Gems & Jewellery

Spring 2023 / Volume 32 / No. 1

TUCSON REPORT 2023

AN INTRODUCTION TO CITES

A LOOK AT FORENSIC JEWELLERY

THE HISTORY OF HPHT SYNTHETIC DIAMONDS

Gem-A
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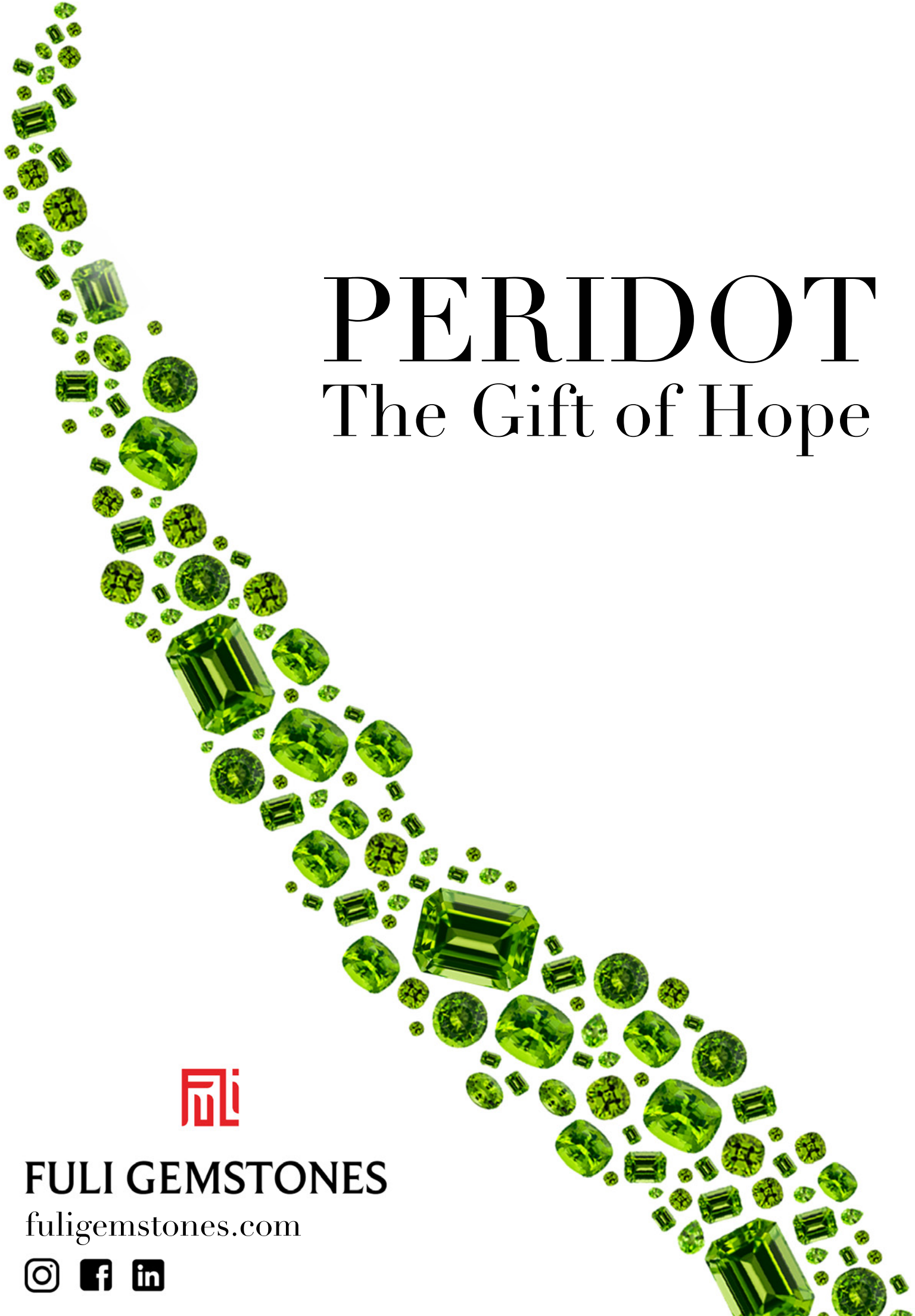
PERIDOT

The Gift of Hope



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SPRING 2023

TUCSON 2023

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INTRODUCING CITES

The history of CITES, now in its fifth decade, and its connection to the gem and jewellery industry.

FORENSIC JEWELLER

Dr Maria Maclennan FRSA has found her calling — the self-created but well-received field of 'forensic jewellery'. Here, she recounts her journey to this specialisation, as well as the project that has become her most recent passion.


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COVER PICTURE

The jewellery on our cover is from Mary van der Aa's Femme Petale line. The ring comprises a 1.78 ct Mahenge garnet and 0.50 tcw purple sapphire, while the Classic Tulip pendant features a 4.51 ct spessartine garnet. Both pieces use 14K gold. All gems are custom faceted by Tucson Todd's Gems. Photos courtesy of Mary van der Aa Fine Jewels.

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Gems&Jewellery

Spring 2023 Edition Featured Contributors

1. NICOLE AHLINE

Nicole Ahline FGA completed her undergraduate studies in geology at Cornell College before enroling at the Gemological Institute of America (GIA) for the Graduate Gemologist (GG) program, followed by the Gem-A Gemmology Diploma program. In 2016, she was hired by GIA as a gemmologist in the gem identification department, where she is now a senior staff gemmologist. While at GIA she has been a frequent contributor to gemmology journals and has given talks on numerous topics. Miss Ahline's current research interests include origin of color in coloured diamonds and geographic origin of corundum and emeralds.

2. JONATHAN BARZDO

An independent consultant focusing primarily on issues relating to the use of wild animals and plants and regulation of wildlife trade, Jonathan Barzdo supports governments, intergovernmental and nongovernmental organisations, institutions and companies to ensure that such trade is legal, sustainable and well managed. His work also encompasses organisational governance related to conservation management. In the past Mr Barzdo has served as deputy secretary general of the Convention on Wetlands; chief of governing bodies of the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); consultant for the European Commission, where he drafted the regulations that implement CITES in the European Union; head of the Wildlife Trade Monitoring Unit of the World Conservation Monitoring Centre; and director of TRAFFIC International. Earlier in his career, he was a wildlife consultant, warden of a bird hospital, a zookeeper and a genetics research assistant.

3. CLARE BLATHERWICK

Clare Blatherwick FGA DGA is an independent private jeweller based in Scotland. She has over twenty years of experience in the jewellery business, ten of which were spent as head of jewellery for Bonhams in Scotland. This role which saw her travel internationally searching for wonderful jewels to be auctioned around the globe. Ms Blatherwick has a keen interest in the historical aspect of jewellery and has lectured extensively on her subject as well as having appeared on various television programmes in the United Kingdom and United States as a jewellery specialist. She is an accredited lecturer for The Arts Society and is a specialist member of the Jewellery Valuers Association as well as a member of the National Association of Jewellers, the Society of Jewellery Historians and the Scottish Gemmological Association.

4. RACHEL CHURCH

Rachel Church writes and lectures widely on jewellery history and design. She is the author of *Rings* (V&A/ Thames and Hudson 2011 and 2017) and *Brooches and Badges* (V&A/ Thames and Hudson 2019), alongside many shorter articles and contributions to catalogues. She worked as a curator at the Victoria and Albert Museum for over 20 years and was part of the team which redeveloped the European Silver Galleries, the Sacred Silver and Stained Glass Galleries and in the William and Judith Bollinger Jewellery Gallery. She is particularly interested in the social history of jewellery and is currently researching male jewellery. Since 2021, Ms Church has been a freelance lecturer and jewellery researcher, available for both private commissions and institutional projects. Her website, *www.thelifeofjewels.com*, looks at the stories and history behind jewellery.

5. LISA KOENIGSBERG

President and founder of Initiatives in Art and Culture (IAC) and an internationally recognised thought-leader in visual culture, Lisa Koenigsberg's work is characterised by commitment to authenticity, artisanry, materials, sustainability and responsible practice. Over 20 years ago, she established IAC's multi-disciplinary conference series on visual culture and has since been responsible for launching its web-based webinars. She has held leadership positions at NYU where she also served on the faculty, at several major museums and at the New York City Landmarks Preservation Commission. Her writings have appeared in books, journals and magazines, as well as in Trendvision's *Trendbook*. A frequent speaker, she has also organised symposia and special sessions at universities, museums and professional organisations throughout the US and abroad. She holds graduate degrees from Johns Hopkins University and from Yale University, from which she received her PhD.

6. GLENN LEHRER

Glenn Lehrer, who established Lehrer Designs in 1981, is internationally recognised as one of the finest gemstone carvers of our time. His fluid gemstone carvings and precisely faceted stones are featured in custom fine jewellery and exquisite gemstone sculptures around the world. A self-taught lapidarist and goldsmith, he earned his GG from GIA in 1979. Mr Lehrer is the recipient of many prestigious awards, including ten Cutting Edge Awards, one AGTA Spectrum Award and an award from the prestigious Association in Germany. He is one of very few modern gemstone designers to have received a U.S. utility patent (#5722261) for the TorusRing Gemcut. Mr Lehrer serves on the board of trustees for the Colorful Life Foundation, a UK-based nonprofit foundation committed to the economic activity generated by coloured gemstones that helps to improve the health and education in gemstone mining and cutting communities in the developing world, along with fostering sound environmental practices.

7. MARIA MACLENNAN

Dr Maria Maclennan, the world's first forensic jeweller, earned her PhD from the University of Dundee in Scotland. Her research explores how design thinking can facilitate interdisciplinary collaboration and champion user-centred practices in diverse fields such as forensic science, policing, government and education. She has collaborated on a broad portfolio of practice outside, inside and alongside high-profile organisations across both academia and in the public sector internationally. She is also a regular contributor on national television and radio. Dr Maclennan is lead service designer for Education Scotland, a major Scottish government agency, and serves as a lecturer in the School of Design at Edinburgh College of Art. She is also principal investigator of Identifying the Displaced, an ESRC-funded multidisciplinary investigation into the forensic value of personal effects in the migration context.

8. AURORE MATHYS

Aurore Mathys FGA EG is a gemmology tutor and collection curator at Gem-A. After completing studies in art history, she started a career in pawnbroking and antiques, with a special interest in Victorian jewellery. She completed her Gemmology Diploma in 2021 and was awarded the Christie's Prize for gemmology, before joining the Gem-A teaching team the following year.

9. EUROSIA NG

Eurosia Ng GG CG is the current vice-president of the Hong Kong chapter of the GIA Alumni Association and the general secretary for the Gemmological Association of Hong Kong. Previously she was the training manager of Gübelin Academy in Hong Kong, teaching the Gübelin Coloured Gem Professional Program as well as providing corporate training for major international jewellery brands in the Asia-Pacific region. Ms Ng is regularly invited to engage in workshops and seminars to a wide audience, unreservedly sharing her passion and knowledge of gemstones. Currently she is working as a gemmology advisor for an international jewellery maison.

10. RICHA GOYAL SIKRI

Trained as an MBA, Richa Goyal Sikri began her gemmological journey in late 2013, travelling and curating trips to gemstone mines, manufacturing centres and artist studios to learn and become a discerning collector. Laterally, she studied jewellery design history, enrolled in a GIA course, and started documenting her experiences on Instagram. In 2017, after 20+ years as director at STIC Travel Group, she decided to pursue a second career as a journalist, storyteller and creative strategist. Ms Sikri has written and executed projects for *Robb Report*, *Harper's Bazaar*, *Vogue*, *Rapaport Magazine*, Art Science Museum (Singapore), GemGenève, the World Emerald Symposium (Colombia), the Asian Institute of Gemological Studies (AIGS), Gem and Jewellery Export Promotion Council (GJEPC), Diamond Exchange of Singapore (DES), the International Colored Gemstone Association (ICA) and the Natural Diamond Council (NDC), among others. Ms Sikri's first book – a collection of short adventure stories, related to coloured gemstones from Africa, that are based on actual events – will be published in 2023.

11. BETH WEST

Beth West is a gemmologist, writer, and educator specialising in diamonds, with over ten years' experience in the industry in varying roles. She is an FGA and a DGA (Bruton Medal winner) and a member of the Federation of European Education in Gemmology. Ms West has worked for a number of auction houses and museums; she has taught diploma-level gemmology at Gem-A's headquarters in London. She currently works as an ODL tutor for the Association, whilst taking on additional writing and consultancy work, principally for the De Beers Group.

Special thanks to Maggie Campbell Pedersen, Anne Carroll Marshall, Mary van der Aa and Orasa Weldon.

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Straight from the heart

Opinion and comment from CEO Alan Hart FGA DGA

We at Gem-A HQ hit the ground running in 2023. We started off the year preparing to return to Tucson for the first time since the pandemic hit. It was wonderful to be back at our space in the Tucson Convention Center, with old friends and new faces stopping by to say hello. Our annual party, held in conjunction with the Canadian Gemmological Association and the Accredited Gemologists Association, was tremendously fun, and I hope everyone who attended enjoyed it as much as I did. Thanks to 100% Natural Ltd for sponsoring the bash.

Back at home, while one group of students took their examination, other groups of onsite and ODL Students prepared to start their terms throughout the late winter and early spring. We continued our educational mission in other ways; I was delighted to attend the Goldsmiths' Craft & Design Council Awards at Goldsmiths' Hall on 6 March to meet the two winners of the Gem-A Award. Our prize, a diamond grading and identification lab course, was open to all entries that included a gemstone or multiple stones as part of their submission. It is my pleasure to welcome both winners, Jiayang Xie and Samantha Sloane, to the Gem-A community.

As we look further in the year and towards the events that lead up to Conference and Graduation, we want to remind you that you still have the chance to renew your Membership. Being a Member of the oldest gemmological organisation in the world, to borrow a phrase from a well-known advertisement 'has its privileges', including access to the incredible content to be found in the *Journal of Gemmology* and *Gems&Jewellery*.

And this particular issue of *G&J* is jam-packed, from cover to cover, with something for everyone. There was so much to report that you'll find this issue runs longer than the usual issues of *G&J*, lest our readers may miss out on any stories that might be of particular interest to them.

The Tucson Gem, Mineral and Fossil Showcase was back in fighting shape this year, with numbers not seen since before the coronavirus pandemic. Jennifer-Lynn Archuleta and Olga González walked the shows to bring our readers news straight from the exhibitors' mouths. But that's not the only trade show to reopen this year; for the first time in three years, the Hong Kong Trade Development Council was able to hold the gem and jewellery shows the city is known for. We were able to bring you some perspectives from those early March shows as well.

The dangers of mercury in gold mining are well known, and have been of concern to many in our industry. Finally, there may be a viable solution. Olga González interviewed Toby Pomeroy and John Richmond, whose GOLDROP processor is the result of passion, hard work and the vision of a better, safer world. In another article, Jonathan Barzdo is a world-renowned, well-respected wildlife consultant who has dedicated his career to protecting endangered animals and plants around the globe. He breaks down the Convention on International Trade in Endangered Species of Wild Fauna and Flora, known as CITES, and how it impacts the jewellery trade, for our readers.

Dr Maria Maclennan is the only person in the world in her profession — she is a forensic jeweller, working with law enforcement across the nation and internationally to help solve crimes through the use of gemstones and precious objects. In a first-person perspective, Dr Maclennan explains how she came to create this occupation, what she does from day to day, and the mission of her current passion project.

Other fascinating content includes a look at the gemstones that can be found in Viva Magenta, the 2023 Pantone Color of the Year; the first part of a two-part series on the history of synthetic diamonds; a look at how Gemfields revolutionised the gemstone auction system; and a brief look at the Coronation regalia we can expect to see when His Majesty Charles III and his Queen Consort, Camilla, are crowned on 6 May.

Enjoy the Spring 2023 issue of *Gems&Jewellery*!

The jewellery pieces that won their designers the Gem-A Award at the Goldsmiths' Craft & Design Council Awards. Left: Samantha Sloane's Crab Cluster ring is made from precast material using crushed foraged crab shell, mussel shell and bio-resin, opals and cast bronze. Right: Jiayang Xie's piece, called The Huge, is composed of a 3.99 ct zircon and fine silver. Photos by Richard Valencia.

Best Wishes,
Alan Hart FGA DGA

Gem-A News

A round-up of the latest industry news from Gem-A

HISTORIC SPENCER-CHURCHILL NECKLACE FOR SALE AT HANCOCKS LONDON

The Spencer-Churchill necklace, created nearly 150 years ago by John Spencer-Churchill for his wife, Frances, is available for purchase at Hancocks London. It is the first time since its creation that the necklace has been for sale on the open market. Photo courtesy of Hancocks London.

A necklace made in 1875 on behalf of John Spencer-Churchill, later the 7th Duke of Marlborough and the grandfather of Winston Churchill, for his wife Frances is available to buy on the open market through Hancocks London for the first time since its creation. The collar necklace is composed of eight 18K gold panels in decorative openwork with stylised floral and scroll motifs linking eight glazed enamel lockets. Each locket is surrounded by a floral wreath and white bows.

John Spencer-Churchill married Lady Frances Vane, daughter of the 3rd Marquess of Londonderry, in 1843. Seven of the lockets, which are hand engraved, commemorate seven of their eight children that survived infancy (one daughter does not have a locket; Hancocks has undertaken research into the reason). Each piece lists a child's initials and, on the reverse side, their name and date of birth. The eighth locket displays a ducal coronet set with tiny gems. The fifth-born child, Lord Randolph Churchill, was a friend of The Prince of Wales (later Edward VII) and the father of Winston Churchill.

Guy Burton DGA, managing director of Hancocks London, said of the necklace, "From sentimental gift to a historic jewel — this is the story of a family necklace and the famous people it connects. It's an utterly unique piece of jewellery, both in its design and concept, and in the family history and social connections of those whose names it carries. The Spencer-Churchills were at the very heart of British society and politics for two centuries and this piece, and the names it carries, reflect their status and influence in a way almost no other family dynasty could match. Its fascinating provenance deserves study by historians equally as much as jewellers. We feel very privileged to bring this piece to the open market and expect an enormous amount of interest given its provenance."

The Spencer-Churchill Necklace is available for purchase for £125,000.

GEMFIELDS REPORTS 2% RISE IN PROFITS FOR 2022

On 24 March, the Gemfields Group reported a 2% rise in full-year profit, in part due to higher prices for uncut emeralds and rubies. Higher gem prices drove Gemfields' revenue to a record high $341 million (~£276.2 million) in 2022, up 32% from $258 million (~£208.9 million) the year before.

In addition to owning 75% of both the Montepuez mine (ruby) in Mozambique and Kagem mine (emerald) in Zambia, Gemfields also owns the Faberge jewellery brand. Montepuez's revenue rose 13% over the course of the year, while revenue from Kagem and Fabergé saw a 62% and 28% increase from 2021, respectively.

For an accounting of the Gemfields auction system, see pp. 56-59.

Thanks in part to the pricing of rough emeralds and rubies, Gemfields reported a 2% rise in profits for 2022. Photo by Richa Goyal Sikri.

JVC ASSISTS FEDERAL TRADE COMMISSION IN JEWELLERY TERMS FOR GREEN GUIDE REVISIONS

In its capacity as the leading authority coordinating Federal Trade Commission (FTC) commentary on behalf of jewellers, the Jewelers Vigilance Committee (JVC) is currently reviewing public comments it received for revisions to the Green Guides, which examine environmental marketing claims (both direct to consumer and B2B). The guides will be modified to reflect a company's products, packaging, services and manufacturing processes; they will also be inclusive of environmental claims not currently explored in the Green Guides. Commonly used terms such as 'recycled', 'sustainable', 'organic' and 'carbon-neutral' are under consideration.

While the JVC had set a deadline for public comments to be submitted by 10 March, they will continue to review any submissions that are sent in via their website, according to deputy general counsel Sara Yood. Further, according to Ms Yood, comments can be sent directly to the FTC until 24 April 2023.

CENTURIES-OLD JEWELLERY RETRIEVED FROM ESTATE OF ANTIQUITIES DEALER RETURNED TO CAMBODIA

Seventy-seven pieces of centuries-old jewellery from a significant period of Cambodia's history were returned to the country in February after a delay of over two years. The collection, which included crowns, earrings, necklaces and amulets, was retrieved from the estate of late antiquities dealer Douglas Latchford, who had been an expert on Indian and Cambodian artefacts. In November 2019, Mr Latchford had been indicted by United States federal prosecutors on crimes related to trafficking in stolen and looted Cambodian art.

Among other charges, Mr Latchford stood accused of falsifying documents regarding provenance and origin of the pieces in the collection, as well as objects that had been housed at museums such as the Denver Museum of Art (which removed the items to return to Cambodia in late 2021). Experts believe that many of the allegedly looted items were smuggled out of Cambodia during times of war and instability, including the 1970s regime of the Khmer Rouge. Mr Latchford died in Bangkok in August 2020, before he could be extradited to stand trial. After his death his daughter and heir agreed to return all items of Cambodian origin that were in her possession. The jewellery collection was returned from the United Kingdom, where it had been stored in a London warehouse.

Part of the jewellery collection allegedly looted by Douglas Latchford that was returned to Cambodia in February 2023. Left: Two gold pins/plaques show a depiction of a half-human figure with green stone; one pin has a stone missing. Right: Part of a gold wreath crown. All pieces shown are from the pre-Angkor to Angkor period. Photos courtesy of the Ministry of Culture and Fine Arts.

The jewellery dates back to the Angkorian Empire, also known as the Khmer Empire (802–1431 CE), although some pieces may predate that era. By weight alone, the gold is worth more than $1 million (£817,500), although it is hard to assign an accurate price for such a rare commodity. The jewellery shows an attention to detail that adds to the appreciations of artisans of the period. Sonetra Seng, a PhD Candidate at SOAS University of London and a member of the Ministry of Culture and Fine Arts, stated, "These exquisite pieces of jewellery serve as a testament to the highest level of craftsmanship, creativity, and *haute couture* during the ancient Khmer Empire."

Visitors can see the collection at the Angkor Wat temple complex. Bradley J. Gordon, chief of the investigation team for repatriations for the Ministry of Culture and Fine Arts, said of the collection, "It is a magnificent return for Cambodia after years of negotiations. Finally, crown jewels of the Khmer Empire are back home after decades of being kept hidden away from the public."

CHRISTIE'S TO AUCTION VAN CLEEF & ARPELS BRACELET OWNED BY MARLENE DIETRICH AND ANNE EISENHOWER

This spring, Christie's New York will hold a sale entitled The Magnificent Jewels of Anne Eisenhower, from the collection of the late philanthropist, decorator and granddaughter of Dwight D. Eisenhower, 34th President of the United States. The star of the collection is a Van Cleef & Arpels ruby-and-diamond Jarretière bracelet once owned by movie star Marlene Dietrich and worn in one of her movies.

Ms Dietrich bought the bracelet in 1937; she wore it in the 1950 movie *Stage Fright*, directed by Alfred Hitchcock. She then wore it again to the 1951 Academy Awards ceremony. Ms Eisenhower bought the bracelet from Ms Dietrich's estate after the actress's death in 1992. The estimated price for the bracelet is $2,500,000–4,500,000 (£2,026,250–3,647,250).

Other pieces in the collection include a remarkable sapphire-and-diamond Van Cleef & Arpels Waterfall necklace; a Cartier art deco bangle bracelet; a Moonlight Rose bracelet from Tiffany & Co., comprising diamonds and other gemstones, circa 1925; and a 20.54 ct D-colour diamond ring. Of the collection, Daphne Lingon, head of jewelry for Christie's Americas, remarked that "Christie's is truly honoured to be entrusted with the Magnificent Jewels of Anne Eisenhower. From exquisite designs by Cartier, Tiffany & Co. and Van Cleef & Arpels to important gemstones, this auction presents a unique opportunity for collectors to obtain a jewel that was thoughtfully acquired over a 40-year period by a true tastemaker."

The live sale will be held in New York on 7 June; bidding for additional jewellery in Ms Eisenhower's collection begins 30 May and ends 8 June.

The most famous piece to feature in Christie's Magnificent Jewels of Anne Eisenhower sale is undoubtedly the ruby-and-diamond Jarretière bracelet from Van Cleef & Arpels, previously owned by Marlene Dietrich (~100–110 tcw rubies, ~58–63 tcw diamonds). Photo courtesy of Christie's.

The Sacred Lotus Flower: An Ancient Cross-Cultura as a Metaphor for the Twe

World-renowned gemstone carver Glenn Lehrer and photographer Orasa Weldon discuss the Sacred Lotus Flower, a piece representing the qualities needed to work towards a hop

The lotus flower is a symbol that has been held with deep reverence across cultures for over 3,000 years. Dating back to ancient Egypt, Greece and India, the lotus flower has been a powerful spiritual symbol for purity, death and rebirth, resilience and strength.

The lotus plant takes root in murky, muddy ponds, where the flower reaches for the sun with its long stem to emerge on the surface of the water. The pristine beauty of the blossom is impervious to the murky conditions from which it rises because of the waxy coating of its petals. The symbolic and spiritual association of this most-revered flower with strength and resilience is due to its origins in cloudy muddy conditions only to emerge and unfold in all its glory, which leads to its archetypal meaning of purity. The symbology of death and rebirth is attributed to its unfolding, petal by petal, in daylight only for the blossom to close completely and submerge below the water at night.

