VO showed the stone to be SR.
- (b) A minty green trillion, which, as you can see from the facet edges in the image, had a very low hardness and fluoresced purple under long-wave ultraviolet (LWUV). The material is from the UK.
- (c) A medium hardness violet stone, DR, with inclusion inside (inset). Namibian material that is best known for its blue variety.
- (d) A vibrant pink DR material with many inclusions and fissures inside, showing strong pleochroism from vivid pink to pinkish orange to the eye.
- (e) A vivid, ever-so-slightly greenish yellow — fairly hard with a high lustre — which was DR, and had this inclusion (inset). I really kicked myself when I got this wrong!
- (f) A vivid orange stone which was fairly soft, as can be seen in the image. The interior seemed a little 'treacly'. It contained liquid-filled 'feathers' or 'fingerprint'-type inclusions (inset) and was DR. I have to say I did not know this one and had not even heard of it. All the more reason to get back to Tucson next year I think.



As in previous years Gem-A was well-represented at a number of conferences and provided a number of very well-received workshops. Claire Mitchell FGA DGA, Teaching Manager at Gem-A, delivered a presentation at the Accredited Gemologists Association (AGA) conference entitled 'Spectroscopy — Bridging the Gap', which was described by the president of AGA, Stuart Robinson, as "excellent" and he described Claire as a "brilliant teacher and gemmologist". This I can personally agree with, having been taught by Claire in the past. The presentation was professional, accessible and relevant, all things that Gem-A, as an educational charity, strives to achieve. This was followed by a hands-on workshop that was queued three-deep at the table. Eric Fritz FGA DGA, Gem-A's North America Manager, held two workshops on natural pearls at the National Association of Jewelry Appraisers (NAJA) conference, which were greatly appreciated by all attending, with his workshop at the AGTA GemFair being so popular it was standing room only! Also at the AGTA GemFair was Gem-A's Gemmology tutor, Pat Daly FGA DGA, who gave a well-received presentation on 'Spectrums', assisted by Julia Griffith FGA DGA, Gemmology and Diamond Tutor for Gem-A, and Eric Fritz.

It is important to note that many commented how busy the Gem-A stand at the AGTA show was, and on the energy and hard work of all staff representing the Association. They were there all day manning the stand with smiles and professionalism, whilst in the evenings they were out dancing and networking at every event in town. Yet again the hard work, dedication and passion from Gem-A staff is a credit to the Association.

SOCIAL

Finally, on to what you can do in your 'down time'. The best party in Tucson (judging by the buzz around town) was Gem-A's Big Bash. In just its second year, the party (kindly sponsored by JIBNA) was a huge success, with over 200+ Gem-A members, friends and colleagues, from all walks of the industry—from stone dealers, mineral specialists and museums—who joined together to network in the beautiful venue of the Scottish Rite Cathedral. If you are planning to go to Tucson next year it is not to be missed.

If you happen to find yourself in the rare position that not every evening is filled with a gala dinner, award ceremony or a party,

then what can you do? Well, what I did was drink margaritas as big as my head in a gorgeous Mexican restaurant over the road from my hotel, where the food was as good as the drinks, and where they make you fresh salsa at your table. I learnt the 'Arizona two-step' from a beautiful cowboy in Mavericks bar and ate steak cooked on a mesquite grill in the fabulously over-the-top Pinnacle Peak saloon bar. I assure you there is enough to keep you occupied, if only you have the energy!

I am going to sum up Tucson with a quote from Chris Smith at AGL, who says it better than I can, and which echoes Rich Barker's

optimistic view of earlier: "The Tucson show remains our industry's most important trade show for coloured stones. No other show is so highly devoted to coloured gems of all types, qualities and sizes. This year was particularly interesting in that even though the global economy is struggling a bit, a majority of the vendors that I spoke with had an exceptional show — including several telling me that it was their best show ever. This made for very positive momentum in the market as we extend into 2016."

Long may it continue and see you all in February 2017! ■

"The Tucson show remains our industry's most important trade show for coloured stones...."

ANSWERS TO SOMEWHERE IN THE RAINBOW:

- (a) 5.43 ct spinel.
- (b) 15.25 ct fluorite from England.
- (c) 3.51 ct apatite from Namibia.
- (d) 6.00 ct pezzottaite from Madagascar.
- (e) 8.30 ct chrysoberyl.
- (f) 6.81 ct triplite from Shigar Valley, Pakistan.

EXHIBITS AT THE UNIVERSITY OF ARIZONA

Eric Fritz discusses two exhibits from Gem-A and Somewhere In the Rainbow at the University of Arizona.

Gem-A and Somewhere In The Rainbow, a Phoenix-based gem and jewellery educational group, have partnered to display many of the best of their collection in two cases at the University of Arizona mineral museum in Phoenix, Arizona. The exhibit, titled 'Happy Birthday To Me', presents traditional and modern birthstones for the 12 months of the year, and showcases fine gems and work from some of the finest designers, together with pieces from up and coming designers. The exhibit features opals — represented by an exquisite fossil clam from Coober Pedy and a black opal brooch from Tiffany, circa 1923 (pictured) — as well as full colour suites showing a range of colours of garnet, diamond and sapphire in both crystal and cut form, pearls showing the full range of shapes and sizes, emeralds and tanzanite, and showcases modern contemporary cutting styles and mineral specimens and their matching cut stones. One of my favourite pieces is the University of Arizona logo, portrayed using over 30 ct of diamonds (pictured).

A large festival was recently held outside the mineral museum with free admission. I attended the festival on the Sunday and shared the beauty of the gemstones with the children present, showing them their birthstones in both rough and cut form. The smiles and looks of amazement remind me why I love my job.



A black opal Tiffany brooch, circa 1923.



University of Arizona logo featuring over 30 ct of diamonds.



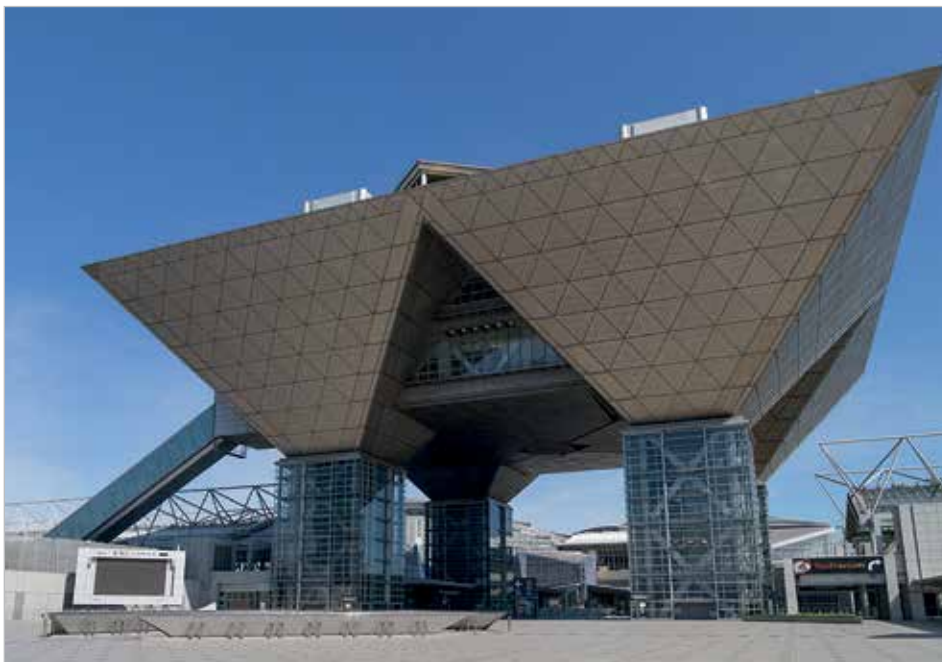
Pearl collection showing different shapes and sizes of pearls.



