

# Gems & Jewellery

Spring 2019 / Volume 28 / No. 1

TRAVELS  
IN TUCSON

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FOSSILS FROM  
THE OCEAN

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EDWARDIAN  
ELEGANCE

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IDENTIFYING  
AMBER

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LIVING CORAL  
COLOURS



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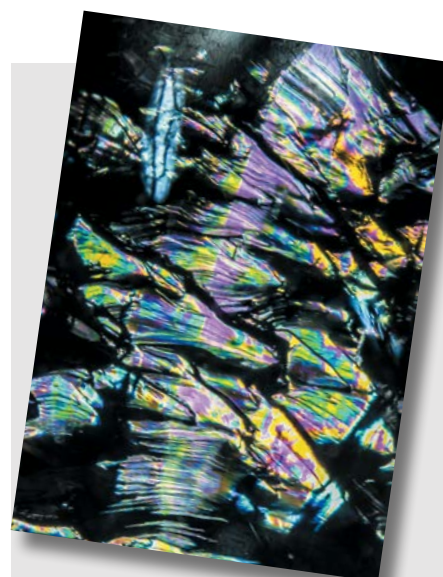
# Gems & Jewellery

SPRING 2019

## JURASSIC JET OF ASTURIAS

Alvaro Martínez-Calvo, a geologist and graduate of the University of Oviedo in Asturias, Spain, offers an overview of Asturias azabache, also known as Asturias jet.

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## COVER PICTURE

'Rainbow Range in the Clouds' in girasol quartz by Rebecca Tsang FGA.

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## TREASURE FROM ANCIENT OCEANS

We interview anthropologist, conservationist and entrepreneur, Volker Bassen to find out more about his global adventures unearthing exceptional fossilised clamshells.

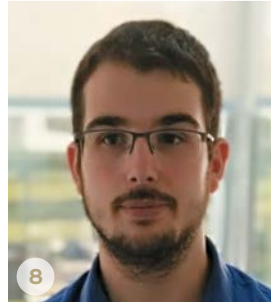
## ABSENT 'AMBER'

If you discovered a necklace possibly made of amber, could you accurately identify it with confidence? This was the question Kerry Gregory FGA DGA asked herself recently when searching through some treasured family items.

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## Gems&Jewellery – Spring 2019 featured contributors

### 1. RUI GALOPIM DE CARVALHO

Rui Galopim de Carvalho FGA DGA is editor of *Portugal Gemas*, associate editor of *The Journal of Gemmology*, Portuguese delegate at CIBJO and consultant to the Portuguese National Assay Office. He is also a lecturer on the history of gem materials in Portuguese jewellery.

### 2. MAGGIE CAMPBELL PEDERSEN

Maggie Campbell Pedersen FGA is president of Gem-A and an associate of the British Institute of Professional Photography. She is an accredited lecturer for the Arts Society (formerly NADFAS). For many years she has specialised in organics and has published two books as well as numerous articles on the subject.

### 3. KERRY GREGORY

Kerry Gregory FGA DGA is a Gem-A online tutor and ATC. Following a career in pawnbroking, Kerry founded her new business, 'Gemmology Rocks' in 2017, which specialises in providing affordable and accessible gemmological support to businesses in the industry, with a focus on commerciality as well as practical advice.

### 4. OLGA GONZÁLEZ

Olga González FGA DGA is the CEO and founder of Pietra PR and has over 10 years' experience in the field of jewellery communications. She currently serves as

president of PRSA-NY and is the networking director for the Women's Jewelry Association's New York Metro Chapter Board.

### 5. STARLA TURNER

Starla Turner FGA GG joined Lang Antiques in 2012 where she specialises in gemstone and jewellery grading and identification. Her jewellery and education credentials include a BA in Education from the University of British Columbia, and her roles as a tutor for Gem-A's Gemmology Diploma and mentor for the GIA's Graduate Gemologist Programme.

### 6. JAN ASPLUND

Jan Asplund FGA DGA, is a freelance gemmologist, consultant and teacher with a special interest in the history of gemstones. Jan teaches gemmology and lapidary at Luleå Technical University and is a board member of the Swedish Gemmological Association. He regularly writes texts and articles for gemstone and jewellery publications, as well as giving lectures at gem and jewellery conferences.

### 7. JOHN BENJAMIN

John Benjamin FGA DGA FIRV began his career in 1972 at Cameo Corner, the celebrated Bloomsbury antique jewellers. In 1976 he joined Phillips Fine Art Auctioneers as a cataloguer and valuer

where he remained for 23 years, ultimately becoming international director of jewellery with responsibility for the sale programmes in London and Geneva. In 1999 he established his own jewellery consultancy John C Benjamin Limited acting as an independent consultant for a private and corporate client network.

### 8. ALVARO MARTÍNEZ-CALVO

Alvaro Martínez-Calvo is a passionate young geologist with a BSc. in Geology from the University of Oviedo, and a special interest in gems, minerals and ore deposits. Alvaro has travelled to mines and outcrops in his spare time looking for fine minerals and gems in Spain, Portugal, Argentina, Brazil, Chile, Perú, Bolivia, France and Switzerland.

### 9. GRENVILLE MILLINGTON

Grenville Millington BA (Hons) FGA RJDip graduated from Birmingham College of Art & Design with a degree in 3D Design, specialising in jewellery. Alongside a full-time career in the jewellery industry Grenville also taught the NAG Retail Jewellers' course, the Gem-A Gemmology Diploma and various one-day gem courses at the School of Jewellery. During his time in Birmingham's Jewellery Quarter, he offered a gem testing and diamond grading service to the trade and he has been a Gem-A examiner since 2007.



# Straight from the heart

Opinion and comment from CEO, Alan Hart FGA DGA

Welcome to the first issue of *Gems&Jewellery* in 2019. The only negative of our first tentative steps into spring is that the excitement of the annual Tucson gem shows becomes a fading memory. There is nothing quite like our yearly trip to Arizona, and we are always inspired, awed and sometimes flabbergasted by the quality (and rarity) of many of the gemstones and minerals on display.

This year though, Gem-A had some very special announcements of its own. I am thrilled to reveal that Gem-A has established a new not-for-profit entity in the United States – Gem-A USA – designed to facilitate Gem-A's gemmological education for budding American gemmologists. Gem-A USA will provide the same Gemmology and Diamond Diplomas and operate to the same standards of education that Gem-A is recognised for across the world.

To mark this exciting step into the United States, Gem-A USA announced on February 7 that JTV (Jewelry Television) will be the first to offer the Gemmology Foundation, Gemmology Diploma and Diamond Diploma courses in Knoxville, Tennessee as an Accredited Teaching Centre (ATC). As a long-standing partner of Gem-A and sponsor of the annual Gem-A Conference, JTV was an obvious choice to support Gem-A USA as it grows in the United States.

Gem-A USA is now welcoming enquiries from prospective Accredited Teaching



A 99.75 carat Australian opal (from Lightning Ridge) as seen at the Tucson gem shows.

Centres (ATCs) across the entirety of the United States. Our global network of ATCs includes schools, colleges and institutions with a passion for training the next generation of gemmologists and diamond specialists. Now Gem-A USA is seeking to establish these all-important relationships, while continuing to offer Gem-A courses via Online Distance Learning (ODL). I hope you will agree that this is a very exciting step for Gem-A education and Gem-A USA. Please do contact our London HQ if you would like to find out more.

We made this exciting announcement at Gem-A's Big Gem Bash, which is now in its fourth year. This fantastic event is our way of gathering together Gem-A Members, colleagues and friends from across the United States at the Scottish Rite Cathedral for an evening of networking. We would like to thank everyone who joined us this year and we look forward to seeing you again in 2020.

Of course, we must thank everyone who visited the Gem-A stand at AGTA GemFair Tucson from February 5-10. We had a fantastic time promoting our education offering to prospective students, while also finding the time to explore the fantastic gemmological treasures on display. A big round of applause must also go to Gem-A team members Sam Lloyd FGA and Charles Evans FGA DGA who delivered an engaging workshop and lecture respectively.

I hope you enjoy this issue of *Gems&Jewellery*, which once again explores the wide and wonderful world of gemmology and its related disciplines.



I am thrilled to reveal that Gem-A has established a new not-for-profit entity in the United States, Gem-A USA...



Announcing JTV as Gem-A USA's first Accredited Teaching Centre in Tucson, Arizona.

There's something for everyone this spring, including kings, queens, cardinals, sharks, sapphires, garnets, precious corals, amber, giant clamshells, Edwardian designs, quartz inclusions, grandidierites, Asturias jet and more... what other magazine can say that!

Best wishes

Alan Hart FGA DGA



Alan Hart with renowned artist jeweller, Wallace Chan, at the 2019 Tucson gem shows.



# Gem-A News

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

## THE PRESIDIUM GEM TESTER II

**This updated and improved coloured gemstone tester is ideal for on-the-go gemmologists thanks to its new compact, sturdy and portable design.**

**N**ow in its second generation, the Presidium Gem Tester II offers a quick and easy way to separate diamonds/moissanites from coloured gemstones, while also identifying up to 16 coloured gems based on their thermal conductivity. The newly-redesigned device is now smaller, sturdier and more practical for the travelling gemmologist, coupled with superior in-built calibration for ease of operation both indoors and outdoors. The Presidium Gem Tester II boasts the

industry's thinnest retractable probe tip (0.6mm) for testing coloured gemstones as small as 0.02 carats, and there's a useful buzzer to ensure your gemstone is accurately in contact with the probe during testing. The device runs simply on two AA batteries, although an adaptor is also included. ■

**If you require any further information, advice or simply wish to make a purchase (Product ID DIT0018) then please email [instruments@gem-a.com](mailto:instruments@gem-a.com)**



**Retail Price £240 + VAT**  
Current Gem-A members and students receive a 10% discount on instruments



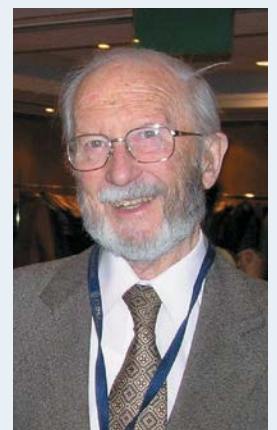
### OBITUARIES

#### Christopher Sean Chalk FGA

We are sad to announce the passing of Gem-A Member Christopher Sean Chalk FGA (8 Feb 1949 - 13 July 2018). After qualifying as a gemmologist and goldsmith Christopher moved to Germany in 1971 to work at the Adam Hörner Atelier in Schwäbisch Gmünd. He returned to England to take up the post of gemmology lecturer at KIAD now UCA: University for the Creative Arts, where he taught for 22 years. Alongside this, he developed a metalwork course for Canterbury Steiner School and all his pupils gained a good depth of knowledge and skill. Some of them later became silversmiths and jewellers, and in recent years a number were accepted on goldsmith apprenticeship schemes. Chris' love of gems and the wonders of the mineral kingdom continued and he shared his knowledge with pupils, students and also the general public at Christmas bazaars and fairs. He has been described as a caring thoughtful talented and modest man who inspired, helped and supported the many people he met in his various roles.

#### E. Alan Jobbins FGA (Hons)

*Rui Galopim de Carvalho FGA DGA shares his thoughts on the passing of E. Alan Jobbins (1925-2019).*  
"Alan was one of the most highly-esteemed gemmologists in the world, not only because of his long scientific career, but also because he was truly kind and generous — making a difference in the lives of many young gemmologists. That was certainly my case. He began his brilliant career as curator of minerals and gemstones at the Geological Museum in London where he served for 30 years with numerous trips to Myanmar, Cambodia, Vietnam, Sri Lanka, Brazil and East Africa, publishing related scientific articles. He also had the privilege to study the British Crown Jewels. Alan was a captivating lecturer with the capacity to make difficult science easier to understand. It was a delight to listen to him and be inspired by that passion for gems and minerals. Among many honours, he was president of the Society of Jewellery Historians and Gem-A, on the review board of *Gems & Gemology*, editor of *The Journal of Gemmology*, founding member of the International Gemmological Conference and ICA, and recipient of the Antonio C. Bonanno Award for excellence in gemmology. Alan will certainly be remembered by many as a top gemmologist and educator. I'll remember him as a friend and mentor that believed in me in my early years. Rest in peace my jolly good fellow."







# GEM-A'S BIG GEM BASH IN TUCSON

On Thursday, February 7, Gem-A celebrated its fifth annual Big Gem Bash at the Scottish Rite Cathedral in Tucson, Arizona.

**A**fter a long day of gem hunting, Gem-A's Big Gem Bash is the perfect way for Members, friends and colleagues to relax and enjoy a drink or two, courtesy of the free bar. Highlights of the 2019 event included live music and the formal launch of Gem-A USA — a new entity that will offer Gem-A's recognised Gemmology Diploma and Diamond Diploma courses in the United States. We would like to thank JIBNA, sponsors of Gem-A's Big Gem Bash, and everyone who joined us for such a fantastic evening of conversation and networking. ■







# Ruby miner at the Dattaw Mine in Mogok, Myanmar

**Photographed hundreds of metres below ground, this solitary image of a miner standing at the mouth of many winding tunnels is the work of Wim Vertriest GG FGA. Here, he explains the story behind the snap, which impressed the judges of last year's Gem-A Photographer of the Year competition.**

**M**ogok has been the most coveted ruby source for centuries. Ruby mines are found all over the area and some have been in existence for several decennia. One of the most famous mines is in Dattaw, located near the top of a mountain. Over the years, it has produced some spectacular gems and crystal specimens. Miners use small drills and limited volumes of explosives to advance their tunnels through the marble host rock in search of the gemstone. All through the mine, the walls are covered with crystalline calcite.

This photo was taken about 120 metres underground in an area where several mining tunnels come together. A single lightbulb illuminates the whole cavern where tunnels are branching in at least five directions. The main tunnel (to the left of the miner) goes back to the surface. A steel cable is used to hoist buckets of marble to the surface where it is broken further to reveal rubies.

*Wim Vertriest GG FGA is currently supervisor of field gemmology at GIA, where he is responsible for sample collection and documenting local gemstone dynamics in gemstone mining areas around the globe. He has (co-)authored several articles on new gemstone localities, updates on existing mining localities, in-depth gemmological studies and treatment experiments. ■*



Friday 3<sup>rd</sup> May to Monday 6<sup>th</sup> May 2019

## The Scottish Gemmological Association Annual Conference

at The DoubleTree by Hilton Westerwood Hotel  
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Full details are available on our website:

<http://www.scottishgemmology.org/conference/>



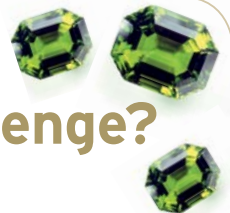
Image: Kim Rix Photography

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**Qualification:**  
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**Entry Requirements:**  
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# UNDER THE MICROSCOPE

Long-serving *Gems&Jewellery* contributor and Gem-A examiner, Grenville Millington FGA, shares images of four unusual sapphires that recently crossed his desk, providing useful insights for amateur gemmologists and professionals alike.

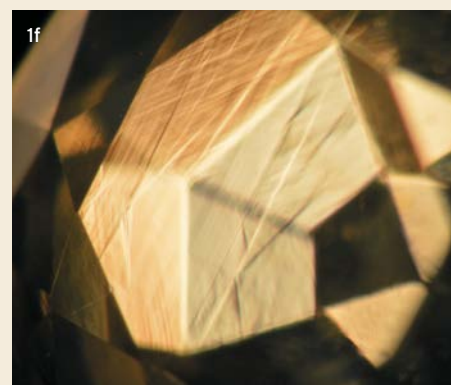
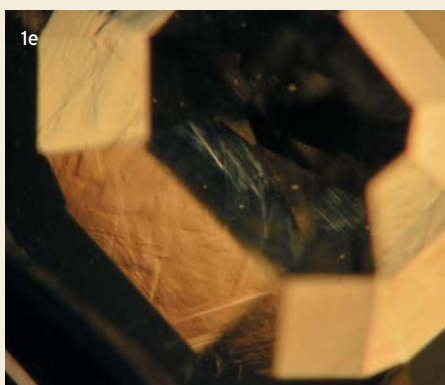
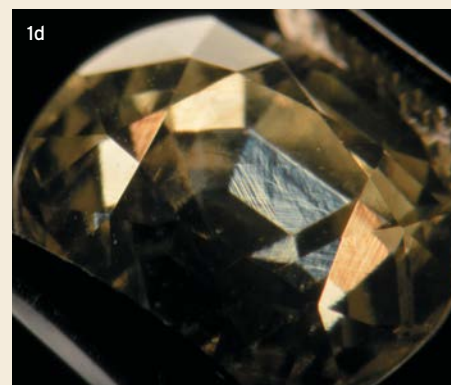
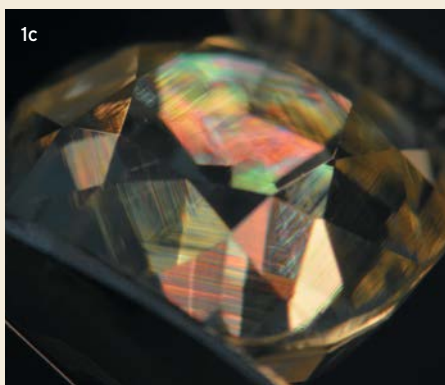
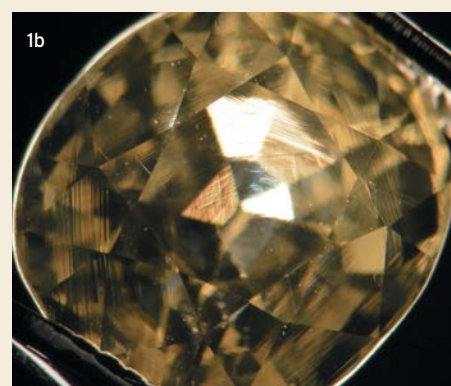
A routine batch of stones sent to me for testing recently yielded some coincidences that only served to add to the usual interest of gem examinations. The stones consisted of rubies, emeralds and sapphires, but it was four of the supposed sapphires that resulted in this article.