While celebrated for centuries for its many spiritual and religious meanings, the lotus can once again be a powerful archetypal symbol for the qualities needed to weather the global conditions of the early twenty-first century. I was inspired to create the Sacred Lotus as I realised that the flower can represent finding new possibilities and opportunities as we move through our political, social and environmental strife towards a brilliant new future.

The creation of the rose quartz-and-sapphire carving was not without its own long journey. Geologically, rose quartz is generally semi-translucent and full of cracks and veils. Once I decided to carve a lotus flower, it took two-and-a-half years to locate a piece of rough that met my standards for optically clear rose quartz of appropriate colour, one free of veils and inclusions. A piece of nearly flawless deep-pink rose quartz rough with the proper optical clarity, weighing 3.5 kg, was finally located in Madagascar.

The gemstones at the core of the carved blossom are also rare. The Montana blue sapphire – carved in the TorusRing cut to allow for another gem to be set at the centre of the flower – weighed over 6 ct, an unusual size for a gemstone from that locality. Fittingly, the orange-pink padparadscha sapphire seated within the blue sapphire's opening, also comes from Montana; this type of gemstone is considered atypical for this source.

My hope is that the Sacred Lotus Flower carving is seen as a powerful symbol of beauty, strength and tenacity to support an emerging new world.

Glenn Lehrer
Larkspur, California

al Symbol enty-First Century

the process of creating and capturing
peful and brilliant future.

When photographing gem-related objects, I often think about the chain of events and the people that worked a piece before it landed on my photography stage. The hands that mined it, careful not to break it; the commercial exchanges that passed it along; the accumulated experience and talent of a master cutter like Glenn Lehrer to conceive and fashion this flower at his lapidary. In many ways, photography is but a minor link. When I hold a carving like this one in my own hands, I recall William Blake's unforgettable words from *The Auguries of Innocence*:

To see a world in a grain of sand,
And a heaven in a wild flower,
To hold infinity in the palm of your hand,
And Eternity in an hour.

When working with Glenn's carving, my assignment was to successfully translate the artist's concept of 'heaven in a flower'. It may take a day or two to consider how to angle my camera or position my lights. It is important to remember that photography also only captures one tiny view of a three-dimensional piece. It is a disadvantage compared to a viewer holding the lotus flower and looking at it from various angles to form a composite 'image' in their minds. Because of this, I will sometimes take multiple pictures to see what angle best represents the piece. Often, I will also talk to the artist about his work to be sure to incorporate a particular detail I may not have noticed. And finally, I might converse with the work of art itself: "What are you trying to show me?"... and then wait patiently to see what is revealed.

Orasa Weldon
San Diego, California

MAKING COLOURS BLOOM IN THE DESERT

THE 2023 TUCSON GEM SHOWCASE

Early February saw members of the gem trade return to Tucson in pre-pandemic numbers. Jennifer-Lynn Archuleta and Olga González FGA DGA learned about the trends anticipated for 2023 by visiting different locations of this year's Tucson Gem, Mineral & Fossil Showcase.

From Uber wait times to lines at restaurants, early February found Tucson bustling with activity. After a relatively quiet few years, when travel was limited due to lockdowns for different localities, gem buyers, dealers and enthusiasts returned to southern Arizona for the three-week Tucson Gem, Mineral & Fossil Showcase, now in its sixty-eighth year. With forty-three shows in 2023, featuring gems and jewellery at all price points, the showcase has something to offer just about every audience. The event has a major impact on the city's economy; according to Vantage West Credit Union, gem show visitors spend an average of $394 (£319.60) per day, with international visitors making up 70% visitors who spend more than $1,000 (£811.16) per day.

If locals were delighted to see their city back in action, that was nothing compared to the members of the trade who were basking in the company of their colleagues and enjoying the gorgeous gems on display. There were definite changes this year — the Gem Shuttle, once a staple used to travel the showcase, did not run this year, and some vendors faced issues with new travel restrictions, leaving booths to be shuffled at shows at the last minute.

Still, there was lots of activity at all the shows, with enthusiastic people lining up to see what each vendor had to offer and, in the words of jeweller-designer Brenda Smith, "they were looking to buy." The numbers at the shows seemed to bear this out. Lowell Carhart of Eon Expos, which has run the 22nd Street Show since its inception in 2010, said that "Attendance was the highest ever. Every Saturday and Sunday around lunch time, the lines would start forming, up to fifteen-people deep. We can only estimate attendance because our show is not ticketed, but based on the above dynamic, as well as parking revenue, we are comfortable stating a 50,000 attendance over last year's 45,000 visitors."

Top: This rainbow bracelet from Oscar Heyman uses the following oval gemstones: Five assorted sapphires (5.23 tcw), three hundred eighty-two fancy-colour sapphires (4.00 tcw), three padparadschas (3.77 tcw), one padparadscha (0.90 ct), two peach sapphires (3.55 tcw) five pink sapphires (8.67 tcw), one orange sapphire (2.10 ct), twelve sapphires (17.76 tcw), four tsavorites (6.89 tcw), five padparadschas (5.81 tcw), six green sapphires (13.92 tcw) three fancy-colour sapphires (3.77 tcw) and eight yellow sapphires (14.44 tcw). It also has eighty-nine round diamonds (4.13 tcw). Photo courtesy of Oscar Heyman.

The enthusiasm started as early as 28 January, and as far north as Phoenix, where the Centurion show kicked off the Arizona-based events in the historic Arizona Biltmore, and hosted 330 stores.

"The Centurion Jewelry Show is the better jewellery store's favourite show for more than 20 years," said president Howard Hauben. "Jewellers showed their strong support at the event with the Centurion's highest turnout in its history." Though the invite-only event in Phoenix ended on 31 January, the animated feeling soon spilled over from Arizona's largest city to its second largest, just 116 miles (187 km) to the southeast.

Overall, people we spoke to about their time in Tucson were both enthusiastic and optimistic about the year ahead, particularly in the realm of coloured gemstones. John Ford, the new CEO of the American Gem Trade Association, stated, "Many of our exhibitors were pleased with sales during the show. Some even had record years. The shortage of unheated rubies and sapphires and pearls certainly made their mark among the public this year, colour continued to be a major draw among gem and jewellery aficionados. Foot traffic at shows was strong, especially among international buyers. John Bradshaw from Coast to Coast Rare Stones, whose booth has been in the same place at the GJX show since 1997 and had 'almost all repeat customers', told us that "80–90% of our Tucson clientele is foreign dealers." People are continuing to look for pieces that are not only fiscally valuable, but that have meaning to the wearer. As fine jewellery designer Svetlana Lazar, a Melee Show participant, explained, "Among designers, I think there was a consensus around the continued popularity of gold, and symbolic jewellery with a strong story and personal connection for the wearer."

The one-of-a-kind Gibson Girl earrings by Brenda Smith, handcrafted in 18k white gold and inspired by the artist Gustav Klimt, are centred around millefiori faces by artist Barbara McGuire. They are also composed of Paraíba tourmaline (1.11 tcw), pink tourmaline (1.54 tcw) and aquamarine (0.56 tcw). Photo courtesy of Brenda Smith Jewelry.

This 4.51 ct bicoloured tourmaline, faceted by Rasool Hakakzada, was among the types of pink and pinkish material popular with ANZA Gems' clientele this year. Photo courtesy of ANZA Gems.

OBSERVATIONS IN TUCSON

The exhibitors that we spoke to all mentioned the foot traffic at the shows this year, noting that foot traffic was up now that COVID-19 restrictions have been lifted. Eric Braunwart of Columbia Gem House, which works with responsibly sourced coloured gemstones and American-made coloured gemstone jewellery, and which exhibited both consequent higher prices has not stopped demand. If anything, many are realising the rarity of coloured gemstones and if they don't buy a gem they like when they see it, it will not be available again." The excited mood was certainly enhanced by the fact that AGTA celebrated its fortieth anniversary this year, which it marked with a celebration at the Tucson Convention Center on 31 January after the close of business.

All our contributors had positive feedback about most, if not all, aspects of this year's showcase that echoes Mr Ford's sentiments. While diamonds and

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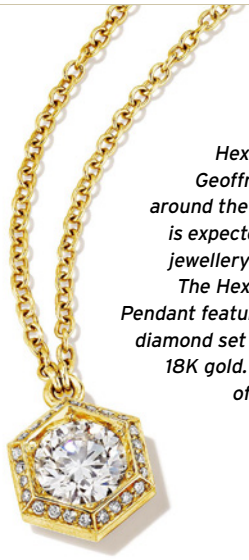
> Overall, people we spoke to about their time in Tucson were both enthusiastic and optimistic about the year ahead.

The Rock Candy Ruby Ring by Kelsey Simmen has a 4.86 ct Chatham lab-grown rough ruby set in 18K gold. Photo courtesy of Kelsey Simmen Jewelry.

Aloha Pearls has found that their business now calls for them to focus on keshi pearls. Photo courtesy of Aloha Pearls.



The upcoming Hex collection from Geoffrey Good is built around the hexagon, which is expected to be a major jewellery trend this year. The Hex Bevel Diamond Pendant features a 1 ct centre diamond set in platinum and 18K gold. Photo courtesy of Geoffrey Good.

at AGTA and the Ethical Gem Fair (see box), noticed that many of the people at his booths this year were younger, and 'nearly all' of them were women. Brian Cook of Nature's Geometry, which also exhibited at AGTA and the Ethical Gem Fair, noticed a good number of buyers requesting information about provenance and artisanal mining.

While, as it was last year, bold colour continues to be king in Tucson, magenta is having its moment in 2023. Viva Magenta is the current Pantone Color of the Year (for an in-depth look at the colour, see pp. 30-33). The colour is considered to be vibrant, sexy and fun – what Pantone has called 'an unconventional shade for an unconventional time' – and designers were prepared for that palette, creating a plethora of jewels in magenta and similar shades. Dealers reported an uptick in ruby inquiries, particularly unheated specimens. Pink sapphire, rubellite, pink spinel and pink tourmaline were seen throughout the gem shows. Monica Stephenson of ANZA Gems which, like Columbia Gem House, showed at the Ethical Gem Fair, reported "there was tremendous interest in pinks, from moody, blushy tourmalines, zircons and garnets to the most vibrant pink spinels. I feel like perhaps Pantone's Color of the Year has collided with the general zeitgeist!" Rhodochrosites were also popular this year, as John Bradshaw from Coast to Coast Rare Stones noted, showing that the colour is impacting gem purchases from the classic, ever-popular ruby to rarer material.

Magenta isn't the only colour that was getting attention this year. Interspersed throughout the shows we saw the resurgence of goth through the presence of black diamonds. While white and coloured diamonds have often been marketed for engagement rings and self-purchased jewellery, not much attention has been paid to black diamonds. Designers are starting to pay attention, giving these gemstones their time in the sun. Black diamonds look great in platinum or silver, with skulls or on dog tags. They are edgy, sparkly, and a bit macabre, a look which definitely attracted folks this year. They were put to good use in John Varvatos' Stardust collection, which was on view at Centurion. Salt-and-pepper diamonds were getting attention; Talking Tree

This ring from Stephen Dweck comprises a 34.00 ct rubellite tourmaline and 2.55 tcw diamonds mounted in 18K gold. Photo courtesy of Stephen Dweck.

Jewelry had salt-and-pepper jewels displayed at their Melee Show booth.

Pearls also had a presence at this showcase, though perhaps not the classic white pearl strand necklace of yesteryear. Alec Rupp-Smith of Aloha Pearls informed us that this is the company's twelfth year in Tucson, and notably missing from their booth were the shoppers – usually people in their 70s and 80s – that have traditionally been their biggest customers. Perhaps that accounts for the change in pearl purchases; while large white South Sea pearls did move, the most popular items at their Pueblo booth this year were Tahitian and keshi pearls. In fact, he said, "we are specialising more and more into keshi pearls, from keshi Tahitian and keshi South Sea pearls to akoya keshi and Edison keshi."

People were looking for unusual faceted gemstones this year, either precut or bespoke, and Magus Gems was one of the vendors that met these requests. Left: A 2.45 ct unheated Peacock Tanzanite in a bespoke shield cut. Right: A 2.40 ct Umba sapphire in a bespoke shape. Photos by Victoria Raynaud.

Justin K Prim of Magus Gems offered visitors the ability to learn to facet at his space at the Pueblo Show. Photo by Victoria Raynaud.

In a similar vein, fine jewellery designer/maker Brenda Smith finds that her pearl jewellery sells precisely because it is unusual. "My goal with pearls is to use them in ways you may not have expected," she said, and she had at least one customer that said that she purchased a pearl ring for exactly that reason. Isabel Dennis of Kima Jewelry also uses pearls in different ways within her work. A first-time exhibitor based at the Melee Show, she was delighted by both the reaction to her pieces and to meet, and exceed, her sales goal. Dennis specialises in designer-maker fine jewellery using classic diamond-setting techniques combined with fresh and modern materials.

But almost everyone reported that people were interested in bright, striking colours. Mary van der Aa, our cover artist and winner of three 2022 AGTA Spectrum Awards (see Last Impression, p. 64), works with gemstones across the rainbow. She informed us that visitors to her space at the Pueblo Show were looking for spinel and sapphire in a variety of hues; she also noted that 'spessartine garnet is more in demand this year as well.' While other vendors found that their clients made requests for other stones, depending on the customer's need and the gem dealer's own specialty, the overwhelming consensus was that people were seeking colour.

Of course, there are many jewels that encompass multicoloured gemstones for a 'rainbow' look. While there are many reasons one might want to 'wear the rainbow', for many, embracing inclusivity and diversity is what comes to mind when looking at a rainbow accessory. For others it is hope, or the metaphorical 'pot of gold' at the end of the rainbow. Its formation after the rain has an otherworldly beauty, encompassing all colours and bringing joy. In jewels, gemstones lend themselves well to placement in the order of the rainbow's colours, and many designers are creating eye-catching pieces, particularly using multicoloured sapphires. After troubled times, people want joy and hope. Acclaimed jeweller Oscar Heyman had this in mind when creating their rainbow bracelets. "Starting off 2023 by getting →

This suite from Coast to Coast Rare Stones encompasses so much of what was popular at the 2023 Tucson shows: colour, unusual gemstones and unique cuts. Back row from left: 3.54 ct diaspore, 5.48 ct apatite, 7.27 ct apatite and 6.03 ct sphalerite; front row from left: 1.34 ct tugtupite, 3.18 ct sphalerite and 2.13 ct sphalerite. Photo courtesy of Coast to Coast Rare Stones.

Talking Tree Jewelry specialises in unique conceptual designs that incorporate gemstones, textures and sculptural elements. The Grotto ring (left) features a 0.445 ct rose-cut rustic salt-and-pepper diamond set in 18K gold; the Herculaneum Signet has 0.245 tcw salt-and-pepper diamonds set in 18K gold. Photos by Autumn Swisher, courtesy of Talking Tree Jewelry.

together with the jewellery community in Scottsdale and the gemstone community in Tucson positions us to plan wisely for the year ahead," said Tom Heyman. "While Oscar Heyman's jewellery designs are timeless, we look forward to feedback from our industry as we have the ability to react in real time to the demands of the market because we produce our pieces in our own New York City workshop."

UNIQUE DESIGNS, RARE STONES AND UNUSUAL SHAPES

There was a clear consensus among show participants that attendees were younger than in past years. A good number of these youthful buyers were looking for unique pieces rather than classic cuts or traditional jewels. Customers wanted pieces that would call out their own originality, and many exhibitors were able to fulfil those needs, either through design, gemstone variety or cut.

Svetlana Lazar enjoyed the attention her creativity brought to her booth. This was her second booth in Tucson, although her third time exhibiting with Melee (which also has a New York show). Lazar has been in the trade for fifteen years, and her pieces have a whimsical, playful twist that her customers love. "My best sellers continued to be the Wishing Well collection rings," she explained. "They are designed around a setting I invented that gives the illusion of water moving beneath the gem. It's something unique and has a great story for retailers to tell their clients."

This one-of-a kind pendant from Svetlana Lazar's Regal Talisman collection features a 9.54 dumortierite cabochon to create an encapsulated blue icy world, a 1.45 rainbow moonstone glowing from within with peach and blue hues, along with sapphire accents (0.25 tcw) set in 18K recycled gold. Photo courtesy of Svetlana Lazar.

Buyers were embracing pearls that were used in unexpected ways. Left: The Naiad necklace comprises a 0.530 ct mirror-cut aquamarine from Malawi, responsibly sourced by Virtu Gems (see box), surrounded by sixteen natural freshwater seed pearls in a decorative fishtail setting. Photo courtesy of Kima Jewelry. Right: Brenda Smith's Fuchsia Pearl and Tourmaline Crossover ring, set in platinum, has an 18.230 ct natural-colour freshwater cultured pearl as its focal point. It is accented with a 2.200 blue-green, emerald-cut tourmaline, as well as natural-colour fancy yellow (0.323 tcw) and natural-colour blue-grey Montana sapphires (0.560 tcw). Photo courtesy of Brenda Smith.

Brenda Smith, who specialises in jewellery inspired by fine art, has collections at different price points for those who want designer jewellery at affordable prices. She sees her customers as people who wants something outside the norm; she believes there is a market for everyone. This year, she found her Faces collection to be particularly popular. These pieces, she explained "feature faces created in the millefiori style with gemstone accessories, inspired by Gustav Klimt, famous for the painting The Kiss. He utilises realistic faces with clothing in geometric shapes. For me, I envisioned gemstones as those geometric shapes. Since my one-of-a-kind are miniature sculptures, most people (who come to the booth) want to know the story behind the design."

Paula Crevoshay's Trapiche earrings incorporates the hexagon that was seen throughout the gem shows this year. The pair comprise, at the tops. two trapiche ruby (19.21 tcw), forty-six labradorite (2.84 tcw) and four moonstones (2.09 tcw). The drops consist of two pearls (48.14 tcw); each pearl has three gold granulations. Photo courtesy of Paula Crevoshay.

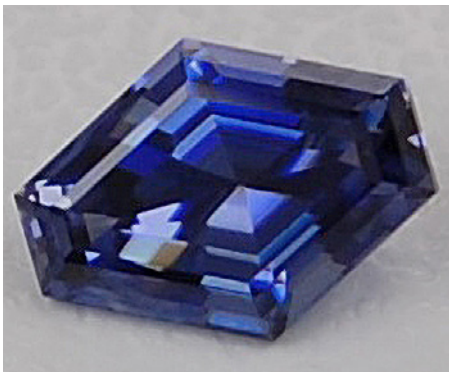
While Smith has been at AGTA for eleven years, this was Gina Marie Pinzari's first year exhibiting at Tucson. Pinzari formed Talking Tree Jewellery after she started making jewellery as a full-time endeavour in 2018. She explained, "I design and make unique sculptural jewellery from fine materials, using traditional techniques and a few I developed in my studio through many hours of trial and error." Pinzari's experience at the Melee Show was excellent. "I noticed there was interest in my most lavish and conceptual designs, which was very encouraging!" Her pieces incorporate gemstones, unique textures and sculptural elements that make her work easily identifiable. "Buyers seemed to be drawn to the things I make that are the most extravagant, that I put the most time into designing, and that used my experimental techniques. As you can imagine these are also my favourite things to make, so that was rewarding feedback that is already shaping my future pieces. I hope to become known for that element of my work."

The centrepiece of this Wishing Well ring from Svetlana Lazar is a 2.03 ct emerald cabochon set in a scalloped bezel setting and mounted in an 18K gold Dragon Scale texture band. Photo courtesy of Svetlana Lazar.

Sometimes inspiration for original design comes from the jeweller's own life. Kelsey Simmen, who has been creating jewellery for the past thirteen years, transformed her experience with type 1 diabetes into her muse. She explained, "my work features sugar as a main theme. I create textures in my pieces by growing, manipulating and building with its crystals, from tiny sanding sugar to large rock candy; I then cast the pieces in gold and silver." This process makes for jewellery that is texturally unique and visually arresting. Ms Simmen displayed jewels that used Chatham lab-grown specimens as well as diamond, emerald and padparadscha at her Melee booth.

Empowering the customer to create their own jewellery and, ultimately a unique look, is a cutting-edge move. The magnetic ring builder display pioneered by Shah Luxury – allowing each user to mix-and-match looks before committing to a purchase – is simply groundbreaking. Yash Shah explained, "One of our goals at Shah Luxury is to make the adventure of customising and buying jewellery an exciting experience. Our online ring builder allows us to tap into people's creativity and facilitates the flow of expression for those comfortable in a digital world. We created the in-store ring builder to reach a wider audience and to get people's hands on actual jewellery. In doing so, we open the customer's world to an omni-channel experience that is simple, elegant and makes self-expression luxurious."

Coast to Coast Rare Stones works with wholesalers who are looking to work with unusual, fine-quality stones. According to John Bradshaw, 'demand is still high' for this rarer material. "If anything," he continued, "we had to limit what each company was buying so that all our regulars could have a selection to choose from." Interest was so strong that Coast to Coast, which usually sells 40–50% of their inventory at GJX Tucson, sold almost 70% of their inventory, making →



Visitors to the gem showcase were looking for unusual specimens, like this 1.20 ct benitoite. Photo courtesy of Coast to Coast Rare Gems.

this show their single biggest year for number of gemstones sold, and the second-best year by dollar value.

Mary van der Aa has worked at the Tucson trade shows for ten years; prior to that, she came as an attendee. She and her partner, Todd Wacks (Tucson Todd's Gems) also stock unusual gemstones, and their customers know to expect these specimens in their cases. "(Our clients) like rare, unusual and absolutely one of a kind," she noted. "People are still searching for the unusual things such as sphene and phenakite."

As far as unusual shapes in jewellery go, the hexagon seemed to be the shape of the year — it was everywhere we looked. It appears that this six-sided shape will be a major jewellery trend in 2023. It symbolises harmony and the balance between female and male energy. Modern and sleek, designers are using it as a bezel set, in prongs, as a chain link and as a gemstone and diamond cut. It offers a refreshing alternative to those looking for something that stands out from the crowd, reflecting individual style. Lapidaries, goldsmiths, and diamond cutters alike are embracing the hexagon, appealing to clientele looking for a jewellery wardrobe refresh. Geoffrey Good and Paula Crevoshay are just two jewellery designers who are incorporating the shape into their work.

John Varvatos used black diamonds to create a stunning men's jewellery line. The ring on the left uses 0.98 tcw, and the pendant on the right 1.17 tcw, black diamonds. Both pieces are crafted from sterling silver. Photos courtesy of John Varvatos.

Unique and bespoke gemstone cuts were also sought by buyers. Gem cutter Justin K Prim, co-owner of Magus Gems – whose unusual set-up at the Pueblo Show allowed visitors to try faceting out for themselves – shared that his customers came looking for unusual cuts or even custom-designed gemstones. "We were showing off a large batch of Umba sapphires in a variety of colours and cut into bespoke shapes," he recalled. "We also had a collection of unheated tanzanites that show a beautiful combination of green, blue, and purple that we cut into unique designs like shields and Old Mine cuts." Such faceting choices outside the usual cuts are becoming ever-more popular amount today's jewellery clientele.

Justin K Prim found that people were asking for Montana sapphires like this 0.65 ct gemstone. Photo by Victoria Raynaud.

NAVIGATING THE SUPPLY CHAIN

As with last year, many dealers still had outstanding issues with sourcing inventory, although others have found workarounds. Brenda Smith clarified for us that she does not rely on any international suppliers, thus she did not experience any real hardship in this area this year. Gina Marie Pinzari of Talking Tree Jewelry reported, "I am blessed to work with a very talented local caster and have access to a local master setter for production. Both of these people live within 30 minutes of me, so I was not affected by these issues." Mary van der

> The vibe in Tucson this February was one that combined excitement, hope and, for many, joy.

The major gems in Kendra Grace's Legendary Symmetry necklace are (from left) amethyst, lime heliodor beryl, rose quartz, aquamarine, Imperial topaz, natural heliodor crystal, rutilated quartz, rose quartz, confetti sunstone, amethyst and tourmaline. The necklace has an 18k gold bayonet clasp. The loose stones in the centre are rutilated quartz, amethyst and Oregon sunstone. Photo courtesy of Nature's Geometry.

Aa indicated that she and Todd Wacks also avoided some of this difficulty: "We had no issues with the jewellery as it is all made by us in the United States."

However, this has not been the case for many gem dealers and jewellery designers. Ms van der Aa did note that she and her partner had some issues with obtaining rough, stating "sourcing rough for new cuts has become a little more difficult as much of it comes from overseas." Alec Rupp-Smith of Aloha Pearls said that, while generally supply was normal, "there were fewer pearl auctions in Hong Kong and Tahiti." Kelsey Simmen shared that "gold is really expensive. I ended up taking work back from a few consignment stores to fill my case up."

This is not just an issue surrounding gemstone inventory; rather, it reaches into all aspects of the industry. Justin K Prim explained, "One of the things we sell is a tool kit that we put together that has all the tools that a new gem cutter needs. We were not able to get these on time for the show because many of the things we put in the kit had been out of stock for months from our suppliers in Bangkok. Also, one of our best sellers last year was a very nice, but affordable gem-cutting lap that is made in small batches from a single maker in Russia. Due to the outbreak of war, it's impossible for us to source these. This is sad news for our customers, for us and for our Russian friend who makes them."

