Gems & Jewellery

July 2015 / Volume 24 / No. 4

Bahia golden rutilated quartz

A historic synthetic diamond

Idar-Oberstein 2015

Gem-A
THE GEMMOLOGICAL ASSOCIATION OF GREAT BRITAIN

Gem-A

THE GEMMOLOGICAL ASSOCIATION OF GREAT BRITAIN

Annual General Meeting 29 July 2015

All current paid-up members are invited to come along and have their say at our **AGM**, to be held on **Wednesday 29 July 2015** at The Crypt, Ely Place, London. Doors open for registration, tea and coffee from 17:30.

To download the Notice, Agenda, Annual Report and Accounts please visit www.gem-a.com/news--events/events/gem-a-annual-general-meeting.aspx.

Understanding Gems

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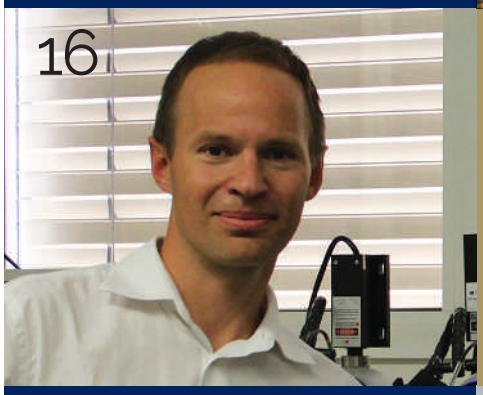
July 2015

Bahia golden rutilated quartz

Brian Cook takes us to the home of this beautiful gem.

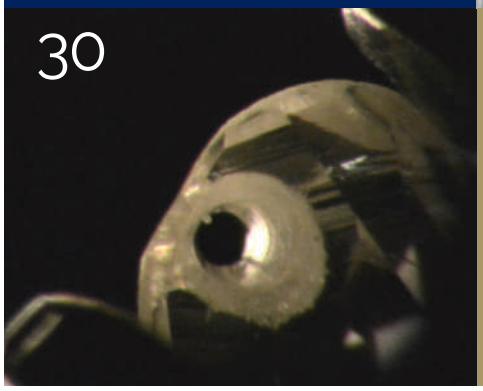


Interview with Thomas Hainschwang

Thomas Hainschwang FGA discusses his work, GGTL and the lab's new Diamond Fluorescence Imaging (DFI) machine.

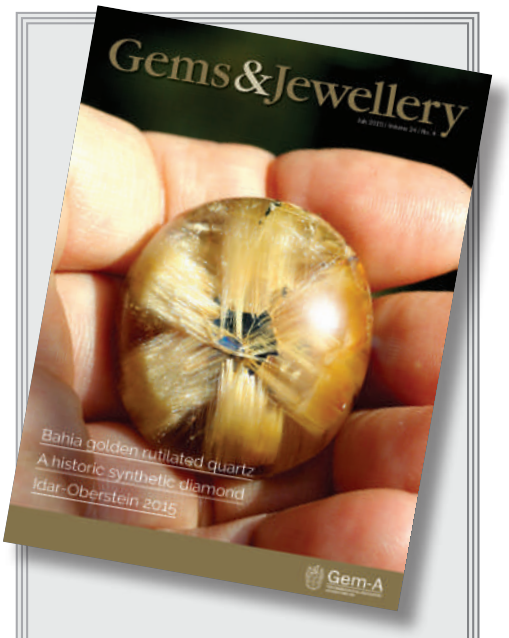
JCK Las Vegas

Gary Roskin FGA gives the lowdown on the JCK Las Vegas show at the end of May.



The ins and outs of polished diamonds: mystery holes

Grenville Millington shows us some mystery holes in the fourth instalment of his series on polished diamonds.



Cover Picture

A full star: an exceptional specimen of Bahia golden rutilated quartz. Stone by Nature's Geometry. Photo Brian Cook.

Published by
The Gemmological Association of Great Britain (Gem-A)

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Registered charity no. 1109555

 ISSN 1746-8043

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A note from the team

In light of recent articles that have appeared in the trade press, we, the team at Ely Place, wanted to write a few words to you all to let you know that our commitment to you, our members and students, is unwavering. We are working hard to keep the Association running as normal and are committed to delivering first-rate education to our students; to facilitating our members' professional development through our membership services and to providing quality gemmological instruments through Gem-A Instruments.

Our AGM will now be held at The Crypt, Ely Place, on 29 July 2015 from 17:30. All current paid-up members have the right to vote in an AGM and to raise any concerns about the governing of the Association. The AGM is not only an opportunity for you to vote, it is an opportunity for you to get to know the Gem-A staff, and to meet the people dedicated to providing you with gemmological services and to promoting gem knowledge. If you cannot attend the AGM you can also vote by proxy; details are available on our website.

Our annual conference, which will host the 18th FEEG Symposium, will be held from Saturday 21 – Sunday 22 November 2015 at the Royal Institute of British Architects. The Graduation Ceremony and Presentation of Awards will be held on Monday 23 November at The Mermaid Conference & Events Centre in Blackfriars, and will celebrate our students' successes over the past year. This year's Conference promises to be better than ever, with a host of international speakers and delegates. The Conference and Graduation Ceremony are an opportunity for you to meet the team, and we hope to deliver a memorable and educational experience for you all. Booking is now open; visit www.gem-a.com/news--events/gem-a-conference-2014.aspx

Lastly, if you have any comments, criticisms or suggestions for *Gems&Jewellery* or *The Journal of Gemmology* please email editor@gem-a.com — we'd love to hear from you.

With best wishes,

The Gem-A Team

Our commitment to you, our members and students, is unwavering. We are working hard to keep the Association running as normal and are committed to delivering first-rate education to our students; to facilitating our members' professional development through our membership services and to providing quality gemmological instruments through Gem-A Instruments.

The editors would like to issue a sincere apology to Axel Henn and Henn GmbH for an error in the BaselWorld feature on pages 30–31 of the May/June issue of *Gems&Jewellery* (Volume 24, No. 3). This publication did not give proper credit to Henn as the owner of the pieces shown in image 2 (a marquise-cut red spinel from Tanzania) and image 3 (cockatoos carved by Alfred Zimmerman from one piece of natural rough Brazilian morganite). We are deeply sorry for this oversight.

Gem News

GRAFF UNVEILS 132 CT YELLOW DIAMOND

Last month a 132.55 ct fancy intense yellow diamond was introduced to the world by Graff. The diamond, cut from an opaque 299 ct rough from the Letseng mine in Lesotho, joins Graff's portfolio of historically important yellow stones, including the Delaire Sunrise, the largest square emerald cut Fancy Vivid Yellow diamond in the world, at 118.08 ct.

Following the assessment of the stone by Graff's senior gemmologists to gauge its individual nuances, the stone was cut to ensure optimum saturation, tone and hue. A balance was needed between "…Articulating the facets to encourage light in, igniting the fire within whilst not losing any of its colour". The result is a Fancy Intense cushion cut diamond. The rough yielded a further eight satellite stones, comprising six pear-shaped Fancy Yellow stones — the largest at 21.34 ct — and two brilliant round stones.

CW SELLORS GETS GREEN LIGHT FOR JEWELLERY CENTRE

Following a six-year project to develop and permit plans for a Jewellery Design Centre of Excellence, the Derbyshire-based jewellery manufacturers CW Sellors Fine Jewellery can now begin work on its newly acquired site. Set in the picturesque surroundings of Carsington Water, just a few miles from its current headquarters, the approved site is now destined to become the UK's leading jewellery-related visitor attraction.

The new development will include open workshops "To influence the education and appreciation surrounding jewellery manufacturing, as well as a wider understanding for British and worldwide gemstones". The new Jewellery Design Centre (which won the support of industry bodies, including Gem-A) will also offer the opportunity for 21 new and skilled jobs to the area, cementing C W Sellors' credentials as one of the UK's leading manufacturer of British gemstones and design.

Chris Sellors, MD, commented: "We are delighted at the decision of the planning committee. [It] has given us a very unique opportunity to develop a visitor attraction and educational centre that is not just the envy of the UK, but admired by visitors worldwide and now we must deliver.

"With Carsington as our base, it gives us the best chance of a sustainable business which will be multi-faceted in its offering. We have been established for over 35 years and with this exciting new chapter ahead of us, we look forward to increasing our apprenticeships, training and design facilities, whilst offering workshop visits, exclusive exhibitions of British and worldwide gemstones and an enjoyable retail environment — all in a unique and inspirational setting."

HARRY LEVY SCOOPS MAJOR AWARD

Gem-A's president Harry Levy, who is also president of the London Diamond Bourse (LDB), was presented with the prestigious prize for Outstanding Contribution to the Industry at the UK Jewellery Awards last month. Mr Levy was recognized for his long career in the industry, spanning over 50 years, which has included numerous prestigious positions of office, including Gem-A president, as well as the setting up of his own gemstone business.

"It was a very special evening for me… I didn't realise I had so many friends!" a delighted Mr Levy told us. In his "off the cuff" acceptance speech he said that "the future of our industry lies with our younger members. In the LDB we decided to form a younger Council to train as our future leaders. We decided 25 was the cut off point, we found no members. We moved to 30, still no one, 40 brought in a few but not enough, so we have now drawn the line at 50. If you want to feel young again join the LDB!"

NAMED DIAMOND MUSEUM OPENS

The Museum of Named Diamonds™, a non-profit entity, formally opened last month with a mission to bring together the stories and emotions that diamonds represent. The Museum showcases online both famous diamonds such as the Hope and the Cullinan, and also 'personalized diamonds' which meet the Museum's criteria, one of which is that the diamond must be named.

The Museum has signed an agreement with The World Diamond Mark Foundation (WDM) to promote diamond awareness to consumers and focus attention on the romantic and symbolic nature of diamonds. The Museum will also include educational information on the role of the WDM, which will recognize the Museum as the industry's official registry of named diamonds.

The Museum operates the Official Archive of Named Diamonds, as part of its service, to ensure that no two diamonds have the same name. "Every diamond has a story, which connects it on some level to a relationship. Grading labs record gemological data. The Museum records emotions, memories, and the excitement behind the diamonds themselves," explains executive director Krista Olson.

"Any diamond can be featured in the Museum," adds Jacques Voorhees, vice-chairman and Polygon founder. "The process is simple. A name must be chosen to make the diamond unique, and to connect it somehow to the relationship it represents. For example, one of our personalized diamonds is named 'Strawberry Harvest', because the money to buy that one-third carat engagement-ring was earned picking strawberries during the Great Depression."

The Museum works with retail jewellers through its 'curators' to make it easy for consumers to name their diamonds and showcase them in the Museum. The Mmuseum charges a fee for the service, which includes the creation of original artwork. Each named diamond's own museum page can be shared via social media.

In addition to Voorhees, governors of the Museum include renowned industry figures Bill Boyajian, chairman and former president of the GIA and Jeffrey Fischer, President Emeritus of the Diamond Manufacturers and Importers Association. Consultants are: Robert Procop, gem expert and editor-in-chief of the newest edition of Ian Balfour's authoritative *Famous Diamonds* tome and Dr Jack Ogden, an expert in diamond history and formerly secretary general to CIBJO and CEO of Gem-A. (visit www.nameddiamonds.org for details) ■

Events

SHOWS

Company of Master Jewellers Autumn Trade Event
9–10 August
Hilton Metropole Hotel, Birmingham
Gem-A will be exhibiting at the Company of Master Jewellers (CMJ) Autumn Trade Event. Once again the CMJ will invite its retail members to this exclusive show, where suppliers will take the opportunity to launch products for the coming spring/summer season.

International Jewellery London (IJL) 2015
Booth J15
6–8 September
Olympia, West Kensington, London
International Jewellery London (IJL) will, as ever, wow visitors with its amazing array of all things jewellery, diamonds and gemstones. Whether you're a jeweller looking to find new collections, a diamond or gemstone dealer seeking a new supplier, or simply an industry professional looking for or offering an industry service, IJL is the perfect event for you. And with IJL celebrating its 60th year in 2015, this year's special anniversary event promises to be particularly special.

CEC Hong Kong Jewellery & Gem Fair
Booth 3M044
18–22 September
Hong Kong Convention & Exhibition Centre, Hong Kong, China
Gem-A will return to Hong Kong's biggest gem and jewellery show to bring you Gem-A Instruments and our world-renowned courses.

GEM-A EVENTS

Gem Central: Correcting Bad Crystal Habits Part 2.5 (Specialist Evening)
21 July
18:00–19:30, Gem-A Headquarters, 21 Ely Place, London, EC1N 6TD
Due to the overwhelming success of 'Correcting Bad Crystal Habits: Part 2', Peter Dwyer-Hickey will return to repeat the second instalment of his highly popular and very informative series. This practical evening will be spent handling and identifying a wide range of crystals and looking at the crystal systems. Illuminating and infused with humour; let Peter correct your bad crystal habits for a second time.
Students and Corporate members: Free
Members: £5
Non-members: £10

Gem-A AGM
29 July
The Crypt, Ely Place, London
Visit
www.gem-a.com/membership to download the Notice, Agenda, Annual Report and Accounts.

Gem Central: TBC
20 August
18:00–19:30, Gem-A Headquarters, 21 Ely Place, London, EC1N 6TD

Gem Central: Maggie Campbell Pedersen Talks Ivory (Specialist Evening)
15 September
18:00–19:30, Gem-A Headquarters, 21 Ely Place, London, EC1N 6TD
Organics expert Maggie Campbell Pedersen will be discussing ivory — the subject and title of her new book, published in June 2015.
Students and Corporate members: Free
Members: £5
Non-members: £10

Gem-A Conference 2015, incorporating 18th International FEEG Symposium
21–22 November
The Royal Institute of British Architects (RIBA), Marylebone, London
Gem-A will host its internationally acclaimed annual conference at the Royal Institute of British Architects (RIBA), Marylebone. Welcoming speakers from across the globe, the Gem-A Conference has a reputation for tackling the most innovative and contemporary gem-related topics, whilst bringing together some of the leaders in the field for a weekend of networking and special events.
For more information visit www.gem-a.com/news--events/events/em-a-conference-2015.aspx.

Gem-A Graduation Ceremony and Presentation of Awards 2015
23 November
The Mermaid Conference & Events Centre, Blackfriars, London
2015 Gem-A graduates and their families are invited to the Graduation Ceremony, to be held at The Mermaid Conference & Events Centre. The ceremony will be followed by a drinks reception. More details to follow.

OTHER EVENTS

Loughborough Conference 2015: Platinum Sponsor
12–14 September
Burleigh Court, Loughborough University, Loughborough
Continuing a long-running tradition spanning over 27 years, the annual IRV Loughborough Conference has become a permanent fixture in the calendars of many current and prospective Registered Valuers. Boasting a number of first-class main speakers and insightful, professional workshops covering a number of areas of the valuing trade, the IRV Loughborough Conference is a must for anyone interested in becoming a valuer.

As Platinum Sponsors, Gem-A will be on-hand throughout the conference to discuss education and training, as well as exhibiting our range of instruments and publications fit for the working valuer.

Bahia golden rutilated quartz

Brian Cook discusses the beautiful gem hidden deep in the Bahia region of Brazil.

1: Perspective from the top of the Pyramid Mine to the village Remedios, founded in the late 1700s, population approximately 500. In addition to the mineral resource the climate and soils of this region are ideal for investment in sustainable food production.