## STONE 1

This light yellow-green stone, a pale lemon in colour, was immediately arresting on examination with a 10x lens because of the unusual graining or growth striae (1a).

It is usual to see evidence of graining in East African yellow sapphires, but this stone had very pronounced graining that more or less followed the full hexagonal growth of the corundum crystal (1b). The graining was also highlighted in the view along the optic axis, between crossed polars (1c). In fact, in several directions of viewing under the microscope, this graining appeared very similar to the growth patterns shown in some hydrothermal synthetic stones (1d-1f). Could this stone be a hydrothermal synthetic? Other inclusions that were more solid in nature were very few — a small crystal-type inclusion (too small to readily identify) (1g) and an unusual double line inclusion (or 'streamer' of small particles) (1h).

Standard gemmological testing revealed the refractive index of the stone to be 1.762-1.771. A full iron (Fe) spectrum could also be observed in the example, with definite absorption bands in the blue (~450nm) portion of the spectrum. A corundum of this unusual light colour may or may not give a noticeable spectrum



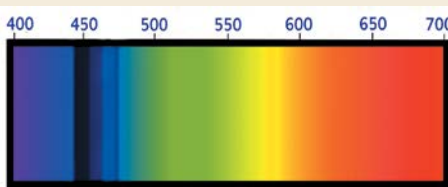
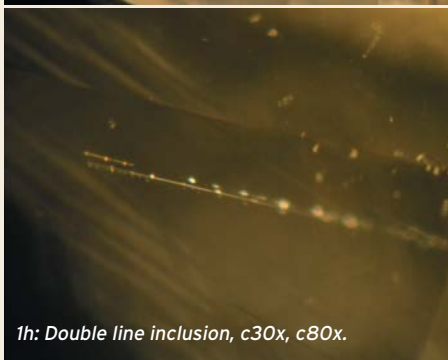
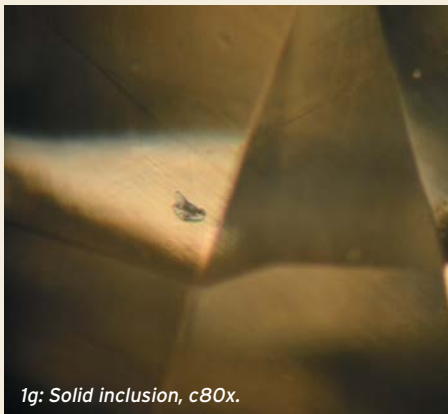
1a: Light yellow green stone, 1.82ct.

1b: Full hexagonal pattern of graining, c.10x.

1c: Clearer view along optic axis between crossed polars, c.10x.

1d, 1e, 1f: Multiple growth/graining effect, c.10 - 30x.





line in the blue (an absence would make identification more difficult). With that thought in mind, the stone was examined through the spectroscope and yielded a much stronger result than expected.

Both tests confirm the identity of the gemstone as corundum, variety sapphire, and the clear full spectrum suggests the stone is natural, but does not indicate any treatments. Under LWUV, the result was a dull apricot. The spectrum can be seen in (1i).

Not all gems produce a recognisable spectrum, i.e. dark lines or bands. For those that do, the spectroscope is a

very strong testing tool. The problem for some gems is that the result is not always consistent. At one time, perhaps 30-years ago or longer, natural blue sapphires gave absorption lines in the blue part of the spectrum, or dark bands, while synthetic sapphires gave no line at all. Natural yellow sapphires showed no line if from Sri Lanka, but a thick dark band if originating from Australia. Synthetic yellow sapphires did not display any lines or bands.

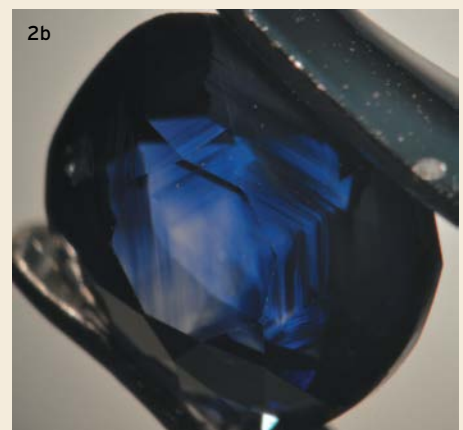
Today, with many corundum gems originating in East Africa, the situation has altered. Yellow sapphires from that part of the world give a very dense set of bands

This highlights the increased importance of internal features to identify it as either natural or synthetic.

that merge almost to one thick band in the blue area of the spectrum (see Stone 3), whilst a strong blue colour sapphire (that would have been guaranteed to show some absorption in the blue part of the spectrum, being from Asia or Australia), may not show any absorption at all or maybe a faint smudged line. The next stone tested, Stone 2, demonstrates this well, with a strong blue colour but shows no line. This highlights the increased importance of internal features to identify it as either natural or synthetic.

## STONE 2

This was of similar size to Stone A, but of a dark and rich sapphire blue (2a). The view under the 10x lens was very reminiscent of Stone A, with what might be described as a frenzied version of hexagonal zoning. In this case, rather than the graining line abundance, the stone displayed streaks of blue accompanied by silk lines (2b, 2c). There were also small crystals and feathers. Together with the observed hexagonal zoning, there was no doubt that this was a natural stone. The R.I. was 1.760-1.769, confirming the identity of the stone as corundum. Under LWUV



2b, 2c: Streaky zoning, plus silk, c10x.

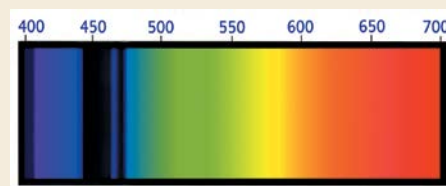
there was no reaction. You would expect a sapphire of this rich a colour to produce a distinct spectrum, although stones of a fine blue colour, with no trace of green, often only give a single narrow, woolly band at 450nm.

This stone gave no dark lines or bands of any description in the blue area of the spectrum, although I could perhaps persuade myself that there may have been a very faint smudge! Another anomaly of East African sapphires, as no doubt this was the origin of these two stones.

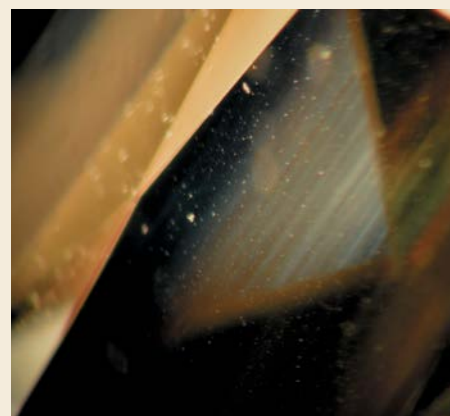




3a: Yellow stone, 4.76ct.



3b: Dense iron spectrum of yellow sapphire, 4.76ct.



3c: Faint straight, parallel graining and dispersed dot-like inclusions, c60x.

### STONE 3

The next gem I looked at was bright, golden yellow, and appeared to be scissors-cut with very symmetrical faceting. It was in a polythene bag with a silver mount that it had not long been removed from.

It gave all the appearances of being a synthetic flame-fusion yellow sapphire. I was a little dismayed at this because the testing of such stones often requires the finding of Plato-lines to prove the synthetic origin, and this is a fairly long and messy operation. On cleaning the stone (wash in warm soapy water and a good wipe) I could see the cut was standard step-cut on the pavilion but what is termed 'princess-cut' in the UK on the crown (3a). Just for confirmation, the RI was measured at 1.765-1.774, denoting corundum.

Under the 10x lens this stone appeared to be clean so it was with the expectation

of 'no spectrum' that I next took it to the spectroscope. Once again, this instrument gave an unexpected result (3b). A look under the microscope eventually showed some parallel growth lines and some dot-like inclusions as a dispersed cloud (3c). These observations confirm the stone to be natural.

### STONE 4

This was another strong yellow stone that easily, under the 10x lens, showed undulating veils of fine droplets and/or coarse droplets. It was not difficult to align the stone to find graining lines. It looked like an East African heat-treated yellow sapphire. The RI was 1.765-1.774 – conclusive of corundum – and the reaction to LWUV was dull orange. No problems or surprises with this stone.

So, why is it included here? Whilst looking at the included veils under the

microscope I came across a very small area that was similar to the unusual parallel lines inclusion found in Stone A (4a, 4b).

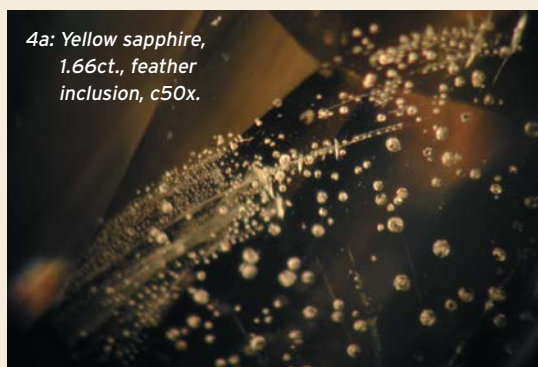
### SUMMARY

The first sapphire examined had an unusual light colour, mid-way between yellow and green. It displayed very strong growth striae forming a full hexagon. In addition to an unidentified tiny inclusion, it showed a pair of included parallel lines. Fortunately, there was a distinct sapphire spectrum to identify the stone as natural.

The second stone had a strong blue sapphire colour, and although we are used to hexagonal colour zoning in sapphire, the display was streaky and, like the first stone, formed a full hexagon. Unlike the first stone, however, there were no absorption lines in the blue. The R.I. and other inclusions confirmed this was a sapphire.

The third stone had all the appearances of a synthetic sapphire, but the spectroscope showed an intense iron spectrum to confirm natural sapphire origin. Finally, the fourth stone had several indications of being yellow sapphire and obligingly gave a similar inclusion to that in the first stone, albeit as part of a much larger feather.

No information was given with these four stones, but the above results suggest they are of East African origin. ■



4a: Yellow sapphire, 1.66ct., feather inclusion, c50x.



4b: A closer look at the parallel lines, c80x.

All images courtesy of the author.



# Jurassic Jet of Asturias, Spain

Alvaro Martínez-Calvo, a geologist and graduate of the University of Oviedo in Asturias, Spain, offers an overview of Asturias azabache, also known as Asturias jet.



*A small seam of jet exposed in the coastal town of Villaviciosa in Asturias. The jet found on the coast is usually of low-quality and is altered by its environment.*

Probably the world's best quality jet is found along the north-eastern coast of England, near the city of Whitby. The Jurassic jet of Whitby has been worked for centuries since prehistoric times, enjoying particular success during the Victorian era. However, less than a thousand miles to the south of Whitby, on the northern coast of the Iberian Peninsula there are other, different deposits. The aim of this article is to give insight into the deposits of jet in the Asturias region of northern Spain.

Asturias jet is technically a type of sub-bituminous coal, with a high content of hydrogen-rich hydrocarbons, low maturity of the organic components, conchoidal fracture and very bright surfaces. Asturias jet does not have a crystalline structure and is formed by free hydrocarbons, amorphous organic matter and pyrite or marcasite iron sulphides ( $\text{FeS}_2$ ). The content of pyrite increases the density of the jet but decreases its stability because the sulphides could oxidise and form sulphates, opening cracks and fracturing the jet.

Jet is not usually found in continuous seams as in other types of coal. Its typical occurrence is linked to coastal sedimentary facies where wood fragments from trees of the Araucaraceae family are transported and accumulated. The lignin of the wood is transformed

into jet in anoxic conditions, usually in the presence of saline water. In this depositional environment, the jet bearing levels are found in channel, deltaic and point bar facies of terrigenous rocks, such as sandstones, and in coastal swamp facies, where jet is found within shales. The first type of environment is similar to the Lastres Formation, where Asturian jet is found.

The Lastres Formation, dated from the Upper Jurassic, is composed mainly of carbonate cemented sandstone with some layers of impure sandstones, marls, shales and limestones. The rock sequence has a thickness of up to 500 metres. The formation is considered to be part of an ancient deltaic system and the jet bearing levels are thought to be related to forests near the coastline-located mud plain, coupled with the influence of seawater and the allochthonous accumulation of plants in abandoned channels, or in the floodplains at the final part of active deltaic channels.

It is in the upper-medium part of the rock sequence where jet is found



*A view of an ancient jet mine near Oles. Image courtesy of Jose Manuel Sanchis.*



in small beds within the sandstone (also associated with other fossils of vegetation). These accumulations have an average thickness of 5 centimetres and an average length of 6-8 metres, although in certain places bigger logs were found, especially during the most intense mining of the 19th century.

Of course, jet was used by inhabitants of the surrounding area long before the Victorian era. Small carvings of jet have been noticed in Palaeolithic and Neolithic sites in Asturias. The presence of jet artefacts, rough material and carvings has also been documented in Celtic and Roman sites in the regions of Asturias and Galicia.

During the Middle Ages there was a surging number of jet traders and carvers. The journey to Santiago de Compostela (the capital of north west Spain's Galicia region, known as the culmination of the Camino de Santiago pilgrimage route) increased demand for jet, especially to be worn as an amulet, usually in the form of a *higa* – a small ornament in the form of a closed fist.

The demand for jet from the British market triggered a 'jet rush' in the area, mostly for export as rough to the UK.



*Traditional methods for working jet rough.*

As an example, in 1412 the guild of jet carvers was established in Santiago de Compostela and in 1443 the guild set up a series of rules to try to ban and control imitations. Nowadays, the name of the street where the jet carvers settled is still named Azabachería, from *azabache* or 'jet' in Spanish. After a fall in demand during the 17th and 18th centuries, the 19th century and the beginning of the 20th century was the period of most intense mining in Asturias. The demand for jet from the British market triggered a 'jet rush' in the area, mostly for export as rough to the UK.

Characterisation of Asturian jet is still an important issue today. As no mines are in operation, rough material arises from stocked material and dumps from ancient mines and coastal sea cliffs.



*Modern equipment for artisanal carving of jet.*



*A big fragment of rough. Note the characteristic conchoidal fracture.*

Some cases of imitation material sold as Asturian jet have been found. The use of resins, or other natural materials of lower quality has been noticed by local artisans, who suffer both from the low availability of working-quality material and cheaper imitations. Some efforts have been done to open a new mine and create a trademark to guarantee the origin of the material.

Scientific work has helped with further understanding of this type of jet, and how to differentiate it, but the relative low price of the gemstone and the





*Traditional jet necklace and amulet designs crafted in silver and jet.*

complexity of tests make changes difficult to apply in the common trade.

Asturian jet has been described as a perhydrogenated coal (combined or treated with hydrogen, especially where hydrogen is added to an unsaturated

organic compound, to the fullest extent), with some characteristics that differ from others coals. This perhydrogenation is caused by an early impregnation of oils contained in source rock levels of the Rodiles Formation (of the geological

time period, Pleinsbachian). These oils fill the pores of the fossilised wood and cause the characteristic brightness, low porosity and durability of jet. It has an average hardness of 3-4 on the Mohs scale, fragile tenacity, conchoidal fracture and an average density of 1.2 to 1.3 g/cm<sup>3</sup>. When carved, its powder has a distinct bituminous odour and brown colour. Under ultraviolet light the fluorescence is orange-brownish.

The correct identification of the botanical species that were transformed into jet is not always easy, but for the case of Asturian jet, recent studies carried out by Spain's The National Coal Institute (INCAR) showed that the wood that was fossilised came from trees of the Agathoxylon, Brachyoxylon and Protobrachyoxylon families. ■

*The author wishes to thank Dr. Laurent Cartier FGA for his support in developing this article. Images by the author unless otherwise stated.*



*View of an exploitation zone inside of an ancient mine near Oles. Image courtesy of Jose Manuel Sanchis.*





# Gem-A

THE GEMMOLOGICAL ASSOCIATION  
OF GREAT BRITAIN

## NEW!

# Workshops, Guest Speakers and Online Webinars for 2019



This year, we have expanded our programme of workshops to welcome new guest speakers and introduce online webinars that are designed for our global audience. Take a look below to plan your year of gemmology education, ideas and inspiration.

Whether you are fascinated by inclusions or interested in valuations, our schedule of workshops is broader than ever before in 2019. There is something for everybody with courses designed for absolute beginners, those

with grasp of basic gemmological knowledge and those at a more experienced or intermediate level.

Don't forget! Our existing range of workshops, including the popular **'Introduction to Gemmology'**

and **'Introduction to Practical Gemmology'**, as well as the intermediate **'Ruby, Sapphire and Emerald'** and **'Investigating Jade and its Imitations'** are still available to book in 2019.