CONCLUSION

The vibe in Tucson this February was one that combined excitement, hope and, for many, joy. People were happy to be back among the glitter of the gemstones and the beauty of the jewellery. The buyers, returning to Tucson in droves from regions that had been under lockdown for the past few years, tended to be young, enthusiastic about ethical issues, and seeking colourful pieces that were unique and helped to express their individuality. This, it seems is just how our exhibitors liked it. So many of our contributors told us that they hoped nothing would change nothing at all about the Tucson experience. As Susan Wheeler said, "Tucson always makes me optimistic!" ■

A suite of rhodochrosites from Colorado (United States). The weights, from left, are 1.97 ct, 3.85 ct, 2.42 ct and 1.95 ct. Photo courtesy of Coast to Coast Rare Stones.

ETHICAL GEM SUPPLIERS AND THE ETHICAL GEM FAIR — TUCSON

Today's jewellery customer is more aware of responsible practices and ethical issues than their counterparts in the past, and plenty of vendors at Tucson are just as concerned as their clientele. The third Ethical Gem Fair, held 28–31 January at Tucson's Scottish Rite Cathedral, was comprised of vendors that have been consistently concerned with the supply chain of the materials they are using in their own work. Having collaborated for years to obtain gemstones and metals from ethical, transparent sources and to work to the benefit of mining communities, these trade members have come together under the name Ethical Gem Suppliers (EGS) to help others achieve these same objectives. According to Monica Stephenson of ANZA Gems, "Our third Ethical Gem Fair in Tucson was a success, with many new faces as well as clients who've been with us since the beginning."

That 'beginning' is somewhat nebulous. While the group held their first Ethical Gem Fair in February 2021, with sessions held via Zoom, most participants have been members of the industry for years, some decades. Agere Treasures was started by Hewan Zewdi in 2015 to promote the work of artisanal miners in sub-Saharan Africa, specifically Ethiopia. Nineteen48, which supplies responsibly mined and

This 1.85 ct beryl from ANZA Gems was ethically mined from Tanzania and cut by Marvin Wambua in Kenya. Photo by Sara Rey Photography, courtesy of ANZA Gems.

fully traceable coloured gemstones, primarily from Sri Lanka and Tanzania to wholesale and retail members of the trade, formed as an ethical supplier of gemstones in 2011. Brian Cook (Nature's Geometry and Quore Jewelry) has worked with rutilated quartz miners in Bahia, Brazil, on various projects to benefit the area for decades; he is currently involved with restorative agriculture in the region. Columbia Gem House, which focuses on loose coloured stones and American-made coloured gemstone jewellery has been in business since 1976. But president Eric Braunwart, who had always followed ethical practices, began setting up trackable-and-traceable fair trade standards in 2000, due to a project he worked on with the World Bank in Madagascar. Each member of the group has a specialisation; Capricorn Gems focuses on the gemstones of Central Queensland, Australia; Perpetuum Jewels works with post-consumer diamonds and coloured gemstones, as well as antique pieces.

The group is focused not just on sales, but on education. Each Tucson show has involved presentations that allow attendees to learn more about traceability, sustainability and issues that face mining communities. Many members of EGS are often on-site at deposits and in mines themselves, speaking to miners and finding out about issues first-hand. They are passionate about these topics and are delighted to find that customers coming to shows are eager to find that their gems and jewellery are ethical, traceable and sustainable.

Such was the case at this year's Ethical Gem Fair. Susan Wheeler, the founder of both the Chicago Responsible Jewelry Conference and the Responsible Jewelry Transformative as well as a cofounder of Virtu Gem – a social enterprise founded by women

Each member of Ethical Gem Suppliers is represented in this banner. From left: Bahia rutilated quartz (Nature's Geometry); pink Sri Lankan amethyst (Nineteen48); Ethiopian opal (Agere Treasures); tsavorite garnet (ANZA Gems); fancy blue Kenyan amethyst (Virtu Gems) post-consumer purple sapphire (Perpetuum Jewels); pink tourmaline (Columbia Gem House); blue Australian boulder opal (Capricorn Gems). Photo courtesy of Ethical Gem Suppliers.

Montana sapphire, in its many colours, remains popular among Columbia Gem House's customers, who appreciate the company's high-quality, cutting-edge faceting techniques. Photo courtesy of Columbia Gem House.

which works with artisanal gemstone mining communities in Malawi, Kenya and Zambia – noticed both old and new faces at the Gem Fair. "We had a combination of industry veterans and large companies who had not taken the leap into adding gemstones sourced with ASM traceability into their supply chains, showing up and ready to do business. Then there were individuals who wanted to become jewellers and started their journey at the Ethical Gem Suppliers show. They asked about how responsible sourcing worked, what the conditions were like for the miners and cutters of the gemstones."

Eric Braunwart of Columbia Gem House and Ian Bone of Capricorn Gems also noticed a greater interest in the story behind the gems. Mr Braunwart explained that "for us, most of the questions were on supportive supply chains that we develop and encourage. We did have some questions on availability." Mr Bone also found people to be extremely receptive to discussing ethical issues; he found "a continued demand for the back story and evidence of mining, processing and cutting meeting standards and expectations." Monica Stephenson agreed, and believed that this may have a great deal to do with the return to in-person trade shows. I think attendees appreciate our edited collections that all feature a story of support for the artisanal supply chains we respectively specialise in. The relaxed atmosphere invites lingering and having conversations, which we are all happy to engage in. As much as we've all grown comfortable with digital commerce, there is a beautiful alchemy that happens seeing the gems in real life." This bodes well for those who believe that the future of the industry relies on ethical behaviour from supplier and consumer alike.

Moyo Gems works with women artisanal miners in Tanzania and Kenya to bring their gem rough to market. This zircon was mined by Omary in Tanzania and faceted into a 4.74 ct gemstone by Beth Stier. Photo by Sara Rey Photographer, courtesy of ANZA Gems.

Columbia Gem House showcased their new Pomme Ruby line in Tucson. The line was given its name in honour of the community in Madagascar where the gemstones are found. The gemstones are shown in a range of sizes here. Photo courtesy of Columbia Gem House.

FIVE DECADES OF WILDLIFE PROTECTION

AN INTRODUCTION TO CITES

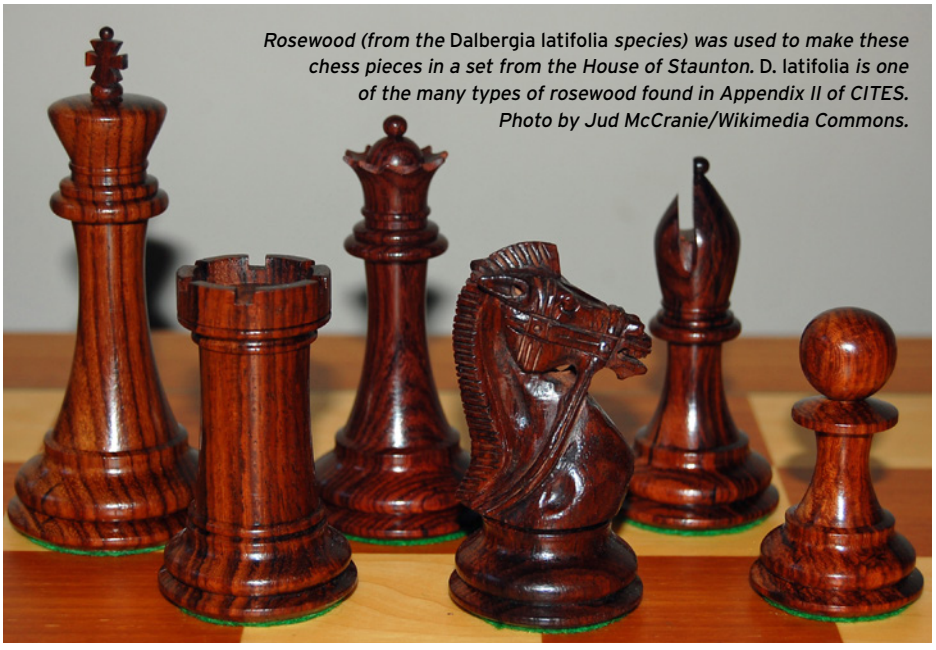
Wildlife and conservation consultant Jonathan Barzdo relates the history of CITES, now in its fifth decade, and its connection to the gem and jewellery industry.

On 3 March of this year, the websites of wildlife conservation organisations were awash with celebrations of the tenth World Wildlife Day, which was proclaimed by the United Nations in 2013. On 3 March 1973, the representatives of eighty nations met together in Washington, DC, to conclude an agreement on a new international treaty, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, often referred to as CITES. This Convention, which is an agreement between governments to ensure that international trade in specimens of wild animals and plants does not threaten their survival, came into effect on 1 July 1975, after ten countries had ratified it by making a formal commitment to implement its provisions. States that have made this commitment are referred to as 'Parties'. As of 2023, there are 184 states that are Parties to CITES, and this affects their import and export of wild flora and fauna, including many items that are used in the gem trade.

A BRIEF HISTORY OF CITES

Wildlife has always been used by humans in some fashion. There are numerous examples of species that became extinct as a result of overexploitation, including the quagga, the great auk, the Falkland wolf, the Carolina parakeet and the passenger pigeon.

The international trade in wildlife involves hundreds of millions of individual animal and plant specimens each year, of tens of thousands of species. The value is enormous; in the EU alone, the legal wildlife trade is estimated to be worth €100 billion (£88.47 billion). So there are huge commercial interests involved.



Rosewood (from the Dalbergia latifolia *species) was used to make these chess pieces in a set from the House of Staunton.* D. latifolia *is one of the many types of rosewood found in Appendix II of CITES. Photo by Jud McCranie/Wikimedia Commons.*

The problem of excessive wildlife trade was discussed and agreed upon at the 1960 General Assembly of the International Union for Conservation of Nature (IUCN). The concerns raised included the trade in game trophies, leopard skins, feathers from birds of paradise, rhinoceros horn products and tortoiseshell. In response, IUCN prepared a draft of an international convention that sought to regulate the international trade. After several drafts and many international consultations, the text was presented and concluded at the meeting of States in Washington, DC, fifty years ago.

It is important to note that not all species used are threatened by levels of trade. Many are threatened by other factors, such as habitat disappearance or alteration, or human-wildlife conflict. It is species that are threatened and within the scope of international trade that are relevant to CITES.

While intended to ensure that international trade in specimens of wild animals and plants does not threaten their survival, CITES is relevant to the world of jewellery. Members of the trade are certainly aware that many of the raw materials used to produce jewellery are derived from wild animals and plants. Some of them come from species that are either threatened or in danger of extinction. Classic examples are horns from the five species of rhinoceros and elephant ivory, all coming from Africa and Asia. But there are many other products derived from wild animals that are relevant for jewellers, including red and black corals; pearl and mother-of-pearl; tortoiseshell from marine turtles; teeth from species including hippopotamus, sperm whales and crocodiles; narwhal

Black coral beads and rough from the genus Leiopathes. This type of coral is incredibly slow growing but can live for thousands of years. Photo © Maggie Campbell Pedersen.

tusks; hornbill casques; queen conch shells; and bone from many types of animals. Products used from the plant world include a variety of exotic woods from timber species such as bayong and from the many species of rosewood.

HOW DOES CITES WORK?

The plants and animals that are protected by CITES are listed in three Appendices, and the Convention applies only to those listed, which include more than 38,000 species. The Convention recognises that peoples and states are, and should be, the best protectors of their own wild fauna and flora. Therefore, it does not affect what goes on within the territory of each country; the treaty deals only with international trade and recognises the responsibility of the government of each country to determine the level of export of wildlife specimens that will not be damaging to wild populations. However, CITES lays down the conditions for allowing international trade in specimens of the species listed in the Appendices, to ensure that the trade is sustainable, legal and traceable.

- *Appendix I* contains species that are threatened with extinction and that are or may be affected by international trade.
- *Appendix II* contains species that are traded at such a level that they could be at risk of becoming 'threatened with extinction' if the level of trade is not regulated to avoid that threat. It also includes species that look like those at risk, which is essentially a way to prevent traders claiming that their specimens are not covered by pretending that they are a similar species.

Any changes to the list of species in Appendices I and II (inclusion, deletion or transfer from one Appendix to another) must be agreed upon by the Conference of the Parties.

- *Appendix III*, however, is a list of species that are included at the request of a State Party that already protects the species under its own national law, and that needs the help of other countries to regulate the trade.

REQUIREMENTS OF PARTIES TO CITES

The 184 countries that are Parties to CITES must adopt laws and policies that align with the Convention's requirements on both a national and international level.

National-Level Requirements. Under the Convention, there are six main requirements:

- *Enforcement:* Parties are required to enforce the provisions of CITES.
- *Authorities:* Each Party to the Convention must designate a Management Authority, which is responsible for overall implementation of the Convention and which issues the permits and certificates to regulate the trade. (There can be additional Management Authorities.) Parties also must designate one or more Scientific Authorities to advise the Management Authority on the acceptable levels of trade for the species in question. As there may be several government agencies dealing with different aspects of enforcement of the relevant national laws (e.g., customs, police, veterinary inspectors, etc.) it is also recommended that national enforcement authorities be designated.
- *Regulation:* The national law must lay down the basic requirements for permits and certificates.

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Ivory beads made from elephant tusks. Photo © Maggie Campbell Pedersen.

- *Monitoring:* For Appendix II species – which account for most of the trade in CITES species – the Scientific Authority of each Party has to monitor the export permits granted alongside the actual exports, to make sure that the exports remain within sustainable levels and must advise the Management Authority if limits need to be set.
- *Prohibition:* Each Party must put in place legislation to prohibit trade that would be illegal under CITES, to penalise illegal trade and to provide for confiscation of specimens traded contrary to the Convention.
- *Reporting:* Each year, Parties also have to provide to the Secretariat of the Convention a report on the permits and certificates issued.

International-Level Reporting. At the international level, the supreme decision-making body of CITES is the 'Conference of the Parties' (the CoP), which consists of the representatives of the Parties meeting together, which they do every three years.

The following duties are the main responsibilities of the CoP:

- Adopt amendments to Appendices I and II, based on proposals from individual Parties;
- Set budgets for the Secretariat, and for meetings and the costed programme of work;
- Propose and vote on resolutions with recommendations to guide interpretation and implementation of the Convention; and
- Make decisions to provide instructions to the Secretariat and to the subsidiary bodies.

The CoP has also established three subsidiary bodies. A Standing Committee follows the implementation of the Convention between meetings of the CoP and makes recommendations to the Parties, including on compliance. The Animals Committee and the Plants Committee provide advice and support to the CoP and the Standing Committee, for implementation of the Convention in relation to animals and plants, respectively.

Necklace depicting a carp by Gillian O'Brien at L'Argenette Jewellery (North Berwick, Scotland). The necklace, composed of hawksbill tortoiseshell, gold and pearls, was made prior to the ban on the use of tortoiseshell (which is listed in Appendix I of CITES). Photo © Maggie Campbell Pedersen.

CITES TRADE REGULATION

Trade in CITES species is managed by a system of permits and certificates, which are issued by a government Management Authority. The conditions for trade in any particular specimen depend on the Appendix in which the species is listed. The summary below omits some of the detail that is not relevant to the professional gems and jewellery domain.

For *Appendix I species*, an import permit is required under CITES. The import permit can be issued only when the Scientific Authority of the importing country advises that the purpose of the import will not be detrimental to the wild population, and when the Management Authority is satisfied that the proposed import will not be for primarily commercial purposes. An export permit is also required, which can be issued by the country of export only when the Scientific Authority has advised that

the export will not be detrimental to the wild population (not needed for a re-export), and the Management Authority is satisfied that the specimen was legally acquired and that an import permit has been issued. As an example, all marine turtles are in CITES Appendix I. So international trade in tortoiseshell (from hawksbill, green and loggerhead turtles) requires a CITES import permit and an export permit.

For *Appendix II species*, an export permit is required and can be issued only when the Scientific Authority has advised that the export will not be detrimental to the wild population (this is not required for a re-export), and the Management Authority is satisfied that the specimen was legally acquired. No import permit is required for Appendix II species under the Convention, but many countries take stricter measures and do require an import permit for these species. Thus, it is necessary to check the requirements of the country of destination; in the case of EU countries, the EU regulations apply. Appendix II of CITES includes the queen conch, black corals and blue corals and most species of rosewood.

In the case of an *Appendix III species*, no import permit is required by CITES but, again, some countries may require one under their own national law. For export from the country that listed the species in the CITES Appendices, an export permit is required, which may be issued only if the Management Authority is satisfied that the specimen was legally acquired. For export from any other country, a certificate of origin from the Management Authority is required. Appendix III includes not only the walrus, from which walrus ivory is obtained, but also several species of deer and gazelle, from which antlers or horns may be used in jewellery.

This summary lays out the basic permit requirements of CITES for the import and export of specimens. But the Convention also makes provision for exemptions under special circumstances. For example, there are exceptions or special provisions relating to specimens that were acquired before the species was listed; for personal or household effects; for specimens from animals produced in captivity or plants artificially propagated; for loans or exchanges between registered scientific institutions, such as museums; and for travelling exhibitions. Unfortunately, there is insufficient space to provide all the details in this short introduction.

The implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora by Party nations is far from perfect. Yet for five decades it has helped to minimise the threat to survival of many species resulting from international demand. Those who are affected by the regulations derived from CITES may sometimes curse the inevitable administration and bureaucracy that helps to protect species. But in the international efforts to tackle the biodiversity crisis, perhaps this is a small price to pay for the long-term protection of the animals and plants that could otherwise be severely endangered. ■

In the EU alone, the legal wildlife trade is estimated to be worth €100 billion (£88.47 billion).

The author auditing an ivory storeroom in southern Africa. Most countries with elephant populations maintain such stocks, which come from seizures of poached or illegally traded ivory. Tusks from elephants that died of natural causes or that were legally killed due to animal-control measures are also found here. Photo by John Sellar.

GOLDROP
A Possible Mercury-Free Breakthrough?

The mercury that is used in artisanal and small-scale gold mining has a destructive impact on human, animal and plant life. Olga González FGA DGA reports on the GOLDROP processor that, through a collaboration between Mercury Free Mining and Industrial Rebuilders, may change the face – and impact – of the gold mining industry.

Mercury poisoning continues to affect millions of children every day around the world, in part due to its use in gold extraction. According to United Nations Environment Programme (2013), artisanal and small-scale gold mining (ASGM) contributes to approximately 37% of mercury emissions on a global scale. In artisanal mining, mercury binds to gold to form an amalgam, separating it from other minerals. The amalgam is removed and heated by hand, isolating gold and distilling mercury but at a destructive cost to the environment, animals and humans alike.

In La Riconanda, Peru, a mining settlement rich in gold deposits, the average life expectancy for miners is 35 – 40 years (Kebede, 2019), due to mercury that contaminates the community's only drinking water. The list of mercury poisoning symptoms is harrowing: toxicity in the central nervous system, seizures, nausea, headaches, motor dysfunction, memory loss, coughing, bleeding, swollen gums, trouble breathing, numbness, pain, blindness, paralysis and death. For gold miners working with mercury, one lives to work and works to die.

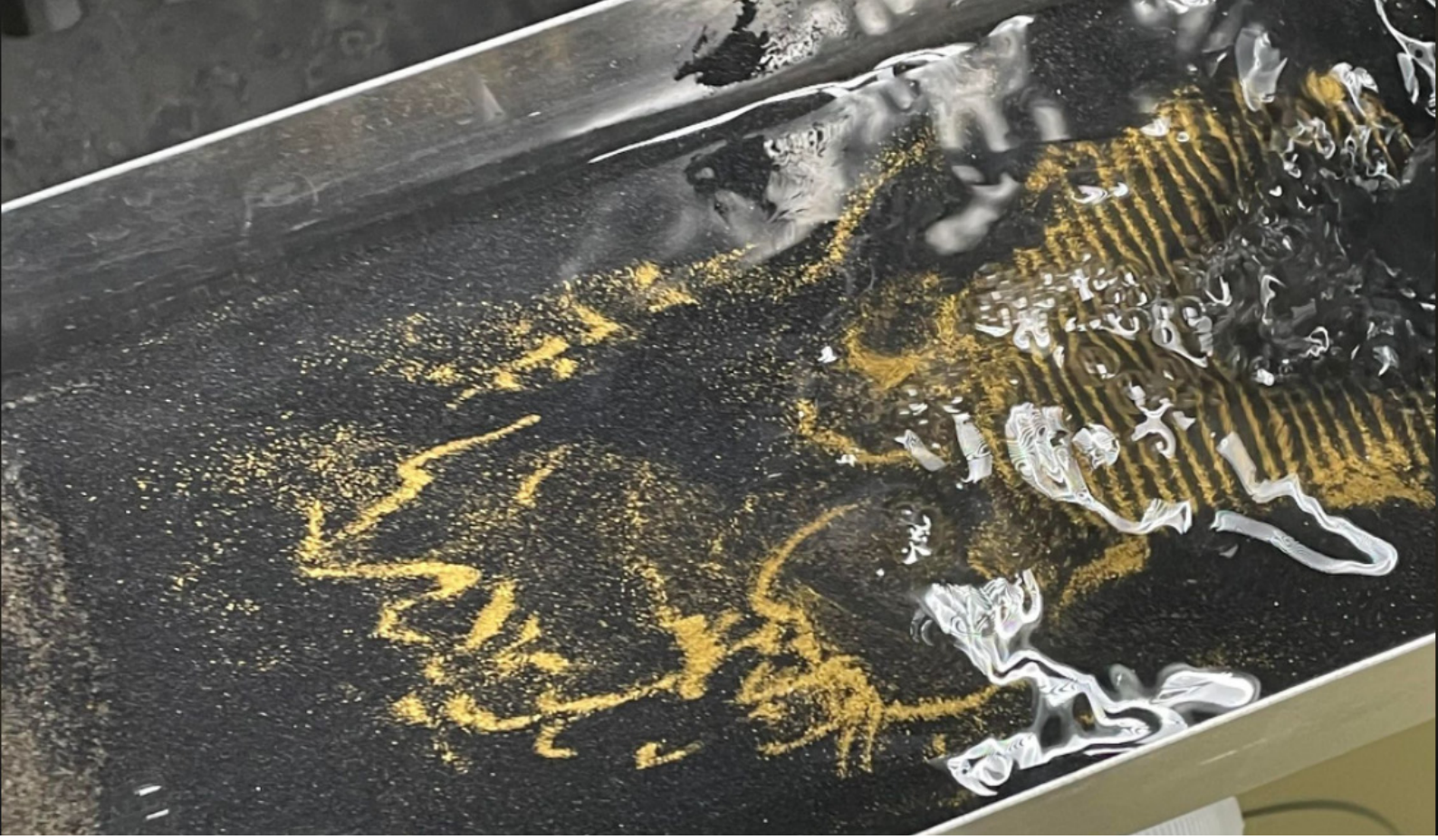
Miners in the West Akim Municipal District of Ghana using the GOLDROP. Photo by Toby Pomeroy.

In 2017, jewellery designer Toby Pomeroy met Peter Diamandis, founder and executive chairman of the XPRIZE Foundation, who asked him, "If you could make a difference in the quality of one billion people's lives in the next ten years, what would you do?" The answer came to Mr Pomeroy immediately, in a spark that inspired a movement that many in the industry are getting behind. "I would take on and solve the problem of twenty million artisanal and small-scale gold miners, who currently release 12,000 pounds of mercury (Hg) every day, into our environment," he responded.

Toby Pomeroy founded Mercury Free Mining (MFM) to eradicate mercury use in ASGM. Now, MFM is collaborating with Industrial Rebuilders Corp. on their GOLDROP processor, which shows promising gold recovery rates across analysed ore types. In 2020 Mercury Free Mining collaborated with the Alliance for Responsible Mining (ARM) to identify possible program testing sites in South America. In 2021, the Gemological Institute of America (GIA) enabled ARM and MFM to launch a program with two mining communities in Peru. Because of current political unrest, the research and processor testing are relocating to a small village mining site in Colombia, to allow for detailed analysis of its functionality and the willingness of miners to accept it in their daily work. In an interview with Toby Pomeroy and John Richmond, president of Industrial Rebuilders, we discuss the mercury crisis in detail, the GOLDROP processor and its capabilities and the journey towards a world where mercury pollution is no longer part of the gold pipeline.

The GOLDROP is a technological advancement for mining, created by Industrial Rebuilders Corp. Why were you interested in finding a solution to the mercury problem in mining?

John Richmond: The mining industry has been regulated to stress safety issues among its employees in performing their work in a safe manner. Artisanal miners, for the most part, are not regulated or taught safe mining practices. Therefore, the use of mercury to recover their gold exposes their lives and the lives of those around them to potential mercury poisoning, as well as poisoning the



Flour gold captured in the magnet sluice. This is where the recovery of smeltable concentrates of tiny gold and gold ore occurs. Photo courtesy of John Schoonover.

environment. Vaporising amalgamated mercury to extract the gold creates mercury vapours whose fumes are highly toxic when inhaled. Mercury vapours bio-accumulate in the body, causing ever-increasing neurological damage. The vaporised mercury also creates a mercury fallout from the atmosphere, as the vapours condense back to a solid state, spreading out and depositing on the surrounding area on roofs, trees, waterways and on the soil for miles. This affects the food the people in the area grow, the animals they hunt and the water they drink by spreading poisonous mercury throughout the artisanal mining community. This is the why the focus is on artisanal miners to eliminate mercury use: to improve their health, the health of their community and to increase their standard of living by providing them with more gold, but without mercury polluting our planet.