This exotic variety of quartz is famed for its brilliant golden flashes and the epitaxial stars associated with hematite. The quartz is found within an isolated mountain range of ancient volcanic rocks at the far western edge of the Chapada Diamantina, in the state of Bahia, Brazil. Since the 1940s and still to this day, mining is carried out by artisanal mining methods. In the last 10 years the gemstones have consistently risen in popularity along with their value, consequently creating a 'rutile rush', enticing large numbers of 'garimpeiros' (prospectors) to invade the region. How this significant resource will be developed from here on will weigh heavily on the sustainability of the culture, economic health and environment of this exotic land and people. When in 1983 I arrived at Remedios (**1**), a village at the heart of this region, I was the first foreigner to arrive there (so it was said). Things have changed somewhat since the age of candles, gas lanterns and the silence of no radio or television in the 1980s, with the arrival of energy in the early 1990s, then cell phones and lastly internet two years ago.

RESOURCES: ROCKS AND PEOPLE

After years of observation and mapping of the mineralized structures in many shafts over a broad area, along with the mine's production results, there is a tremendous amount of quartz and rutilated quartz that exists from near surface to deep layers underground. There is enough quartz to serve generations to come.

Approximately 12,000 people are directly affected by the current artisanal, yet mostly still unformalized, mining activity. This includes miners, sorters, processors, brokers, investors and their families. Partnerships between miners, land owners and investors that may supply equipment, food, explosives and energy etc. sort out the split, based on traditional customs. In 2003 I claimed some large areas of land, initiating a long journey of learning how to formalize an exploration and mining operation. Being the first to ever

2: Typical artisinal miner ('garimpeiro') camp. Notice the tailing piles in the distance.

attempt this in the region, there were many costly and frustrating lessons to learn. Fast forward to three years ago and the beginning of the formation of a miners' co-operative began. Today we have two co-ops, each with over 300 registered garimpeiros, and three areas with permission to mine (**2**).

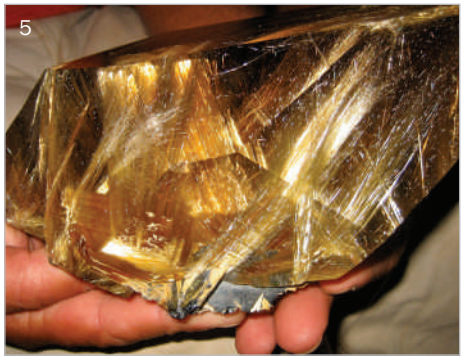
My area, which I reduced to 50 hectares, is in the last stage of permitting, and there will be more areas following. Change happens by example; by collaborating with all the necessary stakeholders and Federal, State and Municipal government to formalize the areas and the miners, we help the miners become 'legal', lest they be marginalized for an activity that is ingrained in Brazilian tradition for generations — the artisanal extraction of gems and minerals. We have found ways to simplify a very heavy bureaucratical process — another Brazilian tradition — and are achieving success and leading by example. The next step is to add value to the resources for the community by training in the processing and cutting of stones. Ultimately I am seeking to introduce other means for income that include food production and tree nurseries. The idea is to invest in the future. Economic, environmental and cultural sustainability should occur together in this exceptional stone-rich and remote community.

The recent CIBJO Congress gathered in Bahia, Brazil in May 2015. As a hands-on working group of industry professionals, the gathering created the opportunity to bring together our industry incentive to formalize artisanal mining and create traceability of gemstone sources, in alignment with the Brazilian government authorities. I was able to lead a group of 12 on a productive field trip to the mining region where we engaged with miners and local government and to see the rocks up close (**3**). The event gave a boost to the process of formalizing the mining, transport and sale of this resource.

3: Brian Cook and Greg Valerio discussing the ins and outs of gemstone traceability deep in the Pyramid Mine. A thin smoky quartz vein runs along the ceiling between their heads. Photo by Bete Lima.

4: Examining signs of rutile and hematite deep in the Pyramid Mine. Photo by Guilherme Fonseca Lima.

With all the mining activity (**4**) the average monthly mine run production of quartz is about 200 tons. This includes non-rutilated quartz. The commercial grades of rutilated quartz fall within the top 10% of production, approx. 2000 kg. Of the rutilated quartz, the top 5% (approx. 100 kg) represents high quality gem material (**5**, **6**). There are occasionally exceptional specimens that fetch very high prices. Mineral specimens represent a small percentage of production as the market is driven by gem-cutting buyers and there is little incentive for the extra care in handling. Some specimens make it out unscathed including the hematite and extra delicate rutile on hematite (**7**). Virtually everything mined is sold, as markets exist for all qualities of quartz mined.



5: Fine specimen of Bahia golden rutilated quartz. The rutile is epitaxial to the hematite crystal at the base.
6: Golden rutilated quartz, irridescent hematite detail. Nature's Geometry.
7: Specimen of epitaxial rutile and hematite on matrix.

Before rutilated quartz was sought, optical grade quartz was collected, beginning in the 1940s. The rutilated material was tossed aside as useless. It was in the 1960s that the rutilated quartz caught the attention of German buyers in Governador Valedares and Teofilo Otoni in Minas Gerais state. Early mineral labels show the locality as Ibitiara, Minas Gerais (Smithsonian). In those days all gems found their way to the stone centres in Minas Gerais. Ibitiara, Bahia, was the municipality seat until it switched to Novo Horizonte, Bahia. Older generations tell stories of 'mining' by simply hiking the hills with sacks and picking up crystals from the surface. Soon they found that by searching in the upper layers of weathered land they could find the crystals gathered in groups — essentially colluvial. When I arrived, the searching garimpeiros were already tunnelling from several metres up to 20 metres in extremely laborious conditions, using hand tools and candle light and crawling on their bellies through tight holes. The mining was done exclusively by local residents. This activity remained essentially the same into the late 1990s, by which time there was an established market, with shafts commonly reaching 30 metres. Miners from outside the region began to catch wind of this resource and soon began arriving. They arrived in a trickle at first but by 2002 more garimpeiros came to test their luck. As time marched on values increased, the holes became deeper, stones harder to find and slowly the influence of the modern world has crept into the culture. Today we have between 1,000–3,000 workers scattered across the mountains. When the Chinese buyers arrived the prices soared, and have held ever since. From 2007–2010 outside investors brought in tractors to scrape the surface in the greed for bigger and quicker production. Luckily these people soon learned that scraping away the earth destroyed the delicate evidence needed to track the veins and made mining more difficult. Today the municipal environmental authority sternly rejects any attempt of heavy machinery used for mining. In essence all activity is very small scale artisanal mining.

8: Ancient volcanic rock of the Serra Mangabeira. Located to the far west: Chapada Diamantina, Bahia, Brazil. There are rare rocks and rare flora here.

A GEM OF A QUARTZ

Rutile as an inclusion in quartz occurs scattered across the planet from Swiss alpine fissures to the Madagascar gem pegmatites, even occurring in parts of Cornwall, England. The commercial quantities of rutile, however, are predominantly from Brazil and Madagascar. In Brazil silver or platinum coloured rutile is found in Minas Gerais. The golden rutile associated with hematite is very nearly exclusive to the Serra Mangabeira mountains in Bahia (**8**).

The quartz from this region is predominantly smoky, running from a very light hint of smoke to deep morion. There is an amber honey smoky tone that is also very attractive. The rutile can be fine 'hair'; thin, long and wispy, needles, or blades. The colour is typically golden and can appear in hues reminiscent of 10–24 ct gold. Some material offers a copper tone in reddish to orangish hues. When light strikes the surface brilliant flashes race the length of the rutile. On blades of rutile you can see rainbow diffraction of the light at certain angles. Golden rutilated quartz is both mesmerizing and exhilarating at the same time. We see more and more designers attracted to the exciting effects of the stone and work with the fact that rarely are two stones alike. Matched pairs are extremely difficult, except for cat's-eyes in cabochon stones, taking advantage of very parallel aligned needles. The quartz acts as a wonderful crystalline medium that can be cut, carved and polished. The gems are offered in styles from traditional calibrated cuts to extremely artistic flights of fancy by inventive and talented artists inspired by the dynamics of the interplay of light (**9**).

9: Fine 18 ct gold, diamond and Bahia golden rutilated quartz bracelet. Carol Levy Designs. Stone suite by Nature's Geometry.

GENESIS

Once upon a time, approximately 1.7 billion years ago, there was a small volcanic range at the edge of a shallow sea. This erupted over some eons and formed layers of different types of rock, including andesite, ryolite, tuffs, ash; a normal but small evolving magma system. It eroded somewhat into the basin but essentially stayed as a group. Then, as is wont to happen over a billion years, the group moved, tilted, became buried and eventually felt the squeeze from neighbouring rocks — albeit only very slightly, considering the amount of time involved. As recent as about 500 million years ago great tectonic forces generated mobile granites and solutions from deep underground. As these lighter hot mineral masses naturally buoyed upward, the most volatile juices found their way higher, and as the older surface layers cracked and weakened from these rising forces, silica-rich solutions entered the old volcanic group (Rio Remedios Formation). Metallic elements of iron and titanium were sucked from the old volcanic rock adding 'spice' to the hot pressurized silica solutions. Suddenly the fluids reached cracks in the cooler rocks and the solutions began to crystallize; iron with oxygen as hematite and titanium with oxygen as rutile. The rutile oriented in alignment with the heavy hexagonal hematite (epitaxial), merged from within the hematite and burst forth on the hexagonal axis in long filaments or stout blades, as if metallic sun rays had been created. All the while the silica crystallized, capturing this synergy and this dance of elements… Frozen in light eternally to eventually erode from the rock and turn to sand and dust, or, to be retrieved by the recently arrived humans to be treasured. ■

All photos Brian Cook, unless stated otherwise.

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rock, gem & bead shows 2015

1st/2nd August Rock Gem 'n' Bead Kempton Park Racecourse

8th/9th August Rock Gem 'n' Bead Royal Welsh Showground

15th/16th August Rock Gem 'n' Bead Pavilions of Harrogate

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

Composite opal rough

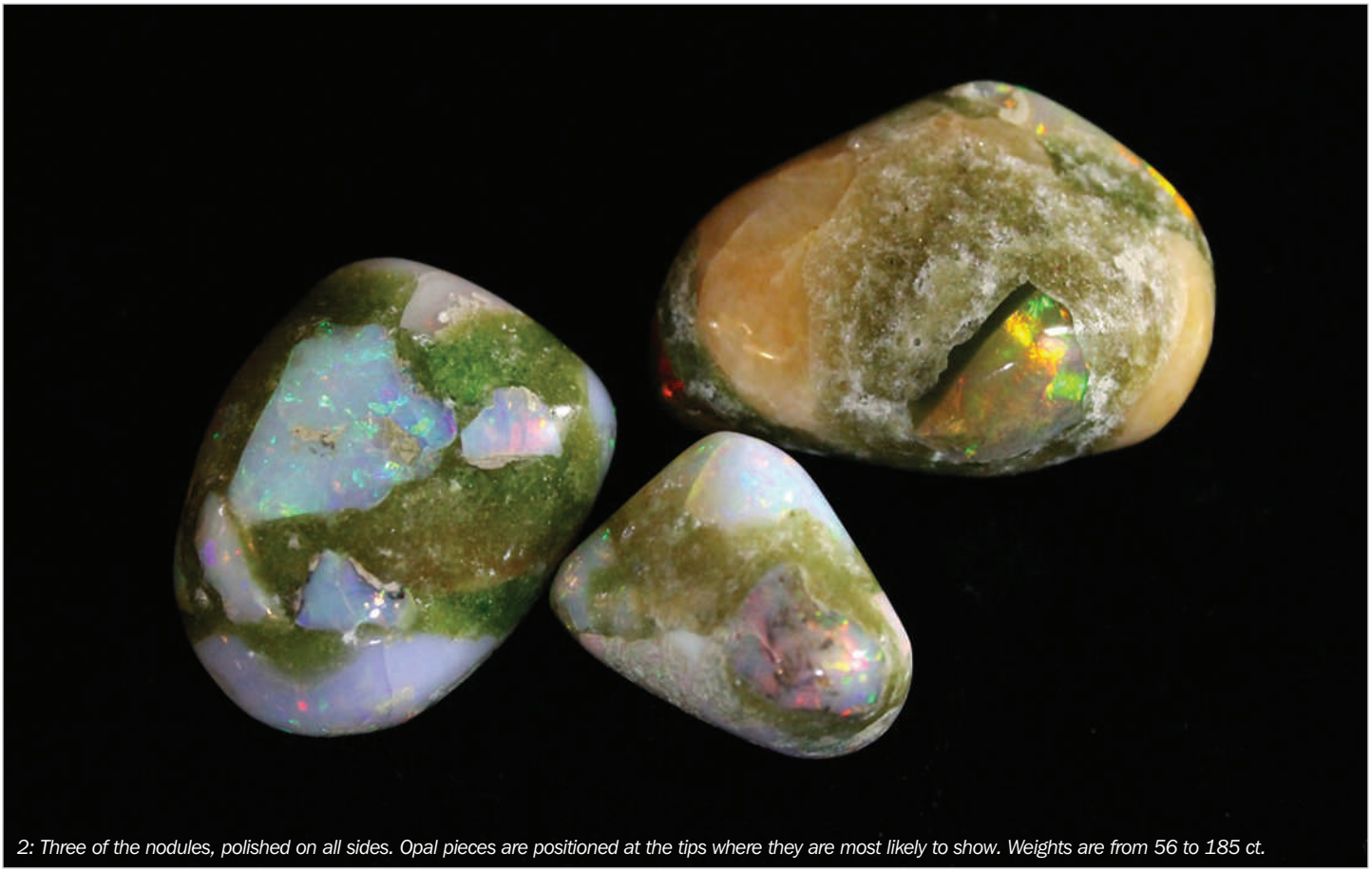
1: A group of rough with natural looking outer layer weighing from 63 to 238 ct. Largest is 50 mm wide.

Cara Williams FGA of Stone Group Labs discusses some unusual opal composites.

Opal dealer Jon Young (owner of www.ethiopiaopals.com) recently submitted 28 samples of opal, reportedly from Ethiopia. Ethiopian opal from Welo ('Wollo') Province has featured prominently in recent markets. Its hydrophane nature has made it a continual focus of gemmological laboratories due to its ability to accept treatments that other opals, such as the Type 1 Australian opal, cannot. This lab has previously reported on several treatments, including smoke treatment, dyes and artificial black backing; yet more treatments have been seen.

Samples consisted of 18 rough specimens that resembled Lightning Ridge nobbies in their outer, clay-like appearance (**1**). Four specimens were 'rubs': rough with windows polished into one or more surface areas. Six were fully polished on all sides and showed their composite nature, resembling brecciated rock (**2**).