Workshop Name	Tutor or Guest Speaker	Dates & Location	Experience Level	Price
<b>NEW!</b> <b>Understanding Inclusions</b>	Beth West FGA DGA	Friday 29th March Gem-A HQ London	Basic gemmological knowledge	Members £145 Non-members £175
<b>NEW!</b> <b>Understanding Valuations</b>	Shirley Mitchell FGA DGA	Friday 31st May Gem-A HQ London	Basic gemmological knowledge	Members £175 Non-members £200
<b>NEW!</b> <b>Assessing &amp; Testing Mounted Gemstones</b>	Shirley Mitchell FGA DGA	Friday 7th June Gem-A HQ London	Basic gemmological knowledge	Members £175 Non-members £200
<b>NEW!</b> <b>Organics (aka Biogenics)</b>	Maggie Campbell Pedersen FGA	Friday 4th October Gem-A HQ London	Basic knowledge useful but not essential	Members £145 Non-members £175
<b>NEW!</b> <b>Online Webinar: Understanding Coloured Gemstones</b>	Gem-A Tutor Team	Thursday 18th July <b>Online Only</b>	For Beginners	Free
<b>NEW!</b> <b>Online Webinar: Understanding Diamonds</b>	Gem-A Tutor Team	Thursday 10th October <b>Online Only</b>	For Beginners	Free

To find out more or to secure your space on upcoming workshops, please visit [gem-a.com/education/courses/workshops](http://gem-a.com/education/courses/workshops) or contact [education@gem-a.com](mailto:education@gem-a.com) or search for Gem-A on [eventbrite.co.uk](http://eventbrite.co.uk).

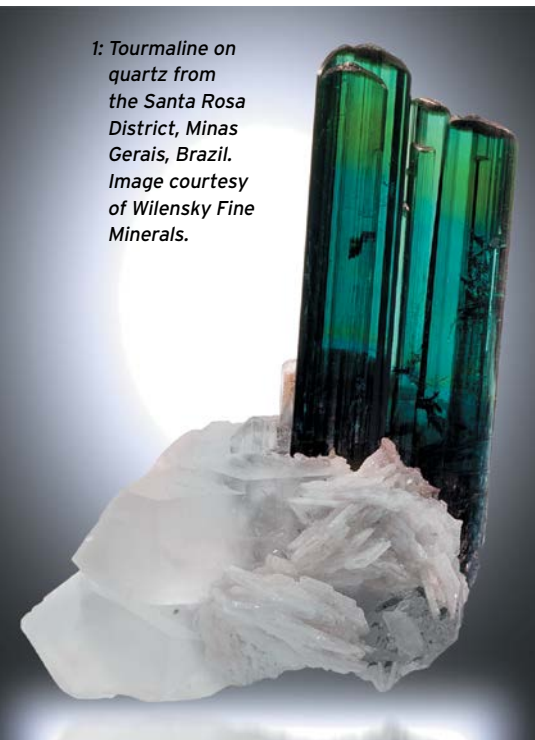


# Fresh FROM Tucson

*Gems&Jewellery* contributor Olga González FGA DGA shares some highlights from the Tucson gem shows, including Colombian emeralds and the British businesses enjoying success 'across the pond'.

**A**fter the Tucson gem shows, an internal recap begins to process all that was seen, heard and exhibited. Something about this year stands out though... Tucson has served to get the industry's feet wet in an inevitable sea of change before major transformations arrive in Las Vegas in the summer. Associations and businesses are experimenting with new venues and layouts, while shows and designers are getting edgier with their gems, aesthetic and storytelling.

1: Tourmaline on quartz from the Santa Rosa District, Minas Gerais, Brazil. Image courtesy of Wilensky Fine Minerals.



## MIXING IT UP

The new Grand Ballroom at the AGTA GemFair got it right. The plush white carpeting and elegant, translucent banners gave the area an upscale feel, differentiating it from the GemHall floor.

Mia Katrin, president of exhibitor, Jewel Couture LLC, said: "We were very pleased with the new location [the Grand Ballroom] for the designers. We thought it was a very elegant and our traffic seemed to be generally quite good. We were on the main floor as people walked through the doors for AGTA GemFair, so it was natural for them to browse in our area before going downstairs to the GemHall with the loose gems."

AGTA and American Gem Society (AGS) Titleholders also partnered for a new after-hours event, 'GLOW'. Held at Charro del Rey downtown, there was a steady stream of revellers from the shows, mostly in their 20s and 30s, networking and dancing accompanied by the luminescence of glow sticks. As always, Gem-A's Big Gem Bash was a who's who of gemmologists.

Tucson's New Mineral Show, which was at the old slaughterhouse on 1102 W. Grant road, was small, but there was a good amount of red beryl on display as well as a new source of fluorescent chalcedony from New Mexico, discovered in December 2018.

Stuart Wilensky, president of Wilensky Fine Minerals said: "We have attended the Tucson mineral shows for 35 years (1).



A different type of green by New York-based Campbellian Collection. These Green Empress earrings feature 3.52 carats of green tourmaline with 0.60 carats of tsavorite garnets, plus 86 diamonds in 18K white and yellow gold.

We have watched it evolve from a market place atmosphere into the 'Art Basel' of minerals. Here in Tucson, one can experience fine minerals as collectibles, investments, and objects of art. The Tucson show ignites an irresistible passion that is literally infectious. It is here that true mineral collectors are born. If the original collectors who started the show 64 years ago could see it now, I think they would be very proud."

## EMBRACING LOCAL

Whimsical and fun, jewellery designers embraced where they come from and presented collections that brought pure joy. Sicilian designer Giuliana di Franco presented her Carosello Collection at JCK Tucson, featuring rings inspired by carousels, or merry-go-rounds, that tell a story as the piece is turned, coupled with Sicilian motifs (2). Similarly, the



2: Rings from the Carosello Collection by Giuliana di Franco. As you turn the ring the images tell a story, which is why its name refers to a carousel or merry-go-round.





3: Emerald ring by Jeffrey Bilgore. 5.77 carat Colombian emerald from the Chivor mines, with diamonds, set in platinum.



The Fall Leaves brooch by So Young Park crafted in 18K yellow gold and oxidized silver with white diamonds. The designer exhibited at JCK Tucson.

Sò Napolitano Collection pays homage to pizza and the region of Naples, Italy.

British business, C W Sellors celebrated its 40th anniversary by revealing a partnership with Fabergé and its London ateliers to create limited edition 18K gold, blue john, enamel, and guilloché eggs in time for Easter.

### GLORIOUS GREEN

Emeralds are trending, both on the red carpet and at the Tucson gem shows. Jeffrey Bilgore had a particularly incredible 5.77 carat Colombian emerald from the Chivor mines, whose rarity garnered attention from buyers and fellow exhibitors alike (3).

Making a splash at the show were emeralds from the Panjshir Valley, in north-central Afghanistan, which are a stunning green and are responsibly sourced, supporting locals through programs such as 'Partner with a Village' (4). As a company, Panjshir Valley Emeralds has worked with both Oxford and Harvard universities to develop a patented blockchain technology for the Afghani emeralds' mine-to-market process.

On the subject of emeralds, Shekhar Shah of Real Gems Inc. commented: "This year, we found a lot of renewed interest in lower price point emeralds, especially Colombian material. Many designers stopped by and were very excited to see all the Colombian beads that we had on display. Another strong item was emerald slices. What seems to be the trend this year is towards lower price point fancy cut items which creates uniqueness in the designer's jewellery."

...shows and designers are getting edgier with their gems, aesthetic and storytelling.

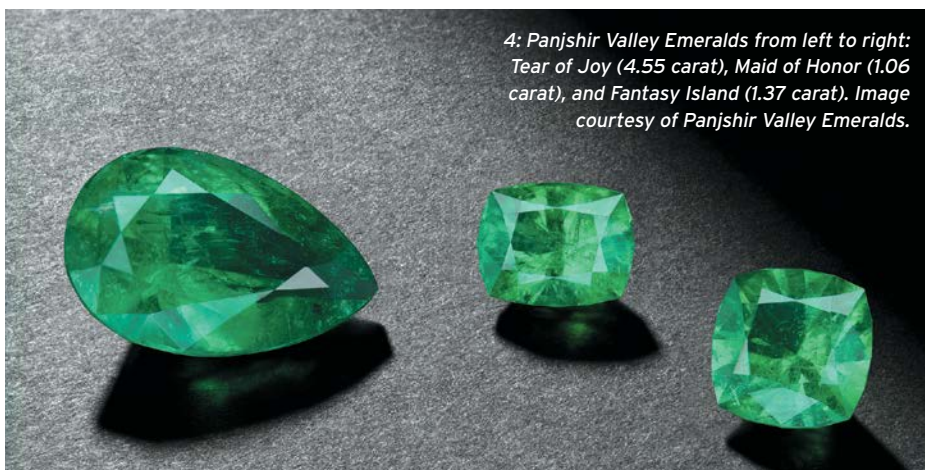
### BEING RESPONSIBLE

Overall, sustainability and responsible sourcing were the hot topics across shows. Human rights attorney turned jewellery designer, Christina Malle, said: "I joined the board of Ethical Metalsmiths in 2018 and recently became a Fairmined licensee. These concrete steps assure clients and retailers alike that my commitment goes beyond blank statements. We are all moving towards

transparency and traceability, and it is heartening to be part of the jewellery communities leading the way."

Also at JCK Tucson, Susi Smither, designer and founder of British company, The Rock Hound, had a sustainability focus, with jewellery product distributed in biodegradable boxes. She says, "I am what you would call a conscious consumer. Thinking about the impact purchases have, doing research and then choosing what I buy based on who is in line with my core beliefs. When I was scrabbling around on my first pile of tailings it really struck me there was such disparity between the mine and market. From that moment I vowed to make a change; we have a duty of care to the mining communities who provide us with the resources we take for granted. It took a while to find the right suppliers but I'm happy with the relationships we've made enabling us to bring aesthetics to ethics."

The beauty of the Tucson shows is they offer something for everyone. This year had an overall sense of optimism — people were buying and exhibitors were happy. Risks were being taken ahead of more changes to come. The acceptance of change and enthusiasm surrounding Tucson is a good indicator that the trade is moving in the right direction. Keep an eye out for more good things to come during the summer shows. ■



4: Panjshir Valley Emeralds from left to right: Tear of Joy (4.55 carat), Maid of Honor (1.06 carat), and Fantasy Island (1.37 carat). Image courtesy of Panjshir Valley Emeralds.





# A RARE FIND

Known for its exceptional mineral specimens, Wilensky Fine Minerals is sure to lure even more enthusiasts to its New York gallery with a display of rare, faceted grandidierites, supplied by Mineral Arts manager and gem dealer, Brice Gobin. Here we find out more about these unusual gemstones that are destined for high-jewellery houses and private collections worldwide.

**T**he name 'grandidierite' was first uttered in gemmological circles in the early 20th century, with its roots traced to southern Madagascar. It is so rare that few have ever seen the mineral in-person, let alone held faceted, gem-quality material in their hands. Grandidierite has a hardness of 7.5, which makes it suitable for jewellery use, although it is fragile and challenging to cut because of good cleavage in two directions.

Around 2014, a new deposit of transparent material in Tranomaro, Madagascar, resulted in some fantastic faceted gemstones, striking for both their bold colour and clarity. It is from this mining locale that Brice Gobin, gem explorer, collector, dealer and manager of Mineral Art sourced his magnificent collection of grandidierite gems over an 18-month period. Included in this selection were around 20 gems, weighing

from one to 9.3 carats, with some being particularly significant for their deep green and bright blue hues. Having visited the mine site, Gobin predicts there may be only five top-quality



*The largest of the grandidierite gems on display at the Wilensky Gallery, weighing 4.96 carats. Image courtesy of Laurent Thomas.*

grandidierite gemstones above three carats the world over.

As a passionate gem explorer, Gobin explains to *Gems&Jewellery* that he prefers to travel "where we can find the unfindable". He continues: "I had heard about this new find of some little gem grandidierites in the south of Madagascar and so I set up a team to sit at the mine site for one year and work, but also to buy all the good stones that were found. Grandidierite was an obscure gemstone [at the time] unknown to most people and even most of the top gem dealers. The first known transparent faceted grandidierite [believed to be from Sri Lanka] weighed 0.29 carats and was purchased for USD \$50,000 in 2003. The first stone with a top colour and high clarity I saw from that new deposit in Madagascar was almost two carats! I was amazed and decided to investigate further immediately."



Described by Gobin as a “collector’s stone”, grandidierites with exceptional clarity can demand significant prices per carat, but this is often overshadowed by a lack of supply, minimal demand and lack of knowledge among high jewellers. “Grandidierite is too rare to be able to provide the jewellery market. No supply, no demand, it’s as simple as that,” Gobin says.

However, for collectors or specialists who are desperately seeking a rare faceted grandidierite above two carats... you are most certainly in luck. Stuart Wilensky, president of Wilensky Fine Minerals and the Wilensky Gallery in New York City, realised the chance to exhibit these rare gemstones was an opportunity not to be missed. Now, a selection of Gobin’s grandidierite gemstones will be available to view until at least June 2019.

Wilensky explains: “The Wilensky Gallery specialises in the very finest mineral specimens of any given species.



*The Wilensky Gallery is currently exhibiting this 3.14 carat grandidierite, valued at \$78,000. Image courtesy of Laurent Thomas.*

Our focus has always been towards offering mineral specimens that exhibit the ultimate qualities directed towards advanced mineral collectors and museums. We have always valued the artistic aspect of minerals, but also believe that with depth of knowledge collectors can appreciate a piece for its rarity, locality or crystal size.”

Having mastered the art of finding museum-worthy mineral specimens, Wilensky saw the benefits of expanding into cut gemstones and displaying the finest examples alongside his ‘raw’ materials. “We all agreed the



*Large faceted grandidierites from Madagascar. Image courtesy of Brice Gobin.*

grandidierite stones would be a great starting point for us to explore the rare gem world and evolve our growing concept of what we envisioned for our new NYC gallery.”

After much research, the Wilensky Gallery team chose three stones based on their “exceptional quality, unusually large size, vivid colour and fine cutting” to exhibit. They are also available to purchase. The first gem has a beautiful, almost electric blue tone and weighs 2.86 carats. The second is a much deeper blue-green oval-shaped gem of 3.14 carats, while the third has flashes of dark forest green (thanks to grandidierite’s trichroic pleochroism) and weighs a staggering 4.96 carats. They are priced at USD \$69,000, \$78,000 and \$129,500 respectively.

When the grandidierites are removed from display this summer, the Wilensky Gallery will quickly put the finishing

touches to its emerald exhibit, due to run from September 26 to December 30, 2019.

Wilensky explains: “This exhibit will include several of the finest-known emerald specimens from private and public collections. We will also have fine emerald cut stones, jewellery and emerald carvings displayed with the specimens.”

Should your passion for the rare and unusual take you to New York City in 2019, we encourage you to stop and see what the Wilensky Fine Mineral Gallery has on display. ■

*Learn more about Brice Gobin and Mineral Art at [mineral-art.com](http://mineral-art.com). Visit the Wilensky Fine Mineral Gallery at 173 10th Ave, New York, or see their website at [wilenskyminerals.com](http://wilenskyminerals.com)*

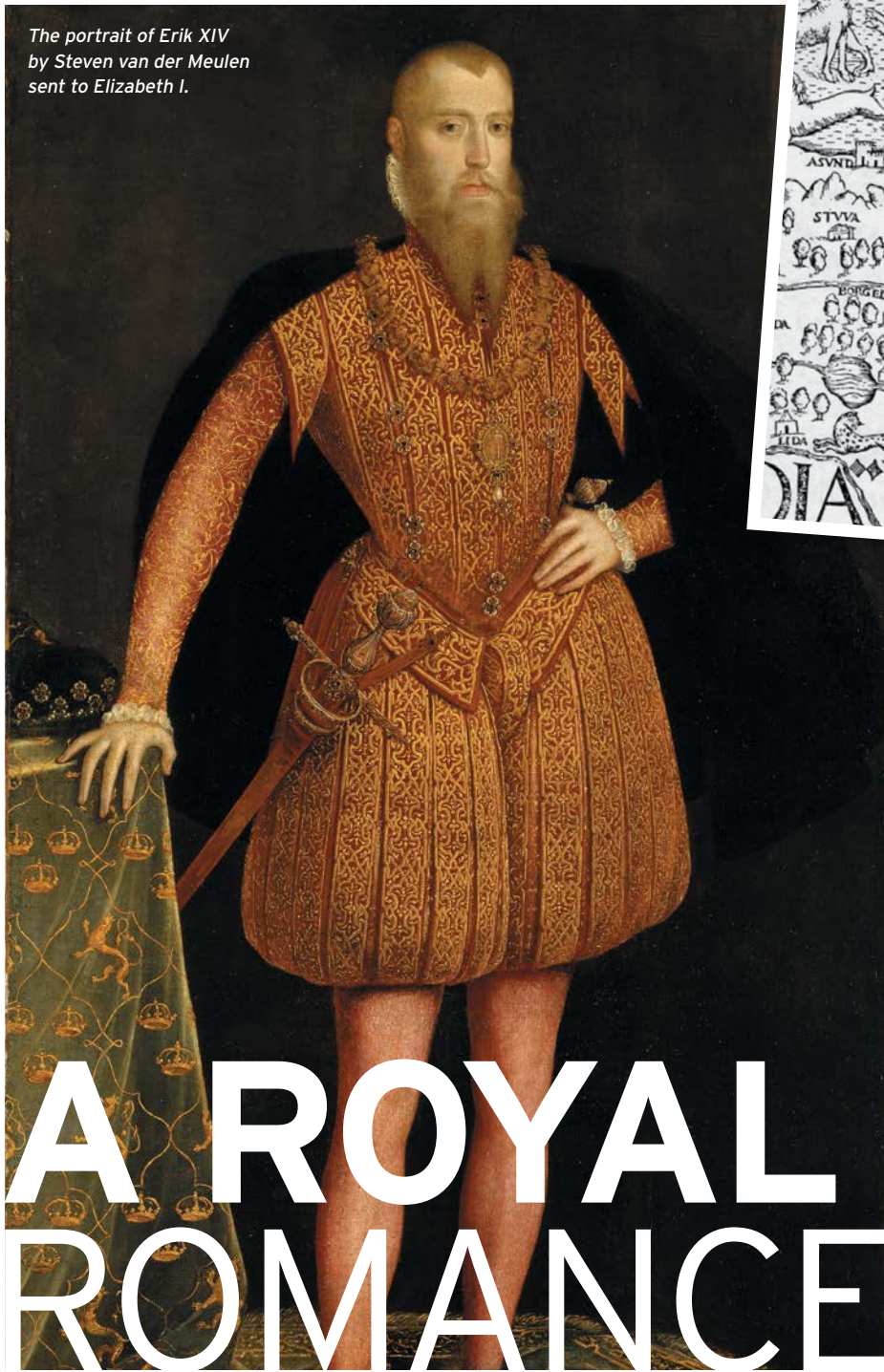
*Gems&Jewellery would like to thank Olga Gonzalez FGA DGA of Pietra PR for her support in developing this article.*



*From rough crystal to a beautiful cut and polished 9.3 carat grandidierite with a bright blue colour. Image courtesy of Jeff Scovil.*



The portrait of Erik XIV  
by Steven van der Meulen  
sent to Elizabeth I.