How exactly does the GOLDROP work without using mercury in the extraction process?

JR: The GOLDROP operates by harnessing the physics of elutriation, which in this case is defined as a vertical water flow suspending the less-dense dirt (3-5 gm/cc), submerged in the water of the fluid trap in the GOLDROP. This vertical elutriation flow of water cannot support the higher-density matter – gold at 19.3gm/cc, platinum at 21.09 gm/cc, silver at 10.5 gm/cc or mercury at 13.5 gm/cc – so gravity takes over and the dense matter drops through the vertical elutriation water flow and into the jar. Adding more dirt into the GOLDROP funnel feeds the trap. The mass and gravity of the incoming dirt down the funnel displaces the fluidised dirt in the trap, 'goosing' the dirt tailings up and out of the GOLDROP and down the magnet sluice into the tailings bucket. The magnetite in the magnet sluice snags and holds on to the tiny flour gold particles (-200 mesh) that escape the GOLDROP that mercury cannot recover. The entire process works using only water, which continuously recirculates through the GOLDROP system powered by a 12-volt battery and a solar panel that keeps the battery fully charged without the need for a fossil fuel-powered generator.

Building a pathway for responsibly sourced mining is difficult. How did you gather support on the ground, at the mines, as well globally on both the trade and consumer level?

Toby Pomeroy: Sharing my passion for what is possible has been key and has attracted great people and support. I have been incredibly fortunate to have amazing support and partnership for what I am committed to.

At the Jewelers of America New York Jewelry Show in July 2017, I met Eric Laker, owner of Lashbrook Designs, a wholesale ring manufacturer in Utah. I shared my commitment, and he questioned me deeply about how my vision would make a difference on the ground and in real people's lives. The following year, Eric joined our board of directors; he and Lashbrook have been our largest and most consistent →

> **The list of mercury poisoning symptoms is harrowing. For gold miners working with mercury, one lives to work and works to die.**

Toby Pomeroy, executive director of Mercury Free Mining, and John Richmond, president of Industrial Rebuilders Corp., exhibit the GOLDROP processor at the 2023 Tucson gem shows. Photo courtesy of Toby Pomeroy.

donors. They have gotten us to this point, where we have promising solutions for miners, who for thousands of years have not had access simple, affordable, efficient and safe means to make their living by mining gold. I can't express my appreciation for Eric and Lashbrook, and many others who have stretched themselves to envision and financially support such a huge cause.

What were the challenges faced when introducing the GOLDROP?

JR: The GOLDROP is a new and untested technology to recover gold. Gold miners in general are secretive about their gold-extraction techniques. New devices and techniques are hard to introduce among prospectors and gold miners, and they are slow to be adopted for this reason. I entered the Conservation X Labs Anti-Mercury contests (offered twice) to no avail; I was rejected for various reasons. The failure of recognition of the GOLDROP's capability to eliminate mercury use among artisanal miners kept me motivated, as I knew the GOLDROP could accomplish that goal. Now the MFM test program has recognised the GOLDROP's abilities.

In the beginning, creating a prize for the best mercury-free solution was a goal for MFM. How did that program work, and how has MFM evolved since then? What do you envision for the future?

TP: We began the program by focusing on raising a $1 million (£809,700) challenge prize as an award for the team of people who could come up with the best solution to mining common gold ore that didn't required the use of mercury. But there was insufficient awareness in the jewellery industry to support a prize for discovery or invention regarding alternatives to mercury. So, we refocused our approach to see how we could find an efficient, innovative processor to help these miners work profitably and safely. We began looking for places where we could demonstrate safe mining practices on the ground to help educate and inform miners and the jewellery industry.

We are making tremendous progress, and the jewellery industry is becoming much more aware of the possibilities. Support for these programs is growing to the point where we are seeing a movement within the industry, and hearing murmurings of the jewellery industry taking on the issue of mercury as its purpose. Perhaps jewellery could become a purpose-driven industry.

How were you introduced to Toby? Tell us about 'the room where it happened', so to speak.

JR: I was introduced to Toby's mission at Mercury Free Mining by Dave Varabioff, founder of Goldbay (www.goldbay.com), when demonstrating the GOLDROP at the GPAA Gold and Treasure Show in Las Vegas. When Dave saw the GOLDROP work, he was flabbergasted! He then told me about Toby and his organisation. I learned that Toby lived ten miles from me, in Corvallis, Oregon. I invited Toby to view the GOLDROP, and he too was very impressed with the GOLDROP performance. Toby then told me of the plight of the artisanal miners using mercury. I was, in turn, impressed with his efforts to solve this humanitarian and environmental disaster, and immediately became a corporate financial supporter of Mercury Free Mining. I am, as Sluice Goose Industries, a member of MFM's Leadership Council in the Chairman's Circle. We both had high hopes for the GOLDROP, which motivated me to keep improving its performance to its current capability.

Tell us about your collaboration with GIA. How did that come about, and how are they working with MFM?

TP: In 2019 I was introduced to one of GIA's community development team and we began searching for communities who desired mercury-alternative processes and that would be fitting for a small pilot program. I have been on the board of directors of the Alliance for Responsible Mining since 2010, and we had also been exploring places where we might start a small mercury-free pilot. We researched innovative, safe processors effective with different ore types. We explored working with the Coodmilla Ltd. Mining Cooperative in Nariño, Colombia, but they were on a larger scale than was fitting for the MFM/GIA project.

Then we located two mines in Perú that were interested in increasing processing efficiency, and one was committed to eliminating mercury use. GIA generously funded us with a $50,000 (£40,490) grant. We collected ore samples and shipped them to our geologist mining engineer, Caelen Burand, at the University of Arizona. Caelen completed the research late last year, finding that the GOLDROP was the most effective in separating gold from the Peruvian ores. We are ready to implement Phase 2 of the program, but since that area of Perú is politically unstable, we haven't been able to work there. So we shifted the focus of Phase 2 to working with a small Colombian community. We are traveling there 20 – 25 March to gather ore samples, demonstrate the GOLDROP, train the miners, to learn if the processor is more efficient than using mercury and to leave the GOLDROP with them for 30 to 60 days to see if they prefer it to mercury.

How do you measure efficiency and success with the GOLDROP?

JR: My sincere hope is to manufacture the GOLDROP in abundance for sale, with the goal of eliminating the use of mercury among artisanal miners, improving their lives and those of their families, the mining communities' general wellbeing and to help save the planet from mercury pollution. This will also set the stage for further research and development to scale the GOLDROP elutriation process for greater volume of material processed, while maintaining its mercury-free capabilities to recover gold.

This photo shows the point of elutriation, where the gold drops out of the dirt at the bottom of the cone-shaped trap. Photo courtesy of John Richmond.

Mercury Free Mining and Industrial Rebuilders Corp. have collaborated to create the GOLDROP processor, which shows promising gold recovery rates across analysed ore types. Photo courtesy of John Richmond.

What do you hope the GOLDROP does for the mining industry, the gem trade and the world?

TP: If the GOLDROP proves to be as effective in the community as it is in the lab results, I hope that word will rapidly spread, others will want to use it and inventors will want to improve upon it. I hope the GOLDROP is a catalyst for innovation, discovery and support, where the jewellery industry can announce to the world that we have taken on solving a 3,000-year-old problem, because we care, and because we are designers of our own future and we are capable of anything.

If this works, it may open new doors, open people's eyes and their hearts, acknowledging that we really are one family, interdependent with one another. The GOLDROP may be a spark that ignites a fire, inspiring a jewellery industry dedicated to raising kids in a mercury-free environment, and gold mining in harmony with all people and the natural world. ■

For more information about supporting mining communities and achieving mercury-free gold processing, visit www.mercuryfreemining.org, *To learn more about the GOLDROP, visit* www.sluicegooseindustries.com.

The Outlook for 2023 is (VIVA) MAGENTA

Pantone's Color of the Year announcement impacts multiple global industries, including the gem and jewellery trade. Nicole Ahline FGA GG explores the reasons for Viva Magenta and reviews the different varieties of gemstones that can be found in this distinctive colour.

Every year since 1999, the Pantone Color Institute (PCI) and its global team discuss the cultural impacts of colour on various industries around the world. This is intended to "engage the design community and color enthusiasts around the world in a conversation… to highlight to our audience how what is taking place in our global culture is expressed and reflected through the language of color." In response, they make a selection that they believe reflects and expresses the frame of mind that the public will have for the upcoming year. Their selection impacts the decisions made by businesses including fashion houses, technology and, notably, the gem and jewellery trade. For example, last year's choice, Veri Peri (Pantone 17-3938-TCX), was indicative of hope, and the possibilities that lay before us (see Spring 2022 *G&J*, pp. 37 – 39).

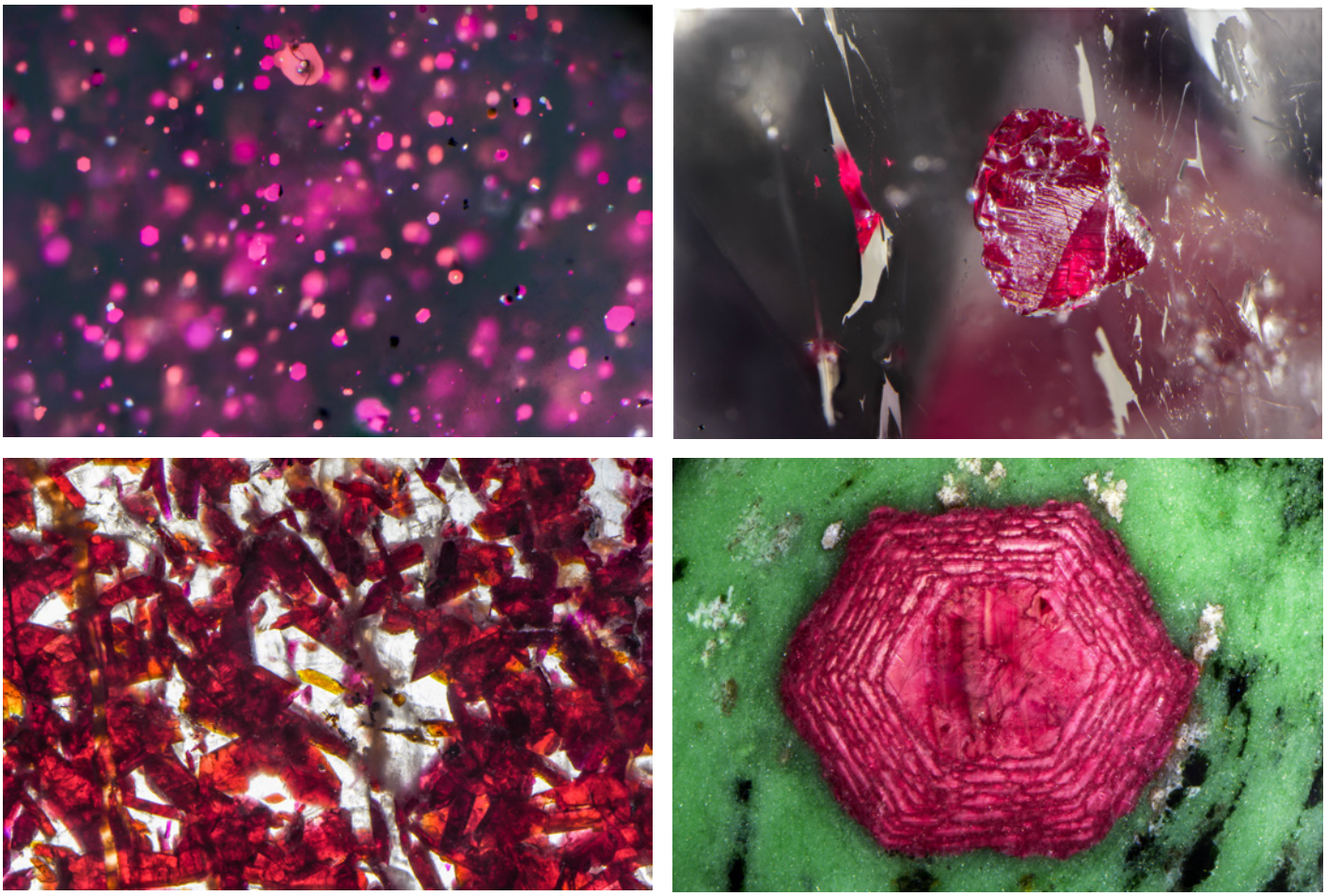
For the twenty-fourth Color of the Year, Pantone's team of 'colour ambassadors' envisaged 2023 as a point in time that we ventured into the unknown with grit and vigour, while full of self-expression. The past few years have been long and heavy for global communities. The start of a new year, a new month or even a new day can bring forth new challenges for many people. American author and activist Glennon Doyle has a well-known mantra (which acts as title of her podcast) of 'we can do hard things'. Industries that rely on colour space and theory need to reflect this in their design. The colour selected to reflect this journey is Viva Magenta (Pantone 18-750).

The reasoning behind this choice, described on the Pantone website as 'a shade of red that expands our horizons of authenticity', is deeply rooted in this idea of self-determination and expression. Red is widely known to be a stimulating colour, associated with – among other ideas – power, action and passion. The selection of Viva Magenta serves to remind us that power, in both acting on our own behalf but also for others, lies within ourselves. "We can never fully understand what lies beneath the surface of the friends and strangers we meet, but we can always work to deepen our empathy. The Color of the Year 2023 speaks to our desire to take on new challenges and try the unconventional while meeting others with compassion."

In announcing its choice, PCI executive director Leatrice Eiseman explains that Viva Magenta also connects back to nature in a very elemental form. The colour "… descends from the red

Two rhodochrosites: A 7.14 ct trilliant cut of unknown origin in front of a 33.9 g crystal with embedded tetrahedrite crystals from the Sweet Home mine in Colorado (USA). Photo by Robert Weldon/GIA.

Tourmaline bottles carved in China, whose Empress Dowager Cixi was a devoted fan of tourmaline, especially pink tourmaline from the Pala District in San Diego County, California. These bottles, which are approximately 2.5 inches tall, are courtesy of the Bill Larson Collection. Photo by Robert Weldon/GIA.



Clockwise from top right: Covellite in a 'pink fire' quartz under oblique fibre-optic illumination, field of view 3.83 mm; cinnabar in quartz, field of view 4.84 mm; ruby in zoisite, field of view 28.20 mm; piemontite in quartz, field of view 17.62 mm. Photomicrographs by Nathan Renfro/GIA.

family, and is inspired by the red of cochineal, one of the most precious dyes belonging to the natural dye family as well as one of the strongest and brightest the world has known. Rooted in the primordial, Pantone 18-1750 Viva Magenta reconnects us to original matter. Invoking the forces of nature…(it) galvanises our spirit, helping us to build our inner strength."

This Fancy Purple Pink Rectangular Modified Brilliant diamond weighs 1.03 ct. Photo by Robert Weldon/GIA; diamond courtesy of T. H. Horovitz.

Even before the announcement of the Color of the Year, gemstones in shades evoking Pantone's choice could be found throughout the jewellery world, which is unsurprising. Those of us in the gem trade know that colour acts as a visual method of expressing what words often cannot, and jewellery set with colourful gemstones is just one way to project such emotions. Viva Magenta, described as 'an animated red that revels in pure joy, encouraging experimentation and self-expression without restraint… a boundless shade that is manifesting as a stand-out statement', fits the bill for anyone who wants their jewels to speak for them.

Fancy-colour diamonds, when using the colour-grading scale of the Gemological Institute of America (GIA), are stones that have more yellow or brown than a 'Z' diamond or exhibit a colour other than yellow or brown. Diamonds can come in every colour of the rainbow – either occurring naturally or through treatment – including shades

Three red octahedron spinel crystals from Mogok, Myanmar (Burma). The largest, weighing 46.2 ct, is a perfect octahedron measuring 1.8 × 2.5 × 2 cm. The two smaller crystals are 8.4 and 7.01 ct, respectively. The three crystals are in a bed of hot-pink spinel octahedrons (152.5 tcw). Photo by Robert Weldon/GIA, gemstones courtesy of Bill Larson.

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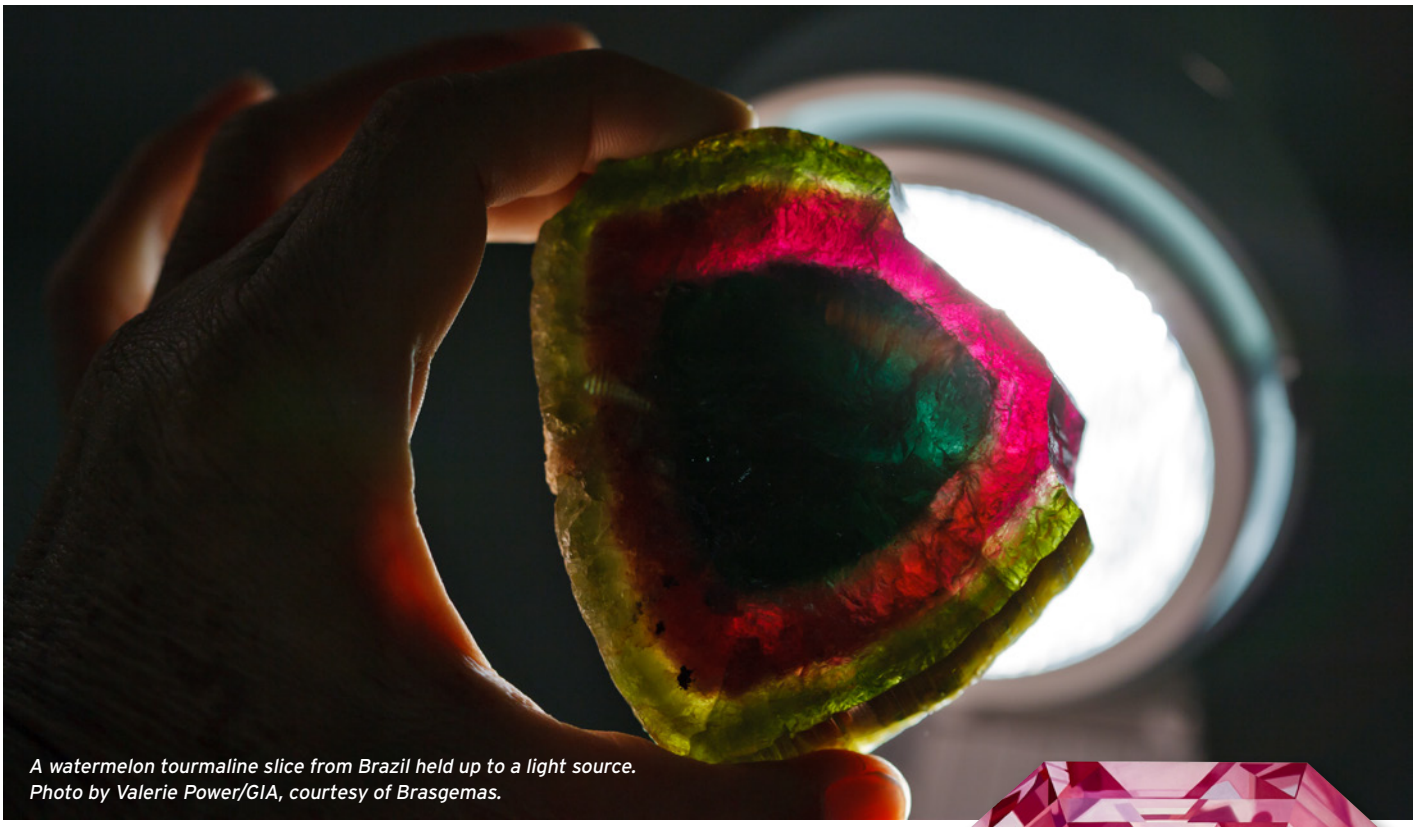


A watermelon tourmaline slice from Brazil held up to a light source. Photo by Valerie Power/GIA, courtesy of Brasgemas.

not unlike Viva Magenta. The Argyle mine in Australia had produced such pink-to-red diamonds from the early 1980s up until its final year of mining operation in 2020. Though production has ended at Argyle, the deposit's coloured diamonds continue to impact not only the jewellery industry but those that exist alongside it. Angie Crabtree, an artist based in Los Angeles, California, creates pieces that straddle the different ways gemstones play a part in society. Her captivating paintings of attract an audience through their larger-than-life size or her use of colours – the way that Viva Magenta might be used – to perfectly portray the stone.

Like diamond, spinel and corundum can occur in pink and red hues, which are caused by the trace element chromium in the crystal structure of the gem material. Corundum has two varieties: ruby, which is red, and sapphire, which encompasses all coloured corundum that is not red. For centuries, spinel was misidentified as the more sought-after ruby. The two gem species are visually similar and can be unearthed in similar conditions. It wasn't until the eighteenth century that spinel was clearly separated from corundum based on its chemistry and gemmological properties. Since then, spinel has transformed its reputation from a ruby or pink sapphire imitation to a desirable and coveted stone of its own right. To add to the list of similarities between these two gem species, they both can occur in a range of saturation that is equivalent to Viva Magenta.

Alpha, an oil painting on canvas by Angie Crabtree, is an eight-foot-tall portrait of the famous Argyle Alpha, a 3.14 ct diamond and the largest vivid pink since Australia's Argyle mine opened in 1984. Photo courtesy of Angie Crabtree.

> Viva Magenta, 'an animated red… encouraging experimentation and self-expression without restraint that is manifesting as a stand-out statement', fits the bill for anyone who wants their jewels to speak for them.

Two other gemstones that jewellery lovers can adorn themselves in to express what Viva Magenta captures are rhodochrosite and pyrope-spessartine garnet. Rhodochrosite is a carbonate mineral; its pure form has a rosy-red hue, but it can have shades of pink to brown. The gem group known as garnet is composed of more than twenty species, with some specimens being a combination of two species; the pyrope-spessartine garnet is one such example.

Pink corundum showing a range of saturation. Photo by Joel Beeson/GIA.

These stones tend to come in shades of pink with orange and red undertones, and can also show colour-change effects.

The tourmaline species shares a certain trait with Viva Magenta: they are both multi-dimensional. Tourmaline has one of the widest ranges of colour among gemstones, and rough crystals can be found in one colour or can be bicoloured. Watermelon tourmaline refers to a tourmaline that has a bright pink core with a green rim, while rubellite is the trade name for tourmaline that has a pink, pinkish red, or red colouration. An important locality for this latter variety is the Himalaya mine in San Diego County, California. Opened towards the end of the 1890s, the crystals that were mined from the pegmatites had a colour of such intensity and saturation that they quickly gained the attention of Empress Dowager Cixi of China (1835 – 1908). As a result, tons of rubellite crystals were sent to Imperial China in the early twentieth century. She had them faceted into gemstones for her jewellery and, since the rough was large and clean, carvings such as bottles and other *objets d'art*.

Viva Magenta is proposed to be intertwined in your life in little ways as that driving force or push to explore and take chances. Pantone takes pains to note that Viva Magenta is inspired by the strongest, most precious natural dyes; just a small amount of colour can be influential. This is reminiscent of a gemstone's chemical structure and their trace-element chemistry which, as many in the industry know, is frequently pinpointed as a stone's colour-causing mechanism. Inclusions found in a gemstone can result in the presence of phenomena (like chatoyancy or adventurescense), provide information on a stone's origin and even contribute to the overall colour of a stone.

This pendant, named La Jenna, and the matching earrings are set with Greenland rubies and pink sapphires. The combined weight of the gemstones in both pieces is 37.45 carats. Photo by Robert Weldon/GIA, gemstones courtesy of True North Gems.

Pyrope-spessartine specimens from Lindi Province, Tanzania, seen at the 2012 Tucson gem shows, with the faceted stones ranging from 2.64 to 9.59 ct. Photo by Robert Weldon/GIA, gemstones courtesy of Michael Puerta.

Studying the micro-world of gemstones through a gemmological microscope can reveal these diverse inclusions. Photomicrographers John Koivula and Nathan Renfro are just two of the many gemmologists who dive into a stone's suite of inclusions, including those that show colours like Viva Magenta, to capture them to be appreciated by others who do not have the use of a microscope.

If the rationale for choosing Veri Peri in 2022 was to consider the possibilities that lay before us, it follows that Viva Magenta is this year's colour for its implicit call to action. For 2023, those possibilities are here and waiting to be conquered. Taking on these opportunities while adorning one's self in gems that conjure Viva Magenta shows what Pantone called 'an ability to answer our collective need for strength'. ■

From Jewellery Design Techniques to Criminal Identification Tactics...

Becoming the World's First Forensic Jeweller

Trained as a jewellery designer, an unfortunate event soon led Dr Maria Maclennan FRSA to her calling — the self-created but well-received field of 'forensic jewellery'. Here, she recounts her journey to this specialisation, as well as the project that has become her most recent passion.

As the world's first forensic jeweller, there is a common presumption that my life is like an episode of a CSI drama. To a certain extent, this is true: unlike most jewellers or gemmologists, many of the pieces I am confronted with sadly belong to the missing or deceased, or individuals whose identities are somehow tragically lost or otherwise unknown. The environment within which I operate is also somewhat different: from examining artefacts that lay cold and disembodied on a mortuary table, to those strewn across disaster sites or hidden away in long-forgotten police evidence archives. Fascinating as my work is, as a trained jewellery designer (with no forensic background whatsoever!), I regularly find myself wondering: "How on earth did I end up here...?!"