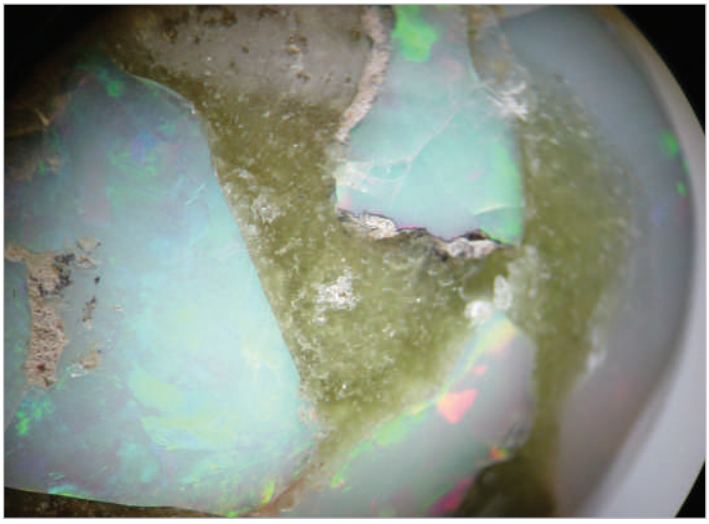
Ethiopian opal forms within volcanic rock and is commonly seen as rounded nodules, similar to thunder eggs, with many featuring concentric colour zoning. Elements of these characteristics were visible in some of the opal areas but not



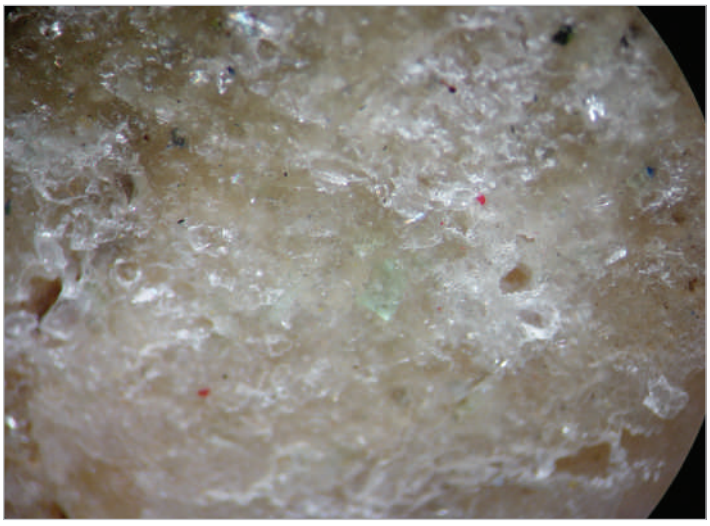
2: Three of the nodules, polished on all sides. Opal pieces are positioned at the tips where they are most likely to show. Weights are from 56 to 185 ct.

across an entire piece. Play of colour areas all exhibited the typical play of colour patterns and inclusions of Wollo opal; a few exhibited shallow surface cracks and two showed crazing. All were hydrophane opal, but one sample contained two very different types of hydrophane opal; two areas were transparent crystal opal with nice play of colour, while one area was whitish, nearly-opaque opal with minimal play of colour and the distinct 'tacky' feel on the skin of extreme hydrophane when rubbed with the finger. It is highly unlikely that these two types of opal formed and matured under the same conditions.

The edges of most opal areas were irregular and exhibited a broken appearance (**3**). Between areas of opal and other rock was a granular, sugary material that was mostly a light, peridot-like green, but varied in colour from a light green to near colourless. Under magnification, small sand-sized grains of colour were visible. A few randomly scattered grains had a 'Coke-bottle' look, while others were red or blue (**4**). Due to the odd and suspicious appearance, Young had applied a hot point and noticed an acrid smell. Infrared testing showed these areas to have a high concentration of epoxy-type resins. The prevalence of the polymer precluded accurate identification of the sand-like grains, but Raman testing gave vague indications of a silica, possibly glass. Several of the polished samples contained large areas of a pinkish near-opaque rock that was identified as chalcedony quartz (**5**).



3: Broken and irregular edges surrounded with green bonding agent. Specimen weighs 148 ct and contains nine distinctly different pieces of opal.



4: Close up of colourless bonded area. Note the greenish glass-like grain in centre as well as smaller red and blue grains.

5: Other than just opal, most specimens had areas of an opaque pinkish rock that tested as quartz, presumably used as a filler.

As plentiful as the Ethiopian opal reserves appear to be, there is little justification for this product other than to utilize scraps.

Some Ethiopian opal is known to contain plant fossils and one of the rough samples contained what appeared to be a plant stem. Such fossils are known to form along the base of an opal where the opal-forming silica soils made contact with a soil base. For this reason, fossils typically occur on the base of an opal as it was forming, rather than suspended within, as appears to be in this instance — further confirmation of assemblage rather than natural composition.

This is a clever misrepresentation that is designed solely for the cutting market, since the assembled nature would become apparent upon cutting and finished gems would presumably only incorporate areas of contiguous opal. As plentiful as the Ethiopian opal reserves appear to be, there is little justification for this product other than to utilize scraps. According to Young, such opal rough composites have been seen in Ethiopia over the past year. In their rough state, with the clay-like outer layer, they can be convincing to the unwary. This is another example of how composite products are more frequently seen in various materials today, particularly rough, cabochons, and beads. ■

Images 1 and 2 by Bear Williams, Stone Group Labs.
Images 3–5 by Cara Williams, Stone Group Labs.

A historic synthetic diamond

Gary Roskin GG FGA and Claire Mitchell FGA DGA offer an analysis of a special synthetic diamond auctioned at Tucson.

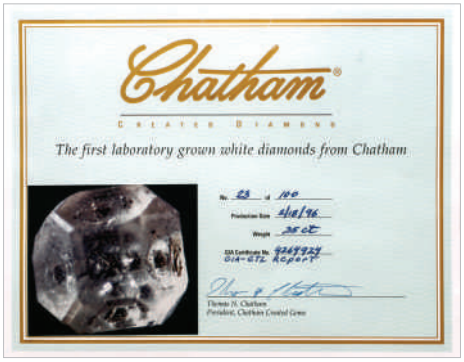
JIBNA Personal Jewelry Insurance bought one of the first transparent white lab-grown diamonds (**1**) made by Chatham Created Gems at auction at the GIA Alumni Association's gala at Tucson, Arizona, in February of this year — a major fundraising source for the GIA Alumni Association. Initially donated to GIA by Chatham, a certificate from the company gives the 0.35 ct rough diamond (**2**) a production date of 18 February 1996. The diamond also came with an Identity Report by GIA Gem Trade Laboratory from May 1996 describing the stone as a "near colourless rough crystal measuring approximately 3.91 × 3.66 × 2.80mm / Conclusion: synthetic diamond."

David W. Hendry Jr., CEO and chief underwriting officer of JIBNA, is delighted with the acquisition. Purposely overbidding on the diamond because he wants to support the GIA's educational efforts and the Alumni Association's gemmologist appraisers, Hendry paid $1,300. Tom Chatham, president and CEO of Chatham Created Gems and Diamonds, remarked to Hendry afterwards that the little rough diamond cost approximately $150,000 to make. When asked what he will do with the diamond, Hendry said he'd like to have the gem and its documents framed and on display, considering the diamond to be a piece of history.

ANALYSIS OF THE DIAMOND BY GARY ROSKIN, FOUNDER OF THE ROSKIN GEM NEWS REPORT

"Growing synthetic diamond is not necessarily all that difficult today as technology has certainly advanced since the first synthetic diamonds over half a century ago. It is still challenging, but certainly the huge hurdles of pressure and temperature have been jumped, and now it's all about the small details that make diamond crystal growth more exciting.

1: The 0.35 ct rough diamond created by Chatham Created Gems and Diamonds.



2: The Chatham Certificate indicating that the diamond is number 23 of 100 early HPHT colourless synthetic diamond crystals donated by Tom Chatham to the GIA for research purposes, dated February 1996.

Basically, we need high pressure, approximately 55,000 atmospheres (roughly 800,000 pounds per square inch), and a temperature ranging from approximately 1,500–2,000˚C. This, along with a crucible that can withstand all of that pressure and heat, a seed crystal of diamond to get things started, and some kind of flux/solvent to help lower the melting/dissolving point of carbon, thus aiding the growth process. This was not an easy thing to do in 1996 when Tom Chatham was working with Russian scientists trying to create colourless diamond crystals. We all know that diamond is made up of elemental carbon atoms, and the more chemically pure, the less tint of any colour will be visible; a truly allochromatic material (colourless in its purest and structurally comfortable state).

What we do know from past growth experiments is that yellow diamonds (the yellow being caused by nitrogen), is much easier to create than colourless diamonds. The nitrogen is said to aid the creation of synthetic diamond and, as a 'byproduct', also gives the crystal colour. Getting rid of all of that nitrogen is key to creating a colourless diamond, and yet removing the nitrogen makes it much more challenging to create a synthetic diamond.

Stepping back a moment, the classic Chatham flux synthetic crystal growth takes place in platinum crucibles, as the platinum can withstand high temperatures without too much disintegration. In the creation of synthetic rubies, sapphires and emeralds, early production using a seed crystal and a solvent/flux would produce gems with metallic inclusions, tiny clusters, needles or platelets of platinum. As the developing processes advanced, however, fewer bits of platinum

3: The classic crystalline habit of a HPHT-created diamond, this cubo-octahedron has octahedral and cubic faces. Also evident is the large metallic inclusion from the flux, which was used to help grow the synthetic diamond crystal.

would end up in the final gem.

For higher temperature synthetic manufacture like diamond, ceramic crucibles were created. Just like emerald, ruby and sapphire, in order to assist the melting/dissolving and crystallization of carbon to create diamond, a metallic flux/catalyst/solvent was created, said to be made up of iron, nickel and possibly other metals such as cobalt. Not only does nitrogen enter the mix intentionally to create synthetic fancy yellow diamonds as was the case with early Gemesis synthetic diamond, but because there is so much of it in our atmosphere it gets into the mix unintentionally, and gives the intended colourless synthetic diamond a slight yellow tint. In order to remove the nitrogen from the mix to create the colourless gem, apparently one needs to add aluminum and possibly titanium into the solvent, acting as a magnet to attract nitrogen atoms. Holding onto the nitrogen allows for growth of the colourless crystal.

In these early Chatham colourless growth synthetic HPHT diamonds, small amounts of metal can be found inside the crystal. In this Chatham diamond crystal, the metal inclusions are obvious under magnification.

The classic crystal shape of a synthetic HPHT lab-created diamond is a truncated octahedron (**3**), otherwise called a cubo-octahedron, showing the eight sides of an octahedron (the classic shape of a natural crystal), as well as the six faces of a cube (flat areas on the octahedron where it should have been coming to a point). This is certainly not the unusual crystal structure for natural diamond. So when you see this crystal structure, one should remember that this is very indicative of the HPHT growth method. Images **4** shown the stone in more detail."

ANALYSIS OF THE DIAMOND BY CLAIRE MITCHELL, TEACHING MANAGER AT GEM-A

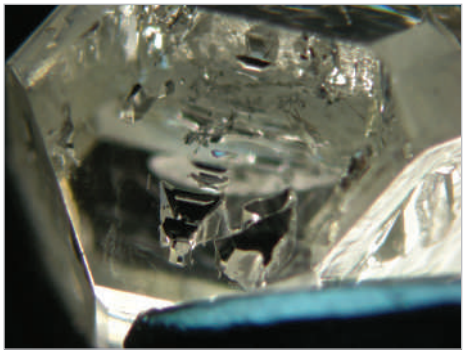
"The sample illustrated, obtained at the GIA silent auction, is one of the first 'white' synthetic diamonds produced by Chatham — No. 23 out of a series of 100 produced in February 1996.

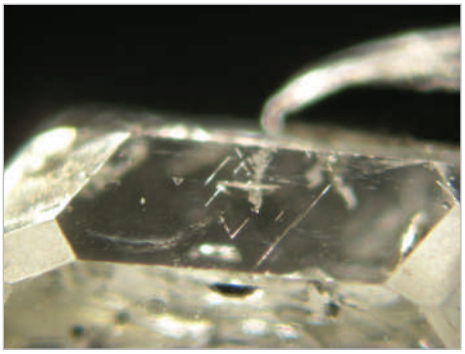
Serious attempts have been made to synthesize diamond since the eighteenth century. "In 1953 ASEA, a Swedish engineering company, succeeded in growing 40 small diamond crystals, followed by General Electric in USA in 1955 and then De Beers in 1959" (taken from the Gem-A Diamond Diploma course notes, section 16 page 3). These early synthetic diamonds were produced predominantly for industrial purposes, however. Other companies, including Chatham, now also produce gem quality synthetic diamonds for the jewellery trade.

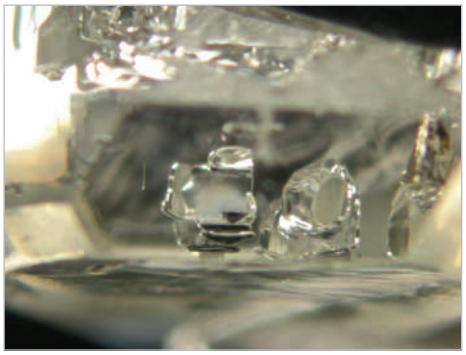
The habit (shape) for the crystal illustrated is distinctive to those produced by the HPHT process, cubo-octahedral growth in the form of a truncated octahedron. The Gem-A course notes also state: "During the production process for some HPHT diamonds, a catalytic solvent is used to assist the dissolving/melting of the carbon source. These metallic solvents allow the diamond powder to dissolve and recrystallize at temperatures lower than would otherwise be necessary, and typically consists of nickel, iron and cobalt, in varying proportions. This metallic solvent may also be referred to as a flux." The diamond we see illustrated shows the remnants of these metallic fluxes, which are not only observable but will also be attracted to a rare earth magnet. This property is not noted in natural diamonds. The sample also appears to contain a seed crystal which is typically only encountered in older or poorer quality synthetic diamonds." ■

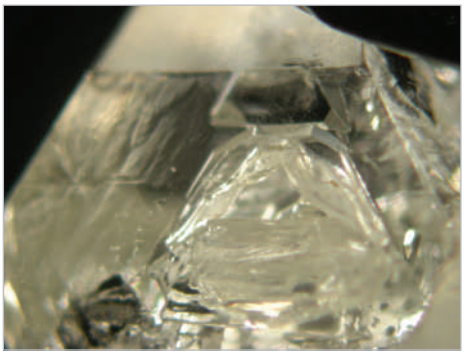
All photos of the diamond are by Greg Stanfield, GG (GIA), courtesy of JEMs Insurance Lab, Louisville KY.

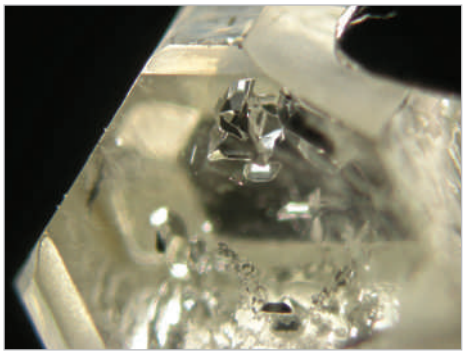
4: More views of the synthetic diamond.

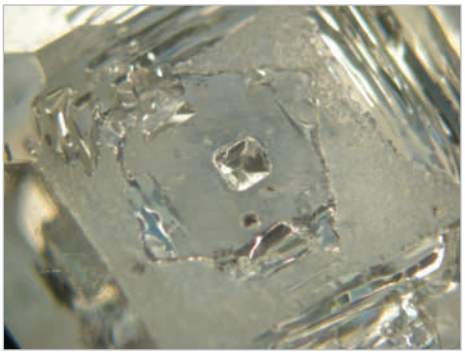












A passion for gemmology

Dr Thomas Hainschwang FGA, 2015 winner of the Antonio C. Bonanno Award, talks about GGTL Labs, his work and his latest gem-testing innovation.

