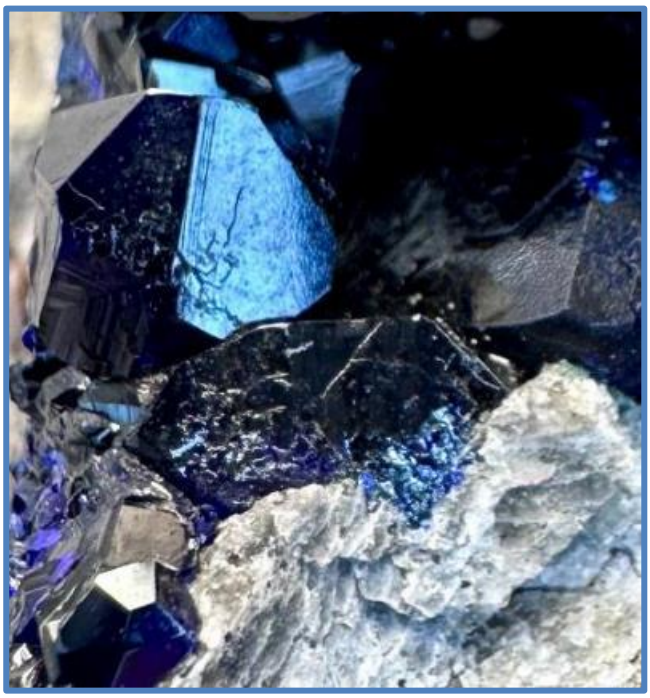
CAPE TOWN
GEM & MINERAL CLUB
FOR THE STUDY OF ROCKS, MINERALS & CRYSTALS

WEBSITE NEWSLETTER

OCTOBER 2024



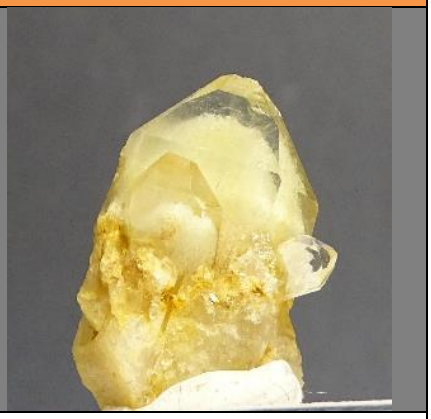
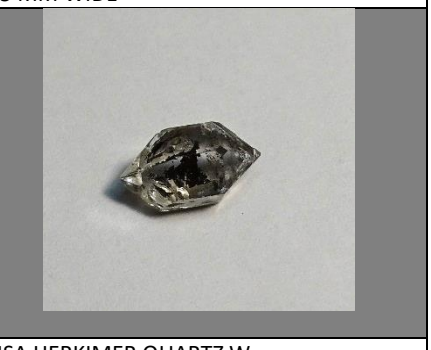
A member's macro photo of a Tsumeb 4 mm azurite crystal from the Easter Pocket

DIARY

October	***5***	***10:00–14:00***	***Open to the Public Day – Rocks, gems, jewellery, mineral specimens to look at, chat about, swap, sell or buy.***
November	***2***	***10:00–14:00***	***Open to the Public Day – Rocks, gems, jewellery, mineral specimens to look at, chat about, swap, sell or buy.***

"FACETIPS – A Gem Cutter's Notebook" by Duncan Miller.

Most of the faceting articles published over the past few years in the Mineral Chatter have now been compiled into a single 128-page document. The pdf file is available for download for free from http://ctminsoc.org.za/articles.php for those interested in having all the articles together.