My professional journey as a jeweller spans almost two decades; however, my fascination with 'all that glitters' began a long time ago, cultured over the many hours I spent as a curious child raiding my grandmother's jewellery box. I have always been intrigued by the notion that history, value or meaning can somehow 'imprint' upon objects, imbuing them with a form of inorganic memory. The ways in which individuals choose to communicate personal identity through the decoration and adornment of the body has similarly always fascinated me; my own skin glitters with various gems and markings in the form of piercings, tattoos and other modifications.

Passionate about objects and adornment from such a young age, it was somewhat inevitable that this curiosity would manifest in various ways throughout my life. After graduating from Duncan of Jordanstone College of Art and Design (DJCAD) at The University of Dundee with a BDes (Hons) in jewellery and metal design in 2010, I delighted in my new professional identity as a contemporary jeweller. Unfortunately, this delight was short lived: my entire graduate collection was stolen from an art gallery a few weeks later. I found myself a victim of jewellery and gem theft. This type of crime is regularly investigated by the FBI and other law enforcement agencies around the world, yet something that police in the United Kingdom seemed to have little to no knowledge of and minimal interest in pursuing. Whilst there was no immediate threat to my life because of these events, the emotional and psychological trauma I experienced was exceptionally real. These petty thieves had not simply stolen my jewellery, they had stolen a part of me — and all the hundreds of hours of necessary energy, labour, thought and emotion I had channelled into the creation of these artefacts.

As it turns out, spite and rage can have a curiously motivating effect!

I returned to the University of Dundee that same year to undertake a MDes in design, graduating with distinction in 2011. Through a serendipitous encounter, my master's project saw me collaborate with police officers and forensic scientists on the design of a 'Forensic Jewellery Classification System' to help identify jewellery worn by missing persons and victims of mass fatalities. Part of the larger European Commission-funded FAST and Efficient International Disaster Victim Identification

Dr Maclennan's submission to the 100 Jewels by 100 Women exhibition (2021). The display, which includes a pearl necklace and loose pearls, reflects her chosen career. Photo by Gabriela Silveira.

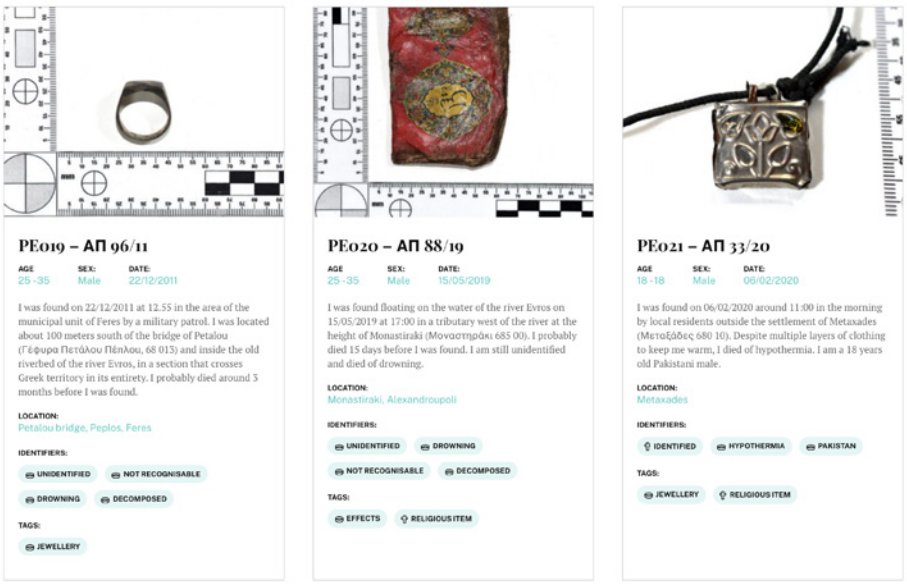
The author dusts a watch face as a first step for examination, in a photo taken for STV News. Photo by Susan Nicholson.

> **The ways in which individuals choose to communicate personal identity through the decoration and adornment of the body has always fascinated me.**

project, a consortium between INTERPOL and five other international partners, the project challenged everything I thought I knew about human beings and their jewellery in terms of identity, death and the human body. It went on to win 'Best Scientific Research Poster' at the annual British Association for Human Identification conference in 2011.

My burgeoning curiosity around the forensic potential of jewellery went on to form the basis of my doctoral research, which I completed in 2018 as part of a unique collaboration between DJCAD, the University of Dundee's Centre for Anatomy and Human Identification and The Institute for Capitalising on Creativity at The University of St Andrews. My PhD work explored the role of jewellery – and in turn, the role of jewellery practitioners – within a variety of forensic and criminal contexts. It found that, across both domains, jewellery is regularly cited as a tool in the pre-emptive identification of the deceased. It is known to help estimate approximate date or time of death (e.g., by examining a watch's internal mechanism); location of death (by analysing the placement or dispersal of objects); nature of death (as the result of accident, suicide or homicide) and even cause of death (through asphyxiation by neck chain). The fundamental nature of jewellery, due to its proximity to the body, means it may also physically harbour trace evidence (such as skin cells) that may collect around design features such as stone settings. Jewellery may simultaneously leave a physical/visual trace upon the skin or body of a victim or perpetrator.

Whilst I would love to take the credit for completely pioneering a new field, the truth is that jewellery valuers, historians, archaeologists and gemmologists have been conducting investigative work pertaining to jewellery for centuries. The tools of my trade and the principles that underpin my work, therefore, remain much the same as any jeweller. The inherent qualities and physical properties of jewellery – including but not limited to hallmarks, gemstones, serial numbers and personalised inscriptions – coupled with relatively untapped yet potentially significant resources (such as designing, making, repairing, appraising, authenticating and pawnbroking) offer analyses and evidence that can potentially reveal a far greater spectrum of information than is traditionally known to law enforcement. Due to manufacturing processes and design, as well as metal content and other factors, many jewellery items are unique and identifiable. Other identifiers are also important and useful, such as personal inscriptions or engravings; religious, cultural or genealogical indicators; or representational symbols such as those found on medals, badges of office and military insignia. Gemstones can be identified via their colour, cut, clarity and carat weight. Each element listed can help to trace and identify an object's maker, owner and wearer, which may offer significant evidentiary value to an investigation. →

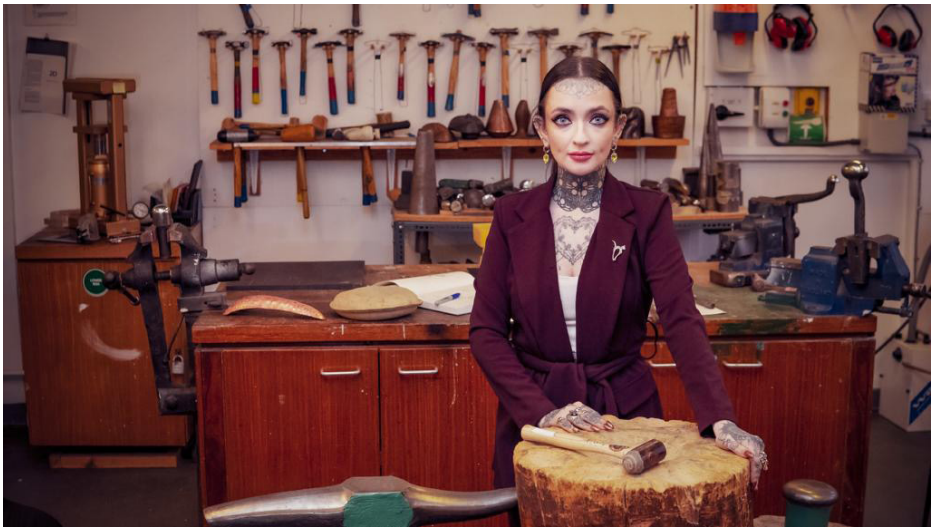


A page of the website run by Identifying the Displaced, showing items found with migrants along with the brief stories these objects tell that may help to give the deceased owners their names. Photo courtesy of Identifying the Displaced.

My practice continues to move away from crafting artefacts at a workbench, though I still participate in events such as 2021's 100 Jewels by 100 Women exhibition, for women who have lived, worked or studied in Dundee. But as I devote more time to examining fragments in a mortuary, my expertise has increasingly been requested on homicide investigations, missing person cases and cold case files across the UK. This demand has seen me retrain in disaster victim identification (DVI), leadership and management, as a court-verified expert witness and as a further education lecturer. I have worked with the police in various capacities: with the UK Home Office and College of Policing (2013 – 2014); the Library of Congress in Washington, DC (2014 – 2015); and the Design Against Crime Research Centre at Central Saint Martins College of Art and Design, University of the Arts London (2015). Laterally, I spent six years in the senior management team of the Police Service of Scotland, including three years as a forensic imaging officer, two as academic research lead and one as service design manager.

I have also worked as an associate/visiting lecturer on the topic of forensic jewellery, delivering training and educational input to audiences that include INTERPOL, the National Crime Agency, the British Transport Police and the European Academy of Forensic Science. Most recently, I have returned to my roots by taking up a permanent full-time appointment as a lecturer (assistant professor) in jewellery and silversmithing at the University of Edinburgh, where I work across both Edinburgh College of Art and the Edinburgh Futures Institute. In addition to pursuing my own research in forensic jewellery, I teach across a variety of interdisciplinary programmes and courses at both the undergraduate and postgraduate levels, including supervision of masters and PhD students.

When deploying to major disasters and criminal cases involving the injury or loss of human life internationally, I have worked to assist with the identification of the deceased, care for relatives of the bereaved and repatriate personal property belonging to victims, carefully piecing together the stories of those involved. In this capacity, I am currently the principal investigator on Identifying the Displaced, a multidisciplinary investigation into the forensic value of personal effects, including jewellery, that are found among the recovered bodies of migrants. I am partners in this collaborative endeavour with the following people: Professor Pavlos Pavlidis (chief forensic pathologist, Alexandroupolis General Hospital), Dr Jan Bikker (forensic anthropologist, The Platform for Transnational Forensic Assistance) and Harry Lawson (independent artist and filmmaker). Our work is funded by the Economic and Social Research Council. The fragmented identities of thousands of missing and unidentified migrants lay tragically scattered along many European coastlines, with many people losing their lives along the 'River of Death', a particularly treacherous crossing separating Turkey and the Evros region of Greece. Of the 550 deaths in the area since 2002, more than 60% of these individuals are still nameless. Personal belongings such as jewellery, watches, glasses and photographs are often recovered with people who were on the move; they may carry personal treasures, protective talismen or alternative currencies for the journey ahead. The project uses interdisciplinary methods across the arts and humanities, social sciences, life sciences and craft and design to achieve its goals of identifying these individuals through the found objects.



Dr Maria Maclennan FRSA as photographed for the book Women in Policing (2022). Photo by Jenni Stuart.

The heart of Identifying the Displaced is a website that seeks to resurrect the lost voices of more than one hundred missing and unidentified migrants currently at rest in unmarked graves and mortuaries across Greece. Each case study posted to the website is accompanied by a unique first-person narrative, created in an attempt to humanise every individual story by gifting individuals with the ability to 'speak' once more, bringing visibility to hundreds of identities otherwise erased. These stories are told through the objects carried by individuals on their respective journeys. Whilst not scientifically robust enough on their own, these 'secondary' methods can hold the key to unlocking a myriad of secret clues about the lost identities of these individuals. The items give clues to their lives, their relationships, even their very DNA: handmade *ta'wiz* amulets that offer safety to the wearer, *misbaha* beads used to keep count during prayer, SIM cards intricately wrapped in clingfilm to protect data from water and photographs and medication intricately sewn into the lining of clothing. The sentimental and often unique nature of many items means they may also be recognised by families, leading to identification through primary means (such as DNA, fingerprinting or dental records). However, with many objects becoming interchangeable within groups (often gifted, stolen or traded, particularly in the migration context), the limitations of such items must also be considered.

Our methodology has involved scanning and digitising hundreds of police files, autopsy reports and postmortem images, combining them

Jewellery recovered from unnamed migrants in the mortuary in Alexandroupolis, Greece and used by the humanitarian endeavour Identifying the Displaced. Left: A pendant on a dark-coloured string. The pendant has the shape of a cross, and is made from wood-like material. Right: A grey metal ring with a blue stone that shows signs of damage. The ring is 21 mm in diameter. On either side of the shank is a floral geometric pattern. The ring has no visible hallmarks or stamps. Photos by Harry Lawson.

with object biographies, social media analyses, digital photography and documentary film. We have thus far focused on uncovering identifying marks and personal features such as engravings, inscriptions and serial numbers found on jewellery, watches and electronics, as well as noting indicators of culture, religion or provenance; we also note how, when and where each item was recovered. Knowledge-exchange workshops have brought together practitioners and organisations active on the issue of migration to study subjects as such jewellery appraisal, design, art history, forensic science, forensic pathology and human rights. They also discuss and advise upon aspects such as procedure, law, ethics, provenance, cultural and/or religious indicators and repatriation. Acquired expertise from the project will, hopefully, enhance opportunities for human identification and further aid capacity building in countries where expertise is limited. Assisting in creating this methodology will help police and pathologists in Greece utilise personal effects within the migration context. We are always looking for individuals – in particular, jewellery appraisers and gemmologists – to help support the project. Neither the jewellery trade nor law enforcement acting alone can effectively tackle the complexity of these issues.

What has become increasingly apparent to me is that education is never over. If forensic jewellery is to be considered a legitimate field of practice, it requires collaboration on the part of many parties. The jewellery and gemmological communities have shown incredible support for forensic jewellery as an emergent domain. I have been invited to speak by organisations such as the Scottish Gemmological Association, the Society of Jewellery Historians, National Association of Jewellers, the National Council of Jewellery Valuers Australia, GemX Club New York, The Royal College of Art, V&A London and, of course, Gem-A! My work has been profiled for international audiences on platforms including *The Financial Times*, *The New York Times*, *BBC World News* and *Ripley's Believe it or Not*, and I am a regular contributor on national television and radio, featured on *BBC Crimewatch*, *STV News* and *Scotland Tonight*. In 2022, I received an Outstanding Early Career Impact Award from the Scottish Institute for Policing Research (SIPR). I was also shortlisted for the BBC Radio 3/Arts and Humanities Research Council's 2022 New Generation Thinkers and was profiled by UK Research and Innovation (UKRI) in their '101 Jobs Changing the World' campaign.

I continue to explore the ways in which I can study gemmology in my own time, and I am fortunate enough to have received financial support from the Gemological Institute of America to study their diamond grading programme, in addition to the National Association of Jewellers' Educational Fund to support my Professional Jewellers Diploma (PJDip). My longer-term ambition is to undertake Gem-A's own Gemmology Foundation and Diploma programmes, to develop my knowledge and expertise in the art and science of gemmology. This will be a long journey, but one I hope will allow me to apply my knowledge and expertise in jewellery and gemstones to help recover the lost identities of individuals across the world. ■

I am currently the principal investigator on Identifying the Displaced, a multidisciplinary investigation into the forensic value of personal effects, including jewellery, that are found among the recovered bodies of migrants.

To learn more about the work of Identifying the Displaced, or to find out how you can be of assistance to their mission, go to identifyingthedisplaced.com.

THE REGALIA OF THE Coronation

The Coronation of Charles III and his Queen Consort, Camilla, will be the first such ceremony in the United Kingdom in seven decades. Jewellery historian Clare Blatherwick gives *G&J* readers a concise background of the objects we are likely to see on 6 May 2023.

The Coronation of His Majesty King Charles III will take place at Westminster Abbey on 6 May 2023. As jewellers, gemmologists and jewellery historians, we are undoubtedly looking forward to seeing the Crown Jewels of the United Kingdom being used at an event not seen for nearly 70 years. There have been numerous publications on, or featuring, the Crown Jewels; this short article will provide a distillation of some of the available information into a brief guide, with a particular focus on the Coronation Jewels and what we might hope to see on 6 May.

Comprising over one hundred items, the Crown Jewels are part of the Royal Collection and are held in trust by the monarch for the nation. Currently housed at the Tower of London, millions of visitors queue to see the collection each year. Since 1843, a Crown Jeweller has been personally appointed by the monarch to look after the collection, and is one of only three people permitted to touch the Crown Jewels. The incumbent, since 2017, is Mark Appleby of Mappin & Webb. The world watched last September as Mr Appleby undertook the deeply symbolic task of removing the Imperial State Crown, the Sovereign's Orb and the Sovereign's Sceptre from Her Majesty Elizabeth II's coffin at her state funeral.

The Crown Jewels can be differentiated into the Regalia (items which are worn or held by the monarch to demonstrate their royal status) and all other objects, which include processional pieces and a significant quantity of plate. The Regalia itself can further be subdivided into those pieces particularly associated with the Coronation and those used on all other occasions. Unsurprisingly, the collection has considerable historic merit and spans about 700 years, from the twelfth-century Coronation Spoon (thought to have been made for Henry II) to the Elizabeth II Armills, made by Garrard & Co for the 1953 Coronation. It is yet unknown if any pieces will be added for the 2023 ceremony. We will have to wait until May to find out if any new pieces are being made specifically for King Charles III or The Queen Consort.

Despite there being archaeological evidence of the wearing of a crown by English kings for around two millennia, the tradition of a monarch's regalia being passed to their heir at the time of their death was not established prior to the twelfth century. At that time, the monks of Westminster Abbey claimed that Edward the Confessor (ca. 1003 – 1066) had left his regalia in their care with the intention that it be used for the Coronation of all future kings of England. While this statement may not have had much truth behind it, his canonisation in 1161 ensured that objects associated with him came to have a holy as well as royal association, and a tradition was established. By the time of the seventeenth-century English Civil War and execution of Charles I

The first colour photograph of the Crown Jewels, published in 1952 in Illustrated *magazine in advance of the Coronation of Elizabeth II. Photo in the public domain, courtesy of Wikimedia Commons.*

in 1649, such was the potency of that regalia that the key pieces did not survive the political transition. They were melted down with the gold used for coinage (and resolutely stamped 'The Commonwealth of England') whilst the remaining pieces were allowed to be sold. With the Restoration of the Monarchy and the Coronation of Charles II in 1661, a new set of regalia was required, and the pieces considered essential for the occasion were a Coronation crown, a State Crown, an orb, a ring, sceptres, swords, spurs and a pair of armills (bangles). These pieces, apart from the ring, form the core of the extant collection. The project was overseen by the Royal Goldsmith Robert Vyner, who outsourced the work to various craftsmen. The bill for that new regalia was reportedly £12,184 7s. 6d., which, according to seventeenth-century English diarist Samuel Pepys, was the equivalent of three fully fitted warships.

In the present day, the press has already reported that the Coronation Crown, also known as St Edward's Crown, has been removed from its display at the Tower of London to make modifications in advance of the May ceremony. This deeply symbolic crown is used only at the Coronation ceremony. Whilst the body of the crown, the settings and associated enamel decorative elements are original to Charles II, the gemstones and diamonds set into it are not those from the 1661 Coronation; those stones had been rented for the occasion, a practice repeated several times throughout history. The discovery of Brazilian diamond reserves in 1725 reduced the reliance on rarer and – due to the reality →

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St. Edward's Crown, also known as the Coronation Crown, was commissioned by Royal Goldsmith Robert Vyner for the Coronation of Charles II. Photo in the public domain, courtesy of Wikimedia Commons.

of supply and demand – costlier Indian diamonds, and gave rise to the inclusion of diamonds in greater amounts into jewels. This ensured that the appetite for this less-ostentatious crown diminished, and for about two hundred years it went unworn but was carried as part of the Coronation procession. Only in 1902, with the Coronation of Edward VII, was a desire to reinstate this crown exhibited. Unfortunately, the King's health was so poor he was thought unable to cope with the weight of the 2.23 kg crown, and he was crowned with the lighter State Crown instead. In 1911, George V had the crown set with gemstones that would remain in place for the first time in its history, and it has been used in that form in every Coronation since. There is with no indication that we should expect anything different in 2023.

The Imperial State Crown, which was made for George VI by Garrard in 1937, is one of the more recent additions to the Regalia. Its predecessors were frequently used, often needed repair and were sometimes replaced by successive monarchs. In some instances, this was for the sake of practicality. For example, Queen Victoria's diminutive stature ensured a crown of appropriate scale was made for her Coronation. That aside, the design of the current crown owes a great deal to those that came before it, and the stones set in previous State Crowns were frequently reused. The Black Prince's Ruby was previously incorporated into Charles II's State Crown, then adapted for James VII/II in 1685. By 1821, St Edward's Sapphire was part of George IV's State Crown. The 104 ct Stuart Sapphire made its way into the 1838 State Crown of Queen Victoria and was relegated to the back of the current Imperial State Crown by Garrard, partly to accommodate the addition of the Cullinan II diamond. If he follows tradition, we can expect to see Charles III wear this crown on his departure from the Coronation ceremony.

Moving temporarily away from crowns to objects that will almost certainly play a role at the Coronation in May, we can assume we will see the Sovereign's Orb and Spurs of 1661, as well as the 1820 Sword of Offering. Armills dating from 1661 and 1953 are extant in the Regalia, and it will be interesting to see if King Charles III uses a pair in the ceremony. Their use in 1661 and in subsequent ceremonies is the subject of some debate, but given the later pair were bestowed upon his mother at her Coronation it may be that we see them again. Less clear is whether the objects of Regalia used in the Act of Consecration will be seen by a global television audience. Considered to be the most holy moment in the Coronation, this part of Elizabeth II's ceremony was obscured from television cameras to maintain its sanctity. The Ampulla of 1661, which holds the blessed oil, and the twelfth-century Coronation Spoon that is used to deliver a cross of the oil onto the head, palms and breast of the monarch may once again be kept out of sight.

The last time a Queen Consort was crowned was 1937; thus, it is beyond the living memory of most people. However, Camilla's role means she too requires a crown and, possibly, associated Regalia. The post-Restoration history of this begins with Mary of Modena's State Crown of 1685, which is still in existence, though it is now set with rock crystals rather than diamonds. The controversy surrounding the Koh-i-Noor diamond, which entered

The design of the current Imperial State Crown owes a great deal to those that came before it, and the stones set in previous State Crowns were frequently reused.

The twelfth-century Coronation Spoon is one of the few Regalia items to predate the Restoration. It is used to anoint the monarch with the holy oil that is poured from the Ampulla, which dates to the 1661 Coronation of Charles II. Photo by Matt Dunham/Alamy.

His Majesty The King – then The Prince of Wales – views the Imperial State Crown during a March 2003 visit to the Tower of London. The King is expected to wear this crown during his departure from Westminster Abbey at the end of his Coronation. Photo by Johnny Green/Alamy.

the Royal Collection in 1850, has no doubt, at least in part, influenced the announcement that Camilla will be crowned with Queen Mary's Crown of 1911. The Koh-i-Noor has been set in the Queen Consort crowns of Alexandra and Mary as well as that of Queen Elizabeth the Queen Mother, where it currently remains. Amendments have been made in the past to Queen Mary's Crown, including when she wore it to the Coronation of her son, George VI, when it was seen without arches and with the Koh-i-Noor replaced by the Cullinan V diamond. As with St Edward's Crown, Queen Mary's Crown has been removed from the Tower of London for adjustment.

Sceptres are expected to be presented to both monarch and consort, with The King receiving the 1661 Sovereign's Sceptre with Dove and the Sovereign's Sceptre with Cross of the same date (with Cullinan I added for the 1937 Coronation). As Queen, Camilla is likely to be presented with one or both of the 1685 Sceptres – one with cross and one with dove (which has folded wings in contrast to the outstretched wings on the Sovereign's Sceptre) – of James VII/II's consort, Mary of Modena.

The Regalia includes three Coronation rings — one traditionally placed on the fourth finger of the right hand of the monarch, and on his consort, during the ceremony. They are the 1831 Sovereign and Queen Consort's ring, as well as Queen Victoria's own Coronation ring. Historically a new ring was made for each monarch, in a similar vein to the Papal Fisherman's Ring, as the Coronation ring would become part of their personal collection. William IV left his ring to his widow, Queen Adelaide. She bequeathed this ring, and her own Consort's ring, to Queen Victoria, who had her own version of William's ring made, albeit much smaller in scale, and left all three rings to the Crown. It is likely that William IV and Adelaide's rings will be used by Charles III and Camilla in May.

It is impossible in this article to discuss the Regalia in its entirety, though we must briefly note the processional pieces and items of plate that we may see on 6 May. Certainly, the Sword of Temporal Justice, the Sword of Spiritual Justice and the Sword of Mercy (with blunted blade and known as 'Curtana'), all of which were made for Charles I, will play a role. Items of plate from The Crown Jewels have typically been displayed at Westminster Abbey at previous Coronations. With more than forty pieces of sixteenth- to nineteenth-century silver gilt and gold objects ranging from chalices to candlesticks, fonts and two incredibly rare caddinets (stands used to present cutlery, bread, salt and a napkin, used only in the most important of houses, perhaps even only royal palaces) it is likely we will see at least some of these deployed.

Millions of people queue each year to see the Crown Jewels at The Tower of London. We will have to wait until May to find out if any new pieces are being made specifically for King Charles III or The Queen Consort. Undoubtedly a global viewing audience will enjoy seeing the existing Regalia at their most splendid, when their potency can be most vividly felt and when they fulfil the purpose for which they are made, at Westminster Abbey during the Coronation. ■

An illustration of Queen Mary's Crown as it looked in 1919. Queen Camilla is expected to wear this crown at the May Coronation, after adjustments are made. Photo in the public domain, courtesy of Wikimedia Commons.