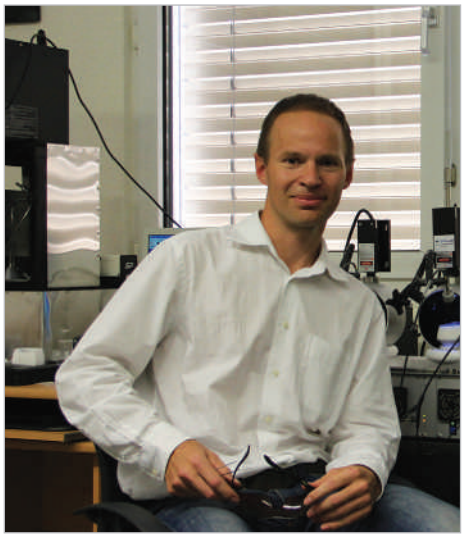
How did the founding of GGTL Labs come about?

They are the result of the merging of two independent gem-testing labs, GEMLAB (Liechtenstein) and GemTechLab in Geneva in 2011. GemTechLab was founded in 1996 by Franck Notari and GEMLAB (Liechtenstein) by myself in the same year. Franck and I met in 2003 and started working together on gemmological research projects. In 2004 I agreed to join him and the rest of the GemTechLab staff to work for the GIA in Geneva for a company called GIA Switzerland. We sold our laboratories' equipment to the GIA and united all of it in Franck's rather small lab in 2005. So our own labs were 'offline' until the GIA venture was terminated by the — rather curious — closure of the lab in early 2007.

We went our independent ways, re-opening our labs, but continued our friendship and research collaborations. In 2010 we decided to join our two labs and develop them together, but keeping the two sites — Franck's in Geneva and mine in Balzers, naming the joint venture 'GGTL Laboratories'. It has been very fruitful ever since; while on both sites all gem-testing tasks are tackled, the Geneva lab specializes in near colourless melee diamonds for the watch and jewellery industry and coloured stones, while the Balzers lab specializes in coloured diamonds — including melee sizes — and pearl testing, plus all types of gemmological research.

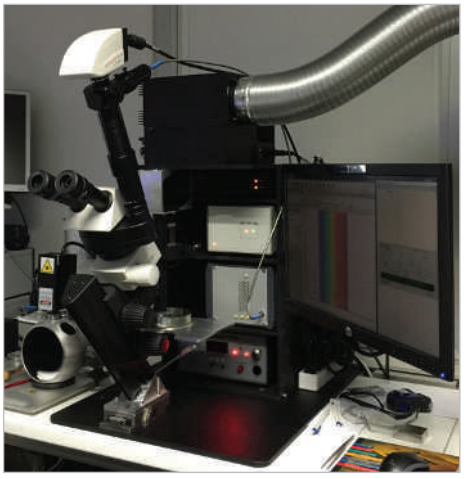
What sets GGTL apart from other labs, in your view?

Good question. Several aspects are unique to us. Hoping not to sound overly self-centred: Innovation — Franck and I have developed our own gem-testing equipment in the past and are now doing the same together. Many years ago Franck created the U-Visio fluorescence microscope, and I have created a range of research-grade testing equipment, including the new DFI fluorescence imaging and photoluminescence/Raman spectroscopy microscope. Designed to work specifically for gem materials, everything is as efficient as



possible. We've also started to commercialize some of these instruments — several are used by companies involved in gem-testing worldwide. Our last joint creation is the 'Deep-UVisio system' — the prototype is currently being finished.

We have analytical protocols and instruments to give us a unique and very efficient specialisation in melee diamond testing. In Geneva this is mainly the quality testing and synthetic screening of colourless melee diamonds, and in Balzers it's the screening of fancy colour melee diamond parcels for any synthetics and treated diamonds and the screening of colourless diamonds for synthetics and natural type IIa diamonds.



GGTL Lab's new DFI system.

Our gem-testing is based mainly on our own research, as well as published data. We are constantly working on research projects on various topics, and virtually all of which are published — more than 150 published articles and 80 conferences around the world by myself alone.

We can and do move our equipment around the world for research projects and gem-testing; we're able to test gemstones whenever it is impossible to send them to our labs, as in the case of very valuable and unique museum pieces. This way we have been building our database of historical diamonds stored in museums worldwide over several years.

At the Geneva facility we are very experienced in cleaning clarity-enhanced emeralds, and, if desired, are able to oil them again after they have been properly cleaned. We offer specific gemmology courses for companies, tailored to their needs and on any desired gem-related topic. Our lab is relatively small. In our opinion a gem-testing lab should not exceed a limited number of employees in order to be able to function as consistently and accurately as possible, and to work as a truly independent and scientific entity.

How did you come to enter the gemmology world?

My family has absolutely no past in gems or jewellery. For whatever reason I've always been fascinated by stones — I started looking for rocks and minerals at the age of five. From 10 I started rock hunting in the Austrian Alps with my great uncle who was a passionate mineral collector. I interrupted my post-school geology studies in 1995 to get the Graduate Gemologist diploma at GIA in Santa Monica, and then the Gemmology Diploma at GAGTL (Now Gem-A). Although I returned to geology and geophysics, I was so taken by gemmology (at the time I had already founded GEMLAB — then really small with standard equipment) that I decided to learn much more about gem-testing and modern testing methods.

My first spectrometer was the SAS2000 UV-Vis-NIR and then I bought the 532 nm photoluminescence system attached to it. This allowed me to publish my first gemmological papers in 1999 and create the GEMLAB webpage, through which regular newsletters

were probably the first ever published gemmological research available online. I joined the Swiss Gemmological Association and took the Expert SGG gemmology diploma in 2002. My first invitation to give a talk about "gem testing using the SAS2000 spectrometer system" was at the annual meeting of the Austrian Gemmological Association.

In 2002 I went to the University of Nantes to work on the Diplôme d'Université de Gemmologie, gaining a diploma — Classification and colour origin of brown diamonds — with highest honours and congratulations of the jury. At this time the lab equipment had already been aggrandised through the acquisition of an infrared (FTIR) spectrometer. The ensuing years saw further development and research and the building of various prototypes of gem-testing equipment for the lab, until Prof. Emmanuel Fritsch asked me in 2008 if I would be interested in working on a PhD thesis. Working more than full time in the lab and having a family, it was madness, but finally I agreed, and started it 2009, under the supervision of Prof. Fritsch and Dr Benjamin Rondeau. Unbelievably I finished it after five sleepless years, with my 407-page thesis on type Ib diamonds.

Congratulations on your AGA Antonio C. Bonanno Award! What does this prize mean to you?

It's a really great honour having received this prestigious award, and being the youngest ever winner of it. I'm particularly happy being part of a select group of respected gemmologists and gem researchers who have received this award prior to me, such as Alan Hodgkinson, Robert Crowningshield, Dr Henry Hänni, Richard Drucker, Dr James Shigley, Stuart Robertson, Dr Emmanuel Fritsch and Dr John Emmett. I had no idea that I was one of the nominees for the 2015 award and it was a fabulous surprise when I received the call from AGA president Stuart Robertson to tell me that I won it. It is especially flattering since Prof. Fritsch, the supervisor of my PhD, was honoured by this award in 2013 — I had to give a short speech at his award reception in Tucson.

At the last Gem-A Conference you spoke about green diamonds. Why that subject?

It was because it is one of my current research topics. I have worked on the origin of colour of green diamonds for several years, starting it with George Bosshart with whom I went to the Natural History Museum in Vienna in 2011 to test historical green diamonds for the first time. This ongoing research is of great importance since the origin of colour of green diamonds is still one of the most controversial topics in gem-testing. I love all fancy colour diamonds, but I also love phenomenal gems, particularly everything that changes colour, as well as really rare (but attractive) stones such as trapiche emerald, benitoite and red beryl. If I had to choose a single favourite stone then it would be a vivid blue diamond, if possible an old cushion cut stone.

How does the new DFI machine differ from DiamondView and what led you to develop it?

The DFI was my own idea and the prototype that is installed at the Liechtenstein lab today was developed and built by myself — no university or external company was involved. It is a flexible screening system using a combination of fluorescence microscopy plus photoluminescence and Raman spectroscopy, and upon request transparency to short wave ultraviolet radiation. It offers up to six different UV excitation bands plus one laser excitation.

The first prototype was far simpler than the final DFI System, and already working at the Liechtenstein lab in 2008. It was developed as a powerful fluorescence microscope using one broad band UV excitation only, but was then further developed during my PhD work, in order to have a more flexible tool. The main reason to develop the final complex DFI machine was the screening of melee diamonds of all colours, particularly yellow and orange, since we found synthetics and treated stones in such parcels. In order to have an efficient tool for their screening I needed to have a very special fluorescence microscope. The result is the DFI.

Thomas Hainschwang receiving the Antonio C. Bonanno Award earlier this year.

Its last version — that is currently available for the trade — was modified in collaboration with Franck Notari. Using the DFI one can observe the fluorescence, colour, intensity and distribution via a microscope or high sensitivity camera and at the same time the Raman and photoluminescence spectrum can be analyzed on the computer screen. So unlike the DiamondView this system uses several excitation bands, combines imaging with spectroscopy and since it is an open system has been particularly designed for melee diamond screening. It can also be used for gemstone filler analysis and quantification, for testing corundum, spinel and many others.

How has the trade received it? Does it make some other machine obsolete?

We've had a number of requests for this machine and a few of them are already used by diamond manufacturers; since it is not automated it needs a technician trained on the system but in contrast to automated systems the DFI generally identifies a diamond as being natural or synthetic directly, no further testing necessary. In a gem-testing lab one single piece of equipment will almost never replace another one, but it gives a lab more analytical capacities. The DFI makes any fluorescence microscope obsolete and depending on the requirements, such as resolution, it can replace a photoluminescence system. For us it is simply the ideal screening system.

What are the biggest issues facing labs at the moment and how is GGTL dealing with these?

The biggest challenges are probably the determination of colour origin of green diamonds, the identification of HPHT treated 'cape' diamonds, the latest generations of beadless saltwater cultured pearls, and finally the eternal problem of country of origin determination, especially for blue sapphire. The treatment of spinel is another hot topic. Our labs perform as much research as possible in order to face these challenges. We constantly build our sample collection and collect as much data as we can in order to be able to offer a solution to most of these difficult analytical issues. ■

Gem-A Conference

Gem-A will host its internationally acclaimed annual conference at the Royal Institute of British Architects (RIBA), Marylebone, incorporating the 18th Federation for European Education in Gemmology (FEEG) Symposium. Welcoming speakers from around the globe, the Gem-A Conference has a reputation for tackling the most innovative and contemporary gem-related topics, whilst bringing together some of the leaders in the field for a weekend of networking and special events.

SATURDAY 21 AND SUNDAY 22 NOVEMBER

Gem-A Conference

Jarvis Auditorium, Royal Institute of British Architects (RIBA), Marylebone, London

Located in the heart of Marylebone, near to Regent's Park and Oxford Street, this architecturally significant venue was opened in 1934 as the headquarters of RIBA.

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

Registration and tea and coffee will commence at 08:45 on both days, and the Conference will close at 17:30 on Saturday and on Sunday.

SPEAKERS

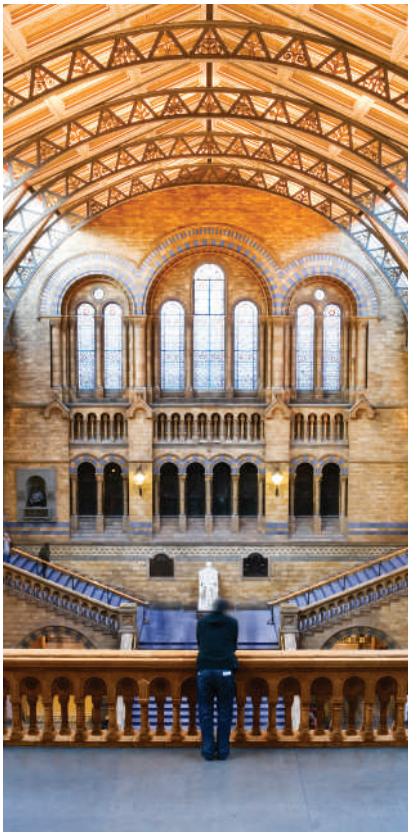
Ilario Adamo ◎ Jean Pierre Chalain ◎ Andrew Cody
Jörg Gellner ◎ Bill Larson
Shane McClure ◎ Adolf Peretti ◎ Paul Rustemeyer
Fabian Schmitz ◎ Martin Steinbach

SATURDAY 21 NOVEMBER (EVENING)

Gem-A Conference Dinner

Florence Hall, Royal Institute of British Architects (RIBA), Marylebone, London

Saturday's programme will be followed by a drinks reception and a three-course dinner where you can relax and enjoy the company of friends old and new. Dress code is smart/casual.



MONDAY 23 NOVEMBER

Seminars

Gem-A Headquarters, Ely Place, London

Two practical seminars will take place at Gem-A Headquarters in London.

Guest seminar hosts:

Richard Drucker FGA GG, President of GemWorld International Inc.
Coloured stone grading and pricing workshop

Alan Hodgkinson
Visual optics

MONDAY 23 NOVEMBER (EVENING)

Graduation Ceremony and Presentation of Awards

The Mermaid Conference & Events Centre, Puddle Dock, Blackfriars
Arrive at 18:00 for registration, 18:30 start

Graduates of the Gemmology Diploma, Diamond Diploma and FEEG graduates and their families are invited to attend the 2015 Graduation Ceremony and Presentation of Awards. The ceremony will be followed by a drinks reception for graduates and guests in the River Rooms.

Guest speaker to be announced.

TUESDAY 24 NOVEMBER

Private viewing of the Natural History Museum's mineral collection

Natural History Museum, London

Explore this breathtaking collection with Alan Hart FGA DGA, Head of Earth Sciences Collections.

Book soon; places are limited at this popular event and always sell out quickly.

Private viewing of the Crown Jewels

Tower of London, Tower Hill, London

You will be taken on a tour of the Tower of London, one of London's finest landmarks and steeped in history, finishing with a private viewing of the Crown Jewels. You will be able to stop and admire each piece on this relaxed and fascinating tour.

Book soon; places are limited at this popular event and always sell out quickly.

Al-Thani Collection at the V+A

Victoria and Albert Museum, London

Featuring spectacular objects drawn from a single private collection, you can explore the broad themes of tradition and modernity in Indian jewellery. You will have the opportunity to view treasures such as Mughal jades and a rare jewelled gold finial from the throne of Tipu Sultan.

Download a booking form from our website at www.gem-a.com/news--events/events/gem-a-conference-2015.aspx.

Mallorca GemQuest 2015

Geoffrey Dominy FGA, author of *The Handbook of Gemmology* and organizer of the Mallorca GemQuest Conference, discusses the inaugural GemQuest, held from 18-20 April 2015.