A portion of the Carta  
Marina map made by Olaus Magnus in 1539.  
The red circles show pearl mussels in the rivers  
Indalsälven and Ängermanälven.

# A ROYAL ROMANCE

Jan Asplund FGA DGA explores the regal allure of pearls in 16th century Sweden and the surprising link between King Erik XIV and Queen Elizabeth I of England.

In August 1560, Erik (1533-1577), Crown Prince of Sweden, was on his way to England when he got news about his father's weakening health and that the King would probably not survive. Erik had to interrupt his trip and return to Stockholm. Just a few weeks later, he was Erik XIV, the new King of Sweden.

Erik's reign was short partly due to mental illness and his younger brother Johan III who dethroned him in 1568. Eventually in 1577 Erik was murdered by arsenic poisoning, probably on the order of his brother. Had Erik's mind been straighter and his trip to England not been interrupted, he might have had a more

lasting impact on the history of Europe.

Under the regime of Erik's father, King Gustav Vasa, Sweden's political and economic influences grew fast and it shifted from a medieval country under strong Danish political influence to a more modern independent renaissance state. Among the many domestic resources Gustav Vasa opted to increase the Crown's control over was the pearl fishing trade. In the early 16th century this was taking place mainly in the northern and eastern parts of the country, at the time including Finland and the parts of Karelia that today belong to Russia.

Gustav Vasa's ambition was to become a renaissance monarch matching Henry VIII of England, Francois I of France and other old courts on the continent. Pearls were a significant status material you needed to display to match the leading royal houses of Europe. Gustav Vasa understood this very well and it is from the time of his reign that we have the oldest maps pointing out where pearl fishing was taking place, as well as the first written documentation on pearl fishing in the Nordic countries. In a map made by Olaus Magnus in 1539, 'Carta Marina' pearl fishing is pointed out at several rivers in Sweden and Finland.

Gustav Vasa founded the Royal Embroidery workshop and from around 1527 pearl stitchers were employed for the adornment of the royal wardrobes. For the Royal Embroidery, foreign





*Perhaps the most famous portrait of Queen Elizabeth I, made to commemorate the defeat of the Spanish Armada, by George Gower (circa 1588). Note the pearls that decorate her elaborate headress and dress.*

artisans from mainly Germany and France were recruited. A completely new industry flourished from the royal demand for fashionable garments using tens of thousands of pearls for decoration. The Royal Embroidery workshop seems to have been able to keep up with the demand from the royals and the vast majority of raw materials used were of domestic origin.

In the accounts of the Royal Embroidery workshop, we find the names of the workers and how much material they required for each piece of cloth ordered. As an example of how many pearls were used, the Embroidery accounts tell us that in the year 1553 a total of 7,255 single large pearls and an additional 15 uns (about 300 grams) of very small pearls that were only weighed, not counted, were used.

An example of a product made with pearls is a hatband ordered in 1553 for King Gustav Vasa. The hatband was made

**Pearls were a significant status material you needed to display to match the leading royal houses of Europe.**

by pearl stitcher Hans Franson, who was one of six pearl stitchers employed at the time. Hans Franson required a total of 684 pearls of which 22 were 'large', 162 'smaller' and 500 'really small', according to record. Apart from the hatband, Hans Franson used another 3,488 pearls for the decoration of six skirts for the Queen and Princesses the same year.

When Gustav Vasa employed foreign artisans to found the Royal Embroidery workshop in the 1520s there were already competent and experienced pearl stitchers working in Sweden. In fact, they had probably been accessible since at least the 12th century. These pearl stitchers worked mainly at a catholic nunnery in Vadstena and produced textiles for the churches such as pearl covered mitres and altar frontals.

Gustav Vasa reformed Sweden in 1527 and did not make it easy for Catholics. He knew about the quality production at nunneries, including Vadstena, and the highly-skilled nuns working with pearl stitching, but instead of using their services he choose to invite foreign experts. Due to confiscation of many of the nunnery's properties they eventually had to sell off their stock of pearls. A stock that according to the nunnery's accounts seems to have been quite significant.

The majority of pearls used by both the



An image of the royal crown of Sweden, created for the coronation of Erik XIV in 1561 by Cornelius ver Weiden. It was originally set with more pearls but they were replaced with diamonds in 1818.



nunnery and the Royal Embroidery were probably of Swedish origin and Gustav Vasa made several efforts to improve the methods used for pearl fishing, as well as increasing the crown's control by appointing special pearl inspectors throughout the country. The King also realised the need to recruit foreign experts to help improve pearl production. In a letter from Gustav Vasa dated January 1, 1537, we find some of the oldest written evidence for pearl fishing in Russia. The letter is an invitation from Gustav Vasa to Dematti Riis from Novgorod. The King wants him to bring local experts to come and help locate the best pearl rivers and to organise pearl fishing more efficiently.

When Erik XIV succeeded his father he kept up the demand for high-quality clothing. During his regime, the Royal Embroidery grew even larger. In addition to domestic production, Erik XIV now ordered clothes from the continent, preferably from Antwerp. It is not known if he imported pearls, but it is but it is clear he understood the importance of domestic pearl production as he made proclamations concerning pearl fishing and trade with Finland, focusing on the need for more efficient control of the trade and banning Russian pearl fishers and traders from Karelia and other areas near the Russian border.

The reason that Erik had started his interrupted journey to England in 1560

**It is possible Erik missed the opportunity to become one of Europe's most powerful kings by losing the chance to show-off his country's greatest luxury asset.**

was to propose to Queen Elizabeth I of England. Erik XIV was ambitious and even when Elizabeth was a young princess he sent an ambassador on a romantic errand. Gustav Vasa sent Erik's younger brother Johan (who would later imprison Erik and take over the throne) to negotiate for him. Johan returned in April 1560 with the message that Erik should come and present himself in person and in August, Erik took off to England. News of his father's weakening health reached him and forced him to interrupt the trip. Within a few weeks, Erik was crowned King of Sweden, and there was no time for him to resume his journey to England.

Erik XIV was a gifted man and his knowledge of the arts, languages including Greek and Latin, astrology and astronomy was well known. He was also very aware of

fashion and knew how to present himself. An example of his self-awareness can be found in the addition of 'XIV' to his name. Sweden did not have a long line of kings named Erik — he simply picked a number that sounded nice and looked good in print. His appearance was a positive point for Elizabeth I, but even more important was that he was a protestant as there were not many suitable allied royal houses in Europe for her to choose a suitable husband. Elizabeth does seem to have been interested to find out more about Erik. As he could not come to England she sent her chamberlain together with the Dutch portrait painter Steven van der Meulen to Stockholm. Meulen made a very nice portrait of Erik XIV but in the picture there is only one single pearl. Anyone who knew anything about Elizabeth's taste in jewellery and clothes knew of her love of pearls. Elizabeth's wardrobe is said to have contained thousands of dresses embroidered with many thousands of pearls. In the most impressive and powerful paintings of Elizabeth I, pearls are the dominating ornamental material.

It is possible Erik missed the opportunity to become one of Europe's most powerful kings by losing the chance to show-off his country's greatest luxury asset. As it turned out, Elizabeth rejected Erik and returned all his gifts except the picture by Meulen. She actually made Meulen paint a picture of herself that was sent back to Erik together with his gifts. That she kept his portrait may have been a sign of some affection towards Erik. Maybe it was just his country that was not deemed powerful enough, or perhaps her chamberlain had spotted signs of Erik's poor mental health and advised against continuing the relationship.

Eventually, in the 1930s, this same portrait of Erik XIV returned to Sweden and is now in the collections of Nationalmuseum in Stockholm. If the picture sent to Elizabeth had shown Erik XIV in a dress covered with pearls, wearing his coronation crown that contained many large pearls, and showing him in a fashion resembling the portraits of the Queen's father Henry VIII, who knows what the history of Europe might have looked like. ■

*References available upon request.*

*Copyright-free images supplied by the author unless otherwise stated.*



## "The exact methods of the craft are unknown as no records remain."

Gem-A President, Maggie Campbell Pedersen FGA ABIPP, considers the intricate Neapolitan piqué of the 18th century and its continued influence on our artistic view of tortoiseshell.



The art of piqué, or inlaying tortoiseshell with precious metals and mother-of-pearl, has been around for a long time. In England, piqué jewellery was popular in the mid-nineteenth century, and in the early twentieth century tortoiseshell-backed dressing table sets with silver piqué were fashionable.

The ultimate piqué work, however, must be that executed by a handful of workshops in Naples during the years around 1720 - 1760, by



Part of a tortoiseshell jug with mother-of-pearl and gold piqué work, made by Giuseppe Sarao in about 1740. Photo by kind permission of Galerie Kugel, Paris.

craftsmen known as *tartarugari* or the tortoiseshell people, the most famous of whom is probably Giuseppe Sarao. The items made were so exquisite that they were never intended for utilitarian purposes, but were commissioned by collectors.

Only tortoiseshell from hawksbill turtles was used, and this was filed, welded, and moulded into whatever shape and size was required to make anything from large caskets, through boxes and platters, to jugs and candle sticks. The tortoiseshell did not have any form of backing, except when used as marquetry. Large caskets were produced using sheets of tortoiseshell made from pieces welded and moulded into shape, and the handles of jugs were made up of layers of tortoiseshell welded together and then carved.

Gold, mother-of-pearl, and sometimes silver was inlaid in the tortoiseshell using heat and pressure. The mother-of-pearl was delicately incised with patterns of foliage, scrolls, garlands, and also faces and figures, with black pigment in the incisions to make them visible. The lavish yet intricate gold work was in strips, shapes, and frequently in tiny dots which were set with such

regularity and precision that it is hard to imagine how it was done. Indeed the exact methods of the craft are unknown as no records remain.

The production of the objects stopped suddenly and no more was made. The reason for this is unclear, but is thought to be due to changes in the political scene and in fashions.

By today's standards, the decoration is definitely way over the top. Seeing a piece in a museum the observer could be excused for not even realising that the background material is tortoiseshell, for so little is left to view behind the decoration. Yet the splendour of a finished piece and the outstanding workmanship is undeniable.

A magnificent exhibition of about 50 pieces of Neapolitan piqué work was created last year by the exclusive *Galerie Kugel*, which overlooks the Seine and the Tuileries Gardens in the centre of Paris. The pieces – which had been collected by the gallery owner over a period of some years, and most of which were for sale – were, sadly, well beyond my means, as prices ranged from €15,000 for the smallest item, to seven figures for the larger ones. But just to view and handle them was a treat. ■

© Maggie Campbell Pedersen.

Published in February, the article suggests that the second-hand market will become the single greatest source of diamonds, making it the largest 'mine' in the world. The Fancy Color Research Foundation, which specialises in assessing the price fluctuations of fancy colour diamonds, predicts the "last miner will turn off the lights [...] in approximately 61 years".

The article continues: "At present, 40 mines worldwide account for 90% of the world's diamond production but only 30% of them have a lifespan in excess of 40 years." With the world-famous Argyle Mine in Kimberley, Western

## THE LAST DIAMOND?

According to a recent report by the Fancy Color Research Foundation, our grandchildren and great-grandchildren are unlikely to ever receive anything but recycled diamonds as mines across the world countdown to closure.

Australia, expected to close by next year (2020) and the Cullinan Mine in South Africa predicted to close within 17 years, the shift towards 'recycled' diamonds may arrive sooner than we think.

"Manufacturing and related technology will slowly disappear," says The Fancy Color Research Foundation, "the GIA will be busy mainly validating old reports; 'second-hand broker' will be a new occupation, and jewelry [sic] brands will buy diamonds back from the public in order to maintain a steady supply." ■

To read the full article, visit [fcresearch.org](http://fcresearch.org)



# Treasure from Ancient Oceans



1: Bassen established the East African Whale Shark Trust with his wife in 2005.



2: Bassen works with quarry workers to carefully excavate fossilised clam shells.

From diving with whale sharks and creating worthy charities to discovering exceptional fossilised clamshells, Volker Bassen is a man of many talents. Here, *Gems&Jewellery* interviews the anthropologist, conservationist and entrepreneur to find out more about his global adventures.

## What is your background and when did you first become fascinated with giant clamshells?

I moved to Kenya in 1990 at the age of 23, having studied engineering in Sweden. I first went to France to attend the PADI European College where I studied recreational scuba diving, dive management and operation. Scuba diving has always been my passion and I have since set up 23 scuba diving schools in Kenya. My favourite animal is the whale shark — the world's biggest fish. It is a gentle giant that can grow as large as six elephants! In 2005, my wife and I set up the East African Whale Shark Trust, in an effort to protect and conserve the whale shark (1).

I will never forget the first time I saw a giant fossilised *Tridacna Gigantea* clamshell. It was deeply embedded in an ancient coral reef limestone bank, about two kilometres from the sea! I met some local quarry workers nearby who were busy making so-called 'coral blocks', which are used for the building industry along the coast, and they showed me a specimen they had recently excavated. I was blown away as it was so massive — well over 100 kilograms.

This particular clamshell was severely broken and I asked them if it would be possible to excavate them without breaking them. They said it would be possible, but they didn't care if they broke as they were sold to a cement



3: Clamshells are often found metres below the ground, requiring delicate excavation work by local quarrymen.





4: Bassen pictured with an almost completely excavated fossilised clamshell.



5: While digging a well, the largest ever *T. Gigantea* pearl was found. It turned out to be in pristine condition underneath the 250,000 year-old limestone.

factory. I went to the cement factory in Mombasa and found a person who could answer my question: what do you use these broken clamshells for? I was told they are crushed into aragonite powder, which is then used in the production of white cement. I thought this was sacrilege and started buying clamshells from the local quarry workers whenever they would find one (2 & 3).

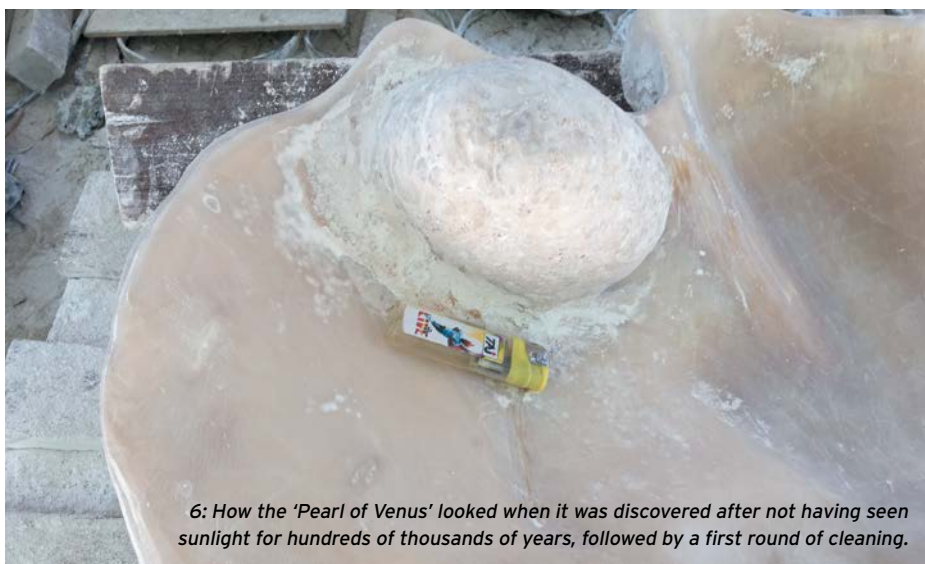
#### When did you start collecting the fossilised clamshells of the now extinct *Tridacna Gigantea*?