Not Just a Pretty Face

The History of HPHT Synthetic Diamonds

Lab-grown diamonds have become part of everyday offerings within the jewellery industry, but the history of diamond synthesis has surprisingly little to do with the gem trade. In the first instalment of this two-part series, Beth West FGA DGA regales readers with a story that begins with diamond's reinvention as an essential industrial tool.

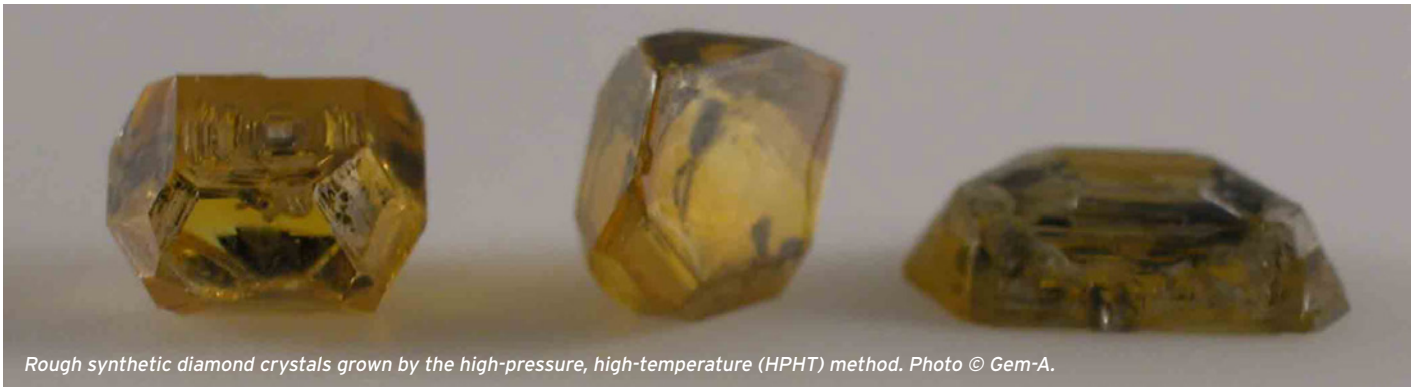
Late in the evening on 12 May 1940, Jan Smits, a Dutch diamond dealer based in London's Ely Place, boarded a British destroyer in Harwich with his friend and colleague (known to history by the pseudonym 'Walter Keyser'). The military vessel had been assigned exclusively for their use. Before they left, they had each been handed a revolver, two thousand guilders and a Navy issue kit bag. On the instructions of the British and Dutch governments, they were to retrieve as many diamonds as possible from their contacts in Amsterdam. The Germans had just invaded the Netherlands, a neutral country, so not without risk and careful negotiation, these two men succeeded in the mission. A kit bag full of diamonds was returned to London and into the protection of the Diamond Trading Company (Walker, 1975). It was vital that the enemy was prevented from obtaining Amsterdam's supply of diamonds. Not because of Adolf Hitler's established penchant for the gem, but because diamond was vital to the war effort.

Tungsten carbide – a relatively new material at the time, resistant to high temperature, incredibly hard at 9–9.5 on the Mohs scale and durable – was used to tool steel armaments. Diamond was the only material hard enough to work the compound, with the gems ground down to be used as an abrasive. Therefore, diamond grit was essential for the efficient production of the tungsten carbide tools. Larger diamonds were also employed. Rounder crystals were embedded in drill bits and used to mine the copper required for the manufacture of bullets and, more importantly, the wire that was used in radar communication. The wire itself was drawn using diamond dies that had been cut from larger crystals. Yellow and brown diamonds (today's canary and champagne fancies) were used in precision tooling (Caveney, 2006)

Diamond was needed to win World War II, and millions of carats of the gemstone were exhausted in the effort. In 1941 alone, industrial material comprised approximately thirty percent of the £7.5 million sold by De Beers' Diamond Trading Company ('Diamond Industry in Wartime, 1941'). This is where the story of synthetic diamonds really begins: when necessity reinvented diamond as a practical and essential industrial tool.

Diamonds' unsurpassed hardness has been acknowledged for millennia. The name diamond derives from the word *adamas*, a Greek word describing a hypothetical material unparalleled in strength. Pliny the Elder assigned the word adamas to the gem in *Natural History* (79 CE). A flawless octahedral crystal could render the wearer as unconquerable as the diamond itself. "Serpents, tigers and thieves fly from the presence of a person wearing a diamond," proclaims the *Garuda Puranim*, a Hindu text that, like *Natural History*, dates to the first millennium CE. Then we learnt to cut and polish it, discovering this incredibly strong stone could also be extraordinarily beautiful.

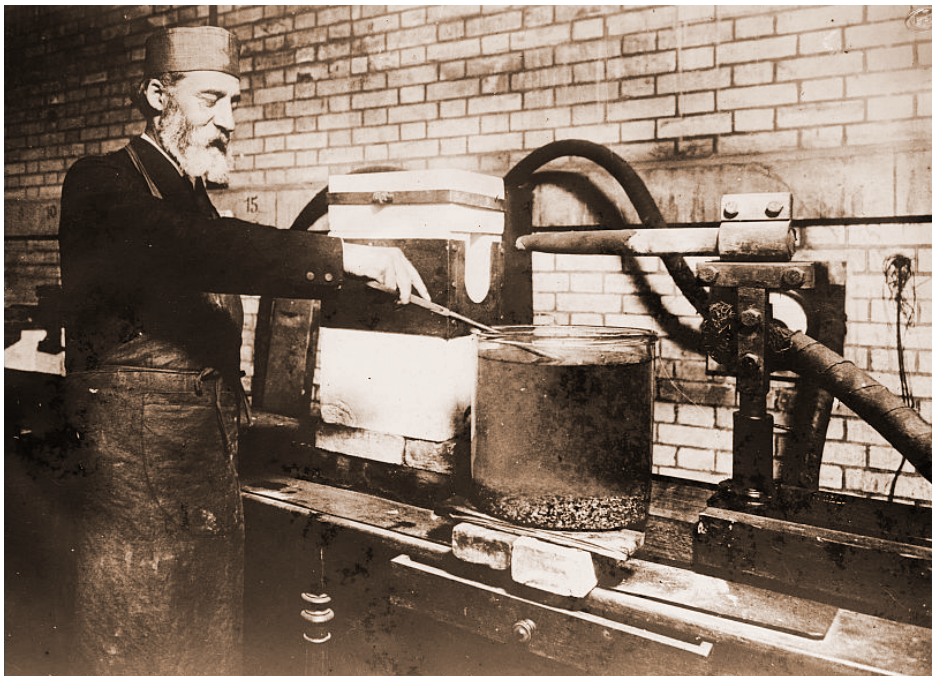
There were two pivotal events that would contribute to the eventual development of synthetic diamond material. The first occurred in 1796, when English chemist Smithson Tennant, following Antoine Lavoisier's experiments on the burning of diamond, determined that the gem was pure carbon. The second was in the early 1870s, when diamonds were found in South Africa's Orange River, and subsequently traced to the first confirmed primary deposit of the gemstone, a neck of volcanic rock that



Rough synthetic diamond crystals grown by the high-pressure, high-temperature (HPHT) method. Photo © Gem-A.

was blue in colour below a certain depth. This 'blue ground' was found at the New Rush deposit, one of the largest and most prosperous for potential prospectors. But the name did not appeal to Secretary of State for the Colonies, John Wodehouse, 1st Earl of Kimberley. Obligingly, the source was named for his title instead. It follows that the new host rock found at the deposit was named kimberlite. By 1887, geologists had deduced that kimberlite was formed under high pressure and temperature deep within the earth and, by default, so must have diamond.

Now aware that two of the key requirements to create a diamond were a carbon source and sufficient pressures and temperatures to cause the carbon to crystallise as diamond, numerous late-nineteenth-century inventors put themselves to work. Experiments from this point forward would eventually reveal that a metal solvent was also required to break down the carbon source (Hazen 2003). The key figures in this pursuit were Scottish chemist James Hannay, French chemist (and Nobel laureate) Henri Moissan, British chemist William Crookes and British engineer Charles Parsons. All the men committed themselves to potentially fatal experiments to induce the conditions required to grow synthetic diamond. Each of their attempts were undoubtedly ingenious, if terrifying. Hannay heated sealed iron cylinders packed with bone oil, paraffin and lithium to approximately 900° Celsius. Crookes advanced this theory by exploding gunpowder in a steel tube. Moissan essentially quenched a mixture of molten iron and sugar in cold water, and Parsons passed high electric currents through graphite. He also took up his rifle and shot carbonaceous samples at point-blank range. Ultimately, none of the four were successful. It was not until WWII, when diamond was employed as an important industrial material, that the bid to produce synthetic diamonds evolved beyond a challenge for persistent scientists.



Nineteenth-century French chemist Henri Moissan attempting to create synthetic diamonds. Photo courtesy of the Library of Congress/Wikimedia Commons.

The first synthetic diamonds, produced by the HPHT method, as produced by ASEA in 1953. Photo by Erik Lundblad, courtesy of Wikimedia Commons.

By 1950, industrial applications for diamond material were expanding. The automotive industry was growing exponentially, and the tungsten carbide – that of the wartime tool armaments – was needed for car parts. The tungsten filament in light bulbs also needed drawing, which could only be completed by diamond. Further, tensions between North and South Korea had led to the start of the Korean War, driving a renewed need for armament manufacture. To cater for the increased demand for diamond in large industrial capacity, a synthetic alternative seemed the necessary next step.

The most visible drive towards diamond synthesis was in the United States. This was in part due to physicist Percy Bridgman, who had developed a high-pressure apparatus capable of generating up to 40GPa, for which he was awarded the Nobel Prize in 1946. He would offer his technical support to three companies, General Electric, Norton and Carborundum, all major consumers of industrial diamonds, who initially worked as a collective on the synthesis project, before disbanding in 1950 to work independently.

But whilst these juggernauts of industry were advancing towards a 'eureka!' moment, a quieter story was unfolding in the clear air of Sweden. →

It was not until WWII, when diamond was employed as an important industrial material, that the bid to produce synthetic diamonds evolved beyond a challenge for persistent scientists.

At around the halfway point of Götgatan, one of the longest streets in Stockholm, is the entrance to the Dutch Embassy. This building was constructed in the 1640s and was once owned by Ebba Brahe, a Swedish countess and lover to the then-king, Gustav II Adolf (1594 – 1632). By World War II, it had fallen into a state of disrepair and sat empty, beyond the odd squatter or brothel worker. But to the more romantically inclined, it had charm. In 1941, two floors of this building were taken over by an inventor, Baltzar von Platen, with the intent of setting up a laboratory to build his 'diamond machine'.

Von Platen was born in 1898 in Skåne County, Sweden. His father was a lawyer, and his mother was an artist and musician. This potent genetic fusion would offer him a sharp intellect and a galloping imagination, allowing him to build an entirely unique understanding of reality, and one he was stoically committed to — to the point he rejected all that was traditionally accepted and decided on the contrary.

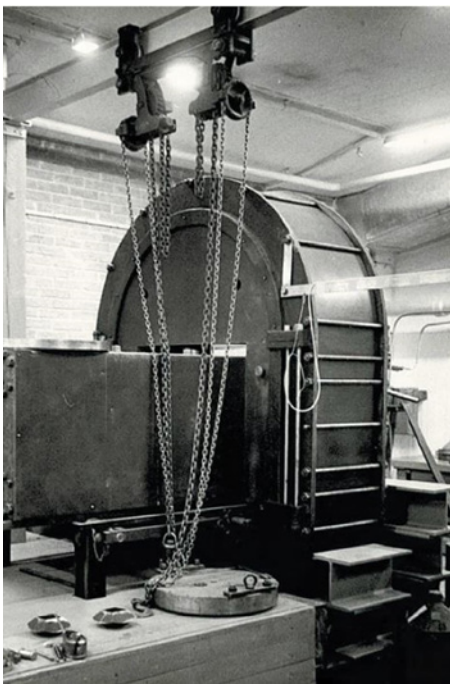
As testimony to his belief in himself, the young man went on to find success. In 1921, whilst still studying mechanical engineering at the Royal Institute of Technology in Stockholm, he and fellow student Carl Munters devised and built the Platen-Munters absorption refrigerator, the precursor to the modern appliance. The invention was taken up by Swedish manufacturer Electrolux, and the two inventors were each offered a deal of SEK 560,000, a job and royalties for every refrigerator sold. But von Platen was restless, and he left Electrolux in 1927, only two years after he had joined. In 1930, von Platen read an article on the function of pressure and temperature in the crystallisation of diamond and the next two decades of the inventor's life were dedicated to achieving successful diamond synthesis.

Ebba Brahe's palace as it appears today. While in the mid-twentieth century it served as the headquarters for von Platen and ASEA's work on diamond synthesis, today it houses the Dutch Embassy in Sweden. Photo by Holger.Ellgaard/Wikimedia Commons.

The apparatus von Platen developed was complex. A marble-sized carbon-rich sample was surrounded by the extremely volatile chemical thermite. The thermite, once triggered by an electric current, would burn at around 2,200°C, generating the required temperatures for diamond

Swedish inventor Baltzar von Platen ca. 1960, roughly a decade after he grew tired of the diamond synthesis project, and about seven years after the experiment bore fruit. Photo courtesy of Wikimedia Commons.

> On 16 February 1953, fifty small synthetic diamond crystals were grown in the dilapidated outhouse of a seventeenth-century palace.



The 'diamond machine' in situ *in the outhouse of Ebba Brahe's palace in Stockholm. Photo courtesy of Eric Lundblad/INDIAQUA.*

crystallisation. The sample would then be encased in an insulating soapstone, boxed in a three-inch copper cube, and locked in by six pyramid-shaped anvils, creating the 'broken' sphere around the reaction cell. This sphere would then be enclosed in a strong copper jacket, placed in a hydrostatic pressure cylinder and bound with piano wire, inducing a pressure of up to 8GPa on the surface of the cube (Lundblad, 1990). It was composed of twenty-four separate pieces. It would also need a stand.

By 1948, von Platen had sought the support of the Swedish electrical company Allmänna Svenska Elektriska Aktiebolaget (ASEA), and his diamond project was advanced with the help of a team of ASEA engineers. The complexity of the project needed more than one man. The pulling apart, and subsequent reassembly, of fourteen tonnes of equipment was difficult, time-consuming work, so the priority of this team was to move this 'diamond machine' to a place where it was least at risk of falling through the floor and the most practical building proved to be the palace's derelict outhouse.

For the next four years, this impromptu laboratory was witness to numerous explosive attempts, frayed tempers and consecutive failures. Invariably, von Platen tired of the project, and left it primarily in the hands of the ASEA team. By 1952, after several tweaks to the original 'diamond machine', a decision was made to add a metal solvent – in this case, iron – to the carbon sample. Finally, on 16 February 1953, running the apparatus at temperatures of 2,200°C and pressures of 8.3GPa, fifty small synthetic diamond crystals were grown in the dilapidated outhouse of a seventeenth-century palace (Lundblad, 1990).

Unfortunately, at this point ASEA believed that they were the only team that was seriously working on such a project. Therefore, ASEA's management suggested that they further refine their methods before publishing their results, or even applying for a patent. It was a misplaced act of prudence. On 15 February 1955, American company General Electric (GE) announced their own success and was immortalised in the annals of science as the first to synthesise diamonds (Lundblad, 1990). GE's success was then followed by that of De Beers Industrial Diamond Division (later rebranded Element Six) in 1959.

The early years of commercial HPHT diamond synthesis was somewhat slow moving. The only major players were De Beers and GE, with Japanese group Sumitomo running a close third. The only product at the time was abrasive diamond grit, used in resin bond and metal bond grinding wheels. By 1970, the process became more controlled, and stronger crystals could be produced for sawing stone and, later, concrete. Polycrystalline products had also been developed, extending their applications to cutting. But fundamentally, industrial diamond was employed for its mechanical abrasive properties. That is, until another method of diamond synthesis began to find its feet. ■

Part two on the history of the development of diamond synthesis, discussing the method of chemical vapour deposition (CVD), will be published in the Autumn 2023 issue of Gems&Jewellery.

The original 'diamond machine' used by the ASEA team as it appears today. Photo courtesy of the author.

Maintaining Purpose:
Looking to IAC's 2023 Gold + Diamond Conference

Each summer, Initiatives of Art and Culture's Gold + Diamond Conference dedicates several days to responsible action within the gem and jewellery industry. Lisa Koenigsberg, IAC's president, explains how 2023's Conference will — among other topics —consider how individual goals can be met while working for an acceptable global value system.

A rubellite extracted from the Cruzeiro mine. Photo by Leo Drummond/Nitro, courtesy of Cruzeiro mine.

Those of us in the gem and jewellery industry are driven by a compelling need to preserve the magic, romance and emotional power of gems and jewellery. At the same time, the industry is confronting external forces that are influencing how business should – indeed, must – be conducted across the value chain if the industry is to flourish in a responsible way. These external imperatives include the United Nations Sustainable Development Goals (SDGs), which are seventeen interconnected objectives centred on sustainability that are intended to further global peace and prosperity, and the Glasgow Climate Pact, the outcome of the 26th UN Climate Change Conference in Glasgow (COP26) in late 2021. During COP26, representatives from almost 200 countries hammered out an agreement advancing the fight against climate change in general and implementation of the 2015 Paris Accord (COP21) in particular.

The tension between these internal and external factors was the focus of Initiatives in Art and Culture's (IAC's) 2022 Gold + Diamond Conference. Participants explored the value of a 'declaration of principles' regarding responsible conduct and recognised the clear difference between such a declaration and a blueprint for implementation. They also sought to remain mindful that detailing ways to 'operationalise' the goals of any such declaration can present obstacles to its adoption.

During the 2022 Conference, IAC presented Mark Hanna, chief marketing officer of Richline, with the fifth Responsible Practice in Jewelry Leadership Award. The award was presented to Hanna in recognition of his bold thinking and his commitment to purpose, transparency and 'trustability'. Rob Bates received IAC's second Award for Extraordinary Contributions to the Diamond and Jewelry Industry in recognition of his twenty years of reporting at *JCK Magazine*.

Hanna and Bates, however, would likely be among the last to argue that the work required to build a more sustainable industry is done. IAC's 2023 Gold + Diamond Conference, "Maintaining Purpose"– to be held 17 - 19 July in New York City – will thus focus in a more granular way on how statements of principle can become blueprints to achieving fundamental transformation in the precious metal, diamond, coloured stone and jewellery sectors.

Miners affiliated with Moyo Gems. Photo courtesy of Pact.

The Conference will, in part, seek to understand how to operationalise the gold industry's 2022 Declaration of Responsibility and Sustainability Principles, keeping in mind that often-vast differences in social, economic and geographic context can preclude the possibility of a single solution to any given problem. Blueprints or roadmaps with clear, quantifiable milestones are essential to this process, as is, in the words of the UN World Commission on Environment and Development, 'meeting the needs of the present without compromising the ability of future generations to meet their own needs'.

Conference attendees will consider the meaning of 'sustainability' before entertaining the following questions:

- How are the goals of any declaration of principles met, and outcomes measured, at each step along the value chain?
- Will individual actors or sectors within the industry need to modify their practices and regulations to comply with what is laid out in documents such as the Declaration of Responsibility and Sustainability Principles, which were proposed at a London Bullion Market Association (LBMA) meeting sponsored by the World Gold Council (WGC) in October 2022?
- How can varied goals and principles of different declarations be harmonised so all can work together toward a generally accepted global value system?

Every link in the jewellery supply chain, from mine to market, has its own potentially adverse impact on climate. IAC's Conference will explore how these individual impacts can best be measured and then mitigated, balancing the need to transition to low- or zero-carbon methods without subjecting at-risk communities to new socioeconomic injustices.

Merian Goldmine of Surgold, Newmont Suriname. Photo courtesy of ATV-Networks.

For example, conference participant Newmont Corporation, the world's largest gold-mining company, has defined clear pathways to achieving a targeted 30% reduction in greenhouse gas emissions by 2030 and net-zero carbon emissions by 2050. To quantify its progress in meeting these targets – the criticality of such measurement being a major focus of the Conference – Newmont relies on science-based criteria that align with standards set by Science-Based Targets Initiative (SBTi). As of 2021, Newmont was one of only two gold mining companies globally and one of only twelve companies in the Standard & Poor 500 to have climate targets approved by SBTi. For countries to meet their commitments under the Glasgow Climate Pact to curb greenhouse gas emissions and to combat climate change in accordance with the UN SDGs, industry as a whole must join them.

Another conference participant, the Centro de Innovación Científica Amazónica (CINCIA) of Wake Forest University is also applying a data-driven approach to achieving UN SDGs, quantifying mercury pollution in Madre de Dios, a region in southeastern Peru's Amazon Basin. Mercury, a potent neurotoxin, has been used for thousands of years to separate gold from ore. Artisanal and small-scale gold mining (ASGM), which has expanded rapidly in Madre de Dios since 2000, is responsible for nearly 40% of global mercury pollution. To better understand the flow of mercury in the Madre de Dios ecosystem, CINCIA has established a local analytic laboratory that quantifies mercury and its dispersion in the environment.

Quantifying a pollutant is an essential precursor to mitigation. Mercury Free Mining, a participant in both the 2022 and 2023 Conferences, focuses on both discovery and deployment of mercury-free processes in ASGM. One such technology is Goldrop, which uses elutriation to separate gold from sediment without the use of mercury (for more information, see pp. 26-29). Goldrop's inventor, John Richmond, will describe the technology for attendees.

It is widely argued that over-rigorous sourcing standards have marginalised artisanal and small-scale mining (ASM) by negatively impacting the miners' local economies. The Conference will explore approaches the global community can take to mitigate negative impacts of ASGM through 'formalisation' by integrating

IAC's Conference will explore how individual impacts can be measured and mitigated, balancing the need to transition to low- or zero-carbon methods without subjecting at-risk communities to new socioeconomic injustices.

it into the formal economy, society and regulatory system. A panel including a representative from the WGC will review proposals by the LBMA designed to encourage inclusion of gold produced by ASGM in mainstream supply lines to, in the words of the LBMA, "advance… governance… [and] open direct market access for those who depend either wholly or in part on artisanally-produced gold for their livelihood…"

Coloured stones, as previously noted, are predominantly sourced through ASM, and the Conference attendees will hear about how Pact, a nongovernmental organisation operating in Africa, Asia and South America, works in partnership with governments, industry and miners to formalise ASM, creating a safer and more productive and equitable enterprise. In collaboration with Anza Gems, Nineteen48 and the Tanzania Women Miners Association (TAWOMA), and building on an education program developed for miners with the Gemological Institute of America (GIA), Pact devised the pilot of what has become Moyo Gemstones, a program helping female miners in Tanzania and Kenya move gemstones from mine to market through vetted local brokers and traders. Pact is also working with the Alliance for Responsible Mining (ARM) to adapt the Code of Risk-Mitigation for ASM Engaging in Formal Trade (CRAFT) – a code intended to increase responsible sourcing of gold from artisanal miners – to coloured gemstones, and with MTL Consulting to bring Moyo miners into compliance with CRAFT.

The family-owned Cruzeiro mine in Minas Gerais, Brazil, aims to create a new mine-to-market model in which goods incorporating its tourmaline and rubellite are finished in-country. This challenges the traditional model of shipping locally extracted resources elsewhere for processing and transformation into greater valued-added product, thus providing greater local economic benefit. In 2022, Cruzeiro and brand-development agency Julls invited a select group of designers from or based in Brazil to create an exclusive collection using the mine's gemstones for the Couture show in Las Vegas. Cruzeiro and Julls will be on-hand to recount this journey.

Brilliant Earth, another conference participant, is pursuing its own path to sustainability. Certified Carbonfree by Carbonfund.org, this American jewellery brand uses conflict-free diamonds, gemstones and precious metals from ethically and environmentally responsible sources, reuses diamonds and chooses recycled precious metals to reduce its carbon footprint. It sources precious metals from refiners that adhere to standards set by organisations such as the Responsible Minerals Initiative and LBMA.

Activists from the Extinction Rebellion group demonstrating during protests outside the Bank of England in London. Photo by Luke MacGregor/Bloomberg.

Turning to training, we will explore initiatives designed to advance careers in the jewellery and mining sectors and ways in which responsible practice can be integrated into curricula. For example, under the auspices of the MJSA Education Foundation, the MJSA Mentor & Apprenticeship Program provides tools that businesses need to bring on and train apprentices. In an endeavour pioneered by the Urban Institute and funded by the U.S. Department of Labor, jeweller and educator Nanz Aalund leads development of the first Competency-Based Occupational Framework (CBOF) for apprentice bench jewellers in the United States. We Wield the Hammer (WWTH), founded and led by self-taught metal artist and arts educator Karen Smith, identifies, trains, tracks and supports young women of African descent who might not otherwise choose a career as a metalsmith. Currently operating in Oakland, California, and Durham, North Carolina – and with plans to extend the program to Senegal – WWTH's training program provides the fundamentals of metalsmithing in an eight-week session in which students learn the art and practice using copper, brass and sterling silver.