The genesis for the Mallorca GemQuest Gemmological Conference started nine years ago during an impromptu visit to Mallorca. I was at the end of a long and exhausting four-month buying trip where I was travelling throughout Europe buying antique jewellery for a private client. Having stayed in 46 different hotels, hostels and bed and breakfasts during the trip, I had planned two weeks at the end to unwind, relax and re-charge my batteries. Although it was the end of March, I had decided to go back to Prague; a city that (in my mind) is one of the most beautiful in the world. My flight from Paris to Prague involved a six-hour layover in Dortmund. At that time there was little to do in the Dortmund Airport and I am not sure if it was the price or the exotic beach featured on the poster of Mallorca that caught my eye, but I ventured over to the Air Berlin counter and enquired about the advertisement that simply said 'Mallorca 29 Euros'. Of course, like all advertising, there was a catch that involved jumping through numerous hoops and climbing over a myriad obstacles to get the 'deal' they were offering. I relayed my story to the customer service representative and asked her what she would do in my position; head back to Prague or go to Mallorca? Without any hesitation she said 'Mallorca'. I raced to the ATM machine, withdrew the money and found myself on a plane full of enthusiastic and rather boisterous German tourists heading to an unknown destination. I knew nothing about Mallorca, had nowhere to stay and I didn't even know if I could afford the even if I could find the proverbial 'room at the inn'.

View from the El Cid hotel.

The ensuing week was one of the best of my life, spent exploring every corner of the island. On the final day I decided to change all my plans again and stay another week, even though I had arranged to fly back to Manchester, England. It was certainly 'love at first sight' but as an appraiser in a country where few people insured their jewellery, the possibility of moving there seemed a distant dream. That conundrum was resolved almost overnight with the success of *The Handbook of Gemmology* and with the realization that writers can live anywhere. Last August, the move to Mallorca finally became a reality.

In September 2014 I attended a Hoge Raad voor Diamant (HRD) one-day symposium in Antwerp and, upon returning to Mallorca, the idea of staging a conference was front and centre in my mind.

I understand that it is often necessary in places such as Tucson or Las Vegas to have more than one presentation offered at the same time due to time restraints and the sheer number of registrants, but, as a public speaker, I have never like the concept. Forcing delegates to decide between speakers is not an ideal situation and having been thrust into this uncomfortable situation many times, I feel it does a great disservice to the speakers who spend endless hours preparing their presentations. They deserve to have an audience that they can interact with instead of a half empty room while being forced to listen to the distant applause from the other presentations being offered in the other conference rooms.

Of course this posed a series of challenges and forced us to organize a programme that was cohesive but also had sufficient variety. If you are not stimulating your audience you will quickly lose them and so it was vital, especially since this was the first time we were offering this conference, to give those in attendance a program that worked on a multiple levels.

Having stayed in Can Pastilla numerous times, I chose the THB El Cid Hotel, located five minutes from the Son Sant Joan airport, on the Playa de Palma beach that extends 4.5 kilometres to S'Arenal. The hotel has affordable rates starting at €75 a night (including breakfast and dinner), and a manager and staff that are clearly dedicated to their profession and the comfort and enjoyment of their guests.

While the original intent of the conference was to target potential delegates throughout Europe, it quickly became apparent that the level of interest extended beyond our original demographics, with many people as far away as Australia and New Zealand asking us if we would be producing a DVD. This lead to a number of discussions and the 'conference changing' comment from Alberto Amengual, who handled the technical aspects of the conference, that we should stream it live and offer it afterwards on 'video on demand'. Suddenly the world was our potential oyster and we conscientiously set about the complicated task of seeing how we could make online streaming a reality.

The second 'conference changing' revelation came when we realized that, if we built the infrastructure ourselves, our costs would remain static regardless of whether we had one person or 10,000 people online. Suddenly the whole concept changed again with the realization that every person that didn't register online was a missed opportunity. This eventually led to the decision to make the online streaming free with the costs being underwritten through the generosity of our sponsors: Gem-A, *The Handbook of Gemmology*, the National Council of Jewellery Valuers (NCJV), the Canadian Gemmological Association (CGA), the Instituto Gemológico Español (IGE), GemDialogue and GemeWizard. By doing this, we also felt we could reach an even larger audience.

THE CONFERENCE

The stage was set as speakers and delegates started to arrive on the Friday afternoon. The 'weather gods' were smiling and so were those arriving at the hotel. We had promised 'Sea, Sun, Sand and Gemmology' and it looked as if we might be fortunate enough to deliver on all four counts.

For those of you who have ever organized a conference you know that it is foolhardy to rest on your laurels and, unfortunately, you simply cannot enjoy the proceedings until the last speaker has delivered his closing words. With the introduction of online streaming we added an unknown element; one fraught with potential danger and, while one never goes into these projects expecting to fail, you also realize that in some cases you have no control over certain key elements and these can have a devastating effect when you least expect them.

From left-right: Alan Hodgkinson, Alberto Scarani, Victor Tuzlukov, Adolfo de Basilio, Geoffrey Dominy, Egor Gavrilenko, James Riley and Marian Jaén.

The Saturday programme started with Alan Hodgkinson, and while he needed no introduction, I noted to the audience that Alan deserves to be recognized among the stalwarts of gemmology, along with such luminaries as Basil Anderson, Robert Webster, A.E Farn, C.J Payne, Herbert Smith, Richard Liddicoat, Michael O'Donoghue and Peter Read for his outstanding contribution to gemmology. As usual Alan delivered his talk on 'Visual Optics' with unbridled enthusiasm and passion to an extremely appreciative crowd. Dr Thomas Hainschwang from GGTL was the next speaker and talked about a 'Day in the Life at a Research Laboratory'. While we may all aspire to be on the front lines, detecting and alerting the industry when new treatments and lab-created stones enter the marketplace, Thomas reminded the audience that being the first line of defence puts a great deal of pressure on the laboratories to get things right the first time. Dr Egor Gavrilenko, director of education for the Instituto Gemológico Español (IGE), delivered the third talk of the day on advanced gem cutting techniques, assisted by the talented and award winning cutter Victor Tuzlukov from Moscow. The final lecture of the morning was the first part of a two-part presentation given by myself on the '3Cs' of coloured gemstone grading (cut, clarity and carat weight), followed after lunch by Menahem Sevdermish and Guy Borenstein from GemeWizard, who talked about colour and how it can be accurately described using their system. James Riley ended the day with a wonderful and colourful slide presentation of the 'Mogok Adventure' to Myanmar last year with Brendan Laurs, editor of *The Journal of Gemmology*, and Jason Williams.

The Sunday programme followed a similar format with Alan Hodgkinson again starting the proceedings with his presentation entitled 'Pushing the Refractometer', during which he emphasized that even in a world where advanced technology is now an essential component, the refractometer still plays a vital role in the identification of gemstones. Thomas Hainschwang then took the podium and talked about changing the colour in diamonds, demonstrating not only the methods used to improve or induce colour in diamonds but also the equipment and techniques needed to identify them. The third presenter of the day was Egor Gavrilenko, who discussed the various types of inclusions found in gemstones, the complexities of photographing them and the various techniques that can be used to capture them digitally or on film. I was the final presenter of the morning programme, and talked about my own experiences last year in Lightning Ridge on a book-sponsored tour by the Gemmological Association of Australia. After lunch, James Riley delivered his talk entitled 'Gemmology – Then and Now', followed by a round table discussion featuring Adolfo de Basilio, Egor Gavrilenko, Alberto Scarani, Victor Tuzlukov and Geoffrey Dominy on 'Coloured Gemstone Grading', moderated by Marian Jaén.

In total, the conference reached out to over 8,000 people through mail-outs, online registrations and physical attendance, and represented 26 countries worldwide.

The Mallorca GemQuest Conference delivered on every level with a unique venue, an exciting programme, quality speakers, worldwide broadcasting, exceptional weather and fond memories for all who participated. From an island renowned for its high quality imitation pearls, the world was most certainly our oyster — at least digitally — for two days. Plans are already in the works for Mallorca GemQuest 2016. ■

All photos courtesy of Geoffrey Dominy.

JCK Las Vegas 2015

Gary Roskin FGA gives the lowdown on this year's JCK Las Vegas Show.

The JCK Las Vegas Show took place at the Mandalay Bay Hotel and Resort in Las Vegas from 29 May–1 June. Reporting on the event is not what it seems. Similar to Tucson, Vegas is a compilation of several shows, including the main one, the JCK Las Vegas gem and jewellery show. JCK also tries to pull in more retail jewellers with its separate pre-show 'Luxury' and Swiss Watch shows, but just down and across the street are three more fairs: Couture at the Wynn, GLDA at the Mirage, and the Las Vegas Antique Jewelry & Watch Show at the hotel Paris.

Everyone who attends these shows likes to compare the current year's show with last year's numbers, so I can tell you that, not unlike almost every year in the past, there were over 20,000 buyers in attendance with over 2,300 exhibitors — more than in 2014! It certainly appeared that business was brisk and the mood was better than last year, but there is no guarantee that what we saw and what we heard really represents a true picture of actual business. So let's just say that there were a lot of people, a lot of vendors and plenty to write home about.

STOCK UP AND GET FOCUSED

These shows are not just for retail jewellers restocking inventory, although this is in fact what most retailers were doing this year. No, these shows are also a chance for North American jewellers to see what is new, what's available and to network with retail jewellery experts.

There are seminars, classes and other opportunities to gather information that might be critical for this year's business. Amongst the dozens of JCK seminars, show perennial Diane Warga-Arias, president of DWA Communications, reiterated the old standard of "don't sit back and wait for business to come to you", presenting the subjects 'Redesigning Retail' and 'The Power of Blogging'. Speaker Terry Hawkins, president of People in Progress Global, stressed the same with 'Why Wait to be Great: It's Either Now or Too Late' and 'The Retail Revolution'. Also presenting was Ben Smith, the chief strategy officer for Relevance, who gave the keynote address titled 'The Millennial Movement: How Millennials are Reshaping the Retail Future'.

AGA AND THE LAB-GROWN DIAMOND CONFERENCE

One of the main pre-events for the gemmologist/appraiser was the Accredited Gemologists Association (AGA) Conference, focusing on gem quality synthetic diamonds. Yes, retailers are concerned about the possibility of buying and selling gem quality lab-grown diamonds unwittingly. The AGA panel of expert speakers was impressive, with everyone from the manufacturing side to the laboratory side well-represented, including Dr James Shigley from GIA research, Dr Thomas Hainschwang FGA from the Liechtenstein GGTL, Eric Franklin from D.Nea diamond manufacturers, Tom Chatham from Chatham Created Gems, Alex Grizenko from Lucent Diamonds, and, as an added bonus, Tamaz Khikhinashvili from New Diamond Technology in St. Petersburg — diamond manufacturers in Russia. The panel was specifically chosen not to talk about how to identify lab-grown diamonds, but to get everyone as comfortable as possible with the inevitability of having lab-grown gem quality diamonds in jewellery, including diamond engagement rings, as well as fashion diamond jewellery. Most impressive was the New Diamond Technology HPHT-grown 10.03 ct square emerald cut (**1**), quality graded by the International Gemological Institute (IGI) lab as VS1, E colour. Khikhinashvili also brought with him several other larger lab-grown faceted diamonds of equal quality, ranging from 3 to 5 ct. This eclipsed the lab-grown diamonds that Franklin and Chatham brought, but the numbers and qualities were all together impressive.

1: The 10.03 ct gem square emerald cut diamond from New Diamond Technology, which makes HPHT lab-grown diamonds.

JCK is not only a gem and jewellery show, but a technology show as well. With the industry focused on gem-quality lab-grown diamonds, it was fitting to see Gemlogis introduce its latest gem tester, the Taupe Diamond Segregator, "for identifying earth-mined diamond". The advertisement was reportedly a bit overenthusiastic, as it really doesn't identify whether a diamond is lab-grown or not. It is a bit more than a Type IIa tester as it will tell you that the diamond is possibly HPHT, CVD or possibly HPHT treated, and then suggest further lab testing.

I am proud to say that one big hit on the technological side was the GemmoRaman, with Alberto Scarani and Mikko Åström of M&A Gemological Instruments (MAGI) showing the ease of their portable Raman spectrometer and the GemmoFTIR units right in the Gem-A booth.

Working at the Gem-A booth is part reunion and part sales. Many of our graduates and students come and visit, tell us what they've been doing for the past year and talk about gems and jewellery they've had the opportunity to handle. One of our graduates, Donna Hawrelko from the Canadian Gemmological Association (CGA), mentioned the CGA Conference in Vancouver from 16–18 October. Of course, we were also promoting the annual Gem-A Conference and Graduation Ceremony and Presentation of Awards from 21–24 November.

MINED DIAMONDS, DE BEERS AND MARTIN RAPAPORT

Every year at the JCK Show, Martin Rapaport hosts Sunday morning breakfast for all who can get out of bed. This year, instead of his usual flamboyant rant on the diamond industry, Rapaport invited Stephen Lussier, executive vice president of marketing at De Beers and CEO of Forevermark, to talk about love and commitment, as well as De Beers' new marketing plan. This also included the announcement that De Beers is bringing back the "diamond is forever" campaign. Yes, he admitted they were wrong to discontinue the iconic mantra.

Lussier noted that $81 billion of polished diamonds were sold in 2014. This would be the highest ever recorded. The Bridal category came in at 25% to 35% of the total market. "Diamonds are the bedrock of the dream. And we cannot take it for granted," says Lussier. Even a pair of diamond earrings sends a message of commitment and love. Unlike any other purchase, locked in the diamond are our memories of the occasion. This is why diamonds are passed along to the next generation. Of course, in a subtle way to push the Forevermark brand, Lussier was quick to point out that 50% of diamond sales are branded diamond purchases.

Rapaport this year was much more serious in his own delivery. The price of rough diamonds has gone up while the price of polished diamonds have gone down. What's worse, this has been ongoing in the industry since 2009. Obviously there is a loss of money in the supply chain, says Rapaport. He placed blame on the Indian banks, making it too easy for diamond cutters to borrow money to buy rough. He also blamed De Beers for selling rough at too high a price. But is De Beers at fault when cutters are coming to them with easy money and buying rough at strong prices? Who is to judge? In the meantime, the Indian cutters are still buying rough at high prices and selling polished goods at low prices. This leaves the industry in a very precarious position, says Rapaport. Either the price of polished goods has to go up, or the price of rough has to come down. And the ease of getting a loan to purchase rough must be substantially challenged. This will not be easy, says Rapaport, but it must be done.

OH THE GEMS WE SAW

Enough of the serious side, let's talk beauty! We met up with Larry West and others at LJ West diamonds to see spectacular fancy vivid blues and pinks. It was obvious this year that fancy colour diamonds are still very popular even with high price tags. Pinks were certainly the most sought after, but browns and yellows were the most affordable.

Interesting to note, with colour diamonds doing quite well, colourless and near colourless are struggling. Even with margins being so low for colourless goods, we really didn't expect to see a major Antwerp diamond cutting firm speaking with an American lab-grown diamond manufacturer. This just reiterates the importance of the burgeoning lab-grown, gem-quality diamond business.

2: The 15.89 ct kunzite from Nigeria.

3: Natural mocha zircon.

4: Hand-carved moonstone earring jackets.

5: A faceted pearl from Galatea, complete with microchip, ready to be recorded and listened to forever. An example of gemmologists catering to the 'Millennials'.

HERE, THERE AND GUITARS?