February's amethyst exhibit.

IJT 2016

Natalie Harris FGA DGA reports on the 27th International Jewellery Tokyo (IJT), held at the Tokyo Big Sight from 20–23 January 2016.



1: Tokyo's Big Sight. Image from WikiCommons © Rs1421.

I was recently given the opportunity to represent Gem-A at Japan's premier jewellery show: an experience of a lifetime. Upon arrival at Narita Airport, Tokyo, it is clear that you are entering a wonderful country that has such a different culture and way of life to that of the UK that I cannot stress enough that you must experience it for yourself.

The show venue, Tokyo's Big Sight (1), is a spectacular piece of architecture raised 58 metres above the ground on four inverted pyramids — more reminiscent of a space ship than a conference centre — and located in the Ariake district of Tokyo Bay.

The show attracts a wide and varied range of exhibitors, from gemstone and diamond dealers to educators, jewellery manufacturers, designers, mineral dealers and watch brands, all promoting and selling their wares over two halls.

As in previous years, the Gem-A stand was run by Ayako Naito FGA DGA, Gem-A's Japanese ambassador, assisted by myself and Andrew Fellows FGA DGA, with Emi Okubo, Kaoru Tokuyama and Eriko Ogita on hand to provide translations. The stand, located in the larger of the two halls, was bustling with members renewing their annual subscriptions, buyers purchasing new equipment, replacements for worn out tools and an assortment of books filled with lavish photographs and information to expand their knowledge. The Gem-A Instruments special show offer, a girdle reader and hearts-and-arrows viewer (a handy two-in-one tool that allows you to read laser-inscribed girdles and view a pattern of hearts or arrows, directly linked to the quality of symmetry in diamonds) was extremely popular and sold out within the first day.

Featured on the show floor were many weird and wonderful objects. One of my personal favourites was a collection of ornately decorated kettles from Obuchi, featuring a delicate 'cherry blossom' pattern — cherry blossom is a native Japanese tree which produces small pale pink flowers during the spring. It is a very common kimono pattern that Geisha's wear when



2: Close-up of Obuchi's ornate kettles.



The Gem-A stand.

serving tea at ceremonies. Established in 1955, Obuchi's kettles are handmade in a specific design, which prevent dripping when hot water is poured out. However, it was the intricate engraved designs and craftsmanship that drew much attention to them. Elegantly wrapped around the bulbous area of this kettle are two Japanese dragons (2). The dragon stands for breath, 'a-hum' in a Japanese proverb. One dragon's mouth is opening and the other is closing ('inhaling and exhaling'), expressing the synchronization of two opposing forces, harmonizing both the mental and physical before they engage in an activity. This is also a good luck talisman within the Japanese culture. The kettles ranged from 100,000–1,500,000 yen.

On the Friday, an invitation had been extended to Gem-A to present a 90-minute seminar at the show, the first time such an event had been offered. One of six

talks on varying aspects of gemmology and the jewellery trade, Andrew's 'Seeing is Believing' presentation and subsequent hands-on session was the only one to be sold out in advance, attracting almost 70 eager participants, most of whom were not students or gemmologists, but interested newcomers. Co-presented in English and Japanese by Andrew Fellows and Ayako Naito, this informative presentation introduced a packed audience to basic gemmology. By the end of the talk, all were inspired by the various optical effects and phenomena that could be viewed with just simple hand-held tools. Whilst several stayed behind to ask questions, take photos and express their delight at the seminar, many rushed to the Gem-A stand for more information and to purchase dichroscopes, spectroscopes and other portable tools. This talk was followed by a similarly successful Gem Central held on Monday evening — which again attracted

high numbers — involving a discussion and practical session on rough crystals. After almost two hours of working through numerous samples in an informal and friendly atmosphere, many members and newcomers to the field left with a deeper insight into rough materials and a greater appreciation for the subject.

There was a fantastic range of jewellery on display at IJT. Most notable were pieces from a company called Malpani from Hong Kong, which was aiming to create unique and individual pieces, and which started introducing diamond slices to the market several years ago. A family-run business started over 10 years ago, Mapani now sells worldwide. One ring in particular caught my eye; shaped like a flower, its five petals were made out of diamond slices, with the diamond octahedral structure visible (3). These slices showed significant growth zoning and element variations, with the darker central areas being caused by hydrogen concentrations. This was a creative use of crystals that may not otherwise have been considered gem-quality. The petals were surrounded by 230 mixed colour diamonds, held together with 18 ct white gold and filigree detailing on the shoulders. The diamond slices had been faceted by a laser to show shallow pavilion facets cut on one side of the slice and a flat highly polished table on the other. The slices range between 2–3 mm thick and 5–12 mm usually of irregular size. These rings showed the continuing trend away from simple, single stone rings into more creative areas.

With the year's booths already booked, IJT promises to be an ever expanding show of opportunities, and one that I was proud to be part of this year. ■

All photos Andrew Fellows, except where stated otherwise.



3: Unique ring made from diamond slices.

The Ins and Outs of Polished Diamonds: Oddities

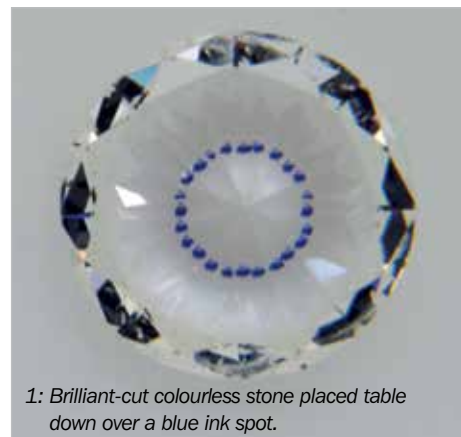
In the final article in his series on polished diamonds, Grenville Millington FGA takes a look at oddities in diamond.

This last look at polished diamonds covers the topics or photographs that did not find a home in the previous themes. Let's start with a question — to make it easier it's multiple-choice. "What is the colourless gem shown in 1? It is a brilliant-cut stone of standard proportions, i.e. crown height approx. 14% of diameter and pavilion depth approx. 43%. Is it: a) diamond b) cubic zirconia c) synthetic spinel?" (Perhaps we should ask DGAs not to attempt this one.) Answer at the end.

Whilst on the subject of proportions and light refraction, I'll include information on a diamond-cut viewer I produced. I used an old pill container of white opalescent plastic, cut a hole in the bottom to accommodate a watchmaker's eyeglass and blackened the inside of the lid. The final addition was a colourless plastic box with a circular hole cut into it to accommodate the polished diamond (in fact I cut two holes of different sizes for different sized diamonds) as illustrated in 2.

The clear plastic part supports the diamond and is placed on the black inner lid, the white cylinder just rests on this and the eyeglass is inserted into what is now the top, ready for viewing.

There needs to be sufficient, ordinary light available externally to penetrate the white



1: Brilliant-cut colourless stone placed table down over a blue ink spot.

cylinder. The diamond can be viewed without distracting surface reflections and under a diffuse light, showing up facets that do and do not return light to the viewing position (3). It is interesting to compare this last photo with that of a synthetic moissanite placed under the same viewer (4).

Another oddity was a diamond with what was termed the 'millennium' cut, a fancy style that could not improve on the standard brilliant (5a, b, c).

When I used to grade diamonds by the thousand it was not uncommon to come across one that was cut from what was termed a 'coated' crystal. This was an octahedron that was colourless on the interior but had a coloured, mostly opaque, natural outer layer. This coloured exterior was usually lemon yellow, sometimes grey — I believe green is also possible but I don't recall seeing one. The outer colour penetrated a short way into the body of the crystal. I've drawn a diagram of this type of stone (6a).

It would be possible to cut a brilliant-cut from such a crystal and omit all the coloured outer layer. Often, however, some of the



2a, b, c: White plastic pill container with the bottom cut-out.