	JO'S QUARTZ SPECIMENS WITH INCLUSIONS	
		
ORANGE RIVER QUARTZ W. HEMATITE 40 MM WIDE	ORANGE RIVER QUARTZ W. CHLORITE 30 MM WIDE	CERES MTS QUARTZ W. UNKNOWN 15 MM WIDE
		
QUARTZ W. RUTILE 15 MM WIDE	MADAGASCAR QUARTZ W. UNKNOWN 25 MM WIDE	MADAGASCAR QUARTZ W. UNKNOWN 50 MM WIDE
		
N. CAPE "HERKIMER" QUARTZ W. 17 OIL INCLUSIONS 12 MM WIDE	QUARTZ W. PYRITE CUBE 12 MM WIDE	CONGO QUARTZ POSSIBLY W. SHATTUKITE 15 MM WIDE
		
MESSINA QUARTZ W. AJOITE 24 MM WIDE	MADAGASCAR QUARTZ W. HOLLANDITE 15 MM WIDE	USA HERKIMER QUARTZ W. ANTHRAXOLITE 6 MM WIDE
Not to scale. Width of crystal when viewed upright		

Can anyone send us different ones to those already shown?

The 5th Mineral Symposium recently held in Johannesburg

This symposium was hosted by MINSA on Saturday 7th September 2024 at the University of the Witwatersrand. The symposium aims to get professional and amateur mineral and gem enthusiasts together, and to promote mineral activities in South Africa. Personally, I felt these objectives were achieved, as this was an enjoyable day for all concerned.

The sixty-two delegates who attended were treated to presentations from nine speakers, a high-quality collection of abstracts and delicious refreshments. Dealers and traders manned tables between sessions and selections of minerals, semi-precious gemstones, books, journals, teaching aids and memorabilia were for sale. A binocular microscope was provided for sample viewing.

The subjects covered in the talks included descriptions of type minerals from the KMF, a new mineral, pilanesbergite, and inconsistencies surrounding prehnite (name and type locality). There was also an eye-opening account of ruby prospecting in Mozambique.

Details of techniques used to analyse old pigments in art works were revealed, XRD techniques were explained, Selfrag splitting to separate mineral phases was described, and images were shown which proved that a SEM could cope well down to nanometre scale. Mineral identification using all five senses was itemised, with sight being the most popular, and sound the least (given that few people admit to tasting rocks even though many do)!

There was much hilarity at a talk about meteorites and “meteorwrongs”, not to mention Russian meteorite samples guaranteed to be fakes!

As far as presentations by members of our own club goes, Lesley Andrews presented some aspects of her copper slag crystals, and Peter Rosewarne submitted an abstract with top class photos of part of his collection.

Many “freebies” were handed out during the day – polished stones, meteorite pieces, stickers and even old carbide lamps. Plans were made to hold another such event more often. If so, it would be worthwhile attending. LA