Next, we will look at how pioneering makers marry sustainability and responsibility with artistry. British-West African jewellery designer Satta Matturi, a board member of the Responsible Jewellery Council (RJC), launched her first collection in 2015. Matturi will explore in her presentation the ways in which she marries her heritage and awareness of a new, emerging Africa with an understanding of British craft and global design to create high-end jewellery such as her Calabash and Kwe earrings. She sources materials from Africa and is keenly aware of the resulting positive economic impact on the local economies. Matturi's work is receiving increasing attention: Oscar winner Viola Davis wore her Kwe earrings on the red carpet at the premiere of Showtime's anthology series *The First Lady*.

The Conference will offer attendees an opportunity to visit RIVA Precision Manufacturing, a company committed to sustainability, responsibility and artistry. in equal measure. CEO Ted Doudak founded RIVA thirty years ago, working alone at night in his basement. The company has since become an integrated manufacturer, occupying 37,500 sq. ft. with over 140 employees, offering a full range of services, from design to production.

The Conference has fully committed to exploring a range of options for

responsible sourcing. We will consider ASGM-sourced gold and recycled gold (including its definition and use). We will also discuss single-mine origin (SMO) gold such as that produced by Hummingbird Resources, a gold production, development and exploration company and member of the WGC. At the same time, the Conference will explore the implications for the jewellery sector of a circular economy in which no waste is generated, and everything is shared, repaired, reused or recycled.

As in past years, The Conference will conclude with the awards for Leadership in Responsible Practice in Jewelry and for Outstanding Contributions to the Diamond and Jewelry Industries. The sixth Responsible Practice in Jewelry Leadership Award will recognise a trade member, or a jewellery-focused organisation, that has made a transformational and worldwide contribution to ethical sourcing and responsible practices. The third award, for Outstanding Contributions to the Diamond and Jewelry Industries, reflects IAC's belief in collaboration, community and commitment, and is intended to recognise and honour extraordinary ongoing engagement and dedication to the realisation of positive change in these fields. ■

Viola Davis at the premiere for The First Lady *wearing Satta Matturi's Kwe earrings, made with ethically sourced diamonds from Botswana provided by De Beers Group. Photo courtesy of De Beers Group.*

In Search of Sakura Ishi

Cherry Blossom Stones from Kameoka, Japan

While on a long-awaited vacation to Japan, Aurore Mathys FGA EG found herself on an unexpectedly spiritual journey to find cerasite, known for its resemblance to the country's symbol of spring.

Although Japan is home to some beautiful gems and decorative materials, such as cultured akoya pearls, Inada granite and jadeite jade, it would not be the immediate location that comes to mind if I had to pick my dream destination as a gemmologist. Nonetheless, when the country fully reopened its borders last year and after planning a long-awaited trip, I started looking at ways to fit in a little gem-related excursion around the Japanese New Year celebrations.

A search on *mindat.org* revealed a few interesting minerals in the area I was going to visit, but one in particular caught my attention: cerasite found in Kameoka city, in Kyoto Prefecture. Its Japanese name, *sakura ishi*, means 'cherry blossom stone' and comes from its unique morphology and flower-like pattern in cross section, reminiscent of Japan's iconic symbol of spring.

The geological origin of cerasite is quite complex and well documented by Rakovan, Kitamada and Tamada (2006). Variations in temperature during igneous intrusions into sedimentary clays led to the formation of cordierite overgrowths (orthorhombic) over single indialite core crystals (hexagonal). Although suggestive of trapiche stones, it is interesting to note that cerasite is the result of intricate intergrowths of two pseudomorphs rather than twinning. The clear demarcations that make the flower pattern so visible are due to the incorporation of matrix inclusions at the boundaries of intergrown crystals.

A sample of cerasite from Kameoka, Kyoto Prefecture, Japan. The material is known as cherry blossom stone or sakura ishi. *Photo by Robert M. Lavinsky, courtesy of Wikimedia Commons.*

The author's journey to Kameoka, about a two-hour ride from Kyoto, found her at a Shinto shrine called Sakuratenjin, meaning 'shrine of the cherry blossom'. Here, the cerasite she sought was found.

Further change in temperature after growth led to the transformation of the indialite core into cordierite, before post-metamorphic hydrothermal alteration of the hornfels matrix resulted in further pseudomorphic replacement of cordierite by fine-grained mica. This last step makes both hornfels and cerasite incredibly brittle and friable, and impossible to be fashioned or set in jewellery.

A few enquiries with mineral dealers and online retailers revealed that, although sakura ishi is a prized collector's stone, it is quite rare, even in Japan. My curiosity was sparked.

I met Paul Melnyk, my local guide on this adventure, on a cold January morning at Kyoto station. A self-taught archaeologist and gem enthusiast, I had contacted him a few weeks prior about cerasite. He had heard of it but had never

been able to find any material, even at specialised mineral dealers, and he immediately offered to go to Kameoka city and see the material for ourselves. Armed only with the name of the stone and the locality, we drove west for about two hours, enjoying stunning views across the Japanese countryside and mountains en route.

Our initial plan was to visit the local mineral shop in Kameoka, hopefully purchase some samples, and ask whether we could see the stones *in situ*. It seemed simple enough, but as we arrived closer to our destination, we started to realise our mistake. In Japan, New Year is perhaps the most important celebration of the year, with most businesses and administrations traditionally closed for up to a week. As city dwellers, we were used to chain stores opening despite the holidays and had underestimated the possibility of finding a ghost town in Kameoka. The only place open was a convenience store, and the sales assistant nearly crushed our last hope when she told us she had never heard of the cherry blossom stone, before wondering if it had anything to do with a shrine located just a few miles away called Sakuratenjin, meaning 'shrine of the cherry blossom'. It seemed the game was still on.

Cherry blossom stones or not, the Sakuratenjin shrine itself was well worth a visit. The narrow drive up the hillside and venerable trees lining stone stairs covered in moss, complete with unbeatable quiet and peace, make it the epitome of a traditional Shinto shrine. After a mandatory prayer asking the spirits to guide us to the sakura ishi, I spotted the attendant's house behind the main building and decided to try my luck. A kind old lady received us,

A group of cherry blossom stones from the Sakuratenjin shrine in Kameoka.

An assortment of sakura ishi specimens, collected by the staff of the Sakuratenjin shrine.

and after I explained in my broken Japanese that I was a 'stone teacher' in England and what I was looking for, she let us in and started pulling out whole trays of cerasite crystals.

"They come from the grey stone in the hills," she explained. "We can't take stones directly from the mountain, but the pebbles in the courtyard come from it." She led us outside and encouraged us to pick up a few pebbles in front of the shrine. Paul reached down to turn a stone at random, and there it was: a perfect, albeit tiny flower-like crystal

> It is said that Michizane's spirit has blessed the ground of the temple in the form of cherry blossoms...

embedded in hornfels matrix. What had started as a somewhat spontaneous and ill-prepared adventure ended in success.

Legend has it that Michizane Sugawara, eminent scholar and politician of the Heian period (794–1185 CE) and now revered as the Shinto deity of culture and studies, lost favour at court and was exiled in 901 to the city of Dazaifu, on the island of Kyushu. Before his departure, his vassals gifted Michizane with a cherry tree so he would not forget his hometown, which deeply

Staff members of the Sakuratenjin shrine kindly donated these cherry blossom stones to the author at the end of her visit.

moved him. Years later, in 1190, Mudan – who founded the Sekizenji Temple on which precincts the Sakuratenji is now built – saw Michizane in his dreams. Michizane told Mudan to relocate the temple to its present hillside location and dedicate a shrine to his memory. From then on, it is said that Michizane's spirit has blessed the ground of the temple in the form of cherry blossoms, and that this is how the sakura ishi began appearing in Kameoka.

Whether one prefers the geological explanation or poetic myth of origins, cherry blossom stones hold a special place in both Japanese culture and mineralogy due to their unusual appearance and complex formation. This was recognised in 2015, when cerasite was designated the stone of Kyoto Prefecture.

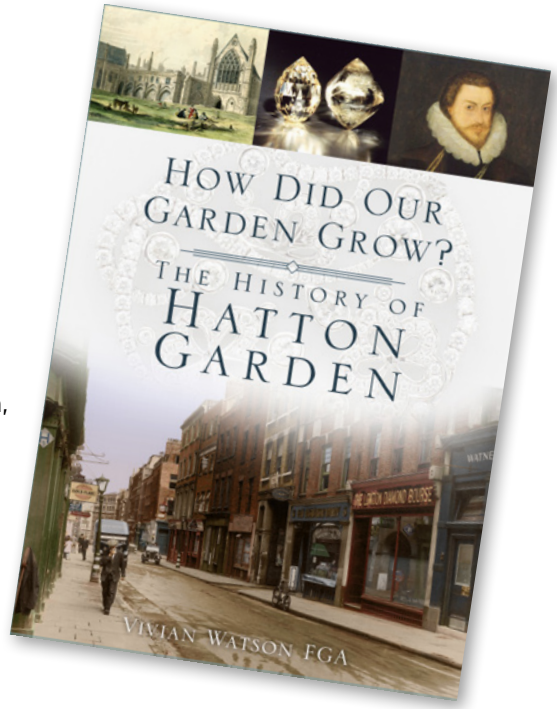
Despite this recognition, sakura ishi are seldom found in the trade and remain a rarity, even in Japan. This makes this trip to the Sakuratenjin all the more special. The few specimens kindly gifted by the temple attendant will be cherished additions to my personal collection. ■

A list of references is available upon written request to the editor.

All photos courtesy of the author unless otherwise indicated.

How Did Our Garden Grow? The History of Hatton Garden

Reviewed by Rachel Church



By Vivian Watson FGA, paperback, 424 pp., illus., publ. by the History Press, Cheltenham, UK, 2022, £40.00.

Hatton Garden has been the centre of London's jewellery trade since the late nineteenth century. In *How Did Our Garden Grow? The History of Hatton Garden*, Vivian Watson FGA, who spent fifty years working on the street, lays out its history and development in a lively, readable account of its firms, inhabitants, secrets and scandals.

A book like this could only have been written by an insider. The world of the Garden was one of word-of-mouth transactions and private dealmaking. Trading in jewellery and gems required working with portable, valuable and easily fenced pieces. People wanted to know the people they were working with — a task made easier by physical proximity. The network of jewellery firms, workshops and traders who set up their premises on Hatton Garden allowed partly made objects to be moved between workshops, from the chaser to the engraver or stone-setter, and meant that the parties all knew and were accountable to each other.

Watson's book isn't just a history of the jewellery trade and its links to Hatton Garden; rather, it is a social history of this fascinating part of London. The book covers the development of Farringdon and Holborn, the importance of the Fleet River and the local parish churches as well as the growth of Hatton Garden itself.

A fascinating chapter looks at the history of each house on Hatton Garden, recording the businesses which were based there as well as the history of the inhabitants, from their professional triumphs to tragic house fires. Each chapter is illustrated with contemporary street plans, prints, paintings, adverts and photographs which bring the story to life and show the area's transformation from a semi-rural collection of houses and market gardens to a densely populated zone of light industry.

The author begins with the early history of the area. In the thirteenth century, it was the site of a palace and garden owned by the Bishop of Ely on the outskirts of the city of London. This history can still be seen in the names of the area's streets – Saffron Hill, Lily Place, Herbal Hill and so forth – although the gardens are long gone. In 1576, the bishop of Ely was persuaded to let his palace and garden to Queen Elizabeth I's favourite courtier Sir Christopher Hatton, for a rent of £10 and a poetic red rose per year. By the late seventeenth century, the countryside around Hatton's Garden had fallen victim to the growth of London and the need for new housing. Spacious houses, described in 1711 as 'an esteemed place for the gentry', replaced the market gardens and fields. The area became a fashionable district, inhabited

Ely Palace in the eighteenth century. Illustration courtesy of the Diamond Trust.

by doctors, solicitors, playwrights and merchants. As the city grew, the gentry moved outwards to the healthier air of the suburbs. Their former homes were transformed into shops and workshops for watchmakers, goldsmiths, jewellers and stone dealers.

How did Hatton Garden come to replace Cheapside as London's jewellery centre? Watson suggests immigration as one explanation. Craftsmen moved from continental Europe to London, bringing their skills with them. Italian specialists in surgical, optical and mathematical instruments settled in the streets around Saffron Hill, bringing techniques which were easily transferred to the jewellery trades. In 1914, the German army invaded Belgium and many of the country's diamond dealers fled to London, setting up new firms on Hatton Garden. More followed in the late 1930s and 40s as Nazi troops rounded up the Jewish jewellers and stone dealers of Amsterdam and Antwerp.

Some figures in the Garden's early history can still be recognised today. The firm set up in 1822 by Percival Norton Johnson at 79 Hatton Garden became the major gold supplier known as Johnson Matthey (a name which is still familiar to those in the contemporary trade). The business grew in the wake of the British Empire. Discoveries of gold in British colonies including Australia (1851), New Zealand (1861) and South Africa (1886) brought huge shipments of the precious metal to the Bank of England, to be refined and assayed by Percival Johnson's firm. The discovery of diamonds in South Africa in 1866–67 would subsequently transform jewellery fashions. Sparkling diamond brooches, pins, necklaces and rings required both skilled craftsmen and a lavish supply of gemstones, and London saw an influx of diamond merchants and cutters. By 1900, Hatton Garden had at least one hundred diamond merchants and had become the centre of the world diamond trade. The De Beers syndicate, based in London and the Kimberley mines in South Africa, controlled most of the world's diamond →

Watson's book isn't just a history of the jewellery trade and its links to Hatton Garden; rather, it is a social history of this fascinating part of London.

The 116.60 ct fancy yellow Vainer Briolette diamond (left) alongside the 202+ ct rough octahedron from which it was cut. Photo courtesy of M. Vanier Ltd.

production, later becoming the Diamond Trading Company. At its peak, 90% of the world's diamonds were marketed in Hatton Garden.

The history of Hatton Garden is also tied to the study of gemmology. A panic over frighteningly convincing false pearls in 1921 prompted the foundation of a diagnostic centre, known as 'The Diamond, Pearl and Precious Stone Section of the London Chamber of Commerce'. Basil William Anderson opened his pearl-testing laboratory in Hatton Garden in 1925, using an endoscope to view a hole drilled into a pearl and inspect its composition. In 1928, Anderson was joined by CJ Payne; one year later the laboratory, now boasting an X-ray machine, was moved from the Diamond House to 55 Hatton Garden. This allowed the firm to test gemstones as well as pearls.

The book is full of intriguing details and stories culled from the author's own life in the trade. In the 1940s, punitive luxury taxes imposed on jewellery led to a flourishing black market. According to Watson's sources, many firms had double sets of books and might be found hastily burning their records when the tax inspector came to call. New jewellery would be passed off as second-hand (and thus exempt from tax) by bashing it about the workshop floor. Jewellery invoices would separate the work into small parts, like a separate cost for a ring and a shank, to bring it underneath the level at which tax was levied. These are the details which no firm would have committed to paper, but which could be collected as oral history by a trusted colleague such as the author. Watson paints an evocative picture of a bustling mid-twentieth century street, peopled by little groups of diamond traders huddled around a small, folded paper packet of gemstones, known as a *brifka*, bargaining hard in a mix of English, Yiddish, French, Dutch or German. Thousands of pounds of stones changed hands on a handshake and verbal agreement.

Businesses also operated in a warren of offices shoe-horned into the formerly grand houses. More trade took place in Mrs Cohen's Viennese cafe on Greville Street, in a thick haze of tobacco smoke and sweat. This became known as the Diamond Merchants' Restaurant and eventually morphed into the first London Diamond Bourse. Watson charts the ups-and-downs of Hatton Garden through national and international events, including the huge rise in the price of silver due to the attempt by Nelson Bunker Hunt to corner the market in 1979, and the dampening effect on trade caused by the changes in value-added tax (VAT) by Nigel Lawson in

By 1900, Hatton Garden had become the centre of the world diamond trade... at its peak, 90% of the world's diamonds were marketed in Hatton Garden.

1985. The move of manufacturing from Hatton Garden workshops to factories in Asia in the 1980s and 90s changed the character of the area again, prompting a move towards retail businesses. Nevertheless, behind the shop façades, some firms and workshops keep the tradition of the Garden alive.

One of the most interesting chapters of the book looks at the oral history interviews taken by Carole Parker in 1997 with around forty-five people who had worked in Hatton Garden. Many interviewees were elderly and their memories bridge nearly a century of Hatton Garden's history. The interviews, summarised by the author, bring out the details of life in the trade – becoming an apprentice, testing gemstones, queuing at long counters at Johnson Matthey to buy gold. The workshops were pervaded by the smell of gas lighting and wintergreen used to brighten up the edges of settings. Starting wages were as low as eight shillings a week and the hours were long, but the camaraderie of the workshops shines through the retellings. Dennis Stellman's account includes lovely designs for pieces from the 1950s and 60s, including a brooch made as a wedding gift for Queen Elizabeth II on behalf of the jewellery industry, sponsored by the Goldsmiths' Company. According to the accompanying letter of thanks, the Queen announced that she would "always be glad to wear and I know that all who see this magnificent example of the jeweller's art, set with diamonds and rubies, will share my admiration for the skill with which it has been made."

The chapter named 'The Garden's Market', tells the stories of more jewellery firms and gemstone dealers, like M Vainer Ltd., established by Czech immigrant Milos Vainer. The company is well known as the cutters of the 116.60 ct fancy yellow briolette diamond known as the Vainer Briolette, now owned by the Sultan of Brunei. Paul Podolsky, whose family had moved from Kiev to London to escape the Russian Revolution of 1917, first entered his father's business at 35 Greville Street in 1927 at the age of four. The family firm became a Hatton Garden fixture and is still remembered through the Podolsky Award for outstanding young craftspeople. Vivian Watson's own family business also yields a fascinating tale. The world of Hatton Garden was rather male dominated, but Constance Watson proved a notable exception to the rule. She took up a job in the jewellery trade in the First World War, when many women took over the positions of men who had been drafted. In 1945, she became an FGA and encouraged her son Peter to enter the trade. The family firm of PJ Watson Ltd. established a reputation for supplying customers around the country with fine-quality jewellery. The next generation included Vivian Watson, the author of this book, who joined the firm in 1967 and retired only recently.

Vivian Watson FGA, author of **How Did Our Garden Grow? The History of Hatton Garden** *and a third-generation member of family jewellery firm PJ Watson Ltd. Photo courtesy of the author.*

Street view of Hatton Garden in 1939. Photo courtesy of the Diamond Trust.

The final sections are made up of a useful chapter on the statistics of the area, showing how the distribution of trades and firms changed from the first half of the nineteenth century to its peak in the 1950s. A timeline matches events from world history with the developments of London and the jewellery trade and provides a useful overview of changes in trademark laws, hallmarking and the foundation of important gemmological institutions.

How Did Our Garden Grow? is a love letter to the Hatton Garden area and the network of jewellers, stone dealers, gem cutters and merchants who flourished in its embrace. Although globalisation has changed the area, reading the accounts of those who still remember it in its heyday paints a picture of a lively, bustling and convivial trade unknown to most who were not intimately linked to it. ■

Sean Gilbertson, CEO of Gemfields, examines Mozambican ruby rough at the Gemfields auction in 2019.

The Colourful Success of the Gemfields' Auction System

Since taking over Zambia's Kagem mine in 2007, Gemfields has revamped the gemstone auction system. Richa Goyal Sikri provides a brief history of Kagem's ownership before exploring the changes Gemfields brought to the bidding process.

At their November 2019 auction, coloured gemstone mining and marketing firm Gemfields received an average per-carat price of US$85.26 (~£71.98) for rough Zambian emeralds, with rough Mozambican rubies commanding $77.12/ct (~£65.11) one month later. Fast forward to the company's May 2022 auction, and the average price for rough Zambian emeralds by Gemfields hit an all-time high of $155.90/ct (about £128.02). The average per-carat price for Mozambican rubies from Gemfields' mine touched $246.69 (approximately £202.58) at the June auction — a 220% appreciation.

Industry participants have various explanations for the increase, such as the disruption of artisanal supply chains for gems combined with a robust and growing demand for hard luxury goods. Still, it is important to remember that prior to the pandemic, Gemfields was already supplying 35%-40% of rough Zambian emeralds, and some suggest around 60%-70% of Mozambican rubies, to the market. But what has definitely changed is the way the mining firm auctions its emerald and ruby production, the result of movement restrictions during the pandemic and a well-thought-out strategy.

Zambia's Kagem emerald mine was established in 1983, a joint venture between a consortium of gem merchants under a company called HAGURA, and the Zambian government. During the early years, emerald production from Kagem was equally divided between these two shareholder groups. The government would auction their emeralds via the Zambian government's Reserve Mineral Corporation. Government auctions offered bidders emeralds parcels across three to five grades, which meant bidders (usually eight to twelve companies) had to first sort the goods before evaluating for yield and quality. Bidding strategy was similarly fragmented and short term. On the plus side, the occurrence of good-quality stones in lower-quality parcels was frequent. This was beneficial for buyers, but not for sellers — in this case, the government, as well as the citizens of Zambia. HAGURA would privately sell their half of the emerald production within their own consortium. A few years later, Kagem abandoned this practice of splitting the emerald yield between the owners, and HAGURA partnered with the Zambian government to auction the entire emerald production. Thus, the inaugural Zambian emerald auction structure was established. Customers, mostly emerald manufacturers from India and a few from Germany and Israel, would travel to Zambia, view the rough emeralds and make their offers.

By 2007, HAGURA's share of Kagem – which was now 75% of the mine – was acquired by Gemfields, a mining firm newly listed on the Alternative Investment Market (AIM) of the London Stock Exchange. In 2009, Gemfields presented the industry with a fresh

A pair of rough Mozambican rubies from Gemfields, weighing 32.50 ct (left) and 29.00 ct (right), that were auctioned in June 2022. Photo courtesy of Gemfields.

Gemfields now sorts rough emeralds from Zambia across 214 grades before auctions.

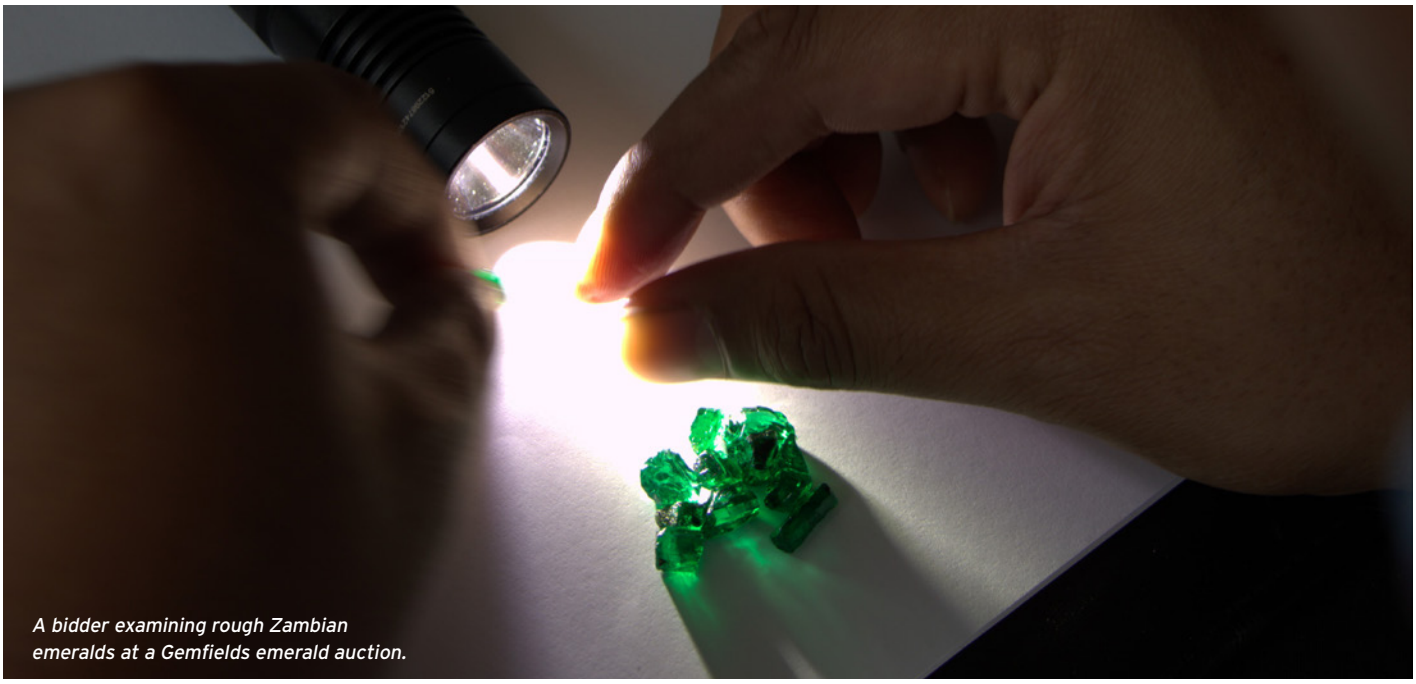
auction format, with rough Zambian emeralds arranged across 180 grades, a far cry from earlier offerings. The architect of the system was Adrian Banks, a former employee of mining and marketing company TanzaniteOne, who joined Gemfields three months before the 2009 auction. Commercial-grade emeralds were auctioned separately from higher-quality material. At both auctions, customers walked into a well-lit space where emerald lots were available for viewing in dedicated booths. Bidders were given a book containing information on the schedules being auctioned, and within each schedule, further details on grade, weight, and number of pieces.