3: Diamond with 'Hearts and Arrows' style cut, viewed in the plastic pill container in 2.



4: Synthetic moissanite seen in the viewer.



5a



5b



5c

5: (a) Millennium-cut diamond weighing 1.03 ct.
(b) Crown view of the millennium cut in the viewer
(c) Pavilion view of the millennium cut in the viewer (not fully centralized).

outer layer would be left on the finished brilliant (not usually large stones; say under 3.5 mm) and on rare occasions the colour from all four sides of the crystal would still be present in the finished stone (6b, c, d). This particular stone also obliged us with a 'natural' of quite regimented trigons (6c).

A small single-cut diamond (about 1.9 mm) that we look at next would no doubt be rejected by most jewellers, but it too held some interest. It appeared to have a cleavage fracture fully across its centre and have many possibly small cleavage fractures that were graphite lined. The interesting part was

[A small single-cut diamond] appeared to have a cleavage fracture fully across its centre and have many possibly small cleavage fractures that were graphite lined. The interesting part was that these blackened cleavages were only situated in the one half of the stone.

that these blackened cleavages were only situated in the one half of the stone (7).

With regard to small stones, the smallest are often used for 'points'. These are fillers for the tiny gaps left between larger stones (diamonds, sapphires, etc.) in, say, a three- or five-stone boat ring, favoured at the end of the nineteenth and early twentieth centuries (8a). Many retail jewellers still refer to these small diamonds as points even though they are very often single-cut (eight-cut) diamonds. However, they were originally very tiny diamond octahedra, and were, literally, the 'points' of the crystals. Six of these are

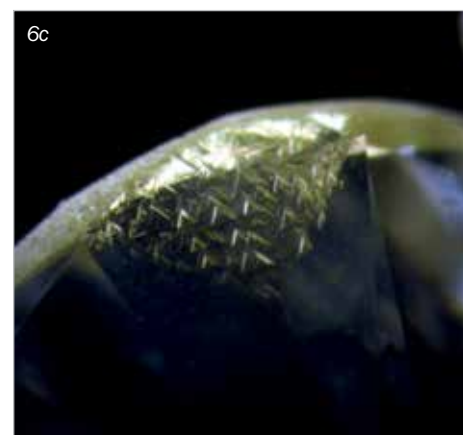


6: (a) Sketch of a 'coated' octahedron, yellow skin, with position of brilliant-cut within.
(b) Brilliant-cut diamond weighing 0.07 ct, cut from a 'coated' crystal.
(c) The 'coated' stone also displayed a 'natural' of trigons, magnification approx. 30×.

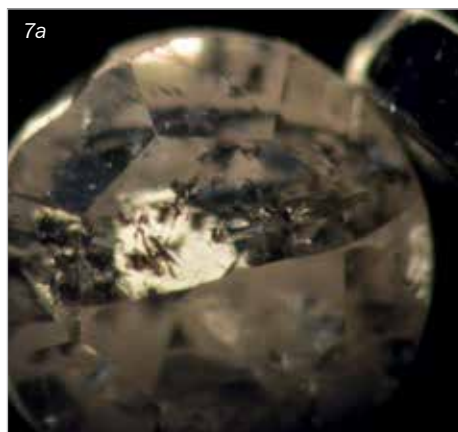
7: Single-cut diamond weighing 0.03 ct, with a cleavage fracture across the whole and small blackened inclusions only in one half of the stone.



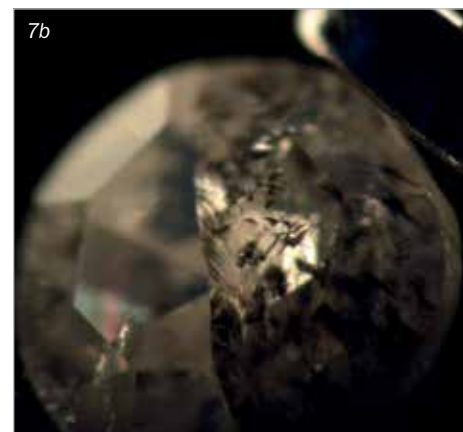
6b



6c

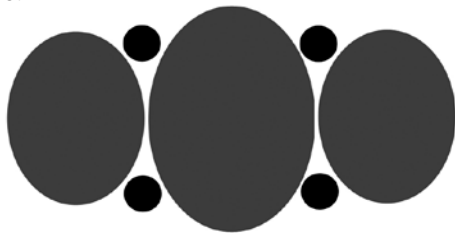


7a



7b

8a



8b



8c



8: (a) The black spots are the position of diamond points. (b) Tiny diamond octahedra; the three lower ones displaying three facets each. The large cut diamond on the right is 3 mm in diameter. (c) Small diamond, single-cut, 0.07 mm. The large diamond is 2.2 mm in diameter.

shown in **8b**, with the lower ones with three facets polished onto them.

If you think the stones in **8b** are small, take a look at an example in **8c**, noting the millimetre size of the 'large' stone!

Some polished diamonds come with diamond reports and with the number reference of the report conveniently lasered into the girdle. However, this is not always an advantage, as shown in **9a**. The lasered

number is easily and clearly visible when the stone is examined through the table (**9c**). This unfortunate consequence can also be seen in **10** and **11**.

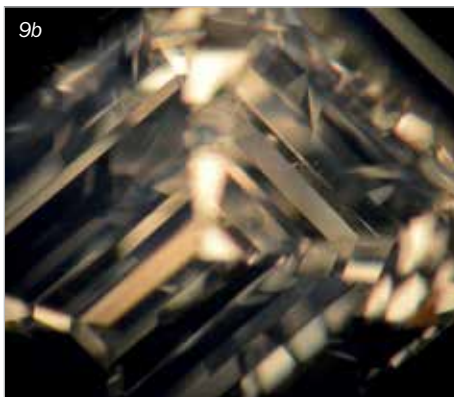
In my opinion, this laser numbering has spoilt the stones and I cannot see how, for example, stone **9** can still have a VVS2 grade when the light path through the stone has been interrupted in this way. The same goes for the examples in **9f-h**.

Another section of a diamond report may include information on fluorescence, such as colour and strength. Because the trade has the idea that exceptionally strong blue fluorescence in a stone (see 'The ins and outs of polished diamonds: fluorescence', *Gems&Jewellery*, Jan/Feb 2016) causes an unwanted bluish cast and even haziness, just the mention of any fluorescence causes alarm to the uninitiated and a request for