International exhibitors included gem merchants from Germany, Brazil, Israel, Thailand, China, Sri Lanka and many more. Still high on the popularity list is 'Paraíba' tourmaline. There wasn't much from Brazil, but there were plenty of cuprian Paraíba-like tourmalines from Mozambique. Riding the coattails of the Paraíba popularity, we also saw nice large evenly coloured deep red rubellites, as well as pink and bicolour tourmalines.

We also met up with José Batista at Rio Diamond, specialists in fancy colours, including blue, pink, yellow and green.

Paul-Otto Caesar showed beautiful German cut gems under the name of Oberon & Caswell here in the United States — overseas you will see him under the name Gustav Caesar. Paul-Otto showed us an incredible 15.89 ct kunzite from Nigeria (**2**), as well as a suite of fabulous smoky quartz, natural colour, from old stock, weighing in at 75 ct total weight.

We met up with Raja Shah at Color First, who showed beautiful suites of natural and enhanced colour zircons including colourless, blue, greens and yellows. Imperial colour (pinkish-orange) was apparently heated, while red, mocha (**3**) and champagne colours are reportedly natural. The rose colour is heated Tanzanian material. Raja also showed us a beautiful aqua colour zircon labelled 'ice blue' and jokingly described as 'Paraíba colour'.

Nandu Nichani from Temple Trading Co. had beautiful labradorite and moonstone carvings on cabochons, as well as rainbow moonstone hand carved flower earring jackets (**4**).

Prijems presented display cases of faceted diamond wafers in designer shapes. Due to limited supply, we weren't able to take pictures, but they did bring out a 7 ct faceted wafer and a suite of faceted wafers weighing 11.89 ct total weight. With the 'Millennials' (an alternative name for 'Generation Y') in mind, these broad larger natural diamonds in lower quality material makes owning diamond jewellery so much more affordable.

Galatea, Jewelry by Artist, is speaking directly to the 'Millenials' with its new

Momento Pearl Collection. "If a pearl could speak what would it say?" asks the promotion. This is where the Galatea recordable microchip — a microchip embedded in the pearl or under the featured gem — was being offered (**5**). Older retailers were finding it difficult to understand the concept and operation of the recordable chip, but they did like it when the pearl activated the software to repeat the private video message.

Lastly, there were two guitars in attendance at the jewellery show. One, a Gibson SG, was encrusted with diamonds, while the other, a Fender Stratocaster, was carved and accented with 18 ct yellow gold and diamonds, appearing as a Fabergé egg (**6**). Coronet was the company promoting the Gibson SG diamond-encrusted guitar valued at over $2 million. Guertin Brothers were showing the $1 million Fender Stratocaster with the Fabergé pinecone design.

OVERALL

Looking back at the week, opinions varied as to whether business was good or not. For the retailer, re-energizing the focus on a younger customer base is becoming the norm. Gemmologically, the greater awareness (and acceptance) of lab-grown gem quality diamonds was evident. Cuprian tourmalines, spinel, blue sapphires, rubies, emeralds and opals seemed to be the more popular and available gem materials, even though prices seemed to be firm. Fancy colour diamonds were high on the wish list, but the U.S. might not be the ideal economy for such a rare gem with five-figure per carat price tags for melee. Popularity in colourless and near colourless diamonds can be broken down into three popular groups: 1) Excellent cut in any clarity and colour will do well, 2) G-H colour, SI clarity goods are targeted for more affordability in nicer quality goods, and 3) anything big — preferably at price point categories, which allows for 2, 3 and 4 ct pieces in even lower quality (L, M, N colour / I2, I3 clarity) than you are probably used to seeing. Diamond slices — faceted wafers in low quality — are just as popular as ever, because of their affordability and big show. ■

6: A $1 million Fender Stratocaster that looks like a Fabergé egg. This beautiful guitar has been carved and inlaid with diamonds and 18 ct yellow gold.

All images Gary Roskin.

7: A fabulous strand of top quality tanzanite beads, with faceted diamond roundels. Tanzanite necklace from A G Color, New York.

8: An incredible matched pair of red hot pear shape Mahenge spinels, 19.10 ct total weight, with a magnificent antique cushion cut tsavorite from the Campbell Bridges Signature Collection weighing 10.74 ct. Gems from Bruce Bridges, Bridges Exploration, Kenya.

9: Designed with a sense of the interior, this is the look of jewellery designer Conni Mainne, California.

10: A rare and large U.S. amethyst, found in the Four Peaks Mine in Arizona. Gem from Commercial Mineral Co.

11: Always the showman, Joel Schechter of Honora Pearls shows us these little beauties: 12-15 mm round high lustre, blemished, bead-nucleated Chinese freshwater, and moderately priced.

You had me at hello

Eric Fritz FGA rounds up the recent events held stateside

"You had me at hello," — one of my favourite film quotations, from the movie *Jerry Maguire*. I know, it's a 'chick flick' — a cheesy movie. One of the lead characters, Dorothy, says it to Jerry when he is pleading his case to her in a long-winded explanation. As the tirade rages on Dorothy finally gets her famous words in: "Shut up… you had me at hello." This happens in real life more often than not.

It happens in the gem world, too. When collaborations with other industry groups and individuals are being sought, I formulate an elaborate proposal in my mind and then, to pinch Dorothy's line, we "have them at hello". The overwhelming response to partnering, sharing workshops and presenting labs continues to humble. Those associated with Gem-A know what a great brand we have and, as people learn more, our reach grows. Many times individuals ask to know more and they like what they hear. This is not due to any personal efforts, it is the full spectrum of staff; team Gem-A makes things happen.

American Gem Society (AGS) hosted its annual Conclave in New Orleans, Louisiana, in April, with Gem-A presenting two workshops on spectra and synthetics and simulants. AGS is a highly respected trade organization, promoting the highest ethical and professional standards of its members through continuing education, and certainly sounds like an event Gem-A would want to be at. At first the prestigious Conclave was a little intimidating, but a comfortable feeling was not far behind as many embraced having a Gem-A connection. The workshops were well received and Gem-A has been asked to expand its offerings for the 2016 Conclave, as well as provide regional workshops throughout the United States for Guild Chapters. AGS is thrilled that we would want to share in their mission, one which is the same for Gem-A. Yes, we had each other at hello.

AGS also hosted a Gem-A Gemmology Diploma lab class in May. Eager students from around the country joined together in Las Vegas for an exciting week of learning. Students are there to discover, and the teaching becomes a pleasure as gemmology unveils its secrets. The week begins with groaning and angst which quickly turn to smiles and laughter. What? Gemmology fun?! Is this possible?! Yes… if you have any doubts then sign up and see. Students often stay in touch after and always have some knowledge to share with the class. There was one student who giggled while testing with the refractometer. Apologizing, they said they were just having fun learning practical knowledge to carry them through. The instructor found himself smiling also.

The JCK Show, the largest jewellery industry show in the world, saw Gem-A head to Las Vegas at the end of May. The team consisted of Paveet Amrit FGA DGA, Elaine Ruddie DGA, both from Gem-A's London office; Gary Roskin FGA, Olga Gonzales FGA DGA, Brendan Laurs FGA and yours truly from the USA. Also present were Ya'akov Almor, Gem-A's business development manager, and GemmoRaman partners Mikko Åström and Alberto Scarani. The booth was busy as usual, with people buying equipment from Gem-A Instruments and enquiring about courses. Many friends old and new stopped by the booth; nothing is more satisfying than having people drop in to commend Gem-A for the advances it has achieved in a short period of time under the leadership of James Riley. Accolades confirm we are doing something right. Barnett Bear was also on top form, even celebrating with a sip of champagne after a successful show.


Eric Fritz,Gem-A's North American manager

On a serious note, I attended a planning committee for The Open Forum on Sustainability & Responsible Sourcing in the Jewelry Industry in James's absence during JCK. The two-day event, to be held in March 2016, will include education on current challenges in all sectors of the industry, information on supply chain integrity systems already in place, and will review current expectations of government regulators, banks that finance the industry and consumers regarding responsible business practices. Attendees are expected from all sectors of the industry, including precious metals, coloured gemstones and diamond, as well as financial institutions, trade organizations and international communities. The planning committee consists of a 'who's who' of industry leaders from across the globe and is attempting to bring all the individual groups' guidelines together into a more cohesive form — truly from mine to market. Visit www.jewelryindustrysummit.com for updates and more information.

Moving forwards, in August I will be attending the National Association of Jewelry Appraiser's 44th ACE IT Annual Mid-Year Educational Conference NAJA in Washington D.C. and the Dallas Mineral Symposium, the latter of which Gem-A are sponsoring. September brings the Denver Gem and Mineral show — Gem-A will be there, offering workshops and presentations, as well as information about our courses, membership and Gem-A Instruments. As for me? Gem-A, you had me at "hello". All the best, my friends. ■

The many facets of Idar-Oberstein

Deborah Mazza FGA DGA reports on the recent Gem-A field trip to Idar-Oberstein, held from 13–20 June.

Opal parrots at F. A. Becker

After the success of last year's visit, Gem-A returned with another group of eager gemmologists to Idar-Oberstein, my old stomping ground, to show the gems it has to offer. As most gemmologists will know, Idar-Oberstein has been a historical gem-cutting centre for centuries, and it still has many of the well-known gem-cutting companies that have made gemstones and the town legendary.

After an early start on Saturday morning we arrived with anticipation at our destination. To our surprise, the first person we met was Michael Hügi from The Swiss Gemmological Society, who was visiting the area to collect minerals and visit his contacts. By way of an introduction to the days to come, Michael kindly showed us specimens and beautiful photos of gemstones and inclusions over dinner, and told us of great scientific discoveries in the inclusion world. We couldn't have hoped for a better start!

On the first day attendees were treated to a comprehensive introduction to the geology of the area with a visit to the old agate and copper mines, which gave us an idea of how the miners and farmers of the area lived in the eighteenth and nineteenth centuries. The icing on the cake wasn't then the delicious ice cream we had in Oberstein, but the very interesting tour of the **Gemstone Museum** in Idar by the curator himself, Fabian Schmitz. In between showing us the fantastic gemmological exhibits Fabian impressed us with his passion for his work and told us that the museum is actually his hobby; his main job being with the German Gemmological Institute. Fabian will speaking at the Gem-A Conference in November.

The following days we delved into various workshops, showrooms and cellars full of rough and old-fashioned tools — some still in use. The weather remained beautiful throughout our stay, and delicious Spiessbraten (the local speciality) and Italian icecream sustained us on more than one occasion.

We were allowed to roam freely through **Friedrich August Becker's** museum-like showrooms; a maze of showcases full of interesting minerals, gemstones and carvings of all sorts; saw again the 'Rolls Royce' of loupes by Harald Schneider and compared it to the 'best' – (or so we thought!) – loupes that we had brought with us.

1: Rhodochrosite pig at Herbert Klein.

2: (From left-right) Helen Plumb, Glynis Hunt, Jim Johnson and Dona Sue-A-Quan at Herbert Klein looking at engravings.

3: Christian Klein explains the first sawing of the rough to us and shows the machines used at Philipp Hahn diamond cutter.

Jadeite beads at Groh + Ripp.

Great tourmaline temptations at Constantin Wild.

Stefan Klein of Herbert Klein again wowed us with his skill in carving by perfectly carving the smallest of figures on tourmaline rough with great speed and precision, while his mother and daughter showed us beautiful flowers, gorgeous animal figurines and other objects made for jewellery.

Attendees also visited the only big diamond lapidary in Idar-Oberstein, **Philipp Hahn Söhne**, and were shown around by his son-in-law Christian Klein, who was pleased to present and discuss with us his rough and cut diamonds and give us an overview of the diamond business in Idar, where all stones above 0.5 ct are sold with a certificate by the Diamant Prüflabor in Idar-Oberstein. We reacquainted ourselves with their diamond spheres and the 'Diamond Dog', (a real one), known also as 'Lissy' when not guarding her owner Christoph Hahn in the lapidary.

The always-sparkling **Constantin Wild** presented us with a wonderfully classy brunch, the idea being 'Brunch and Gemstones at Constantin's'. Constantin then exceeded our expectations with the combination, kindly supported by Alexander and Ina.

Jürgen Brunk of **Groh & Ripp** then showed attendees through his basements full of precious rough patiently waiting its turn to be cut into beautiful gemstones, which we also saw in his showroom.

We then discovered a real 'Aladdin's Cave' while visiting **Hermann Petry**, where Thorsten showed us his basement full of cut items, which wait for fashion to turn full circle once again.

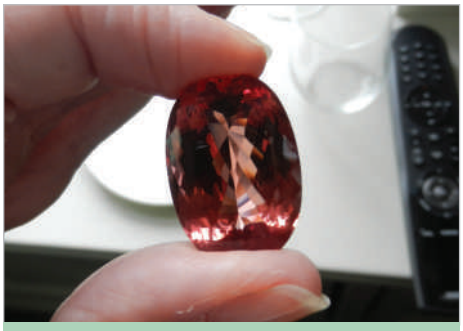
Attendees were treated to a wonderful opal experience at **Emil Weis**, where family Schütz and Weis showed us around their workshop and let us try our skills in cutting and polishing opals — both of which which only look easy! We were shown opals from all over the world, such as Tiffany stone opal from the USA (a purple-blue veined potch opal containing fluorite, beryl and other elements), fire opal from Mexico, black opal and boulder opal from Australia and many other beautiful stones.

Some people might not think much about cameos, but as Helen Plumb of Just Gems in Aberdeen (a member of our party) said of Erwin Pauly: "He turns something simple into something highly desirable." Erwin, who is only semi-retired because he cannot let go of his passion, is often asked by other companies in Idar-Oberstein to make cameos for various occasions at short notice. He also has the urge to teach whoever might be interested; that is why his workshop experience is incredible as everybody gets to have a go at carving. After the workshop, Erwin and his wife Erna entertained us with a glass of wine, some champagne and his accordion — an afternoon that will remain in our most cherished memories for the rest of our lives.

As is the case on field trips, you think you have had an incredible day and the next cannot possibly be as good, but in Idar-Oberstein every day is an amazing experience; every workshop or company we visit is a 'facet' of Idar-Oberstein, while most only get to see its 'crown'. It is a very close-knit community, and word of our stay was soon common knowledge, and we were welcomed with warm open arms.

We also had the good fortune to visit **Atelier Munsteiner**, where we met with Tom and his delightful, talented goldsmith wife, Jutta. Both their talents combine to form fantastic modern jewellery with Munsteiner-cut stones. Tom showed us his new creations, some of which are cut in such a way that the inclusions fall out if you are not careful! Tom's mantra is "work with nature, not against nature", hence the conscious use of inclusions in his work. What really caught my eye this time was rock crystal with solid crystals of rock crystal growth inside, known as negative crystals — truly a crystal within a crystal!

After a brief visit to **Alexander Kreis**' big workshop, another talent in cutting Oregon sunstone, we moved on to the most incredible workshop of them all: that of **Manfred Wild**, whose imagination and creativity in forming works of art so diverse and rich surpasses most; works of art that only a few can own, appreciate and afford. Manfred showed us his creations including the new kaleidoscope made with agate slices — a dream. The day was rounded off by a splendid wine tasting



Imperial topaz at Constantin Wild.

hosted in the hotel by a local wine dealer.

The last day was a strong contrast which started with the very modern, pristine and bright workshop at **Wild & Petsch**, where Axel and Ralf showed us the high tech machinery used for special orders.