Some photographs from the event

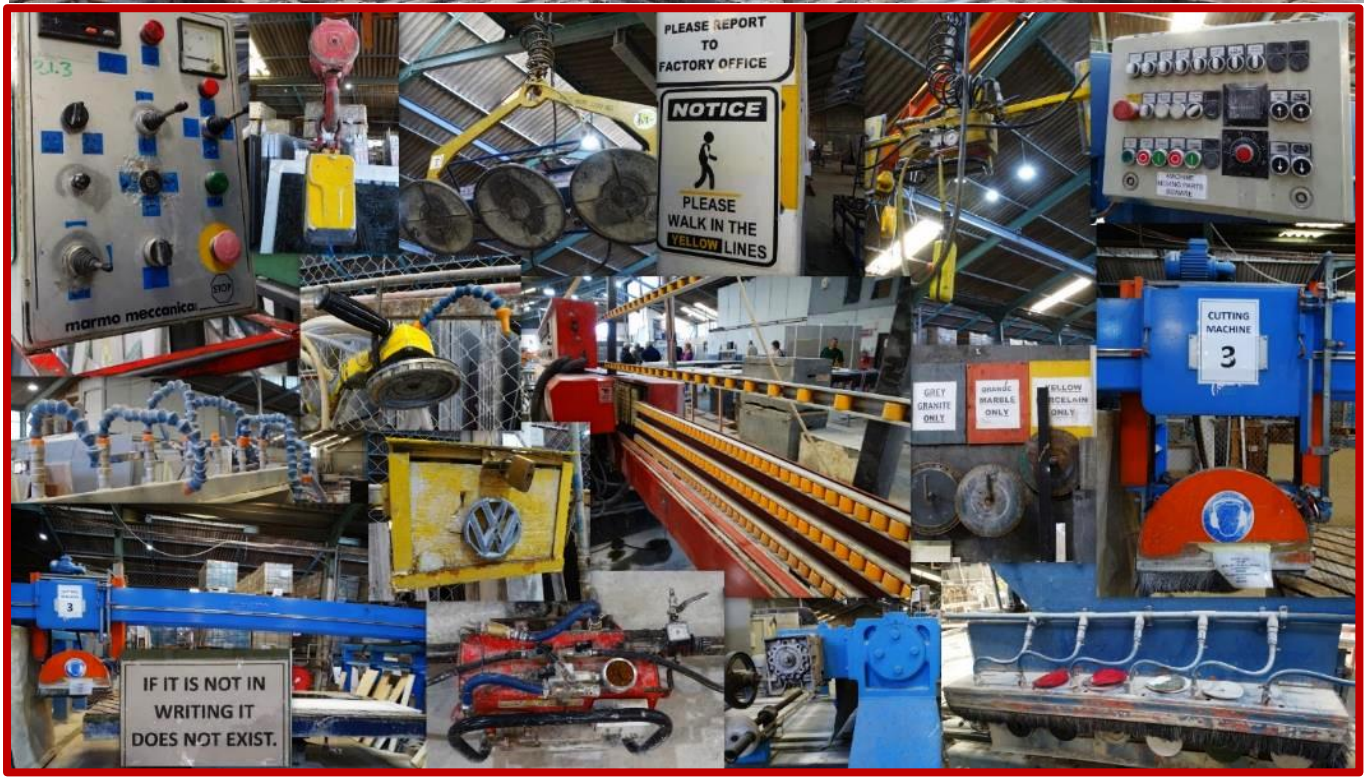
Visit to the WOMAG factory in Epping

On Saturday 31st August, 15 club members visited the wonderful **W**orld **O**f **M**arble **A**nd **G**ranite factory in Epping at the kind invitation of Rieyaad Hess, their Site Manager & Product Specialist.

Probably not many of us had applied our minds to such large stone working before. It was fascinating to learn so much about Dimension Stones and how they are sourced, cut, processed, and arrive at the factory to find new homes. Potential customers have hundreds of slabs to choose from for use in kitchens, bathrooms, and even wall coverings. The colour range is quite amazing, plus the fact that even with the same rock, if it is cut with the "grain" or against the "grain" it can produce a totally different visual effect. The slabs are basically graded as granite, marble, or onyx, depending on their hardness, and require different saw blades to cut the different type of stone, and different speeds of polishing to bring the cut edges back to the perfection of the main surfaces.

My camera found the stone slabs too shiny to record well, so I started taking pictures of the machinery instead, with the result below. It was quite a collection. Birch plywood is used as the cutting surface. JW

< Photo Tracy Hannath



Some examples of what we saw

Rieyaad has sent us the following information on some of the stones they work with:

Onyx

Brown onyx originates from volcanic and sedimentary environments, where mineral-rich water seeps through cracks and cavities in the earth. Over time, this mineral-laden water deposits layers of silica and other minerals, creating the striking banding patterns characteristic of onyx. The natural beauty of brown onyx is further enhanced by its translucence, allowing light to pass through and accentuating its rich colours and intricate designs. This stone is typically found in specific regions around the world, with notable deposits in places like Mexico, India, and Iran. Each source imparts unique characteristics to the stone, making brown onyx not only a material of aesthetic appeal but also one with geological significance.

Brown onyx is renowned for its striking aesthetics, characterized by rich, warm tones that range from deep chocolate to lighter caramel shades. The stone's unique banding and veining create intricate patterns that add depth and visual interest. Its translucent quality allows light to filter through, enhancing the stone's natural beauty and creating a captivating glow when backlit.

Labradorite

Labradorite stone mining involves extracting this stunning feldspar mineral from deposits, primarily found in Canada, Madagascar, and Finland.

"Labradorescence": this visual effect can range from vibrant blues and greens to stunning golds, making each slab unique. Finally finished slabs are packaged for distribution, ready to be transformed into luxurious surfaces in homes and commercial spaces. The entire process not only highlights the natural beauty of labradorite but also supports local economies and promotes sustainable mining practices.