I started collecting *Tridacna Gigantea* 20 years ago (4). I rarely sell any, and in many cases give them away as gifts in the form of simple jewellery we make out of the so-called 'heart' of the clamshell, where the [living] clam would have started growing. I remember the first clamshell I bought and cleaned up found a home in my living room and I still have it. On the day my son Samuel was born I received one of my biggest clamshells from a chieftain of the Digo tribe. After cleaning away all the ancient limestone, two fossilised blister pearls (later certified by GIA) were found inside. The clamshell, which weighed 297 kilograms, was found 4.3 metres below the ground and took a month to excavate.

When asked how much the clamshells were to purchase, I stumbled... how much does one ask for when every piece is unique?

#### What can you tell us about the *Tridacna Gigantea* blister pearl you found that is believed to be the largest of its kind?

In 2014, while digging a water well for an orphanage, my workers found a 355 kilogram clamshell with a huge boulder the size of a mango sticking out of it (5). This turned out to be the largest *Tridacna Gigantea* baroque blister pearl found to date, in pristine condition (6). We nicknamed it the 'Pearl of Venus'



6: How the 'Pearl of Venus' looked when it was discovered after not having seen sunlight for hundreds of thousands of years, followed by a first round of cleaning.



7: The 'Pearl of Venus' – dubbed the 'rarest pearl on earth' – cleaned and polished.



and estimated its date at around 240-250,000 years old (7). *Tridacna Gigantea* went extinct around 180,000 years ago.

My wife encouraged me to exhibit my finds and I ended-up at the 2016 Hong Kong Gemstone, Mineral and Fossil Exhibition, where I managed to rent a booth at the last minute. Soon people were queuing to have their photo taken next to the world's biggest clamshell! When asked how much the clamshells were to purchase, I stumbled. I have never been in that situation before... how much does one ask for when every piece is unique? I shook on a price of roughly US\$100 per kilogram for two of the largest specimens and sold all of the spheres, balls and jewellery I also had on my stand within half a day.

### Did this lead to more international recognition for giant fossilised clamshells? Where did you go next?

Following this I participated in several shows in Hong Kong, Tucson, Saint-Marie, Munich, Dubai, London and Paris (8). Everywhere I had the same success, people were in disbelief! I decided to focus on interior design shows instead of gemstone, mineral and fossil shows and it proved to be the perfect move. These clamshells make the most beautiful luxury washbasins in the world as every piece is unique (9). While attending the Maison&Objet Paris interior design show, legendary yacht interior designer Rémi Tessier walked to my booth, purchased three clamshells and ordered eight more for the *Eclipse* — a luxury motor yacht built for Russian businessman Roman Abramovich.

### How did you develop the connection with *Tridacna Gigantea*, the Roman goddess Venus and your charity WonderCup?

I saw the painting *The Birth of Venus* by Sandro Botticelli, painted in 1485, and it suddenly dawned on me that Venus, the goddess of love and fertility, was born from a giant clamshell according to legend. As I sold more and more fossilised clamshells I used the proceeds to fund menstrual cups for adolescent girls at an orphanage, which I continue to support today. World Bank estimates that adolescent schoolgirls in developing nations lose 20% of their education because they can't afford sanitary items. This inspired me to create WonderCup, a brand, charity and educational service designed to help local girls. So far, we have donated



8: Bassen showcasing his finds at trade events across the world.



9: The clamshells continue to sell well as luxury washbasins for hotels and private customers.



10: The Venus Collection on display at The Hotel Show Dubai.



These clamshells make the most beautiful luxury washbasins in the world as every piece is unique.

10,000 WonderCups financed by the sale of clamshells and jewellery.

Today, our Venus Collection jewellery ([venuscollection.co.uk](http://venuscollection.co.uk)) and *Tridacna* Collection jewellery ([tridacna-collection.com](http://tridacna-collection.com)) allows women to make a statement, while improving the lives of others and helping to end the stigma around menstruation that many continue to face (10 & 11).



11: Jewellery from the *Tridacna* Collection, handmade in Kenya and Germany, using fossilised giant clamshells. The sale of each piece benefits Bassen's charity, WonderCup.

**You are an active philanthropist and conservationist at heart. What else are you involved in to protect some of the world's most endangered species?**

I am an honorary member of the Hainan Sea Shell Conservation Group, which was set up to protect modern-day giant clamshells, *Tridacna Gigas*, from extinction (12). To just sit back and point fingers isn't going to work. You have to identify like-minded people and start sharing information and facts with them. Only from within can you provoke real change.



12: Bassen in his role as an honorary member of the Hainan Sea Shell Conservation Group.

Some *Tridacna* clam species are now protected under CITES appendix 1, the same as ivory. Needless to say I often get asked if the clamshells we offer are legal to export and import. The answer is yes, as they are extinct and don't fall under CITES categories (similar to ivory versus mammoth tusks). All our clamshells come with a certificate verifying they are from an extinct species for peace of mind.

Elsewhere, I offered fossilised *Tridacna Gigantea* specimens as a sustainable alternative to ivory carvers in 2012 (13). The results were magnificent. ■



13: An example of a beautiful clamshell carving as an alternative to ivory.



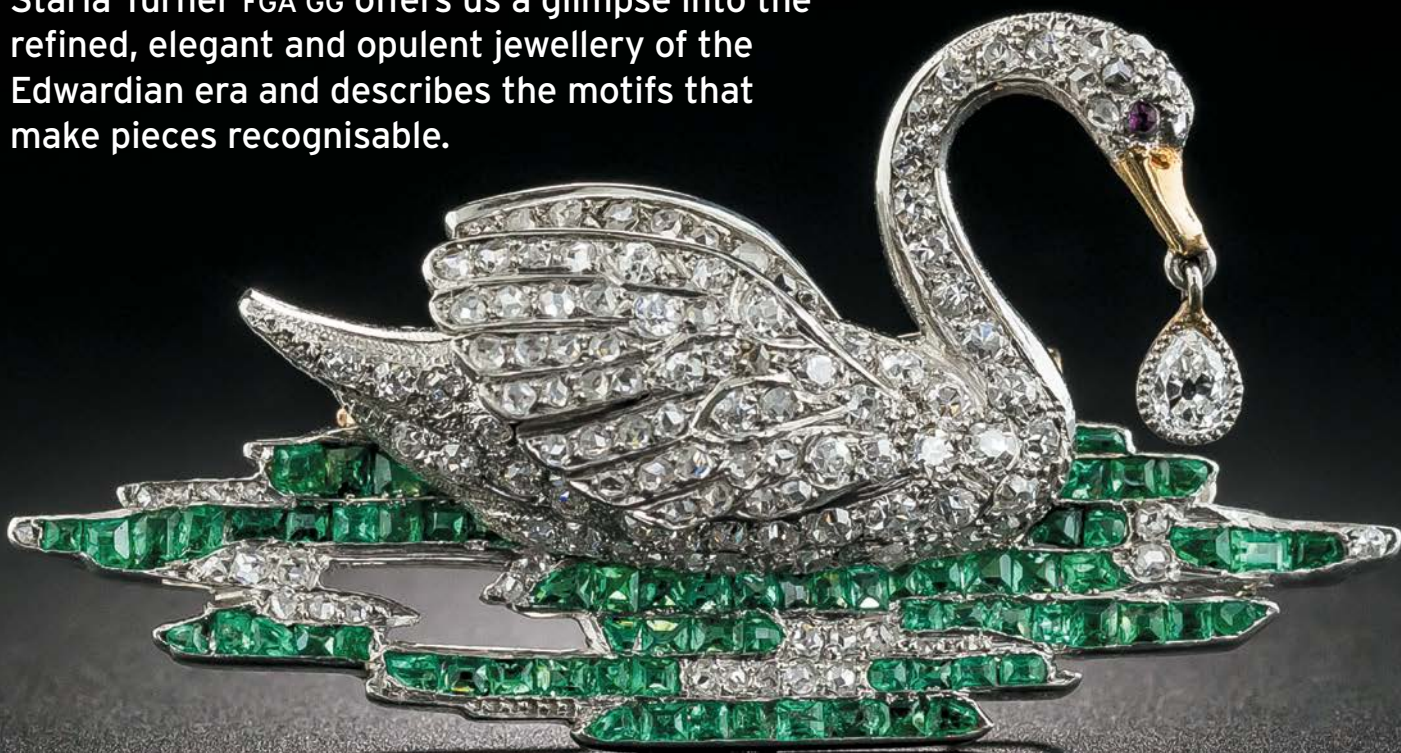
A giant fossilised *Tridacna Gigantea* clamshell is lifted by three Kenyan quarry workers.

All images courtesy of the author.



# Edwardian Elements

Starla Turner FGA CG offers us a glimpse into the refined, elegant and opulent jewellery of the Edwardian era and describes the motifs that make pieces recognisable.



The short reign of King Edward VII (1901 to 1910), his court, his sporting lifestyle and his wife Alexandra of Denmark were a breath of fresh air to fashion at the close of the 1800s.

Jewellery motifs changed accordingly, with intricate and gracefully symmetrical, diamond-encrusted and lacy designs adorning the neckline, chiffon gowns and the 'up-do' hair styles of the well-to-do. Delicate scrolls, leaves, ribbon bows, hearts, circles, swooping swags (or garlands as they were later called), and veil-like twinkling jewellery complimented a new sophisticated style.

To me, Edwardian designs look like a frozen moment – curled in movement, shimmering, draping, scrolling, swaging, circling – just waiting to be worn and move again. The Edwardian femininity, fluidity, and fineness are unmistakable. Iconic pieces have hinges, dangles, swags, articulation, and tiny swinging gemstones droplets evoking a liquidity and liveliness.

Queen Alexandra loved the uncomfortable but fashionable 'dog collar' plaque style necklace, often backed by black velvet. The style transitioned into a column of 6-16 rows of pearls – a challenge to wear for sure. Changing dress necklines brought changing neck ornamentation. A good example is the rivi re necklace – a neck-encircling strand of graduating, millegraine-edged, bezel set diamonds – sometimes worn as two bracelets. We see up to 72-inch long strands of 'spectacle set' diamonds, a minimalist technique where only a thin wire wraps the diamond girdle and small side jump rings attach to the next gem. The lavalier is an articulating drop suspended from a matching design element and attached directly to a thin, fancy link chain. The neglig e necklace has two drops, often on different lengths of chain, attached to one design element and a simple chain. Basic pendants have diamond-set, double side engraved, tapered bales that hang on thin, intricately designed chains.



*The front and back of a beautiful swan pin, showing the calibr  cut emeralds and the typical swinging diamonds, all set in platinum.*

The Edwardian era also saw a fascination with tiaras. Bandeaux, like tiaras, could double as necklaces or bracelets – screw holes or extra loops in the backside show their transitioning versatility. Sautoirs, long bundles of pearl strands ending with tassels, were wrapped around necks, waists, bodices and arms. Bracelets show symmetrical repeating designs in either full length or top half only designs. A new trend was the more diminutive, tapering diamond





*A pierced-out brooch from the Edwardian era.*

and coloured stone bracelets with articulating or stretching metal links in the rear. Rings were becoming wider and domed just enough to accommodate the depth of the centre diamond.

Solid platinum or platinum over gold suited the pale, pastel and feminine fashion palette. Platinum was a new white metal that, unlike silver, didn't stain the skin and clothing and could strongly, but delicately, hold the all-important diamond. Initially, platinum was bonded to yellow gold, a technique created to add value and acceptability to this new, inexpensive and unappreciated metal.

The vast majority of Edwardian diamond pieces I see are hand-fabricated (cut, sawn, rolled, drawn and assembled). Cast pieces are uncommon due to the high heat required to melt the metal. Edwardian jewellery is typically assembled from fewer parts, likely due to the visibility of the yellow gold-based solder that was used. This yellowish solder in seams disappeared into a whiter hue after WWI when white gold made its debut. In addition, platinum is a noble metal - it does not tarnish - so the tarnish one sees is from the solder mix of gold, silver and platinum. Therefore, tarnish and patina can add provenance as it develops with age. Sometimes re-polishing the metal can remove a bit of authenticity.

South Africa supplied a plethora of diamonds. While the Second Boer War (Oct 1899 - May 1902) had an impact on pricing, the demand continued. The diamond circular saw, the fixed dop (the clamp that holds a diamond being cut) for precise angles, bruting machine advancements and electricity reduced cutting times. They also resulted in the more brilliant, rounder European-cut diamond. Marquise and pear-shapes also became more available. The beauty of

a finished diamond became the focus, rather than the weight retention. Later into the period, single cut diamonds replaced the rose cuts of the past. With faster cutting techniques, the sparkling 17 facet single cut became the perfect accent to delicate jewellery. Smaller Swiss-cut and small European-cut diamonds also help date this era. Old mine cutting was phased out by the end of the era, but diamonds were still recycled into new pieces.

Pearls were second to diamond in popularity and suited the monochromatic styling of the era. Their ethereal sheen worked beautifully with gossamer fabrics. Articulating drops, like water, added the wonderful element of movement in open

To me, Edwardian designs look like a frozen moment... just waiting to be worn and move again.

work designs. Due to the rarity of natural pearls (cultured pearls were about to debut in numbers) seed pearls of 3.5mm or smaller were cut into two useable halves and flush mounted onto metal. The American and Scottish freshwater pearls reveal a whiter, wrinkled skin whereas the Indian Ocean and Gulf salt-water pearls are creamy to light grey (often turning grey from a soap that has been used to clean them) and smooth skinned. Uncut and larger natural pearls are often button or oval shaped. The

very round cultured pearls in Edwardian pieces tend to be replacement stones.

Sapphire, emerald, opal, ruby, amethyst, demantoid garnet, moonstone or peridots were recessed into a circle of diamonds — enter the halo ring! Look for treasures in these old pieces: Kashmir sapphires, Burmese rubies, Russian demantoid garnets, Australian black opals.

Calibr  cut stones, the tiny (1-2mm), straight-sided, geometrically shaped ruby, sapphire, emerald and amethyst, were cut to fit into channels and dance around designs. The newly-created and evenly-coloured synthetic sapphire and ruby calibr  appear in late Edwardian pieces. Black enamel or onyx also provided contrast to the all white look as it transitioned from the mourning jewellery age. A platinum and diamond central ornamentation could also be highlighted with a larger splash of colour from background bases of pastel toned, transparent to translucent enamels over an engraved gold base — a technique called 'guilloche'.

Further defining methods of this era are millegraining and fret work. Overall pieces are finished with delicate, minute beading making the metal disappear into the design. This millegraining took away the sharp edges, softening the look and emphasising the diamond sparkle. Millegraining also enhanced the knife-edged, open, thin wire work called fret work (like the frets for chords on a guitar neck) that created the airiness to the designs and highlighted the incredible expertise of the craftsman.

After WWI the flowing movement of the graceful Edwardian jewellery eventually blended into, and was then lost to, the geometrical, static, anticlassical, architectural style of the Art Deco Era — that caught on like fire. Out with the old, and in with the new. ■



*An Edwardian era pin that would have doubled as a tiara or hair ornament.*



# Mazarin's Passion for Diamonds

Having successfully completed her Gemmology Diploma and Diamond Diploma, Charlotte Pittel FGA DGA shares an abridged version of her excellent project on Cardinal Jules Mazarin and his legendary love of diamonds.

**T**he Mazarin diamonds were a collection of 18 diamonds left to Louis XIV and the French Crown Jewels by Cardinal Jules Mazarin. Discovering the story of this group of diamonds, the man who collected them and what happened to them is like an incredible work of fiction.

## THE CARDINAL

Born Giulio Raimondo Mazzarino on July 14, 1602 to a minor Italian noble family, Mazarin was a man of many interests and talents. His early education was at Jesuit school in Rome before studying law in Madrid. On his return to Rome around 1622 he attended the University of Rome La Sapienza, and following a spiritual awakening he entered the pontifical army. In 1628 he joined the diplomatic services for the Holy See and became involved in Italian politics whilst working alongside the Cardinals Sachetti and Barberini. His subtlety, patience and hard

work were recognised and in 1630, during the war between France and Spain over Mantua, he was sent to negotiate with Cardinal Richelieu.

Richelieu, impressed with the young man, invited him to Paris where he soon became a confidant and advisor to the Cardinal, joining the court of Louis XIII and Queen Anne d'Autriche. After taking French citizenship he became known as Jules Mazarin and in 1641, was promoted to the rank of Cardinal (1). Following Richelieu's death in 1642, Mazarin succeeded him as the Chief Minister of France and, after the death of Louis XIII in 1643, assisted the Regent Queen Anne in governing France on behalf of her then-child son, Louis XIV.