We carried on to the **Deutsche Gemmologische Gesellschaft (DGemG)** where we met again with Fabian Schmitz who took us around the classrooms and their collection used for students. Afterwards Dr Ulrich Henn took us around the gemmological laboratory filled with all the modern high tech equipment every lab should have.

The afternoon was dedicated to the old world, where Mr Braun showed us through the impressive (still working) old factory machines in the **Jakob Bengel Haus**, where a new company has now started production of new Art Deco jewellery in the old style, using Galalith from Italy.

The trip ended with an outstanding tour around the **Mineral Museum** in Oberstein, where fossils, cameos and impressive minerals from the area, as well as from around the world, are displayed.

A delicate bee made from gold with rough diamond slice wings by Manfred Wild.

A collection of jaspers at Edelsteinmuseum Idar, featuring mookaite beads, dalmatian jasper, a mookaite woman with umbrella and 'cappuccino' jasper in the background.

Fire opal faceting at Emil Weis.

Beautiful Munsteiner amethyst.

While speaking to the people we met, a frequent concern was raised that presently there aren't any young people interested in making a career as a cutter or engraver. There are plenty of lapidary opportunities around the world but few can offer the access and experience in terms of knowledge and skill, as well as artistry, which can be had in Idar-Oberstein. An apprenticeship would be a fantastic opportunity for anyone interested in living and working in Idar-Oberstein. If anyone is thinking along these lines, I would be only too happy to put them in touch with some of my contacts.

It always makes me very happy to be able to show this gem of a town and its many facets to those in the trade. I lived and worked in Idar-Oberstein for almost 30 years and take for granted many things which amaze outsiders. As Barbara Kolator said: "The trip offers an insight into the practical world of lapidary seldom experienced by a theoretically-trained student."

Everyone in the group loved the experience, and everyone I spoke to had a different highlight of the trip; some were amazed by the amounts of gems and rough some of these companies have in their cellars — sometimes rough which is over 50 years old — While others were very pleased with their purchases and new business contacts, but most were simply thrilled to have made new like-minded friendships. ■

All images by Deborah Mazza.

On behalf of Gem-A and attendees I would like to thank our many wonderful hosts, who enthralled and amazed us with their skills, talent, and sheer passion for gems and minerals:

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Andreas and Gerhard Becker
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Stefan, Christel and Isabelle Klein
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www.besucherbergwerk-fischbach.de

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The ins and outs of polished diamonds: mystery holes

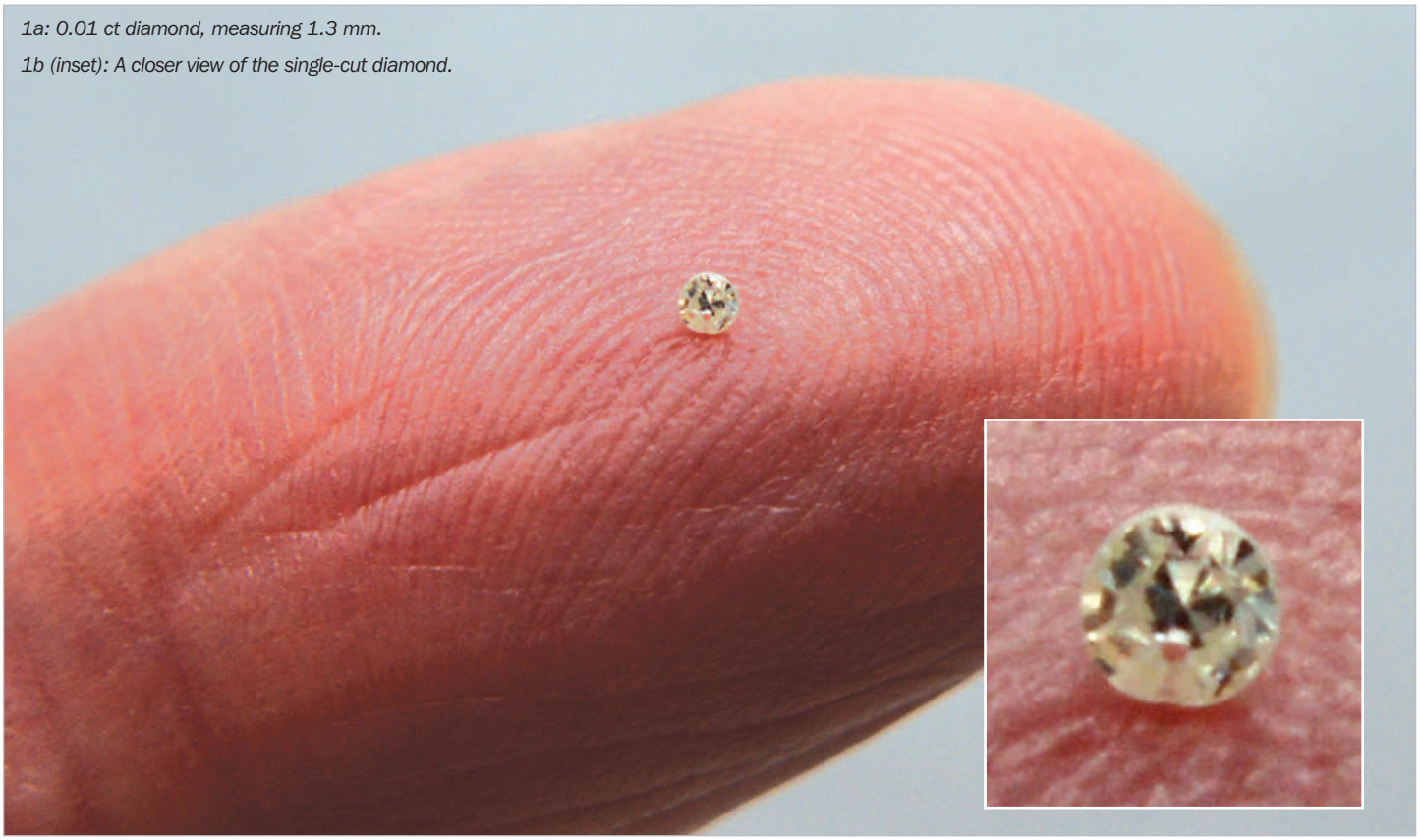
Grenville Millington FGA takes a look at two interesting diamonds with puzzling holes.

So far we have looked at standard features of polished diamonds, albeit possibly uncommon examples, but in this article we focus on two specific diamonds: the first stone is rather small and would be completely overlooked by most people as it only weighs one hundredth of a carat. I tend to look at every stone I purchase through a 10× lens — even these tiny diamonds that are used for setting in ring shoulders or as border stones in lower priced cluster rings. Therefore, if I am buying 5 ct of these diamonds then I shall be picking up and examining 500 stones. These stones will not be graded with the 4Cs, merely looked at to see if they are commercially okay. Even so, in 1980 I viewed a parcel of such stones with enough concentration to pick out the first stone, shown in **1a**.

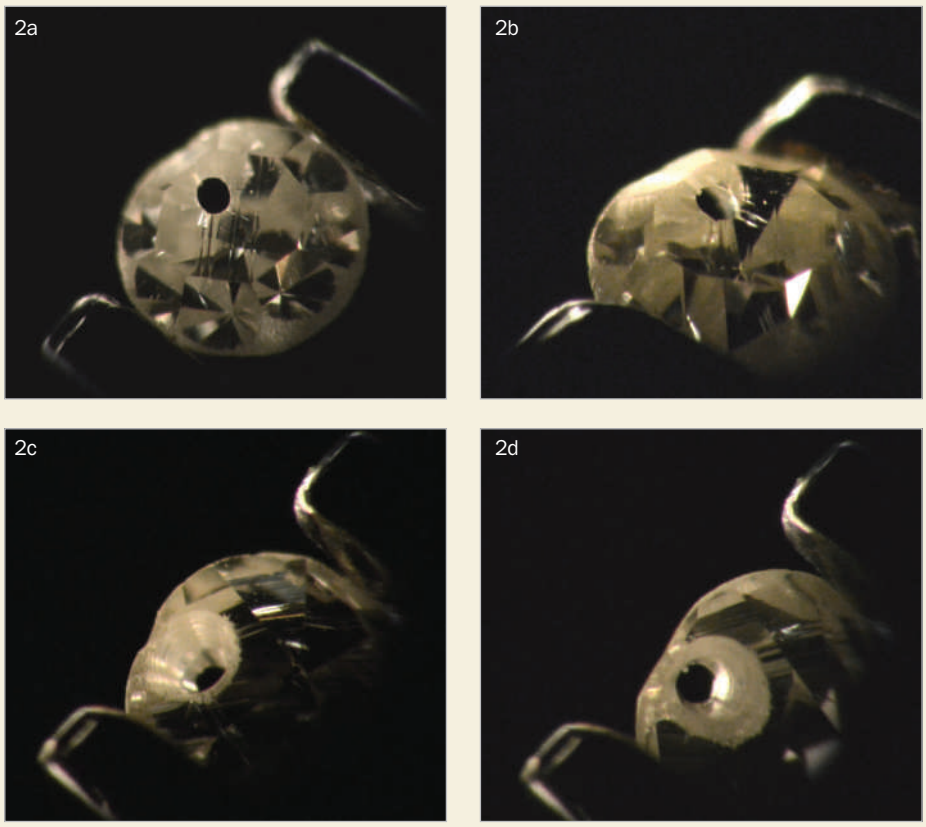
As you can see, the diamond is probably smaller than a standard pinhead, and, as you can perhaps make out in an enlarged view, a single-cut, or eight-cut (an octagonal table with an eight-facet surround), **1b**. If you look very closely at photo **1b**, you may just make out a pink dot near the bottom of the stone. This dot is my finger, visible through a hole in the diamond! I couldn't believe this myself — surely not?! A closer look under the microscope was required, which gave the image seen in **2a**. As you can see, it looks like an eclipse of the sun: a black hole that is a slightly 'off' circle. Another view is shown in **2b**.

What about the other side of this diamond? Photos **2c** and **2d** show the view from the pavilion side. Now that you can see the hole from both ends you immediately notice something unusual: the hole in the table has a sharp perimeter but the hole, on emerging from the pavilion, has a broadening diameter. In addition to this, the wall of the hole has concentric shallow ribs, yet the part nearer the table seems to be smooth. To convince myself that I was actually seeing a hole I threaded a very fine orange fibre through.

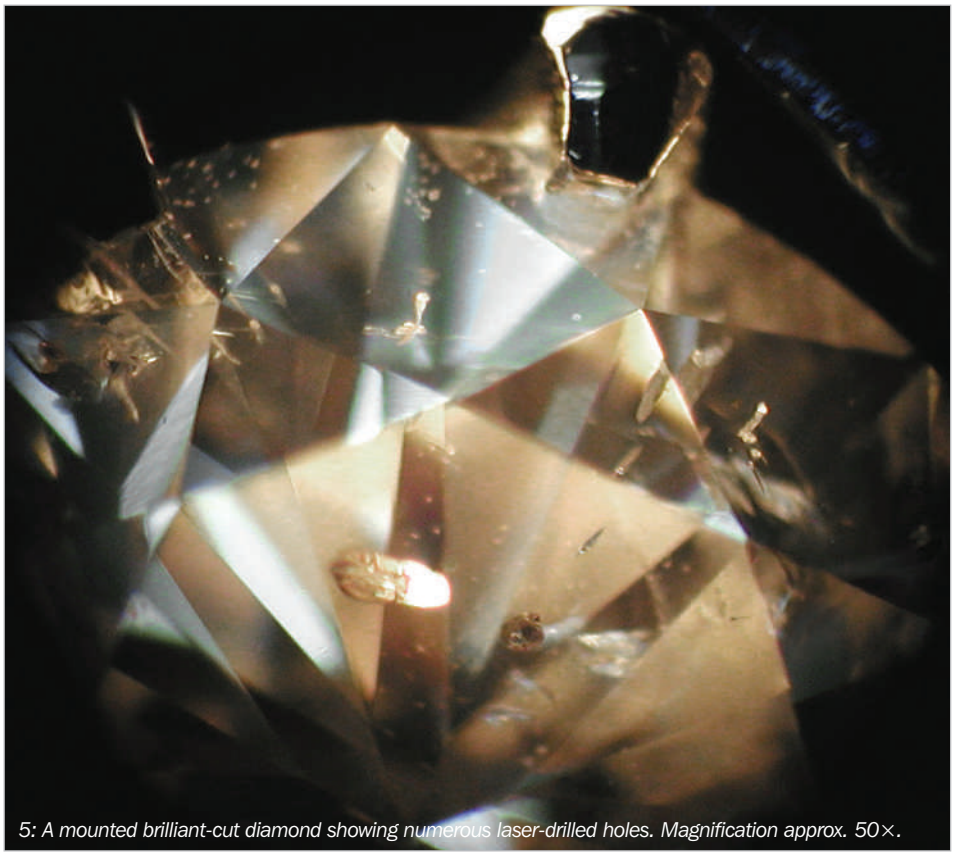
What, then, was it? This was before laser-drilling; yet I could not conceive that



1a: 0.01 ct diamond, measuring 1.3 mm.
1b (inset): A closer view of the single-cut diamond.

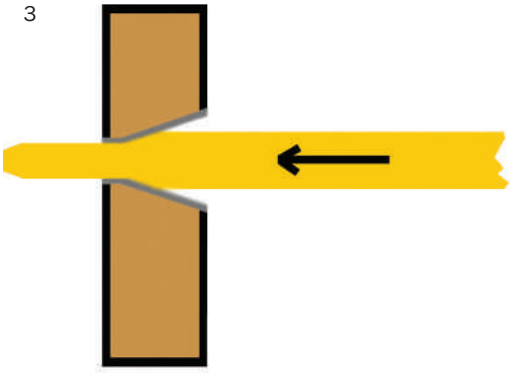


2a: The hole through the 0.01 ct diamond. Magnification approx. 50×.
2b: An oblique view of the hole. Magnification approx. 55×.
2c, 2d: Pavilion view of the hole. Magnification approx. 60×.

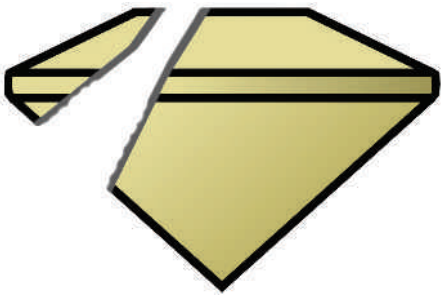


5: A mounted brilliant-cut diamond showing numerous laser-drilled holes. Magnification approx. 50×.