Incorporating labradorite into household items not only enhances visual appeal but also connects spaces to natural beauty and positive energy. Whether through decor, functional items, or wellness products.

Travertine

Travertine originates from the mineral deposits formed in natural hot springs and limestone caves, where calcium carbonate precipitates out of the water. This sedimentary rock is primarily composed of calcite and forms in layers, often incorporating organic materials and minerals that create its characteristic colours and patterns.

The distinct veining in vein-cut travertine results from the way the stone is sliced, emphasizing its linear features and giving it a unique aesthetic appeal. The colours can range from creamy whites and warm beiges to rich browns and earthy reds, influenced by the minerals present during its formation.

Travertine's porous nature contributes to its unique texture, making it a lightweight and versatile material for various applications. It is highly valued for its ability to regulate temperature, making it a popular choice in both indoor and outdoor settings. Its natural beauty and durability make travertine a favoured option for flooring, wall cladding, and decorative elements, bringing a timeless elegance to any space.

The Vredefort Dome (as you have perhaps never seen it)

by Peter Rosewarne

Flying from Cape Town to Johannesburg on 2nd September on my way to **Santiago, Chile,** I happened to glance out of the window about an hour and a half into the flight. It took me a while to realise what I was looking at – the Vredefort Dome, from an angle that few of us have probably ever seen it.

A simplified geological map for the area is shown in Image 1.

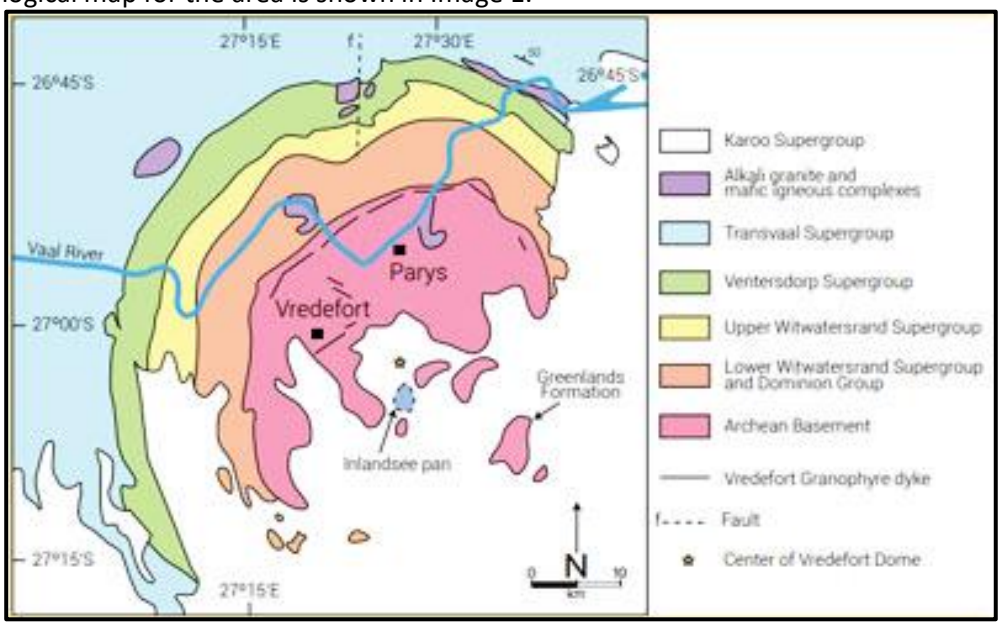


Image 1: Simplified Geology of the Vredefort Dome (from Reimold and Keoberl, 2014)

The images below are all looking to the northwest from an altitude of about 10 000 m. They aren't very clear, being taken through the perspex of the plane's windows. However, one can make out the salient features. In **Image 2**, in the western part of the dome, the light brown area in the foreground is underlain by Archaean granite-gneiss and the town of Vredefort is the darker smudge to the right of the engine cowling, You can make out the circular structure of the dome curving from the edge of the engine to midway on the right hand edge of the image. These 'steps' are formed by the upturned strata of the Witwatersrand Supergoup. **Image 3** is of a polished sphere of the rock *pseudotachylite* from a quarry in the granite-gneiss, a black 'glass' with embedded fragments of granite. caused by the meteorite impact. This impact occurred a little over 2 000 million years ago.