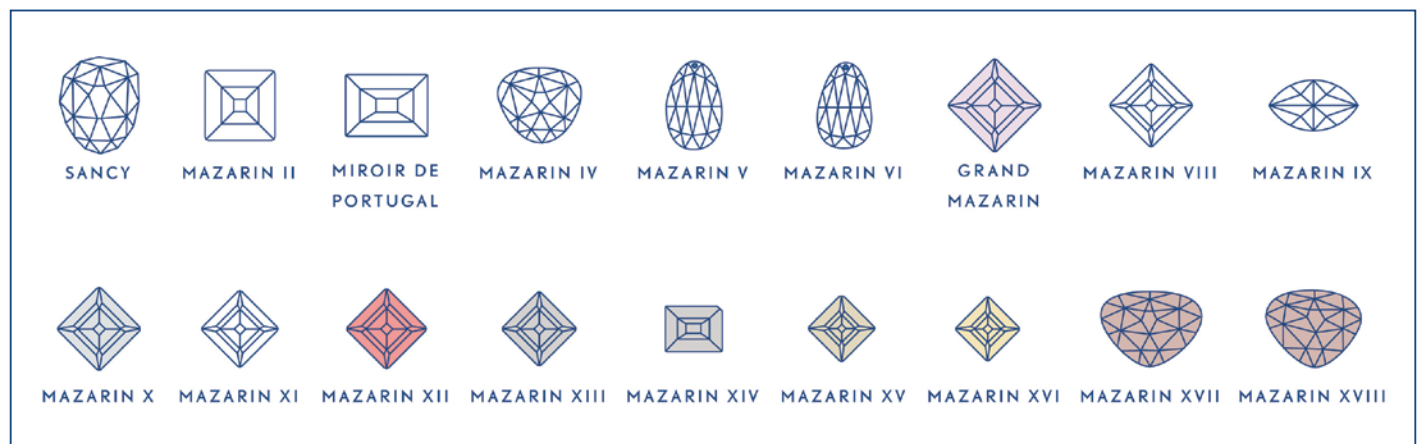
Mazarin was a keen student of the arts, but diamonds were his first love. His collection contained the most beautiful examples, many of them sourced from other European royal families, his preferred jewellers of the time including



1: A bust of Cardinal Jules Mazarin in Paris. Photograph by PlanetKorriban on Flickr (Creative Commons).

Lescot, Gabouri, Lopés, and almost certainly from renowned traveller Jean Baptiste Tavernier (1605-1689), who would also supply King Louis XIV.

Following his death, Mazarin made generous donations to hospitals, hostels and the arts, and bequeathed his extensive collections of jewellery and gems. Queen Anne received the Rose d'Angleterre (a large round diamond of approximately 14 carats) and a perfect cabochon ruby in a ring. The Duc d'Orléans received 31 emeralds, while Queen Marie-Thérèse was bequeathed a cluster of diamonds. Among his more noteworthy instructions, however, was his wish that a collection of 18 diamonds be given to the King and the Crown of France, on condition that they carry the name Mazarin (2).



2: The 18 Mazarin Diamonds. Illustration inspired by the work of author, Bernard Morel.



## THE MAZARIN DIAMONDS

Mazarin assembled this rare and beautiful collection of 18 stones towards the end of his life. Only three of these stones are named: the Sancy, the Mirror of Portugal and the Grand Mazarin. Sadly, due to the tumultuous nature of 18th century French history, many of the 18 stones have disappeared.

### The Mazarin I – the Sancy

It is believed that the 106 (old) carat Sancy formed part of the collection of Charles the Bold, Duke of Burgundy. Following his death it disappeared for over 20 years, finally reappearing in Germany in the hands of a merchant banker named Jacob Fugger. He planned to sell the diamond to the King of Portugal, Don Manuel I, and re-cut it into the pear shape we see today. During a period of huge political upheaval and conflict between England, France, Spain and Portugal, the diamond would finally end up in the collection (and take the name) of Nicholas de Harley, Seigneur de Sancy and Baron de Maule (1546-1629).

De Sancy was made Superintendent of France by Henry IV and pledged his diamonds to raise money for the crown. In 1596, however, he negotiated the sale of the stone to James I of England, who set the Sancy as a pendant into the jewel known as the Mirror of Great Britain (3).

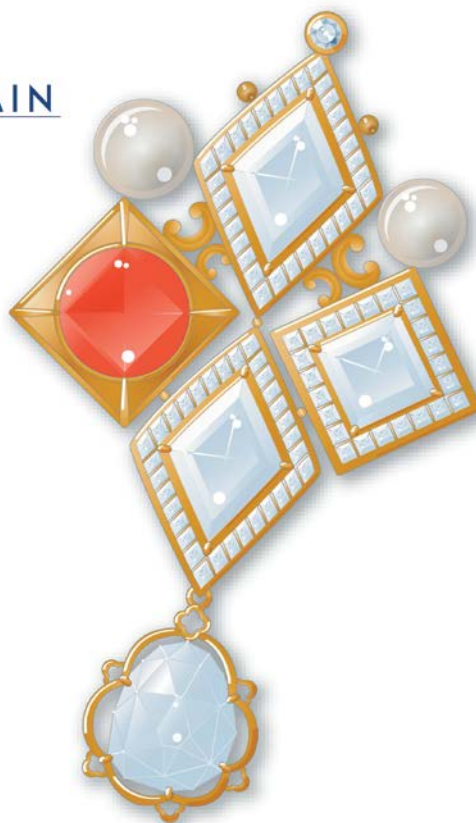
James's successor Charles I sold off precious stones to raise funds for the Royalist cause and, in 1644, sent his consort Queen Henrietta Maria to France to secure supplies and munitions. She borrowed enormous sums from the Duke of Epemon and pledged the Sancy as collateral. In 1649, when Charles I was beheaded, the Queen was exiled. The Sancy diamond was claimed by the Duke and subsequently sold to Cardinal Mazarin.

The Sancy then became part of the French Crown jewels and was mounted in Louis XV's coronation crown in 1722. Today, the Sancy is on display at the Louvre Museum in Paris.

### The Mazarin II

Author Bernard Morel suggests that this stone could well be the Pinder diamond, based on a 17th century description and drawings made by Thomas Cletscher. Sir Paul Pinder was a businessman and diplomat and, in 1611, James I made him an ambassador to Turkey where he managed

## MIRROR OF GREAT BRITAIN



3: An impression of the Mirror of Great Britain, as seen affixed to King James I's hat in a portrait that hangs in the Scottish National Portrait Gallery.

to acquire some exceptional jewels, including the Pinder. Called at this time the Great Diamond, it was acquired by Charles I in 1625 for 18,000 livres but not paid for. It is likely that this is one of the stones pledged by Queen Henrietta Maria in 1646 and then acquired by Mazarin, becoming known as the Second Mazarin.

Only three of these stones are named: the Sancy, the Mirror of Portugal and the Grand Mazarin. Sadly, due to the tumultuous nature of 18th century French history, many of the 18 stones have disappeared.

It was included in a diamond chain worn by Louis XIV, before being re-cut and set into the centre of the Order of the Golden Fleece made by Jacquemin for Louis XV. Thereafter it was unset and remained in the collection of Louis XVIII until his death in 1824, at which time it was returned to the Crown collection.

Sadly, the stone was stolen during the 1848 revolution.

### The Mazarin III – the Mirror of Portugal

This stone belonged to Dom Antonio, Prior of Crato. After a short period with Elizabeth I and named the Portugal Diamond, it was mounted into a pendant set with a large pearl drop and given to Henrietta Maria on her betrothal to Charles I. It eventually became a part of the Mazarin Collection.

As was the custom, many of the French crown jewels were in settings that allowed a freedom in how they could be worn. As such, the Mirror of Portugal was set not only in Louis XIV's diamond chain, but also in a hairpin worn by Queen Marie-Thérèse, which also bore the Grand Mazarin and some substantial pearls.



## GIRANDOLE EARRINGS

MAZARIN IV



MAZARIN V



MAZARIN VI

4: An illustration of Queen Marie-Thérèse's girandole earrings, inspired by the work of Bernard Morel, containing some of the Mazarin diamonds. These earrings were documented in the 1691 inventory of the French Crown Jewels and were valued at 500,000 livres.

The Third Mazarin was unfortunately lost to the French Crown jewels when a substantial number of the jewels were sent to Constantinople never to return, including the Mirror of Portugal and many other Mazarins.

### The Mazarin IV

This stone was first referenced in Bernard Morel's book as being set into a pair of Girandole earrings created for Queen Marie-Thérèse (4). It is shown sitting as the top button with the Mazarin V as a drop. Its pair uses other diamonds, including the Mazarin VI as the drop.

### The Mazarin V – VI

Both the Mazarin V and Mazarin VI were pierced at the top, so were perfectly shaped to be worn as drop earrings. Records suggest that both of these stones were cut by Francisco Ghiot of Antwerp: 1632 for Mazarin VI and Mazarin V in 1636. In a later inventory of 1774, they show up possibly as rings.

### The Mazarin VII – Le Grand Mazarin

This legendary coloured diamond was sold at Christies on the November 14, 2017, achieving a price of CHF 14,375,000

(approximately GBP £10,969,567.60). A GIA certificate (No. 5182785154) and classification letter confirms that this historic light pink, old-mine brilliant-cut diamond is a Type IIa and weighs approximately 19.07ct.

This diamond can be traced back to Indian mines near the Golconda trading centre, but quite how it came to Cardinal Mazarin is unknown. Once the diamonds were passed to Louis XIV and the Crown Jewels collection, it is believed that Queen Marie-Thérèse was the first to wear it. Following her death in 1683, Louis regained the Grand Mazarin and added it to his legendary chain of diamonds. It was listed in the 1691 inventory as sitting at number five on a chain of 45 diamonds, numbered in descending order of size. It was added to the crown of Louis XV, along with the Sancy.

### The Mazarin VIII

One of the few diamonds to survive a significant sale in 1795, this Mazarin stone sat at either position six or seven on Louis XIV's diamond chain. The standout piece in which it featured, along with the Grand Mazarin, was the Diamond Diadem of Marie-Louise,

Empress of the French from 1810 to 1814. A large diamond parure was ordered soon after the wedding of the Emperor and Empress, along with a coronet, a necklace, pair of bracelets, girandole earrings and a belt. There was also an order for a substantial diadem.

### The Mazarin IX

Originally described as boat-shaped, the term 'marquise' was coined during the reign of Louis XV, largely due to a rumour that it matched the lip shape of his mistress, Madame Marquise de Pompadour. This diamond was set as the eighth button on one of Louis XIV's *justacorps* (an open-fitted coat).

### The Mazarin X – XVI

Along with others, these diamonds were also included in the diamond chain belonging to Louis XIV and also in the coronation crown of Louis XV. The Mazarin XII was described as having a red colouration, probably due to the reddish flaw in its girdle.

### The Mazarin XVII-XVIII

The last two stones of the collection - XVII and XVIII - were virtually identical, with XVIII slightly larger. It seems that these stones were kept as a pair and used as buttons on a coat belonging to Louis XIV. They are most famed for being part of Empress Eugénie's reliquary brooch of 1855, now part of the collection at the Louvre (5).

... the term 'marquise' was coined during the reign of Louis XV, largely due to a rumour that it matched the lip shape of his mistress, Madame Marquise de Pompadour.



## EMPERESS EUGÉNIE'S BROOCH



5: An impression of Empress Eugénie's reliquary brooch designed and created by Alfred and Frederic Bapst in 1855. It was sold to the Louvre Museum in Paris in 1887.

### THE MAZARIN CUT

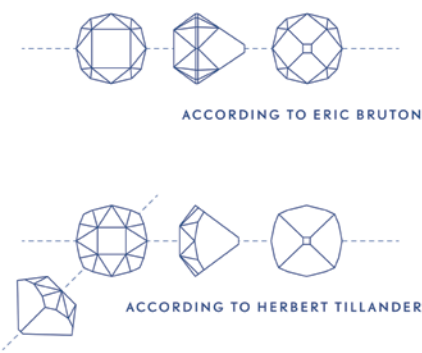
It should be noted that none of the 18 diamonds that Cardinal Mazarin bequeathed to Louis XIV were cut in the 'Mazarin cut'. Instead, the cuts were as follows:

- Pear-shape double rose cuts – I (Sancy), V and VI
- Rectangular table cuts – II (Mirror of Portugal), III, IV
- Square table cuts – VII (Grand Mazarin), VIII, X, XI, XII, XIII, XV, XVI

- Heart-shape flat rose cuts – XVII, XVIII
- Marquise – IX

The fashioning of diamonds in 17th century Europe was undeveloped. Until the 1400s the natural form of the diamond was used, so an octahedral crystal or other rough was refined and set (known as the 'point cut'). The table cut was first seen around 1477, marking the first true cut where the octahedron crystal had its top flattened by grinding

### THE MAZARIN CUT



6: A representation of the Mazarin Cut, inspired by the drawings and insights of Eric Bruton and Herbert Tillander.

and sometimes a culet added to the lower point. Varieties of the table cut are the thick table cut, the mirror cut, the tablet and the lasque cut.

After the table cut followed rose-cut stones; a flat backed stone with a domed front. There were a variety of rose-cut styles in use at the beginning of the 15th century and it was considered the most appropriate cut for a flatter, thinner stone. Early brilliant cuts were first seen in the mid-1600s, leading us back to the diamond-loving Cardinal Mazarin. Single-cut or eight-cut diamonds had eight facets on the table and eight facets on the pavilion plus a culet. These then evolved into the double, cut with 16 facets on the table and 16 facets on the pavilion plus a culet.

It was in the mid-17th century that the Mazarin cut appeared, cushion-shaped with 34 facets in total: 17 facets on the table and 17 facets on the pavilion, including the culet, plus a girdle (6). This design of facets greatly increased the diamond's reflective properties and it showed more fire and brilliance.

Although Mazarin was a devoted diamond collector, it is unlikely that he actually invented the Mazarin cut. However, he was a definite forerunner in the rise of popularity for this style of cutting and it is most likely that the cut was named after him as a tribute. ■

*The complete version of this project, including references, appendices and a bibliography are available upon request. All images and illustrations are supplied by the author unless otherwise stated.*



1: The plastic beads (inner) and the amber beads (outer) shown together.

# Absent 'Amber'

If you discovered a necklace possibly made of amber, could you accurately test and identify it with confidence? This was the question Kerry Gregory FGA DGA asked herself recently when searching through some treasured family items, requiring her to call upon Gem-A president, Maggie Campbell Pedersen FGA ABIPP, for assistance.



Last autumn my wonderful mother-in-law, Jasmine, passed away. My boyfriend and I had the bittersweet task of clearing her home, going through a lifetime of memories and possessions, sometimes smiling, sometimes crying and constantly reminiscing. It was during this process that we came across the, until this point, elusive 'amber' necklace that belonged to her mother-in-law, Margot.

I had heard about this necklace many times and over the years Jasmine had shown me all of her jewellery, much of it inherited from Margot; beautiful Edwardian, Art Nouveau and Belle Époque pieces, aside from this one necklace because she could never find it. She berated and tortured herself over the loss of this necklace because she was sure it was valuable natural amber, and she felt she had let Margot down losing it.

When we found the necklace stuffed in a plastic carrier bag at the bottom of her wardrobe, along with scarves, belts and accessories, it produced a number of emotions. There was laughter, because it was so like Jasmine to put something somewhere 'safe' and not be able to find it; sadness that she had upset herself for so long thinking she had lost it; and gemmological intrigue on my part as to whether it really was old, valuable and natural amber.

After nearly 20 years of studying, practising and teaching gemmology, I would say I am a very competent gemmologist. However, like many working gemmologists, my knowledge and experience of organic (or biogenic) gemstones is embarrassingly limited. I realised I couldn't accurately and competently test and identify the beads without some research. This led me to think, how do you learn to test and identify something you have not identified before when you are not in a classroom environment? How easy is it to get accurate information from the internet?

I Googled the phrase 'How to test amber?' read the top three results and watched the top three videos on YouTube. I then read the chapter on amber in Maggie Campbell Pedersen's *Gem and Ornamental Materials of Organic Origin* (2010) to see what the 'Bible' had to say.

I decided I would work through the suggested tests from the internet

This led me to think, how do you learn to test and identify something you have not identified before when you are not in a classroom environment?

resources in what I thought was a logical order, comparing the 'amber' to a string of yellow plastic beads resembling amber from my own grandmother. Whilst Maggie suggests identifying amber is based mainly on observations rather than tests, only one internet resource suggested looking at the material! Other than in Maggie's book, there was no information about what it amber should look like, observations or images.

On observation Jasmine's beloved 'amber' beads were warm yellowish orange flattened irregular ovals, varying in size, colour and transparency, some being opaque, some slightly translucent and one bead with a transparent section on one end. They have a gentle undulating swirled texture inside, and crazing to the surface, some of which is very fine and hair-like, while some which resembles a snakeskin pattern.

I observed smooth conchoidal fractures, as well as natural looking small cracks and crevices often with a brown colouration. There was no evidence of inclusions, except in one bead with a small circular inclusion that could either be a small piece of flora or possibly a disc shape stress fracture. In contrast, the plastic beads were perfectly round with a mould line around and showed conchoidal fractures which had a more even appearance. The swirled texture inside was also more pronounced. Both the 'amber' and plastic beads felt warm to the touch, the amber also felt a little tacky, which may just be a result of them needing a clean, and both had very little left.

All of the resources suggested doing

a salt water test. The advice was simple: make a solution by dissolving salt in water, if the material floats it is genuine amber, if it sinks it is not (most did not mention the possibility of any simulants floating). Two resources mention that having mounting or stringing may affect the result, but the others made no mention of this, and there was no caution about air being trapped in drill holes on any of the resources I looked at. Both the 'amber' and plastic floated in the salt solution!