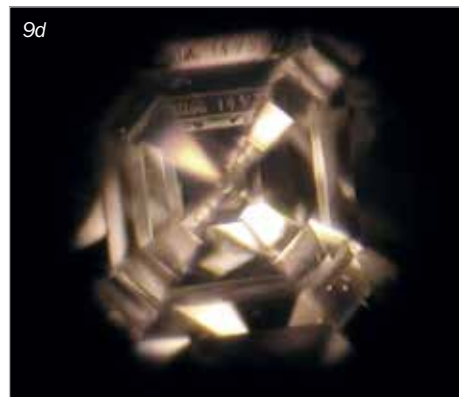
9a



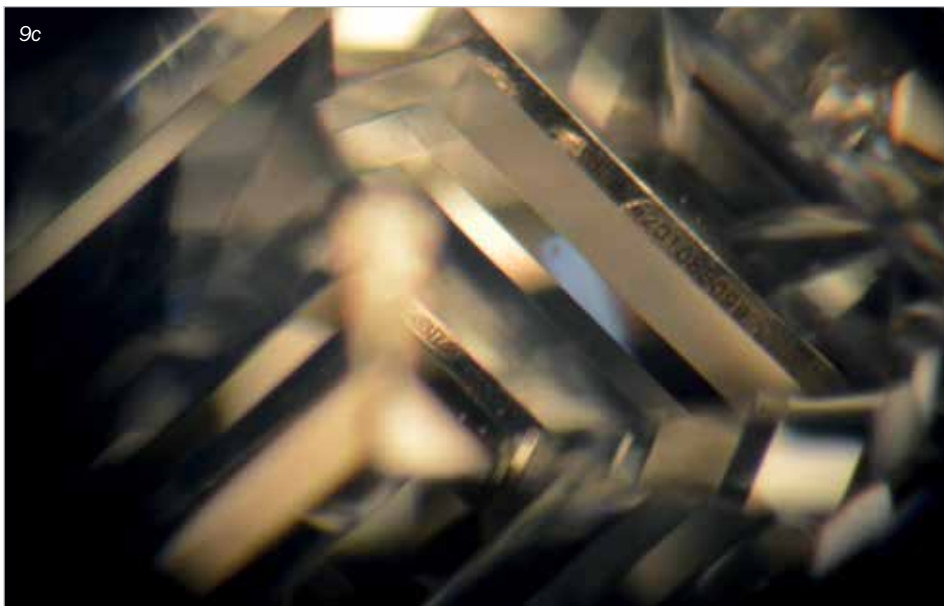
9b



9d



9c



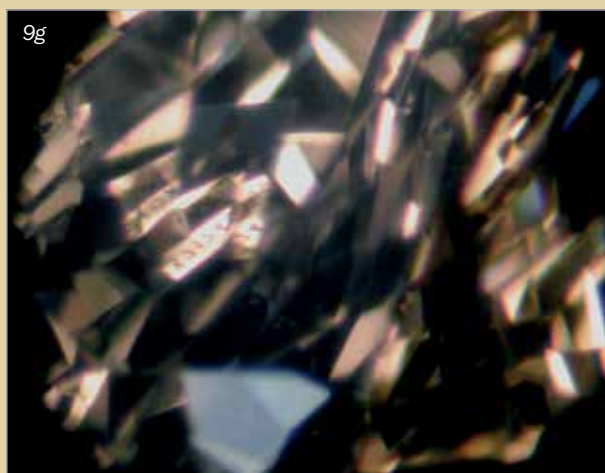
9(a-c): An emerald-cut diamond, graded as 0.97 ct, E.VS2, showing the lasered report number reflected within, magnification approx. 7×, 40× and 50×.

d) Diamond 0.40 ct, E.VS1 showing inner reflection of laser inscription on girdle, magnification approx. 35×.

a lower price! Pressure is, no doubt, put on the producers of the reports to keep such information as low key as possible. Here are photos of a 1 ct diamond, graded D.IF (in other words a top grade) and the same stone under LWUV light (**10a, b**). Also shown is the report, showing the stone's 'fluorescence' results (**10c**).

One topic we haven't covered in this series is colour. I haven't been in a position to photograph large fancy-coloured diamonds, hence they are absent (except for small stones in the previous article). I did think it useful to include a photo of my 'master stones' of the standard diamond colours, as many in the trade do not appreciate the very slight differences between the grades (**11**). As you can see,

9 (e-g)
Marquise-cut diamond,
0.52 ct, displaying reflections
from the laser number on
the girdle, magnification
approx. 7×, 25× and 60×.



10: (a): The 1.07 ct diamond in white light and
(b) in LWUV light. (c) Grading report for the
diamond.

stones graded the equivalent of I, J or K are nowhere near as 'bad' as many people seem to think when told a diamond is graded with one of these terms.

The diamond master stone is at the top of its grade, hence the top master stone is grade E. Any compared diamond that is better, i.e. less colour, is thus termed D. I find it useful to actually have a D stone (to the left in 11) to compare and confirm.

I still remember the first time I got a close look at a pile of loose, faceted diamonds and how they seemed to merge one with another as light threaded its way through. That was in 1970 but the vision of it is still there and even now I find this sight mesmerising (12).

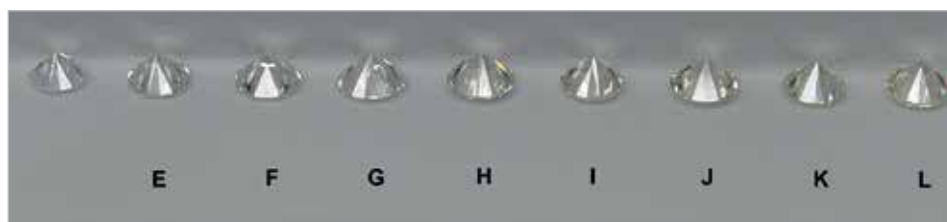
Which just leaves us with the question at the beginning of this article to answer. The correct response is option (a) diamond. The spot test, or line test, is quite an effective one for telling if a colourless brilliant-cut stone may be diamond or not. If the spot or line is easily visible then the chances are that the stone in question is an imitation. The spot should not be visible, or certainly not a circle of spot images, if the stone is diamond, strontium titanate, synthetic rutile or synthetic moissanite. The other common diamond imitations, including cubic zirconia, will show a full circle of spots or a line, depending on your preferred method.

So, what about the stone in our photo? Yes, it's a diamond! And, yes, it's of good

proportions (a shallow-cut diamond will show some of the circle of spots). What I neglected to mention was that I immersed the diamond in water! Hence the light path angle is not as great as between air and diamond, and a full circle of spot images is visible.

Always remember, in gemmology it's wise to query (almost) everything. ■

All images Grenville Millington.



11: A set of colour master diamonds equivalent to the GIA grading system. The largest stone is 0.40 ct.



12: A pile of brilliant-cut diamonds.



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Preseli bluestone

Sarah Steele FGA DGA discusses the myth, legend and controversy surrounding this ancient stone.



1: Stonehenge.

If ever there was an unlikely candidate for a gem material then Preseli spotted dolerite would, at least at face value, be it. Over the last five or six years however it has appeared on the market in increasing quantities, both as jewellery and ornamental items, prompting English Heritage and the National Trust to consider unprecedented measures in order to restrict its sale, leading to an ethical debate: should this native material, which has been important to the occupants of the British Isles since 2900 BC, be available for our general consumption or removed from the market to protect the suggested source of the raw material?



2: Piece of bluestone.

It seems that the people of the twenty-first century have a desire to own a piece of the material which has almost come to represent the Stone Age, a material of such importance to our Neolithic ancestors that they engaged in a seemingly impossible feat of human engineering, moving huge blocks of this material 250 miles in order to build one of the world's most iconic ancient monuments — Stonehenge.

STONEHENGE

Stonehenge, on Salisbury Plain, Wiltshire, has been a designated UNESCO World Heritage Site since 1986, ranking alongside sites such as Machu Picchu in Peru and the Xian Terracotta Warriors in China (1). It is a complex site, best known for the standing stones — the collective landscape of which, in association with other surrounding structures, demonstrates Neolithic and Bronze Age ceremonial and mortuary practices resulting from around 2,000 years of continuous use between 3700–1600 BC. The sheer size of its megaliths, the sophistication of its concentric plan and architectural design, the shaping of the stones and the precision with which it was built, secures Stonehenge as one of the most impressive prehistoric megalithic monuments in the world.

The large stones that form the Outer Circle are known as 'sarsens'. They are hard,

resistant sandstones thought to have been collected from glacial moraine deposited within the local Salisbury Plain environment. The sources of the smaller stones that form the Inner Circle and the Inner Horseshoe, known as the 'bluestones', are not native to the Salisbury Plain area (2). The earliest structures known in the immediate area are four or five pits, three of which appear to have held large pine totem-pole-like posts erected in the Mesolithic period, between 8500 and 7000 BC. It is not known how these posts relate to the later monument of Stonehenge but we do know that in about 2900 BC the bluestones were set up in the centre of the monument.