Image 2: Vredefort Dome in the Vicinity of Vredefort

Image 3: Pseudotachylite Sphere

In **Image 4 below**, the Vaal River can be seen entering from the right before turning abruptly to the northwest and then just as abruptly to the southwest, following the contact between the West Rand and Central Rand groups. This is in the central part of the dome.

Image 4: Vredefort Dome with the Vaal River

Image 5: Vredefort Dome in the Vicinity of Parys

In **Image 5**, we have moved, at about 700 km/h, towards the northeastern part of the dome and the town of Parys can be seen on the banks of the Vaal River.

WATCH THIS SPACE NEXT MONTH FOR A REPORT BACK ON PETER'S VISIT TO CHILE!

"The Blues"

Azurite
by Peter Rosewarne

Introduction

No, this is not an article on Chelsea FC or one of my favourite genres of music, it's merely #7 in a continuation of the colour-themed minerals articles. We'll be skipping the more obvious candidates such as *azurite, aquamarine, sapphire* and *sodalite* in favour of some less well-known blue-coloured species such as *benitoite, cavansite, jeremejevite, smithsonite, kyanite,* and *halite*. I can only think of two minerals with blue in their name, *Blue John* and blue lace *agate*, but I guess we should also include azurite and *cyanotrichite*? There are quite a few blue mines, including the Blue John, Blue Jay, Blue Bird and Blue Bell mines.

I'm presuming that *copper* is the main metallic ion colourant or chromophore, but we'll find out as we run through the selection. Examples are either from or ex The Rosey Collection except where image credit is given. There might not be 50 official shades, but we'll see how many hues of blue we can get through! An interesting but useless thought just occurred to me; blue is one of the three primary colours but many secondary minerals are blue…

The Minerals

First up is a rare "ocean blue" smithsonite, a *zinc carbonate*, from Choix, Mexico, below left.
Then we have a "robins-egg blue" smithsonite from the Kelly Mine, New Mexico, which is famous for this colour of smithsonite. In both examples the blue colour is due to the presence of copper.

Figure 1: Blue Smithsonite, Choix, Mexico

Figure 2: Smithsonite, Kelly Mine, New Mexico, USA

Finds of bladed "light-blue" barite crystals on *goethite* were made in 2011 at the Ouichane Mine, Morocco, with the best specimens ranking in the "best of" category for barite. The example in **Figure 3** was purchased from Rob Smith, African Gems and Minerals, in 2023. Barite is a *barium sulfate* and feels characteristically "heavy" in the hand due to the relatively high atomic weight of barium.

Figure 3: Barite on Goethite, Morocco

Next, below, we have a "sky-blue" sheaf of bladed kyanite crystals from Minas Gerais, Brazil (**Figure 4**). Depends on where you live, I guess, because I don't recall seeing too many skies of that colour growing up in the UK. Kyanite is an *alumino-silicate* and is a mineral of high-pressure metamorphic rocks, and forms a polymorphic series with *andalusite, staurolite* and *sillimanite*. It is also a rare accessory constituent of *eclogites*. In metamorphic rocks, the blue colour of kyanite is due to Fe and Ti ions.

Figure 4: Kyanite, Minas Gerais, Brazil

Moving closer to home, **Figure 5** is of blue *willemite* from the Tsumeb Mine, Namibia, possibly from the second oxidation zone. It is a *zinc silicate* mineral.

Figure 5: Willemite Tsumeb Mine, Namibia 4.2 x 3 x 2 cm (courtesy of Marin Minerals)

Remaining in Namibia but with a much rarer mineral, we have jeremejevite from Mile 72, Cape Cross. The best examples were discovered in 1972. There are also occurrences in the Erongo Mountains, sometimes heavily corroded. It also comes as colourless crystals. It is an *aluminium borate* and occurs in *granitic* pegmatites. One of the best examples graces the cover of "The Smale Collection II" book, as shown in **Figure 6**. It is 5.7 cm tall.