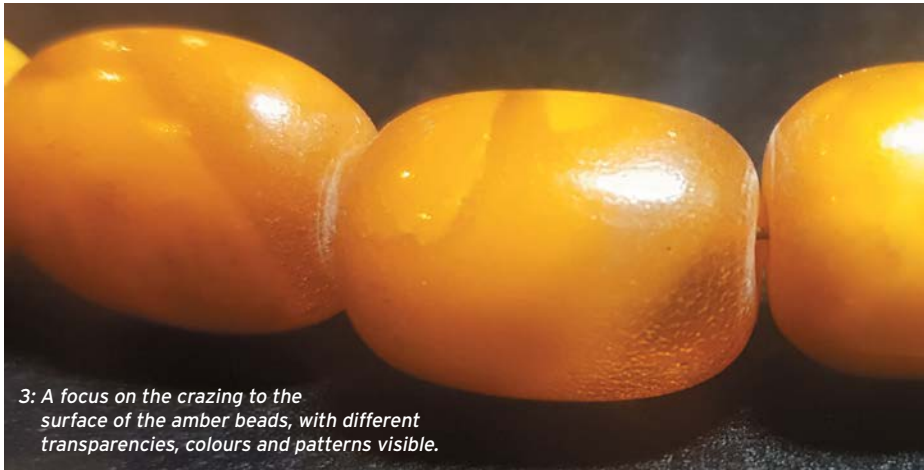
Next I checked the static electric properties by briskly rubbing the pieces on a woollen blanket; both the 'amber' and the plastic beads became charged and picked up small pieces of tissue paper. The amber gave off a faintly 'piney' smell and the plastic didn't appear to smell of anything. Checking the reaction under LWUV, both sets of beads fluoresced a chalky yellow, showing the swirl patterns. So far if I had just followed the internet advice I would be confirming that my plastic beads were genuine Baltic amber.

Despite the plastic and the possible amber behaving almost the same in tests, I made an educated assumption that Jasmine's beads were indeed natural amber, mainly due to observations (confirmed by the tests), although a definite ID would require advanced testing. I was also starting to think maybe I had been too hasty and perhaps my own grandmother's beads were ambroid, they certainly had a 'feathery' appearance as Maggie Campbell Pedersen illustrates in her book.



2: A closer look at the mould marks around the plastic bead.





3: A focus on the crazing to the surface of the amber beads, with different transparencies, colours and patterns visible.

I continued onto destructive testing. I didn't want to damage Jasmine's beads, so I bought some amber beads at auction that look remarkably similar to test. In destructive testing, both the amber and plastic were scratched with a piece of

apatite indicating a hardness of five or lower. When testing the sectility of the materials by cutting a bead hole with a small knife the amber chipped. The plastic was considerably easier to cut but didn't really pare as you would expect.

The deciding result was the hot needle test, the amber melted slower and gave off a pine smell, while the needle went into the plastic like a hot knife into butter and gave an acrid burning plastic smell.

I think in this case a little information can indeed be a dangerous thing. There was confusion in most of the advice and a feeling that the people offering it didn't really know what they were talking about. There was also a lack of caution when explaining destructive testing techniques. The internet resources seemed to make quite broad bold statements, leading you to believe the tests are black and white. As a layperson you could easily misidentify based on the advice, as I would have with my plastic beads. No doubt there are probably quite a lot of 'rare natural Baltic amber' beads made of plastic being sold online for just this reason.

## Maggie Campbell Pedersen shares her insights into amber identification

When identifying amber it is important to remember a few things. Firstly, there is a vast quantity of 'amber' variations to be found: natural ambers and copals from various regions, treated ambers, re-constituted ambers, treated copals, plastics, and amber-plastic mixtures. Many of the fakes are very convincing.

If asked to make an identification the first thing I do is examine the item. Only on the rarest occasion is it possible to identify anything with certainty from photographs.

One of the favourite tests advocated by the internet (and by ignorant or unscrupulous dealers) is to rub an item on a rough surface such as a blanket to see whether the 'amber' becomes electrically charged and can lift a piece of tissue paper or a feather. Amber does become charged — but so does plastic. The 'piney' smell given off by Kerry's darker beads when rubbed suggests a younger resin than Baltic amber, which has a higher melting point and is unlikely to give off a smell.

For beads such as Kerry's I will always advocate the saturated salt water test as a marvellous starting point. It is true that very large drill holes can trap air and help to keep the beads afloat, and that a heavy thread can help to make them sink, but to date I have never experienced either problem.

If the beads sink in the salt water they are definitely not amber. If they float there is a small possibility that they are one of the few plastics occasionally used that have an SG as low or lower than amber. The yellow beads look like plastic, but as they float they could be reconstituted amber with a yellow dye added, though the acrid smell when touched with a hot point suggests otherwise.

The darker beads — those that belonged to Jasmine — seem to resemble Baltic amber, the surface of which has darkened with age. The surface crazing is not, however, normal for Baltic amber. It could indicate copal, or another type of amber. Pressed Victorian amber sometimes displays crazing, but — judging by the photos — these beads do not resemble that. At that stage I usually ask the owner whether they have any idea where the beads could have been purchased. Did the family visit New Zealand? (Kauri copal.) Or another country where there is local amber, some of which is known to craze? Or maybe

the beads have simply been stored in a way that it has encouraged surface degradation?

The hot-point test is a good guideline for resins, but it is slightly destructive. If it is to be used it should be carried out very carefully on the originals, as lookalike ones may not be of exactly the same material and could give a misleading result.

So what are Kerry's beads? At this stage the results are inconclusive, and as gemmologists we should turn to a laboratory for further testing such as Fourier-transform infrared spectroscopy (FTIR) for a more definitive answer. ■



4: Testing both the amber and plastic in salt water, with the plastic and amber strung beads floating, three loose amber beads floating and two plastic imitations sunk at the bottom (as distinguished by the shadows of those above cast downwards).

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INSTRUMENTS

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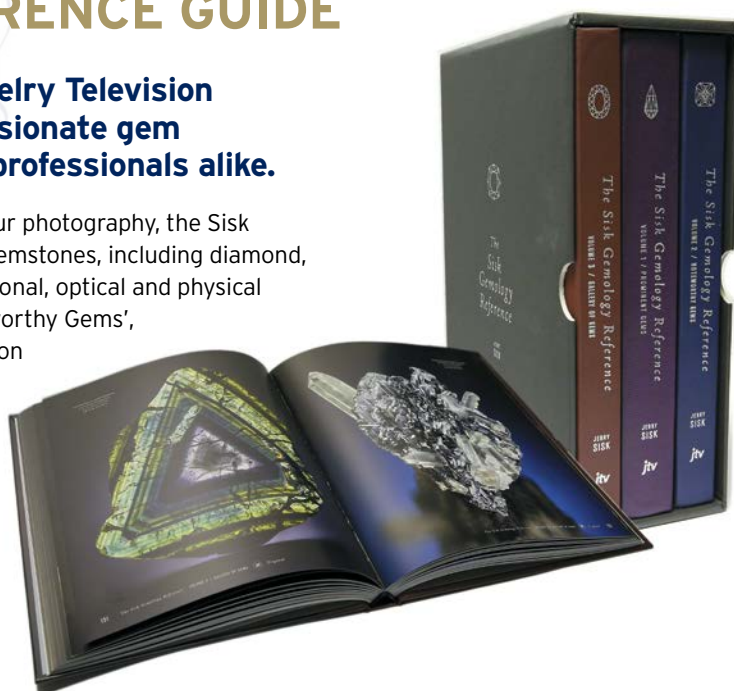
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## GEMSTONE CONVERSATIONS: GARNET

*Gems&Jewellery* is pleased to welcome jewellery historian and valuer, John Benjamin FGA DGA FIRV as a guest columnist for 2019. In this, the first of a four part series, John will explore how recognisable gemstones were used in antique jewellery designs, starting with garnet.

I have often thought that garnet is a rather underappreciated stone. True, it is extremely common and turns up in everything from ancient gold rings to cheap, modern, mass-produced bijouterie — but this misses the point, which is that the sheer beauty and versatility of garnet meant that right up to the beginning of the 20th century it was consistently one of the most popular of all gemstones used in decorative jewellery.

Garnet was esteemed by the Romans at a time when a vivid gemstone conveyed wealth and status. Fine examples were polished into cabochons or cut into cameos and intaglios depicting classical figures or deities. By the 5th and 6th century garnet was often the stone of choice with small, simple, domed or faceted examples providing a decorative embellishment to Anglo Saxon brooches, pendants and buckles. No doubt because of its widespread availability it was frequently set into Medieval rings and ornaments and by the late 16th and 17th century its sheer abundance and desirability led to it being used throughout Europe in everything from rings and earrings to opulent pendants, usually accompanied by colourful, polychrome enamel and gold mounts. Many of these Renaissance and later garnets were polished into large and irregular-shaped hollow-back cabochons known as 'carbuncles' and were usually rich, purplish-red almandines from India and Ceylon. There are quite a large number of these garnets on display in the incomparable Cheapside Hoard at the Museum of London.

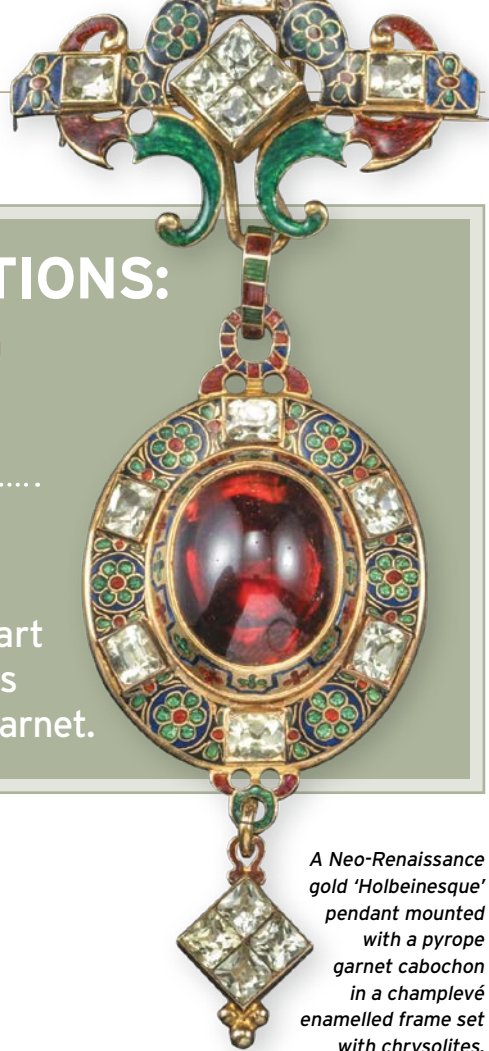
For me, part of the allure of garnet is the broad range of colours available and I have always admired hessonites, not only for their rich, orangey-brown colour but also for their interesting 'treacle-like' inclusions. Since garnet is a reasonably hard gemstone it provides an excellent cutting surface, so from the 16th to the 18th century hessonite (known in those days as 'Jacinth' or 'Hyacinth') was a popular stone for fashioning into cameos or setting into bracelet clasps. Undoubtedly, it was the late 18th and early 19th century when garnet really came into its own.

Flat-cut almandines of cushion, pear and circular shape were artfully set into parures comprising a necklace, a pair of bracelets, earrings and a brooch.

Foiling the stones and fully enclosing the mounts at the back intensified their glowing appearance, especially when illuminated in candlelight.

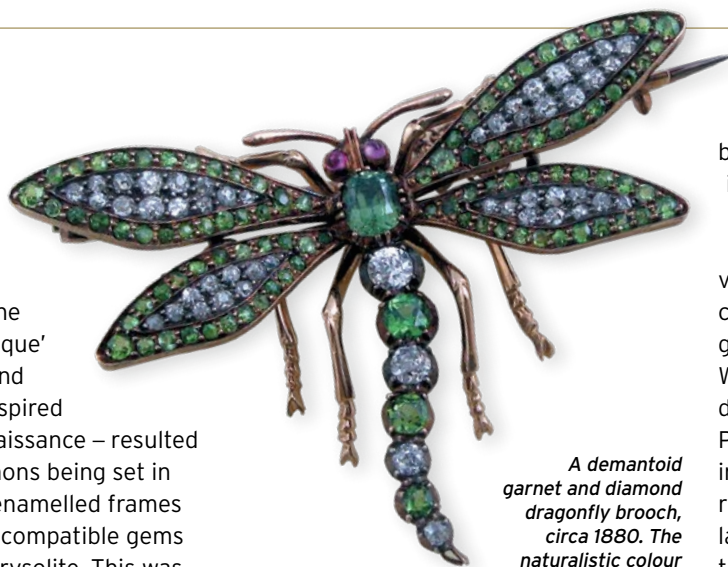


*A Georgian gold and flat-cut almandine garnet parure comprising a necklace, earrings, maltese cross and brooch, circa 1800.*



*A Neo-Renaissance gold 'Holbeinesque' pendant mounted with a pyrope garnet cabochon in a champlevé enamelled frame set with chrysolites, circa 1870.*

The use of garnet in moderately priced jewellery continued through the 19th century reaching a peak of popularity in the 1870s when 'Holbeinesque' jewellery – pendants and earrings of a design inspired by the look of the Renaissance – resulted in large pyrope cabochons being set in colourful, champlevé-enamelled frames often accompanied by compatible gems such as diamond or chrysolite. This was the so-called 'Grand Period' of jewellery manufacture and the rich, vibrant colour of garnet provided the perfect vehicle for showing off bold and distinctive bracelets, brooches and necklaces.



*A demantoid garnet and diamond dragonfly brooch, circa 1880. The naturalistic colour of this ever popular variety of andradite garnet resulted in a wide range of novelty insect and reptile brooches appearing on the market at the end of the 19th Century.*

body, resulting in a surge of popularity in novelty brooches designed as frogs, lizards and dragonflies.

While the more commonplace red varieties of garnet continued to be set in cheap, universally available nine carat gold rings and pendants until the First World War, by the 1920s its use had largely declined and, while it does appear in Post-War 'Retro' jewellery and, of course, in modern tsavorite and mandarin garnet rings, the 'golden years' of traditional, large scale garnets are now well and truly over. Abundant, often inexpensive and supremely versatile, garnet is surely one of the most underrated of all the better known gemstones. ■



*A 'Bohemian' garnet cross circa 1890. Versatile and inexpensive, these colourful jewels were extremely common at the end of the 19th century.*

Handmade craftsmanship gave way to mechanical, repetitive mass production at the end of the century. Garnet continued to be used in cheap central European jewellery often accompanied by inexpensive colourful gems especially turquoise and pale green beryl such as turquoise and pearls in poor quality, silver gilt settings. At the same time jewellers in Czechoslovakia (now Czech Republic and Slovakia) began to set clusters of small simply-faceted pyropes in base metal thus providing colourful but affordable bangles, brooches and earrings for the mass market. These 'Bohemian' garnets are very much of their time and are still very common today.

**Abundant, often inexpensive and supremely versatile, garnet is surely one of the most underrated of all the better known gemstones.**

There was, however, one last moment of glory for garnet. Demantoid, the bright green variety of andradite garnet, had been discovered in the Russian Urals as far back as 1853. Nevertheless, it was not until the 1880s that it started to be set commercially in jewellery and accessories, firstly by Peter Carl Fabergé and subsequently by jewellers in London who obtained supplies from gem merchants such as E W Streeter. The naturalistic green tones and adamantine lustre of demantoid perfectly conveyed the look of a reptile's skin or an insect's



*Late 18th/ early 19th century Neoclassical hessonite cameo ring of the Emperor Tiberius – the profile exhibiting the excellent cutting surface inherent in this variety of grossular garnet. Image courtesy of Bonhams.*



John C Benjamin FGA DGA FIRV is an independent valuer, jewellery historian and author of *Starting To Collect Antique Jewellery*. Find out more at [johnbenjamin.co.uk](http://johnbenjamin.co.uk)



Two necklaces: Angle's skin (Boké or Magai) coral, the albino variety of *Pleurocorallium elatius*, and Oxblood (Aka or Moro), the deep red variety of *Corallium japonicum*. Image courtesy of Chii Lih Coral.



# Living Coral

Inspired by Pantone's 'Color of the Year 2019', Rui Galopim de Carvalho FGA DGA dives into the underwater world of precious coral and addresses some of the misunderstandings around its use in the jewellery industry.

The colour of many precious corals has been announced as the 'Color of the Year 2019' by Pantone, the US-based company known for its proprietary colour system widely used in the printing industry. Under the name 'Pantone 16-1546 Living Coral' this colour code alludes to the pink to red colour that is commonly associated with corals. A clarification is therefore in order to properly understand what it is meant by coral in the jewellery industry.

Coral is the collective name that has been used to describe a very large number of species of cnidarians of the Anthozoa class. Among these more than 7,300 species, we encounter the endangered shallow-water coral species in Australia's Great Barrier Reef and elsewhere that have been suffering

from bleaching and death as a result of climate change and ocean acidification.

This dramatic situation for the equilibrium of the planet's marine ecosystems has negatively impacted on the reputation of coral as a luxury product. It happens that the corals used in the jewellery industry do not live in the same ecosystem as those endangered reef corals. This is why those that are used jewellery and decorative arts have been designated as 'precious corals' by CIBJO, the World Jewellery Confederation, separating them from the 'common corals' and even more dramatically from the endangered reef corals.