Perhaps the distance over which these bluestones have been transported is the cause of man's fascination with them, instead of the larger sarsen stones. This was addressed in 1923 by H.H. Thomas from the Geological Survey, who published a paper in *The Antiquaries Journal* claiming that he had "sourced the spotted dolerite component of the bluestones in hilltop rock outcrops in the High Preseli, to the west of Crymych in west Wales. Specifically, he thought that the tors on Carn Meini (also known as Carn Menyn) and Cerrig Marchogion were the likely source outcrops" (*Earth Heritage*, Summer 2013).



3: Map showing location of the Preseli Hills, Pembrokeshire, and Stonehenge, Wiltshire.



4: Pendant, skulls and other objects made from Preseli spotted dolerite, made in China.

GEOLOGY

Preseli bluestone is a metamorphosed dolerite outcropping in the Preseli Hills (3) (known locally as Preseli Mountains), Pembrokeshire, Wales. It is particularly notable for its spotted appearance in hand specimen, an effect caused by low-grade regional metamorphism during the Caledonian orogeny.

In thin sections the rock contains large pyroxene (augite) and altered plagioclase grains. The original igneous minerals have been partially altered to chlorite and epidote during greenschist grade metamorphism, and although large pyroxene grains remain, almost all the plagioclase has been altered. The remainder of the fine-grained matrix was also altered by metamorphism, although many igneous mineral shapes are evident.

Not all of the bluestones standing today at Stonehenge, however, are spotted dolerites. Four of them are ash-flow tuffs, of rhyolitic composition. In order to identify the origin of the bluestones, Aberystwyth University has worked to analyze the composition of micron-sized zircon crystals from rhyolite samples from Stonehenge using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). The technique focuses a very high-power laser beam onto the zircon crystals to 'ablate' them — essentially vaporizing them. The vapour generated by this process is then analysed in the mass spectrometer, which reveals the chemistry of the zircon crystals. This was the first time zircon chemistry had ever

been used to determine the provenance of archaeological material.

New research by a team of scientists including researchers from University College London (UCL), University of Manchester, Bournemouth University, University of Southampton, University of Leicester, Amgueddfa Cymru – National Museum Wales and Dyfed Archaeological Trust, presents detailed evidence of prehistoric quarrying in the Preseli Hills in Pembrokeshire, helping to answer long-standing questions about why, when and how Stonehenge was built.

They have identified the outcrop of Carn Goedog as the main source of Stonehenge's 'spotted dolerite' bluestones and the outcrop of Craig Rhos-y-felin as a source for one of the 'rhyolite' bluestones.

The special formation of the rock, which forms natural pillars at these outcrops, allowed the prehistoric quarry-workers to detach each megalith with minimal effort. Dr Josh Pollard, from the University of Southampton, said: "They only had to insert wooden wedges into the cracks between the pillars and then let the Welsh rain do the rest by swelling the wood to ease each pillar off the rock face. The quarry-workers then lowered the thin pillars onto platforms of earth and stone, a sort of 'loading bay' from where the huge stones could be dragged away along trackways leading out of each quarry."

Professor Colin Richards, an expert in Neolithic quarries from the University of Manchester, said: "The two outcrops are really impressive — they may well have had special

significance for prehistoric people. When we saw them for the first time, we knew immediately that we had found the source."

Radiocarbon-dating of burnt hazelnuts and charcoal from the quarry-workers' camp fires reveals that there were several occurrences of megalith-quarrying at these outcrops. Professor Mike Parker Pearson, from UCL, said: "We have dates of around 3400 BC for Craig Rhos-y-felin and 3200 BC for Carn Goedog, which is intriguing because the bluestones didn't get put up at Stonehenge until around 2900 BC. It could have taken those Neolithic stone-draggers nearly 500 years to get them to Stonehenge, but that's pretty improbable in my view. It's more likely that the stones were first used in a local monument, somewhere near the quarries, that was then dismantled and dragged off to Wiltshire."

The megalith quarries are on the north side of the Preseli Hills, and this location undermines previous theories about how the bluestones were transported from Wales to Stonehenge. Writers have often suggested that bluestones were taken southwards from the hills to Milford Haven and then floated on boats or rafts, but this now seems unlikely. Professor Parker Pearson has suggested that the only logical direction for the bluestones was for them to travel north, and then travel by sea around St David's Peninsula, Pembrokeshire, or travel east along a similar route to that of the A40, which runs from Fishguard in Wales through to London.

WHY PRESELI BLUESTONE?

The new discoveries may also help to understand why Stonehenge was built. Professor Parker Pearson and his team believe that the bluestones were erected at Stonehenge around 2900 BC, long before the giant sarsens were put up around 2500 BC. So why did Neolithic man decide to use Preseli bluestone?

A twelfth-century account of Geoffrey of Monmouth uses the myth of Merlin bringing the stones to Stonehenge and states that the stones had medicinal properties that could be accessed by washing the stones and then pouring the water into baths. The water absorbed the healing virtues of the stones. Even today, folklore in Pembrokeshire suggests that the Preseli bluestones possess healing qualities.

There is yet another intriguing (and surprising) aspect to the Preseli bluestones,

Writers have often suggested that bluestones were taken southwards from the hills to Milford Haven and then floated on boats or rafts, but this now seems unlikely.

which is that a relatively high proportion of them (perhaps as much as 10%) have the rare property of being lithophones — ‘musical stones’. That is, they can ring like a bell or gong, or resound like a drum, when struck with a small hammerstone, instead of the dull ‘clunking’ sound rock-on-rock usually makes.

As gemmologists we seldom use sound when contemplating gemstones, other than the distinctive ‘chink’ of spodumene perhaps, but as a lapidary, sound is important when polishing stones. We are often subconsciously using sound for facet orientation, to listen for surface imperfections and to distinguish different hardnesses of the material we are polishing.

The fact that lithophones are along the Carn Menyn ridge tends to suggest that sound may indeed have been an important factor in the general location being special to Neolithic people — the sounds from stones were perhaps perceived as emanating from spirit inhabitants of rock and cliff interiors. The underlying reason for the perceived

importance or special nature of the bluestones by Neolithic people therefore seems to lie in the idea that Mynydd Preseli was viewed as a sacred land in that era. Could it be that deep within our psyche we still carry a connection with this ancient landscape and the desire for objects made of the bluestones is still strong within us?

MODERN DEMAND

The material which has flooded the market is Preseli spotted dolerite rather than the rhyolitic material. It is fashioned primarily into large cabochons or skulls, spheres, wands and other items evoking pagan symbolisms (4). The bulk of the material is polished in mainland China, with elaborate carvings being worked in the Netherlands according to my source. The bodies that are concerned with protecting the sites of the bluestone are increasingly concerned that illegal extraction of material must be occurring due to the large quantity of material on the market. This has an implication from an archaeological point of view as these ancient sites, believed to be the Neolithic quarries from where the megaliths were extracted, may still hold clues as to Stonehenge’s history and are designated Sites of Special Scientific Interest (SSSI) and are therefore legally protected.

Having spoken to the source of the majority of rough material into the supply chain, however, I am assured that all the material currently on the market has come from his source, a farmland some 500m outside the boundary of the SSSI. He explained to me that the source of his deposits are glacial erratics, the weathering skins of which have indicated a date of deposition circa 11,000 BC at the end of the last ice age and predating quarrying activity by some 7,000 years. The erratics are dug up from his farmland, usually five to six feet below the surface and then exported for manufacture. Despite this, in order to protect the bluestone quarries, it has been proposed that a worldwide ban of the sale of Preseli spotted dolerite may be required. This would be unprecedented for a non-organic gem material and raises the important question of whether (and, indeed, how) such prehistoric stone sources should be protected and conserved in the future. It also demonstrates the need for geologists, archaeologists and manufacturers to work more closely together to ensure a greater transparency regarding the sourcing of our British gem materials. ■

All photographs this article courtesy of Sarah Steele.