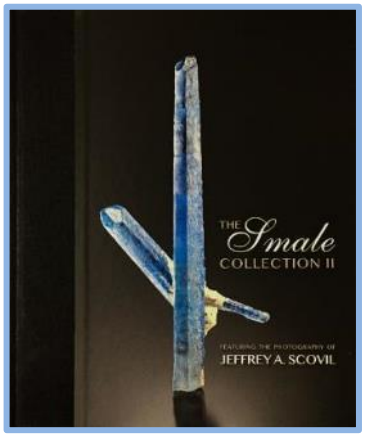


Figure 6: Jeremejevite, Cape Cross, Namibia

Staying with uncommon minerals, next up is benitoite, a *barium-titanium silicate* and very aesthetic examples are shown in **Figure 7 below**, with two cut gems, from the Dallas Gem Mine, California, USA. The left photograph is by the Mineral Gallery and the right photograph by Spirifer Minerals. The left photograph shows the crystals on a characteristic bed of white *natrolite* with a couple of black *neptunite* crystals. These minerals are derived from hydrothermally altered *serpentinite*. Titanium ions give benitoite its intense blue colour and it occurs in unique flattened pyramoidal crystals.

Figure 7: Benitoite, Dallas Gem Mine, USA

Figure 8 below is a nice plate of teal-blue *apatite* crystals from the Lake Baikal area of Russia, an uncommon mineral specimen location. Apatite, or *fluorapatite* as it is now more accurately called, is another of those minerals that comes in multiple colours, including brown, green, blue and pink. The blue colour is due to traces of our old friend, Fe.

Figure 8: Apatite, Lake Baikal, Russia

Cavansite is a *calcium vanadium silicate* usually occurring in *basalts* along with *zeolites* such as *apophyllite* and *stilbite*. Th example in **Figure 9 below left** is from the well-known locality of Pune in India from the so-called Deccan Traps basalts. The peacock-blue colour is caused by vanadium.

And finally, for all of us who thought that halite was a boring white or colourless mineral, take a look at **Figure 10**. It comes from the Intrepid Potash East Mine in New Mexico. The chromophore is apparently *potassium*.

Figure 9: Cavansite on Stilbite, Pune, India

Figure 10: Halite, New Mexico (Internet image)

Concluding Remarks

In terms of blue hues, we've had ocean-blue, robin's-egg blue, teal-blue, peacock-blue and sky-blue and some common and not-so-common minerals. And now the familiar question, do you get blue *diamonds*? Yes, you do but they are amongst the rarest and most expensive of diamonds and only found at a few mines, including the Cullinan Mine, South Africa and, previously, the Argyle Mine, Australia. The blue colour is due to the presence of *boron* in the crystal lattice. In the image at right is a rough 28 carat diamond from the Cullinan Mine and to its right, the "*Blue Moon of Josephine*," a 12.03 carat cut stone. That just leaves green and purple if we disregard white, grey and variants such as e.g. mauve, violet and orange. *Sacre bleu!*

Image by Petra Diamonds

Another useless thought just occurred to me: presumably there were no blue minerals before the Great Oxidation Event of between *c*.2.4 to 2.0 billion years ago?

From the Cabinet of Curiosities

This month's Curiosity is zoned fluorite from the Illinois Fluorite District, USA. but twinned with a twist! I came across the specimen in **Figure 1a** in an article on the mineral collection of Laura Delano in Rocks & Minerals Vol. 98 No. 4 of July-August 2023. This is a very nice zoned cube, 10.3 cm wide, on sphalerite. Hang on I thought, I've seen this colour combination in fluorite before, in The Rosey Collection. My specimen is shown in **Figure 1b**, a more modest 7 x 4.5 x 4.5 cm. Both are from the Minerva #1 Mine and are exact colour twins. **PR**

See below:

Figure 1a: Zoned Fluorite Crystal (image courtesy of Rocks & Minerals).

Figure 1b: Zoned Fluorite Crystal (The Rosey Collection)

The Mineralogical Society of Southern Africa, PO Box 28079, Goede Hoop Street, Bothasig, Cape Town, 7406, registered Non-Profit Organisation No. 61-850, trading as The Cape Town Gem & Mineral Club, and affiliated to the Federation of South African Gem & Mineral Societies.
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