## WHAT ARE PRECIOUS CORALS?

These are corals most used in high-end jewellery and decoration and are limited to species belonging to the Corallidae family, particularly from the genus *Corallium*, *Pleurocorallium* and *Hemicorallium*. It is in some of these groups that we can find the red and pink, sometimes salmon-coloured and often white varieties with porcelain like lustre after polishing that relate to this year's Pantone colour.

Although a few varieties of red and pink coral were listed for the monitoring of the trade in Appendix III of CITES at the request of China in 2008 (*Corallium elatius*, *C. japonicum*, *C. konojoi* and *C. secundum[sic]*), no precious corals are listed in the more restrictive CITES Appendixes I and II. It must be said that



Pantone's 'Color of the Year 2019' described as 'Living Coral'. Image by Pantone.

the recommendation for monitoring expired in 2013, being extended until 2016, and that for the next CITES meeting in 2019, no further action is to be proposed for precious corals. Current fishing regulations in the Mediterranean, Taiwan and Japan have played an important role in resource management of precious corals and more initiatives are being implemented to further the issue.

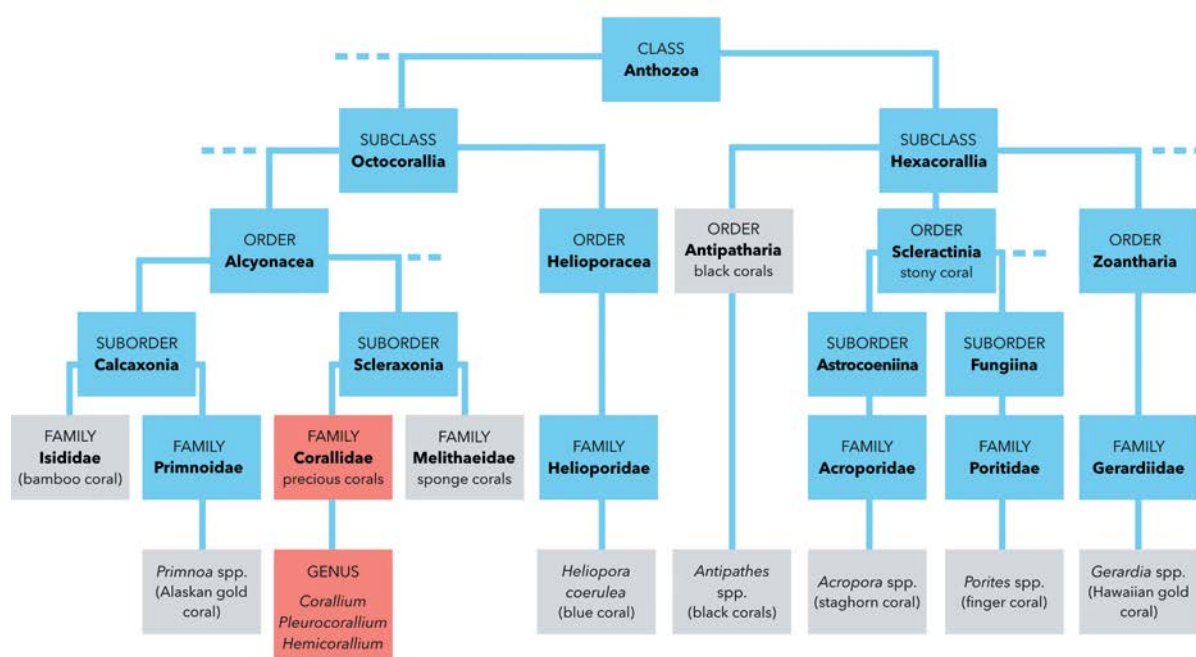
Let's then establish what are the precious coral species currently recognised by the trade: *Corallium japonicum* (Aka, Moro or Oxblood coral), the dark red to very dark red corals with a lengthwise white interior which live at depths of 80 to 300 in Japan; *Pleurocorallium elatius* comprising of two varieties: the so called Momo, Cerasuolo or Satsuma coral, a bright red, salmon, orange and flesh colour with a lengthwise white interior and its albino variety, known in the trade as Angel Skin, Boké or Magai coral, a delicate flesh pink, with different colour intensities, which live at depths of 150 to 300 meters mainly off the coasts of Japan and Taiwan; *Pleurocorallium konojoi* (Pure White or Shiro coral), the milky white and sometimes with red or pink specks, that live at depths of 80 to



A parcel of polished small branches of Deep Sea coral (*Hemiorallium laauense*).  
Photo courtesy of Liverino 1894.

It happens that the corals used in the jewellery industry do not live in the same ecosystem as those endangered reef corals.

300 meters in the South China Sea and off the coast of Hainan; *Pleurocorallium secundum* (Midway, Rosato or White/Pink), the veined white or pink, and sometimes with red specks, or uniform clear pink, that lives at depths of 400 to 600 meters off the coasts of Hawaii and Midway Island; *Hemiorallium laauense* (Deep Sea or Shinkai coral), the bright white, clear pink or white pomegranate with red veins or spots which live at depths of 1000 to 2000 meters off the coast of Midway Island,



The taxonomy of precious corals (in Pantone 'Living Coral' colour) and Common corals (in grey).





The dramatic effects of bleaching in coral reef (before and after). Image courtesy of The Ocran Agency / XL Catlin Seaview Survey/Coral Reef Image Bank.

north-west of Emperor Seamount; *Hemicorallium regale* (Garnet coral), the pomegranate colour with different shades of uniform pink that live at depths of 350 to 600 metres off the coast of Hawaii; *Hemicorallium sulcatum* (Misu, Missu or Miss coral), the pink to violet uniform colour which live at depths of 100 to 300 metres in the Philippines northern coastal waters; last but not least, *Corallium rubrum* (Sardinian or Mediterranean coral), the historically and culturally famous uniform red with medium to strong saturation that live at depths up to 1,000 metres (harvested only bellow 50 meters) in the Mediterranean and in the Atlantic Ocean off the coast of North Africa, including in the waters of the Canary Islands and Cape Verde.

#### WHAT ARE COMMON CORALS?

Apart from the above mentioned Corallidae family species, there are a few other corals that have been used for decoration and in jewellery. These, defined as common corals, include

mostly calcareous types, like sponge corals, bamboo corals and blue corals as well as black and golden corals, which have non-calcareous exoskeletons. Many of these must undergo treatment (e.g. bleaching, dyeing, impregnation) to be used as gem materials.

Contrarily to precious corals, certain common coral species are listed in CITES Appendix II, e.g. black coral (*Antipatharia* spp.), blue coral (*Heliopora coerulea*), stony corals (*Scleractinia* spp.), organ-pipe corals (Tubiporidae family), fire corals (Milleporidae family) and lace corals (Stylasteridae family).

Reef coral preservation should be on the top of the agenda not only of the jewellery industry but also of society as a whole, mainly by reducing the carbon impact of civilization that is responsible for climate change and ocean acidification. CIBJO recently argued through its Coral Commission president Vincenzo Liverino under the banner of a 'Promise of Sustainability' at the 21st FEEG Symposium and CIBJO Seminar on Responsible Sourcing and Sustainability

held at the VicenzaOro show, Italy in January, that it is a task of the industry and first of all of the coral industry to set an example by embracing the 'Jewellery Industry Measurement Initiative' promoted by CIBJO to help companies within the jewellery industry understand their environmental impact, reduce their carbon footprint, and protect themselves and the industry as a whole.

The need for education of both the trade and the consumer in these matters is therefore of prime importance to correct what was a lack of consistency in the terminology used to describe precious coral, to inform the public of about the biology, ecology, history and legacy of precious coral and to raise public awareness of issues related to the sustainability of coral in general, and precious coral in particular, predominantly in light of the challenges posed by global warming and ocean acidification. ■

Images courtesy of the author unless otherwise stated.

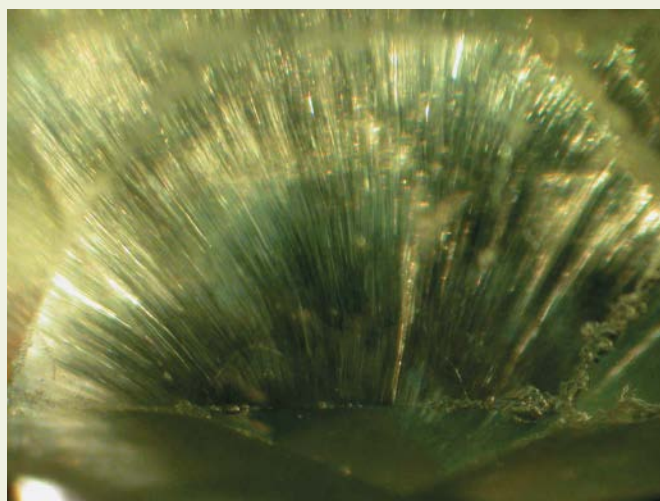
# Perfectly Imperfect

Can the presence of inclusions increase the value of a gemstone? Here, *Gems&Jewellery* considers how inclusions can affect value, both aesthetically and financially.

Even those with no training in grading and assessing diamonds can understand that the presence of inclusions – sometimes described as ‘imperfections’ – reduces the value of a diamond. It is a neat and understandable system, which is why the Four Cs have remained integral to the sales process for decades.

In contrast, coloured gemstones are more subjective. Despite there being many gemmological factors that influence the value of a coloured gemstone, it is impossible to ignore the personal factors. Perhaps the customer is looking for a specific birthstone, perhaps a favourite colour, or a gem with a particular mythology or ancient connotation?

In some cases, however, striving for a gemstone with perfect clarity can ignore the aesthetic (and diagnostic) interest of inclusions. Quartz is an ideal example. The transparent variety, rock crystal, is used in jewellery pieces and in carvings, but it doesn't pack the same punch as quartz with inky rutile inclusions, or ‘angel hair’ strands of gold rutile. Similarly, there is something about strawberry quartz, especially when the flashes of red iron oxide aren't too densely packed. Quartz is not an expensive gemstone, which makes perceived attractiveness important to its eventual value. Other useful examples include moss agate and its dendritic inclusions that appear to grow just



under the surface. With many of these gemstones, it is the balance of colourless quartz and the density, spacing and colour of the inclusions that makes them attractive. We could say it is a ‘perfectly-imperfect’ combination.

When it comes to ‘imperfections’ adding value, we must discuss amber and its propensity to trap small insects (and even small frogs) in time. In December 2018, scientists were overcome with Burmese amber samples containing preserved, three-dimensional feathers from a 100-million-year-old feathered dinosaur. This is undoubtedly priceless to a palaeontologist, but not necessarily to the practising gemmologist or jewellery customer.

Next, it is also worth considering the creativity of master gem carvers who perceive the value in a stone because of what it can become, or its aesthetic potential. The presence of inclusions

or banded layers can bring the story of a carving to life. Patrick Dreher's ‘Strawberry Starfish’, which appeared in this magazine in 2017, utilises the strawberry quartz, rock crystal and amethyst in one single crystal to create the scene of a starfish clinging to coral above the sea floor.

Finally, with some higher-value gemstones, inclusions may not add value, but they certainly indicate value. When looking into a demantoid garnet, the presence of a characteristic horsetail

inclusion is likely to make the heart of a gemmologist skip a beat (pictured above), perhaps conjuring visions of a gem from the time of the infamous Russian Tsars. Similarly, the hazy, cloud-like appearance of myriad dissolved rutile particles in a sapphire could result in dreams of a lost gem of Kashmir, as this type of inclusion is often seen in these historic and exceptionally high-value gemstones.

The question of value is one of the many things that makes gemmology so varied and nuanced; a career full of constant learning. Now, as ‘snowflake’ or ‘salt and pepper’ diamonds become more common, the questions of perceived value, aesthetic value and monetary value are sure to keep us all on our collective toes. ■

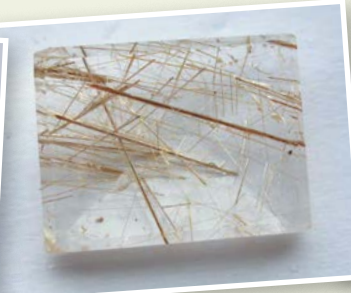
*Images courtesy of Gem-A gemmology tutor, Pat Daly FGA DGA.*



Moss agate



Chlorite in quartz



Two examples of rutilated quartz, sometimes known as ‘angel hair’ quartz.





# Our Time in Tokyo

Gem-A welcomed the New Year with a visit to International Jewellery Tokyo (IJT) at Tokyo International Exhibition Center from January 23-26, 2019.

With its proud tradition of fine craftsmanship and fascinating history, Japan is the perfect place to present

Gem-A's long-standing gemmological knowledge and education services. To reach potential students, Gem-A exhibits at International Jewellery Tokyo (IJT), which always proves a fantastic event.

This year, Gem-A's chief liaison officer in Japan, Ayako Naito, was joined by gemmology tutor, Pat Daly FGA DGA, head of education, Nysa Pradhan, regional head of Asia, Anne Carroll Marshall FGA DGA and head of China, Jessica Han FGA, for what was a productive four days.

Highlights included three buzzing 'Gemmology Clinics' allowing visitors to ask questions and experiment with gemmological instruments, plus a gemstone identification competition that kept amateur and professional gemmologists guessing. Gem-A was also pleased to welcome representatives from its Approved Practical Providers in Fukuoka and Osaka, as well as its Accredited Teaching Centre, Japan Gem Society (JGS).

## GEM-A INTERNATIONAL SCHEDULE 2019

Want to say hello to us? We will have a presence at all of these shows and conferences in 2019:

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**IJL**  
London, UK  
Sep 1-3

**Hong Kong Jewellery and Gem Fair**  
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Sep 18-22



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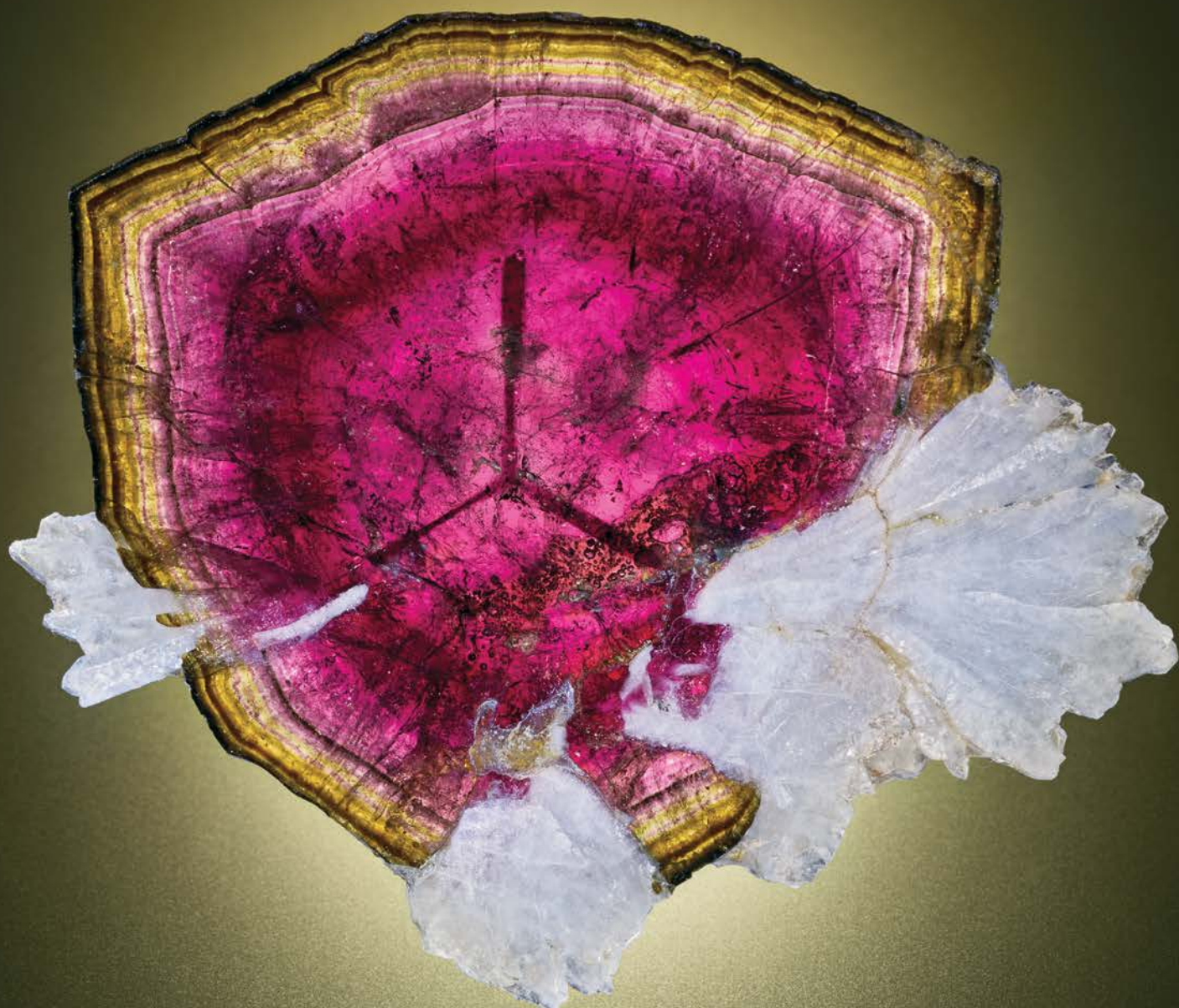


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