FURTHER READING

Bevins, R., and Ixer, R., 2013. ‘New Science pinpoints source of Bluestones’.

Earth Heritage, Issue 40, Summer 2013, 12–14
http://www.earthheritage.org.uk/ehpdf/EH40_7-13final.pdf

Parker Pearson, M., et al., ‘Craig Rhos-y-felin: A Welsh bluestone megalith quarry for Stonehenge’, *Antiquity*, **89**(348), 1331–1352.
<http://dx.doi.org/10.15184/aqy.2015.177>

English Heritage
<http://www.english-heritage.org.uk/content/visit/places-to-visit/history-research-plans/stonehenge-phased-plan>

ITV, ‘Appeal to stop Preseli bluestone ‘burglars’’, 18 February 2016
<http://www.itv.com/news/wales/update/2016-02-18/appeal-to-stop-preseli-bluestone-burglars/>

Landscape Perception, ‘The Story of the Bluestones’, 2012
http://www.landscape-perception.com/the_story_of_the_bluestones/

National Museum Wales, ‘Sourcing the Stonehenge Bluestones’, 21 February 2012
<http://www.museumwales.ac.uk/articles/2012-02-21/Sourcing-the-Stonehenge-Bluestones/>

Stonehenge and the Ice Age
<http://brian-mountainman.blogspot.co.uk/2010/02/bluestone-quarry-consigned-to-scrap.html>

UCL, ‘Stonehenge ‘bluestone’ quarries confirmed 140 miles away in Wales’, 7 December 2015
<https://www.ucl.ac.uk/news/news-articles/1215/071215-stonehenge-bluestone-quarries>

UNESCO, Stonehenge, Avebury and Associated Sites
<http://whc.unesco.org/en/list/373>

Craftsmanship & Design Awards 2016

The Goldsmiths' Craft & Design Council's annual celebration of jewellery, craftsmanship and design culminated in an exquisite awards ceremony held on Monday 29 February at Goldsmiths' Hall. Known as the 'Oscars of the Industry', the Goldsmiths' Craft & Design Awards are the only peer-reviewed technical and creative awards in the UK, yielding exquisite work from up and coming designer-makers.



1: 'Brooch' by Victoria Chen.
Photo Richard Valencia.

For the past several years Gem-A have sponsored the event as a Special Patron, donating two scholarships to students who demonstrate an inspiring and unique use of diamonds or coloured gemstones in their work. The winners of this year's award, chosen by a panel of Gem-A judges, will receive places on Gem-A's ODL Diamond Diploma course, allowing them to gain a thorough understanding of diamonds, to help shape and influence future designs and constructs.

The winners, Victoria Chen and Paula Sloan (pictured), displayed wonderful use of stones in their unique designs. The judges were impressed by Victoria's brooch mount (1), stating that the workmanship and attention to detail involved in the crafting of the piece was exquisite. A perfect mount for coloured diamonds or gemstones, once set the piece would be striking. Paula's Gold Necklet with Tourmaline (3) impressed the judges with its use of tourmaline, with the design mimicking the natural shape of the stones. The judges were also impressed with the arrangement and selection of the different shades of blue and green tourmaline, which also added to the striking nature of the piece. The judges also took special measures to award Joseph



2: 'Eternal Heart Pendant'
by Joseph Jackson.
Photo Richard Valencia.

Jackson with a place on one of Gem-A's one-day workshops, for his Eternal Heart Pendant piece (2). Joseph's piece caught the judges' eye with its delicate and unusual design, which they saw as having huge potential and viability in the commercial market.

It was not only the winners' unique and well-executed designs that caught the judges' attention; all of the winners demonstrated a real desire to study diamonds in their personal statements, stemming from a genuine interest in gemstones and their relationship to jewellery and, indeed, the jeweller.

Gem-A offer their congratulations to Victoria, Paula and Joseph.



3: 'Gold Necklet with Tourmaline'
by Paula Sloan.
Photo Richard Valencia.



(From left-right) Timothy Schroder, Prime Warden of the Goldsmiths' Company, winners Victoria Chen, Paula Sloan and Joseph Jackson, and Gem-A's Charles Evans FGA DGA at the award ceremony. Photo Julia Skupny.

The Journal of Gemmology

Guy Lalous ACAM EG
summarizes three
articles from
Volume 38
Number 4 of
*The Journal of
Gemmology*.

Gold Sheen Sapphire*

Summary of 'From Exsolution to "Gold Sheen": A New Variety of Corundum' by Thanh Nhan Bui, Katerina Deliousi, Tanzim Khan Malik and Katrien De Corte.



These Gold Sheen sapphires, faceted into chequerboard cuts or polished as cabochons, weigh up to 30 ct each. The golden sheen, colour zoning and fracture patterns are present in various combinations. Photo by T. K. Malik.

The article describes attractive sapphires notable for their golden sheen — both the material and the effect are completely natural. The gemstones are heavily fractured, full of inclusions and typically translucent. The bronze golden sheen is due to the reflection of light from an oriented network of exsolved needles and platelets. Most of the material is opaque and gems are typically cut with large tables and are oriented to best display the sheen. If cut en cabochon, the Gold Sheen sapphire will often display asterism. The gemmological properties of the Gold Sheen sapphire, a magmatic type, most closely resemble those of the black star sapphires from Australia and Thailand.

Optical microscopy highlighted the presence of a network of metallic-appearing needles and platelets and some larger black plates. Qualitative EDXRF spectroscopy revealed the presence of the following trace elements: Fe, Ti, V, Cr, Ga, Nb and Ta. A relatively large amount of Fe suggested that this element was probably the main ingredient of the inclusions.

Raman micro-spectroscopy is a powerful tool for identifying microscopic inclusions that are located at or near the surface. Raman micro-spectroscopy identified the main inclusions as ilmenite and hematite and some relatively thick black plates with lateral dimensions greater than the hematite-ilmenite as magnetite. All of those are Fe-Ti oxides. Some long needles consisting of tiny particles proved to be boehmite and diaspore. The Fe-Ti oxides and the diaspore-boehmite needles all formed in the sapphire as a result of epigenetic solid exsolution. Boehmite and diaspore, two polymorphs of aluminium oxide hydroxide, are correlated to the polysynthetic twin planes. The Fe-Ti epigenetic inclusions crystallize due to the presence of defects and impurities of Fe and Ti in the host crystal as it cools after its formation, forming microscopic needles and plate(let)s.

The mine is already exhausted but there is enough rough material available to fulfil the market demand for the near future.

* A summary of an article published in *The Journal of Gemmology*, **34**(8), 2015, 678–691.

Age of Zircon Inclusions to Determine the Geographic Origin of Sapphires*

Summary of 'Age Determination of Zircon Inclusions in Faceted Sapphires' by Klemens Link.

Geographic origin is important when determining the value of a high-end sapphire. A method for age determination of zircon inclusions in faceted sapphires is described within this article. The age data can shed light on the genetic conditions under which the sapphire formed and can point to the original host rock.

Zircon (ZrSiO_4) is a mineral of great benefit for geochronologists as uranium (U) can be incorporated up to a few hundred parts per million in zircon. Starting at the time the zircon is formed, U isotopes undergo radioactive decay to form lead (Pb)

daughter isotopes according to their decay constants. Measuring the radiogenic Pb allows one to precisely calculate the formation age of the zircon. LA-ICP-MS is a well-established and frequently used method in the geosciences for measuring *in situ* uranium-lead (U-Pb) ages of zircon. This procedure can be applied to sapphires with surface reaching zircons.

The article also discusses the potential influence on U-Pb age dating of post-formation metamorphic events and laboratory heat treatment as increasing temperatures lead to enhanced Pb diffusion

toward the outer rim or completely out of the zircon. The loss of (radiogenic) Pb changes the U/Pb ratio and resets the 'radiogenic' clock. Another potential complication for age dating could be caused by complexly zoned zircons, in which the varying zones represent different times of formation.