3



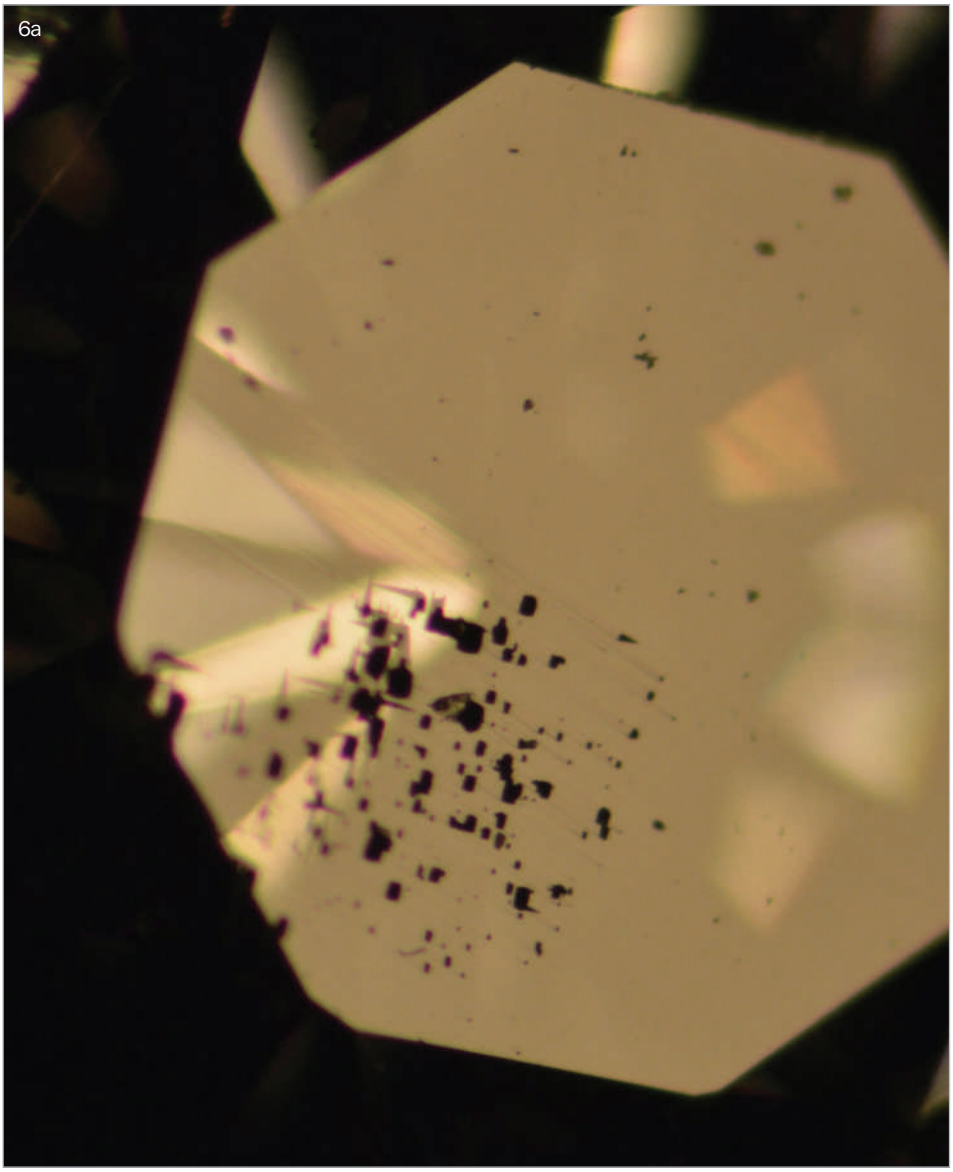
4

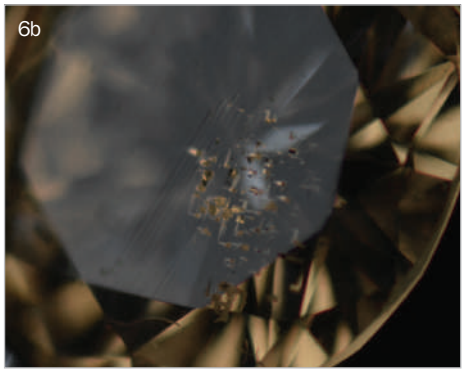


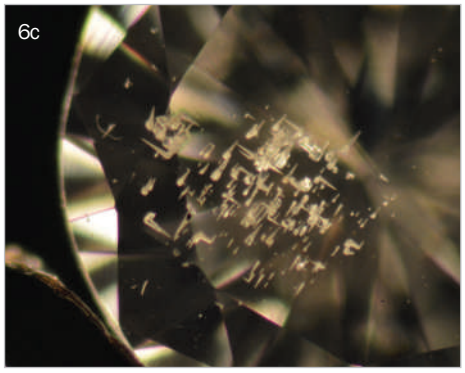
3: Diagram of a cross-section of a steel draw plate with gold wire being drawn through.
4: Diagram of the hole in the diamond.

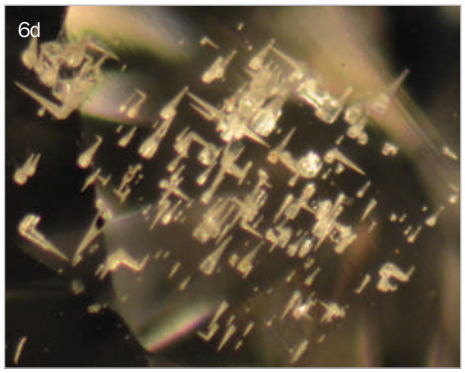
this hole was natural. Although I hadn't seen one, I knew that draw plates had been made from diamond. A draw plate (**3**) is usually a hardened steel plate (more like a block) with a series of graduated, tapered holes for drawing wire into smaller and/or different shapes, such as round, oval, square. The wire is sharpened so that its reduced end fits through one of the holes in the draw plate, and the end is grasped by a pair of pliers and pulled through, forcing the wire to take on the shape of the hole. It is

If you look very closely… you may just make out a pink dot near the bottom of the stone. This dot is my finger, visible through a hole in the diamond! I couldn't believe this myself — surely not?!









6: The 0.07 ct brilliant-cut diamond measuring 2.7 mm, showing: (a) Light reflected from the table. Magnification approx. 70×. (b) Polishing drag marks on the table. Magnification approx. 50×. (c,d) The inclusion cluster of cuneiform shapes. Magnification in 6c approx. 100×.

then (if necessary) passed through the next slightly smaller hole until the required gauge is achieved.

If a diamond was used for a draw plate, the diamond with the required hole would be set into a larger steel supporting plate. Compare the diagram shown in **3** to the diagram of our diamond, (**4**).

I believed that this diamond was cut from one that had been used as a draw plate.

I took this in to class for my students to have a look at and, once viewed, the packet was put away. Some 24 years later, during a routine examination of a parcel of diamonds I was going to purchase, I came across a brilliant-cut that had an odd cluster of inclusions, but notably some pin-pricks on the table. In the years between examining the two stones featured here we had, of course, witnessed the introduction of laser drilling down to dark inclusions in order to 'bleach' them — supposedly to make them less noticeable. A tell-tale sign was a pin-prick on the surface of the diamond which indicated the laser drill hole entrance. A microscope would then confirm the operation. Shown in **5** is a brilliant-cut diamond with numerous laser-drilled holes which have a slightly tapered shape. They are more or less at right angles to the diamond facet surface.

It was such a stone I expected to see when I placed this 0.07ct brilliant-cut diamond under the microscope, **6a**.

Could the hole in the small single-cut diamond be natural after all? You have as much information as I have; what do you think?

Up until this point, I was still thinking this was a laser-treated stone, but was curious about the grouping of so many holes. A different viewing angle is seen in **6b**, which appears to show polishing drag marks coinciding with the surface pits. If this is the case then the holes cannot have been drilled after polishing, as is the case with laser-treated stones.

It was time to look with the darkfield illumination highlighting what was beneath the table facet (**6c**, **6d**).

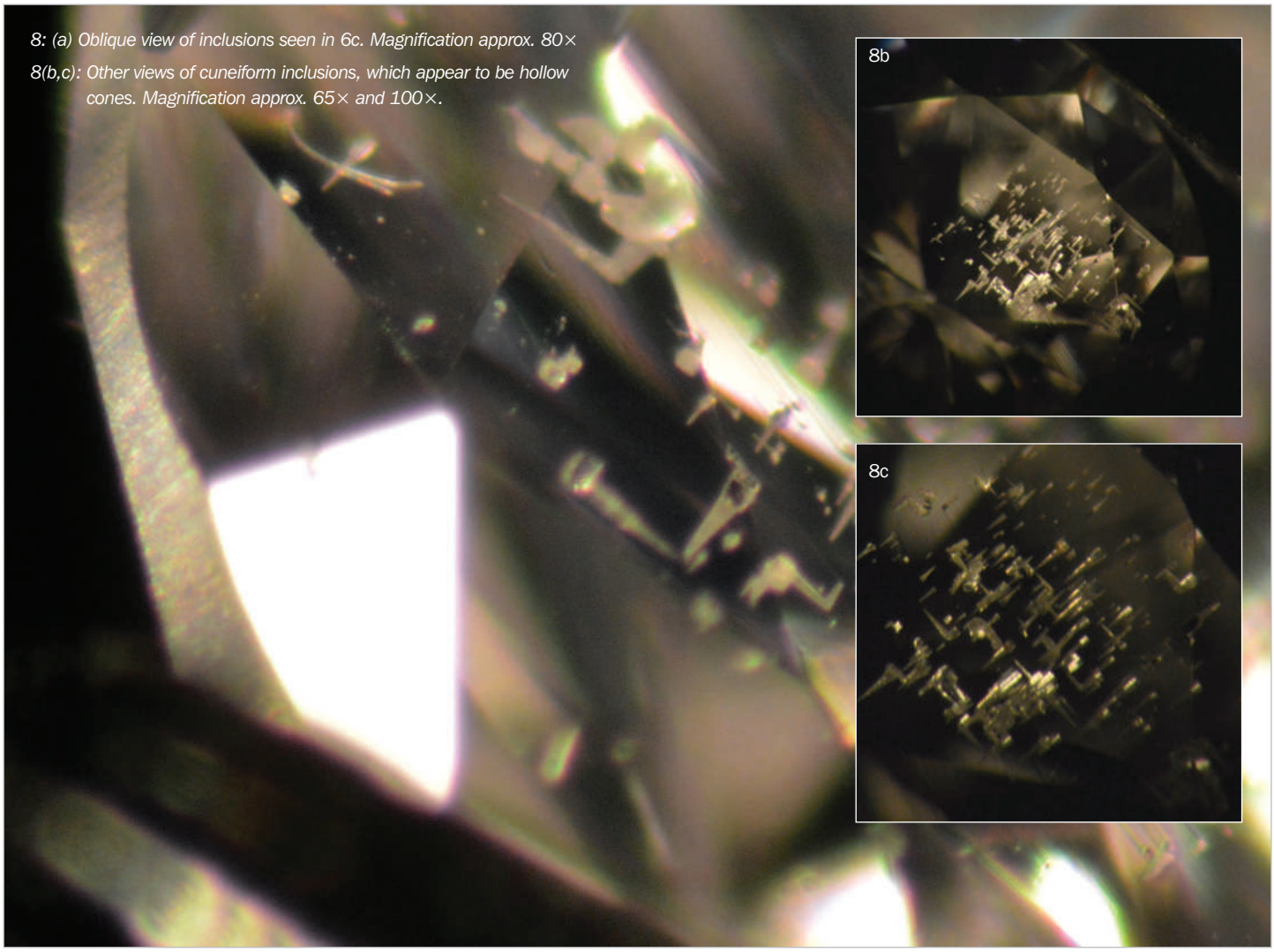
The inclusion spots had a cuneiform shape and were arranged in two sets perpendicular to one another. There was some similarity to the laser drill holes seen in **5**, but they had a regularity that wouldn't be seen in treated stones and the holes were not reaching any other inclusions.

They certainly looked like hollow cones, some of which reached the surface, but most were below the surface, ruling out external drilling processes. I've drawn an exaggerated version, shown in **7**. Shown in **8a**, **8b**, **8c** are the inclusions; the hollow cones were basically tapered holes with ribbed sides.

I conclude that these cuneiform, cone-shaped inclusions are natural, with some of them producing surface pits where they have been cut through with the polishing process. I've never seen anything quite like them before, with the exception of laser-drilled holes (such as those shown in **5**).

It was only after I had taken the photos shown here in 2014 and viewed them together on the computer screen that I realised the similarities between these two stones. Could the hole in the small single-cut diamond be natural after all? You have as much information as I have; what do you think? If anyone is looking at these pictures and recognizes what they are or how they were formed then please email editor@gem-a.com. I would be pleased to know more. ■

7: Exaggerated diagram of the conical holes within the 0.07 ct diamond.



8: (a) Oblique view of inclusions seen in 6c. Magnification approx. 80×
8(b,c): Other views of cuneiform inclusions, which appear to be hollow cones. Magnification approx. 65× and 100×.

Catriona McInnes

Catriona McInnes MBE MA FGA, considered by all who knew her as the smiling, welcoming face of the Scottish Gemmological Association (SGA), sadly passed away on 20 May 2015.

After gaining a degree in Politics and Economics Catriona trained as a mathematics teacher. It was only when she joined the Glasgow Geological Society in the early 1970s that she took a keen interest in geology, returning to university in 1976 to complete a degree in the subject, during which time she helped catalogue mineral specimens for the Hunterian Museum.

Catriona met her husband John on a field trip and they married in 1977. They moved to Edinburgh that year for John's work at the British Geological Survey. Catriona continued teaching in secondary school where she developed the course for the new subject of Computer Studies, receiving an MBE in 1996 for her services to education.

All of Catriona and John's holidays and spare time were spent (along with their children and dog) collecting minerals and gemstones. They visited many localities described by M. Foster Heddle in *The Mineralogy of Scotland* and have amassed an immense collection of Scottish minerals, earning them a worthy and detailed mention as private collectors in *The Minerals of Scotland Past & Present* by Alec Livingstone.

Once the family grew up Catriona and John focused their holidays around visits to famous mineral localities in many parts of the world, where they bought and collected gemstones. After completing her Gemmology Diploma in 1997, Catriona taught gemmology at university, as well as conducting practical tutorials for Gem-A students in Scotland and Northern England.

She set up her own business collecting and selling gemstones with a speciality in Scottish gemstones, including sapphires from Lewis and Mull, smoky quartz from various areas in the Cairngorms, prehnite from Loanhead Quarry Ayrshire, garnets from Elie Fife and tourmaline from Glenbuchat, to name but a few.

Originally Scottish students attaining FGA status became members of 'EGGS' — the Edinburgh Gemmology Group run by Brian Jackson — but the popular group was restricted in numbers as the meeting location was too small, so there was no room for the newly qualified gemmologists to join and continue their passion. With the help of friends, Catriona resurrected the Scottish branch of Gem-A to encourage an interest in gemmology in Scotland. She took over the organization of the annual conference in 1999 which went from strength to strength with her great enthusiasm and superb organizational skills. Catriona made everything run like clockwork and made sure there was plenty of time for delegates to have fun as well as to learn more about gemmology.

The SGA was founded in 2008, with Catriona being one of the five inaugural members. She was appointed secretary of the organization — and was the most wonderful secretary any organization could have wished for. Catriona helped establish the SGA Conference as one of the friendliest gemmological conferences worldwide.

Scottish gemmologists have lost their shining star and special friend. Catriona had a smile and kind word for everyone, and gave her time and enthusiasm so freely. We will all miss her and cherish her memory.

Gillian O'Brien

Scottish gemmologists have lost their shining star and special friend. Catriona had a smile and kind word for everyone, and gave her time and enthusiasm so freely.

Catriona will be deeply missed by all at Gem-A. Our thoughts and condolences go out to Catriona's family and friends, and to all at the SGA.

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