The key difference between the Gemfields and HAGURA format was the precise consistency in grading. For HAGURA, the best-quality rough emeralds mined during that season would be designated as Lot 1. While quality levels may change from one auction to the next, for Gemfields, the definition of a grade, and the quality of emeralds presented within each grade (sorted per colour, clarity and crystal) never changed. The other difference under Gemfields was a reduced number of auctions. The company held auctions on a biannual basis, with larger volumes available for purchase. Auction results, complete with pricing details, were published in the public domain.

In 2014, Gemfields replicated their emerald auction template to sell rough rubies from the Montepuez Ruby Mine (MRM) in Mozambique. With rubies, they hit the big leagues, generating $33.5 million (~£20.3 million) in revenue with their maiden auction in June 2014 (versus $5.9 million/£3.7 million for emeralds in 2009). But the fundamentals of Gemfields' auction process remained the same. Once bidders had inspected the ruby schedules, they submitted their sealed paper bids in a secure container on-site. The Gemfields team would physically open each sealed bid to determine the winners as the bidders waited at the auction venue. In an interview, Adrian Banks, now the managing director of product and sales at Gemfields, explained, "We got to a stage, especially with our ruby auctions, where we had close to one hundred schedules. At the end of each auction, our team had to take stock of multiple bids for each schedule, identify the winners, enter the data from the handwritten forms into an Excel spreadsheet, re-count to ensure there were no mistakes, and double-check everything. Basically, over three hours of nonstop work. It was clear we needed to find a better solution."

Banks and his team began researching ways to automate some of the auction processes in 2018. They travelled to Antwerp, Belgium, to study methods used by the diamond industry. A year later, they took their first steps by automating the stock management processes at both their mines in Zambia and Mozambique. Also in 2019, Gemfields invited a technology firm, →

In 2009, Gemfields presented the industry with a fresh auction format, with rough Zambian emeralds arranged across 180 grades, a far cry from earlier offerings.



A bidder examining rough Zambian emeralds at a Gemfields emerald auction.

Bidgemmer, to attend their ruby auction in Singapore with a view to developing further solutions. Sean Gilbertson, CEO of Gemfields, shared that "In evaluating solutions for automated bidding, we identified data security and privacy, platform customisation and ease-of-use for our customers as the key criteria. This focus informed the creation of our current auction platform, in conjunction with our technology partner, during 2019–2020."

The outbreak of the coronavirus pandemic resulted in the closure of Gemfields' mines in Zambia and Mozambique, and border restrictions cancelled all auctions. As weeks rolled into months with no sales activity, a project that had been initiated to bring efficiency became vital for revenue generation. After almost a year of customisations and trials, Gemfields was ready to test their new auction system. The company conducted five sequential emerald auctions between 2 November–11 December 2020, focussing on smaller quantities of top-grade emeralds. To circumvent movement restrictions, select lots were made available for in-person and private viewings in Tel Aviv, Singapore and Jaipur, after which customers placed their 'virtually sealed' bids using the new online auction software.

An essential difference in the way Gemfields do business is paying taxes and royalty on the final revenues generated at the company's international auctions, rather than paying taxes on self-declaration of values when rough gems are initially exported. According to Govind Gupta, shareholder of HAGURA and director of the Kagem emerald mine before Gemfields took ownership, it was not customary for government officials to attend Zambian emerald auctions. Government attendance at emerald and ruby auctions was pioneered by Gemfields to bring greater transparency to their dealings. That's why it was vital for a solution to be created that would allow government representatives from Zambia and Mozambique to witness the auction results in real time. Banks stated, "Improvements in video conferencing, combined with the online bidding platform meant government observers could dial into a Microsoft Teams meeting where they witnessed the auction closing live on video, and saw the values of the winning bids, providing them with an immediate understanding of the revenues achieved and therefore what taxes were due to the host country."

This large emerald rough was produced from Gemfields' emerald mine in Zambia.

Has this new auction system influenced the upward trajectory of pricing for rough Zambian emeralds and Mozambique rubies? Before the pandemic, Gemfields' rubies and emeralds were arranged and viewed inside dedicated booths. Bidders would move from one booth to the next depending on their level of interest; a bidding team would get forty-five minutes at a time for viewing. Customers could return to re-inspect a schedule, but popular goods caused increased waiting times. With the new system, customers pre-book their viewing days. Gemfields provides two full days for inspecting low-quality emeralds, with three days allotted for higher grades. Viewing-time slots are allocated on a first-come, first-serve basis. The longer format for viewings also enables participants to work around their personal commitments. For ruby auctions, clients can spend up to several days peacefully inspecting goods worth

millions of dollars without any schedule-related pressure, enabling meticulous assessment of possible colour, clarity and yield before placing bids. As per Banks, "The auction viewing duration is now considerably longer when compared to the pre-COVID-19 model. Viewing is now approximately three weeks or more, so this increases the auction time for our management team, but the benefits and quality of viewing is much improved for our customers, so the increased duration is well worth it."

Another feature of the new format is the increased splitting of auctions from the original two auctions to now three or more, depending on the volume of Gemfields' production. Between each auction closure, bidders have around two hours to revise their bids. "We now close the auction in several parts depending on the type of auction and size," explained Banks. "Some customers have commented that they would prefer the auction to close in fewer parts, but overall, we believe the current model offers our customers the best opportunity, and the auction results have been excellent."

However, what customers gained in time, they lost in market intelligence. At previous auctions, winners were announced at the auction venue in the presence of all bidders. While the value of the winning bids was private, customers could be seen furiously making notes of winning companies against each schedule in their bid books. Now, customers log into their profile, click on results, and the system will inform them if a parcel was sold or withheld without revealing the winner. Reserve prices of unsold parcels are also not communicated to bidders, as they were pre-pandemic. Customers also miss observing which schedules are getting more attention from the market versus others. Yet most purchasers prefer the extra layer of privacy and, as per Gemfields, they now receive bids on certain grades that they didn't get earlier. Bringing the viewings to gemstone hubs like Jaipur and Bangkok has also expanded Gemfields' customer portfolio. Company sources confirm that approximately 30% of customers who placed bids at Gemfields' emerald and ruby auctions since November 2020 had not taken part previously. Gemfields is also pleased with increased interest from Thai manufacturing companies in emerald auctions, since high-quality emerald viewings have shifted from Singapore to Bangkok.

> Approximately 30% of customers who placed bids at Gemfields' emerald and ruby auctions since November 2020 had not participated in previous years.

From the start of their operations, Gemfields has implemented initiatives that are both new and beneficial to the coloured gemstone industry. The firm's inventive approach has produced responsible, large-scale mining operations in Africa for coloured stones, a distinct grading system offering rough emeralds and rubies across 214 and 500+ categories, respectively and a foolproof mine-to-market traceability programme for its emeralds. More recently, they have released a measure, called the G-Factor for Natural Resources, to calculate a mining company's revenue contribution to its host nation. Gemfields' recent technology-based recalibration of its auction platform has taken the value of Zambian emeralds and Mozambique rubies to new heights. Comparing the average per-carat price achieved at its auctions pre-pandemic versus with the new model in the last two years, the increase for rough Zambian emeralds has been ~83% and for rough Mozambican rubies ~220%. Although the company states that the specific mix of material offered at each auction varies in size, colour and clarity due to production variations and market demand, the appreciation pattern is undeniable. Gemfields' total auction revenues for 2022, with MRM and the Kagem emerald mine, have set a new annual record of $316 million (~£258.4 million), up 32% from 2021. It will be interesting to see how consumer demand, and retail prices, are affected as other mining companies in the coloured gemstone sector look to emulate Gemfields' success. ■

Grade A rough rubies from Mozambique (left) and Zambian emeralds of various grades (right) that were sold at auction by Gemfields.

All auction-related photos by Richa Goyal Sikri.

THE RETURN OF THE HONG KONG TRADE SHOWS

In early March, the Hong Kong Trade Development Council held the city's gem trade shows for the first time since the start of the coronavirus pandemic. Eurosia Ng interviewed four exhibitors about their experiences.

The Jadeite Dragon Brooch by Dawn, part of the 'Cabinet of Dawn' collection, features a green jadeite body with tsavorite garnet on the head and claws and white diamond everywhere else. Photo courtesy of Dawn Jewellery.

After three years, the Hong Kong Trade Development Council (HKTDC) welcomed members of the global gem and jewellery industry to the city. The 39th Hong Kong International Jewellery Show and the 9th Hong Kong International Diamond Gem and Pearl Show, both held from 1 – 5 March, were open for the first time since the COVID-19 pandemic. The government's mask mandate was lifted on 28 February, enabling buyers and exhibitors to go mask-free, and big smiles were seen once again at Hong Kong Convention and Exhibition Centre. During those five days, the shows were visited by 60,000 buyers from 130 countries and regions, with a large majority from mainland China and Asia. Sophia Chong, deputy executive director of the HKTDC, said "We are delighted to see the overwhelming support from industry buyers and exhibitors for the twin shows. The vibrant atmosphere, busy traffic and packed booths not only reflected the global jewellery market's pent-up demand after three years and strong buying power, but also reaffirmed Hong Kong's position as the world's premier trade fair capital in Asia, which brings the world together to do business and to build relationships."

House of Gems 1986, with six global offices and two manufacturing facilities, specialises in manufacturing and supplying natural-coloured diamonds and gemstones, particularly investment-grade stones. Kunal Sheth, the company's managing director, mentioned that House of Gems 1986 has been exhibiting in Hong Kong for well over twenty years, and said, "We make it our jobs to know what a brand would want before they even ask for it. Our job as a supplier is to anticipate, factoring in market trends. We tend to choose quality over quantity. In doing so, a lot of 'transactable' or 'commercial' stones fall outside our purview — and we are okay with that. We can't be everything to everyone."

Those that do respond to the company's appeal can follow them on social media. Sheth noted that "Social media is a special avenue for sharing what we love with fellow diamond and gem lovers. We've been active on Instagram and LinkedIn since 2019. This has been a great medium to help define who we are as a company. We use it to help brand ourselves and the quality we stand for. We also try to educate our audience, especially when it comes to rarity, sourcing and manufacturing. Our audience loves seeing the transformation of stones from beginning to end. It allows

The Idar-Oberstein-based Caram prides itself on its offerings of the 'big three' coloured gemstones. From left: Earrings with 8 tcw round Zambian emeralds and 8 tcw diamonds; an unheated 17-ct Burmese sapphire known as the Pride of Burma is at the centre of this ring, surrounded by 6 tcw diamonds; earrings with 25 tcw unheated Tajik rubies with 5 tcw diamonds. All pieces shown are mounted in 18K white gold. Photos courtesy of Caram.

them to feel like they've been a part of the journey."

Of this year's show, Sheth noted that "It was well above expectations. We were pleasantly surprised to welcome back so many clients from mainland China. However, in terms of sales, they were below expectations. As a result of lockdown, we found that many Chinese clients were surprised by the increases in pricing. For example, yellow diamonds are one of our specialties. The demand and prices of yellow diamonds is arguably the highest it has ever been, but some clients were offering per-carat prices on these items at the prices of three years ago; there is an adjustment and catch-up period that needs to take place to realign the market." Nevertheless, Sheth felt that the overall sentiment was positive. "Re-connecting with people and displaying your product sparks a conversation that could potentially end with a sale. Most of us dealers believe that we need a few more trade shows to establish transparency in pricing and product availability for our customers." Sheth recognised that trade shows serve another purpose. "The stone market, like most others, has experienced inflation in pricing since COVID-19. Due to this, buyers are becoming more hesitant on making high-value purchases (>$300,000/£245,205). I do believe the lack of trade shows contributes to this discrepancy. Shows help establish transparency in product availability and pricing. More trade shows will help buyers digest new pricing over time."

Ribbon bow brooch by Cartier Paris (ca. 1910), composed of platinum, pearl and diamonds. Photo courtesy of Palais Royal.

> **"There is an adjustment and catch-up period that needs to take place to realign the market."**

When asked about new gemstones House of Gems 1986 brought to the show this year, Sheth replied, "We exhibited three new stones — all of which we manufactured from rough to polish: two were fancy vivid yellow emerald-cut diamonds weighing more than 15 ct. The third gemstone was my personal favourite: a 22-ct vivid red spinel from Tanzania. The size, colour, cut and clarity of these stones were enough to catch a lot of attention without the need for promotion." When asked to elaborate on the spinel, Sheth added, "Mahenge spinels seem to be at their peak in popularity, and exceptional quality spinels seem rarer and rarer to find. We have been collecting them for many years because the fire in the stone is purely intoxicating. And I love that spinels can come in such a wide range of potent and saturated colours. There seems to be a growing demand and a shortage in supply. I personally love them because you get the same fiery impact as a ruby but are more likely to have an extremely clean stone."

While Sheth indicated that the advent of the coronavirus pandemic forced House of Gems 1986 to change direction and grow their business outside Asia to sustain their livelihood, Rahul Jain →

The 22-ct red spinel shown here is from Mahenge, Tanzania. Photo © House of Gems 1986.

The ring shown here, comprising a green jadeite cabochon mounted in 18K yellow gold, was created by Dutch goldsmith Leen Heyne for Dawn Jewellery's 'Cabinet of Dawn' collection. Photo courtesy of Dawn Jewellery.

from coloured gemstone and bespoke jewellery manufacturer Caram, indicated that "Business boomed during COVID. Customers had built-up savings and no travel expenses... we enjoyed not having to do as much business travel and avoiding show expenses."

Caram has been operating in Idar-Oberstein, Germany since 1975; their target audience is more focused on B2B, high-end jewellery stores, auction houses, as well as jewellery manufacturers. They also work on bespoke jewellery pieces for private clients. Caram's approach is to use the rarest, most beautiful gemstones to create unique, one-off jewellery pieces in timelessly elegant designs, with inspirations drawn from nature as well as important architecture. The company started leveraging social media about five years ago. "We find people like posts that share knowledge about our gemstones and our design process," Jain explained. "We use Instagram the most often to keep audiences engaged and up to date."

Caram has been exhibiting at the Hong Kong trade shows since the late 1980s, and when reflecting on this year's show, Jain noted that "we received mostly existing customers; there were very few new faces." Overall, he had a similar take to Sheth. He said, "Foot traffic was way above expectations, although sales were not commensurate with the traffic, as we see Chinese buyers struggling with prices."

In terms of new products at the show, Rahul said "We brought two impressive Burmese blue sapphires with us: a 20-ct oval and a 17-carat half-cushion." But Caram's best sellers at the show were the traditional 'big three': "Colombian emeralds, unheated sapphires and unheated rubies did the best for us. We are well known for all these types of gems." Regarding trends among buyers, Jain further commented that "Chinese buyers were more open to heated rubies and sapphires if clarity and colour were nice."

Like Caram and House of Gems 1986, Dawn Jewellery, which focuses on in-house designs made with jadeite jade and diamonds, has exhibited in Hong Kong before. At this year's International Jewellery Show, they did so under a new concept called 'Cabinet of Dawn', displaying creations made with other materials by different artisans and goldsmiths around the world. Their director, Yve Chan, joined the industry in 2011 after his goldsmith training and graduation in the UK, and started Dawn in 2014. Dawn's pieces are mostly one-off creations with great attention to the design concept and craftsmanship, attracting sophisticated clients that mostly come from the Asia-Pacific region. Like many other jewellers, Dawn uses Instagram in Hong Kong, as they believe it is a useful and cost-effective tool.

Dawn started to exhibit in trade shows starting in 2015. During the pandemic, Dawn focused on the Hong Kong local retail market instead; this was strong enough to help them sustain the business. Unlike other exhibitors we spoke to, Chan indicated that they had paid for advertisements and other media to reach out to customers after their hiatus. In terms of this year's show traffic, Chan's comments were like those of other attendees: "There was a lot of traffic, and people came from all over the world; however, the sales for us did not match the traffic, as most people are either reconnecting or looking

Palais Royal has a competitive edge because to close a deal in signed jewellery, trust is the most important factor.

A platinum diamond feather brooch by Cartier (ca. 1935), measuring 8 cm, with round diamonds set in platinum (French mark), signed Cartier, numbered. Photo courtesy of Palais Royal.

around." Chan further stated that "High-end jewellery didn't seem appealing to buyers. We managed to make some good connections, though."

Chan also had an interesting observation about the show. "Many visitors came and wanted to take photos or do live-streaming to sell to their audiences directly, and they didn't seem to follow the traditional way of buying and selling. This trend was developed before COVID and became more popular during the pandemic. Some visitors liked to film and pretend that they are buying jewellery during the show. These people are not from our industry, but tourists or 'key opinion leaders' (KOLs, aka 'influencers') who would then post on TikTok and Little Red Book. We are finding a way to face to this new reality."

Gilles Zalulyan is one of two partners at Palais Royal Hong Kong Ltd, which specialises in signed vintage jewellery, specifically Cartier and Van Cleef & Arpels. Zalulyan began collecting around three decades ago, starting his journey in Paris in 1996. Palais Royal supplies to retailers around the world, mostly in the United States and Asia. Zalulyan explained, "We also sell to the French big houses who buy vintage jewellery, and a small part of our business is selling to museums and collectors. They usually find us by recommendation, as we have a very discreet online presence to protect our retailers. We mainly focus on sourcing, which is the most difficult part."

Palais Royal has been present at the Hong Kong trade shows for more than fifteen years and this year was extremely busy, even more so than they were pre-COVID, but Zalulyan explained that "many visitors were in the vintage hall out of curiosity. European and American buyers didn't come this time, but at the end we are pleased that the Hong Kong show is back." At the same time, Zalulyan noted that Palais Royal did not have the same struggles that some other jewellery businesses faced during the pandemic years. "In fact, 2020 and 2021 weren't so bad for vintage jewellery, as Hong Kong was never in lockdown and we could trade with China, although 2022 was a quiet year as China was more difficult to reach and the mood was down in Hong Kong." Zalulyan also believes that vintage is currently trending, as it is generating a lot of curiosity on a global level.

While Palais Royal continued selling during COVID, mainland buyers were not able to attend those shows, and this made a huge difference. "For a company like ours, one that is very active in buying, we need a large turnover, and this is only possible with trade fairs." Additionally, Hong Kong trade depends heavily on China, as well as the rest of the world. Palais Royal has a competitive edge because to close a deal in signed jewellery, trust is the most important factor; Zalulyan explained that there are a lot of forgeries in his field. "The fact that we published and organised some exhibitions helped a lot to make sales." However, as our other exhibitors mentioned, Zalulyan also noticed that the show this time affected a new crowd, "a lot of traffic was driven by curiosity, so only one out of ten customers was buying. In general, this show was much more tiring than any show we have ever done. To close a deal at the Las Vegas show, it can take only five minutes. Most of mainland buyers don't function like that, they will need more experience to reach this point and in a few years, it will be the case!"

Overall, the exhibitors we spoke to navigated the pandemic and were quite happy to be back and showing their goods in Hong Kong, even if actual sales were low this first year back. Everyone we spoke to indicated that buyer expectations would eventually catch up with the prices that had developed on the market while the show was on hiatus. In the meantime, businesses were reconnecting with previous clientele and recognising that buyers were delighted to be back among their colleagues at the Convention and Exhibition Centre. As Gilles Zalulyan of Palais Royal said, "I'm quite confident there is only one place in the world like Hong Kong. Everyone loves to come here. it is a magical place." ■

Two fancy vivid yellow emerald-cut diamonds. The top specimen weighs 18.02 ct, while the bottom gem weighs 27.01 ct. Both have VS+ clarity grades. Photos © House of Gems 1986.

One Designer's Story

Mary van der Aa, whose pieces are featured on our cover, was a first-time winner at the AGTA Spectrum Awards in Tucson. Here, she tells us about her decisions and designs for all three prize–winning pieces.

This was my first time winning a Spectrum Award, and I still can't believe all three pieces I entered took first place. It was truly incredible; I had always dreamed of the day I might win, and I'm still beaming. It was a huge moment in my career. Seeing all three pieces in the AGTA display was truly a life-changing moment for me.

All three winning pieces were created in platinum. While it isn't as easy to work with as gold or silver, it is definitely worth the effort when you are creating such meaningful jewellery.

Winning Best Use of Platinum and Color at the AGTA Spectrum Awards, the Aria Ring by Mary van der Aa is composed of a 2.10 ct demantoid garnet flanked on either side by blue zircons (3.00 tcw), accented with diamonds (0.75 tcw) and mounted in platinum.

ARIA Ring (Best Use of Platinum and Color): I was inspired to create this ring based on the demantoid garnet that I was gifted by my business partner and best friend, Todd Wacks (Tucson Todd's Gems). The stone is from Namibia, and Namibian demantoid garnets are known for their bluish-green color. I really wanted to bring the blue forward, so I had Todd custom-facet Cambodian blue zircons to go on each side. He had to cut them three times until they were in line with my vision for the ring.

Because demantoid garnet is a highly dispersive stone, I wanted to use other stones that could match that dispersion — hence the use of the zircons and diamonds. The sparkle is the same across the whole ring because the dispersion is the same.

The Divinity Pendant (Platinum Honors-Classical): Todd faceted the aquamarine used in this pendant a while ago, and I begged him to hold it and let me use it one day in a piece. Thankfully, he agreed!

While many of my pieces are very future-forward and modern, I wanted to go for more vintage look with this necklace; I wanted it to be classic and timeless. I really wanted to use Paraíba tourmaline in this design, because I thought they would be perfect as such unusual and rare accent stones; seeing the two blues next to each other would be a stunning contrast. It took a while to find that many matched stones and in the sizes I needed. I used diamonds in the halo for that added bit of sparkle.

Van der Aa's Divinity Necklace took first place in the Spectrum Awards' Platinum Honors – Classical category. The piece features a custom-faceted 20.20 ct aquamarine accented with Paraíba tourmalines (0.43 tcw) and diamonds (0.75 tcw), all set in platinum.

I made the decision to have a closed (solid) back, so that the colour of the aquamarine never changes whether it is worn on different pieces of clothing or skin tones; you will always see that same incredible blue. The closed back also helps to reflect light back through the stone in a bright way.

The Atomic Love Ring, which won the AGTA Spectrum Platinum Honors – Bridal category, comprises 1.55 tcw demantoid garnets surrounded by 0.17 tcw Paraíba tourmalines, with 0.50 tcw diamonds in the bands, mounted in platinum.

Atomic Love Ring (Platinum Honors-Bridal): To be honest I entered these on a whim. This ring is not a 'traditional' bridal style, so I was actually quite surprised when I won! The 'ring' is actually three rings, so you can wear it with the bands or or just the bands by themselves... however you like. I love the versatility of this design. It's also quite a 'science-y' piece; the centre halo actually makes a star and the rest of the ring is constantly moving, like atoms. I love to use celestial and scientific themes in my jewellery pieces. I'm very passionate about both of those fields.

The centre stone is a Namibian demantoid garnet. It has an incredible green with these amazing blue flashes, so once again, I wanted to pull that colour out by using Paraíba tourmalines, even with the difficulty of finding so many matching stones in such quantity, as they are rare. I added diamonds because I thought they added to sparkle of the piece. The flanking bands, which I named 'Twinkling Bands', represent stars in the sky twinkling back at the viewer.

All photos courtesy of AGTA.

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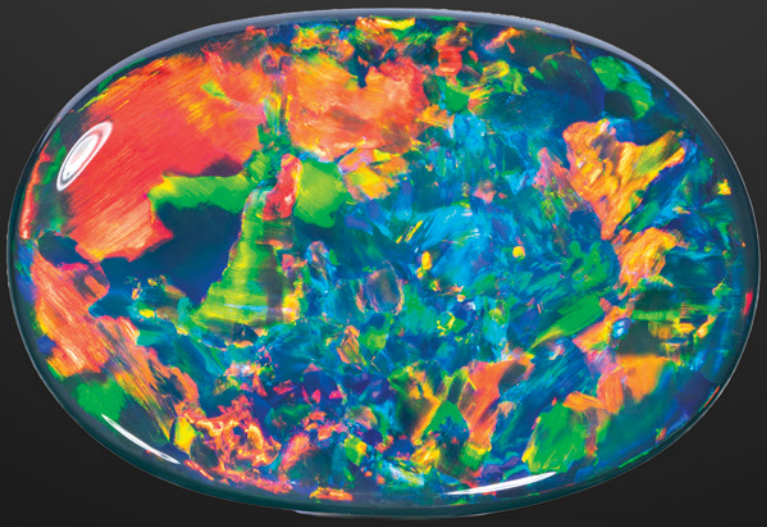

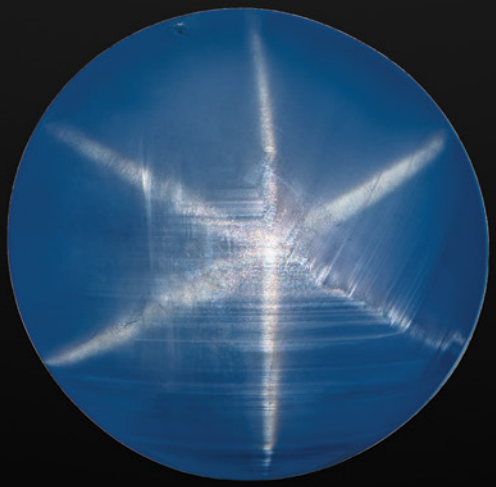

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