The age dating of zircon inclusions can supply valuable information that supports the conventional methods of geographical origin determination of sapphire. This test has been routinely applied to client stones at the Gübelin Gem Lab since July 2015.



These Sri Lanka and Madagascar sapphires are typical candidates for hosting zircon inclusions that could be used for age determination to better characterize their origins. The stones range between 1.4 and 29.7 ct, and are unheated, with the exception of the yellow sapphire on the left. Photo by K. Link.

* A summary of an article published in *The Journal of Gemmology*, 2015, **34**(8), 2015, 692–700.

Identification of CVD Diamonds: a growing challenge*

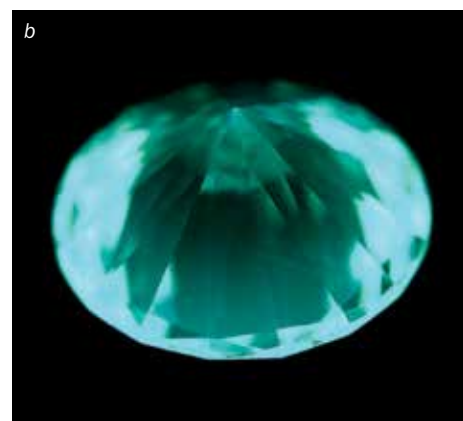
Summary of 'Identification of a CVD Diamond with a "tree ring" growth pattern' by Yan Lan, Rong Liang, Taijin Lu, Yong Zhu, Tianyang Zhang, Xuan Wang, Jian Zhang, Hong Ma and Zhonghua Song.

Recently a faceted CVD diamond was submitted to the NGTC's Shenzhen Laboratory. A bluish green fluorescence pattern, similar to the 'tree ring' growth features seen in some type I natural diamonds, was observed in the table of the sample with the DiamondView. When viewed from the pavilion, the sample showed the characteristic parallel layers associated with the growth of CVD synthetic diamond. The DiamondPlus indicated 'Refer CVD' from the photoluminescence (PL) measurement of the 737 nm Si-V-centre.

The absorption spectrum in the mid-infrared region showed that the sample was type IIa. The weak line at 3107 cm^{-1} provided strong evidence that the sample had been HPHT treated. PL spectra were acquired with four different laser excitations (325, 473, 532 and 785 nm). Emissions at 415.3 nm (N3), 503.2 nm (H3), 575nm (NV⁰) and 736.6/736.9 nm were obtained. The presence of PL peaks at 415 nm and 503.2 nm indicated that the sample underwent post-growth high temperature, high-pressure (HPHT) treatment. The 575 nm emission is commonly detected in CVD synthetic diamond. The 736.6/736.9 nm doublet is attributed to the Si-V-centre. This defect is seen very occasionally in natural diamond and can be used to identify CVD synthetic diamond.

X-ray topography and Laue diffraction revealed that the crystallographic orientation of the table facet was inclined approximately 20° to the $\{111\}$ octahedral plane, rather than being oriented in the typical $\{100\}$ cubic direction.

Refinements in growth processes of CVD synthetic diamonds have yielded bigger stones with variable properties according to the added impurities or post-growth treatment. The 'tree ring' growth structure observed is due to the crystallographic orientation of the table facet and has not been previously reported in a CVD synthetic diamond. Identification of CVD synthetic diamonds has become a growing challenge.



DiamondView images of the 0.61 ct CVD sample show bluish green UV fluorescence patterns with a 'tree ring' growth pattern seen in the table-up orientation (a) and a layered growth pattern viewed through the pavilion (b). Photos by Y. Lan.

* A summary of an article published in *The Journal of Gemmology*, **34**(8), 2015, 702–710.

Blue, reds and primrose: A diamond and a dancer

Following on from his note about blue diamonds in the previous issue of *Gems&Jewellery*, Jack Ogden FGA looks into the story of a huge blue diamond, the Russian Revolution and a beautiful Parisian dancer.



1: The Tereschenko or Mouawad Blue diamond.

In the summer of 1984 David Warren, now Senior International Jewellery Director at Christie's, received a phone call from the auction house's bank manager with a question: "Do Christie's sell blue diamonds? Our client has one the size of a pigeon's egg." The huge gem turned out to be the Tereschenko diamond, one of the least known large blue diamonds, and, at 42.92 ct, just a shade smaller than the 45.52 ct Hope (1). It sold at Christie's in Geneva in November 1984 for a then-record price of \$4.6 million to Robert Mouawad and is now called the Mouawad Blue. Unlike the Hope and many of the other famous diamonds, it has lacked a romantic history. There has been no curse or celebrated Mughal emperor to add notoriety or spice. The Christie's catalogue, and Lord Balfour in his standard work on the world's great diamonds, simply notes that the first known appearance of the stone was in 1913 when the Ukrainian Mikhail Tereschenko left it with Cartier in Paris. In 1915 he instructed them to mount it in a necklace which was returned to him in Russia before being spirited out of the country again in 1916, on the eve of the Russian Revolution. Then, according to Christie's and Balfour, it passed into anonymous private ownership until it came up at auction in 1984.

Perhaps we can now add some spice, even a curse, to this story, by introducing a French dancer born in the final decade or so of the nineteenth century. She entered the entertainment world under the stage name of Mademoiselle Primrose and by 1911 was performing in Le Théâtre des Capucines in Paris. She was renowned for her attractiveness and, in a rather surreal article on the components of female beauty in Paris that appeared in various American newspapers in late 1911 and early 1912, she was noted as one of the most beautiful of reigning stage beauties in Paris with particular praise for her "most charming chin" (2).

If Mikhail Tereschenko left the 42.92 ct blue diamond with Cartier in Paris in 1913 he may have encountered Mlle Primrose in that city. This is not such a wild suggestion because in 1924 we hear of a former Parisian dancer named Mlle Primrose, real name Suzanne Marie Blanche Thuillier, who had resided for a time in St. Petersburg, Russia, and who moved in Court circles there. She had left Russia for France just before the Revolution and was the



2: Suzanne Marie Blanche Thuillier or 'Mlle Primrose' ca 1920.

owner of what was described as a 43 ct blue diamond, called by some the 'Russian Imperial Blue', and by others (rather bizarrely) the 'Blue Diamond of Ceylon'. The newspapers at the time gave myriad origins for the stone, neither verified nor mutually exclusive. It came from the eye of an idol in India; reached Russia in the time of Peter the Great; had been set in the Russian Crown Jewels; had been secretly purchased in London "under romantic circumstances" and so on. One newspaper even hedged its religious bets and said the gem had "ornamented the finger of Buddha in a Hindu Temple". Particularly intriguing is a report in a British newspaper that "In April 1912, there were rumours in Hatton Garden that a diamond merchant was walking about with a quarter of a million in his wallet. In fact he had received from his Dutch agents a stone [a large blue diamond] which had been sent from America with instructions to let it fetch what it would." This merchant supposedly pieced together the history of gem, found out that it had once belonged to the Russian Imperial family and put out feelers which reached the then-Czar who sent an emissary to obtain it. Perhaps more about this supposed transaction will come to light, but in the meantime we can observe that a presence on the market in London in 1912 would tie in nicely with Tereschenko depositing a large blue diamond with Cartier in Paris in 1913.

After Mlle Thuillier and her diamond reappeared in France, some newspapers reported that she had been given it by Czar Nicholas as a token of his regard for her; others that it was given to her by "a member of the Imperial Court of Nicholas". The latter view was supported by those in the know who vehemently denied, or expressed indignation, at the suggestion that the late Czar gave Thuillier the diamond. Indeed, according to *Le Parisien* newspaper in June 1924, when directly asked where it came from, Thuillier explained "evasively" that strictly speaking she was not admitted to the imperial court, but "frequented assiduously with the gentlemen of the court who occupied the highest positions". She never claimed that the diamond was presented to her by the Czar. So, if a gentleman other than the Czar gave her the gem, Mikhail Tereschenko is perhaps a potential contender. Was a gift of the blue diamond the ticket to a new life outside Russia on the eve of the Revolution? She reportedly



An actual-size CZ replica of the Mouawad blue.

arrived in Nice in the South of France in 1916 and pawned it there that same year. The diamond had travelled in a secret pocket of her sealskin coat.

Following her arrival in the South of France Mlle Thuillier's beauty and attire "made her a spectacle among the many lovely women" there. She gambled excessively, however, and this "most notoriously extravagant woman in Europe" inevitably got into debt and had to pawn the blue diamond more than once. In June 1924 the diamond was in pawn for 200,000 francs, and with creditors circling, but there was the expectation that it would be redeemed and available for purchase. Apparently a Parisian dealer had already offered £125,000 and an American woman £200,000. What then occurred is unclear. There are reports that a Joseph Paillaud of Cap d'Ail, near Nice, had put up collateral of 1,350,000 francs and would take ownership of the diamond if not repaid in full by 9 December 1924. Mlle Thuillier made a plea to the Court and in March 1925 the Civil Court in Nice removed it from Paillaud's possession. Apparently Paillaud's actions equated with acting as a pawnbroker, an activity for which he was not licensed. A police search of his house — named, ironically, *Chalet Russe* (Russian Chalet) — revealed numerous pieces of jewellery lacking the required hallmarks plus records of transactions that were not properly registered.

Mlle Thuillier might well have predicted Paillaud's bad luck. A newspaper report in

1929 recounted that she had believed the diamond to be cursed. This may be typical press sensationalism, but some accounts say she was something of a mystic with an interest in the occult and in 1924 was even considering taking the gem back to India so it might be replaced on the statue of Buddha from which it had been robbed. It clearly never made it back to the statue and the last we hear of the large blue diamond is in March 1925, in the custody of the clerk of the civil court in Nice. The last we hear of the celebrated Mlle Primrose — with her charming chin — is in jail in Nice in April 1929, after several years of dire poverty. Her desperate situation had driven her to forgery.

What happened to the large blue diamond from 1925 until it resurfaced at Christie's, Geneva, in 1984 is so far unknown, but a French newspaper in 1924 had already commented that the diamond had "undoubtedly not yet finished the cycle of events of its adventurous life". ■

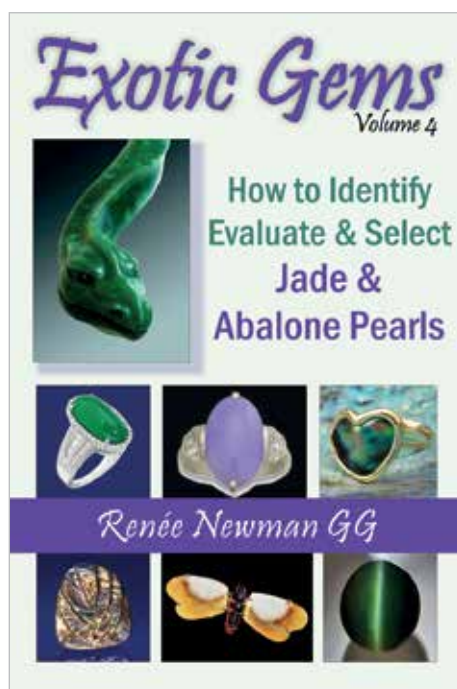
Note: The above was compiled from contemporary press accounts from Europe and America. Their lack of accuracy is demonstrated by their confusions and contradictions, so for now this is a *tale* of the Mouawad-Tereschenko diamond, not necessarily *the* tale of the Mouawad-Tereschenko diamond).

Exotic Gems: How to Identify, Evaluate & Select Jade & Abalone Pearls

The fourth volume of Renée Newman's 'Exotic Gems' series covers jade and abalone pearls — an unusual combination, but one which gels together well in this book. The first 12 chapters are dedicated to jade, covering identification, differentiation from imitations and simulants, and the range of jade sources around the world.

Many think of jade to be the green stone that is commonly portrayed in non-gemmological texts, but it can occur in a whole spectrum of colours, including blue, lavender, yellow, orange, brown, grey, black, white and colourless. From the first page Renée immerses the reader in the challenging world of jade, a world not only of gemmology, but also of music, status, history, investment, spiritualism, mysticism and health. With regard to the latter, Renée quotes Kunz's famous work, *Curious Lore of Precious Stones*, which borrows from an earlier Chinese encyclopedia, which states that when boiled with rice and dew, jade created a "divine liquor" which ensured that "whoever took it for a long space of time ceased to suffer from either heat or cold and no longer felt either hunger or thirst". This sets the tone for the section on jade, showing that the material has a far greater cultural importance than as a mere rock.

Renée also sets out the basic identifying features of jadeite and nephrite, and shows readers how to differentiate between them using both standard handheld equipment and laboratory-grade equipment. This section also includes unique images that gemmologists might not expect, including a single monocrystalline cabochon of pure, colourless jadeite and a nephrite cabochon displaying chatoyancy, both features that aren't associated with the usual polycrystalline form of either species. The text goes on to consider the many and varied imitations of jade in all its forms, covering over a dozen of the more common imitations, including



Exotic Gems: How to Identify, Evaluate & Select Jade & Abalone Pearls

By Renée Newman

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aventurine, chrysoprase and hydrogrossular garnet, accompanied by information on the relevant tests and identification factors to enable the reader to differentiate jade from its imitators. Renée then discusses the various treatments that can be applied to jade. It is surprising how few treatments there are, given jade's long history as a culturally significant and desirable stone. Waxing, heating, coating, dyeing and impregnation are covered by Renée, along with any tell-tale signs of treatment, followed by a 'clues' section to enable hobbyists to identify treated material.

As with any book on identification and evaluation, the text also reviews the factors that affect price and value and includes a selection of images taken from auctions, which shows the high prices that some pieces can achieve, and reminding the reader how the skill and quality of craftsmen can have an important effect on value, in addition to the usual colour and clarity factors.

Renée then shows that, contrary to popular belief, jade is not just an oriental stone — it can be found worldwide, too. She gives readers a virtual tour of known and expected locations and sources, such as China, Taiwan and Burma, followed by some lesser known sources (and in some cases, unexpected ones!). Many people have heard of jade from Canada, Australia and New Zealand, but how many would think of Russian, Turkish or even Swiss jade? A lot of these sources can be traced back to Neolithic times, as illustrated by a selection of white nephrite jade knife blades uncovered in Korea. All of these sources have one thing in common, however: the fact that at each site a history of ornate carving and jewellery use exists. Renée goes on to show the differences and similarities between these varied sources.

The latter chapters of the book are dedicated to the abalone pearl. Formed within a species of marine snail, abalone pearls are seldom round, and are more commonly found in baroque shapes, or Mabe form. Abalone pearls occur in a range of colours, with blues and greens being the most common. Renée highlights how this beautiful gift from the sea was popular with Apache, Maori and other native tribes. Its use in jewellery may be slightly limited due to its shape, and also due to the strictly controlled supply — for example, there's currently an annual bag limit of 18, with a maximum of only nine bags from Sonoma and Marin regions on the Pacific coast. Economically this translates as abalone pearls trading at up to US\$2,000/ct. A section on care and caution with regard to abalone pearls ensures that the reader is aware of anything that could potentially damage these true gems.

With an extensive range of over a dozen book titles spanning all aspects of gems and jewellery, this highly interesting edition lives up to the high standards expected of Renée's work and is a great addition to every gemmologist's book shelf.

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