Website Newsletter of the Cape Town Gem & Mineral Club

AUGUST 2023

Two kunzite (pink spodumene) stones completed recently by Duncan Miller.
The 24,06 ct oval is 20 mm long. The 29,94 ct 'Tripolar Brilliant' by Merrill O. Murphy is 19 mm long in longest dimension, but deeper than the oval, hence heavier.

DIARY

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

Letters to the Editor

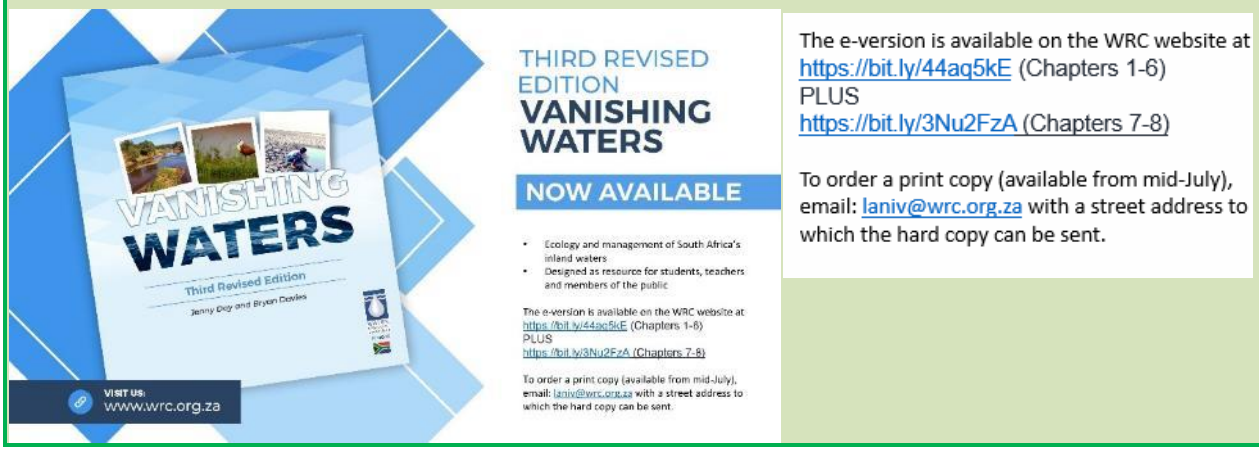
Dear Ed,
In the July Mineralogical Chatter Peter Rosewarne wondered how modern artisanal Zimbabwean miners identified where to dig for gold. He guessed that they may have followed earlier excavations, but then how did those earlier miners identify suitable localities? Most Zimbabwean hard-rock gold occurs in quartz veins with visible gold, unlike most South African hard-rock gold that is in conglomerate. Colonial European gold miners in Zimbabwe followed traces of earlier indigenous mining, which exploited surface-reaching quartz vein ore. This is explained in a comprehensive review of indigenous gold mining in southern Africa, available on Research Gate.
https://www.researchgate.net/publication/261827219_Indigenous_Gold_Mining_in_Southern_Africa_A_Review.

In the 1870s, Thomas Baines visited the Zimbabwe Gold Fields and produced several oil paintings illustrating early colonial mining. One shows "Makhombo, a Mashona […] picking out samples from the reef" (Miller 1999:161) to show the hunter Henry Hartley, credited with the "discovery" of the gold fields. You can read the text of my article on Research Gate, but I don't have copyright to the illustrations, for which you would have to consult a book in a library.
https://www.researchgate.net/publication/369097237_Miller_D_1999_From_science_to_allegory_geological_observations_of_Thomas_Baines_In_Stevenson_M_ed_Thomas_Baines_an_artist_in_the_service_of_science_in_southern_Africa_146-161_London_Christie's

Regards
Duncan Miller

JENNY DAY'S NEW BOOK:

Dear Jenny,
Congratulations on the completion of the revision of your book! I have downloaded both files and simply scrolled through to enjoy the copious beautiful illustrations.
Best wishes,
Duncan



Desert Roses from Port Nolloth, Northern Cape, South Africa

Gisela Hinder, Rosh Pinah Geo Center, Namibia

Port Nolloth and McDougall's Bay are well known for their white beaches, birdlife and the history as a harbour town for copper concentrate from the Okiep/Springbok copper mines. But most of all they are famous for the alluvial diamonds found by Jack Carstens in gravel beds on the beach in 1926 and later also mined offshore.

Interesting and strange desert roses can be found adjacent to the salt pan situated north of the little coastal town of Port Nolloth, 78 km south of Alexander Bay. Digging only about 20 to 30 cm into the still wet salty clay layer produces these little gypsum crystals in abundance. Don't be shy to get very dirty and don't forget to wash off all your iron-containing tools thoroughly after the digging exercise. I forgot to clean my Geo Pick properly and it rusted extensively! A good scrub removed the rust and spraying it with silicone did the trick.

The author and Sonja Smit working their 'mudhole' next to the salt pan near Port Nolloth, digging for desert roses. The specimen on the right still needs a good wash.

Some of the specimens found that day before cleaning. Note the one at the top centre, displaying two crystal blades growing on a rosette. The best way of cleaning the rosettes is putting them in water for a couple of days and spraying them clean with a watergun afterwards. Nevertheless, be careful not to use to much water pressure or destruction of the crystals is inevitable! The question always arises how the gypsum rosettes came into being and it is difficult to imagine that they basically grew in the mud out of a mixture of different elements, mainly calcium, sulphur, oxygen and water and the arid conditions they were in.

Not to go too deeply into scientific explanations about the crystal growth of the desert roses I used the info from Wikipedia, the free encyclopaedia. "A desert rose is an intricate rose-like formation of crystal clusters of gypsum or barite, which include abundant sand grains. The 'petals' are crystals flattened on the *c* axis, fanning open in radiating clusters. The rosette crystal habit tends to occur when the crystals form in arid sandy conditions, such as the evaporation of a shallow salt basin. The crystals form a circular array of flat plates, giving the rock a shape similar to a rose blossom. Gypsum roses usually have better defined, sharper edges than barite roses. Celestine and other bladed evaporite minerals may also form rosette clusters. They can appear either as a single rose-like bloom or as clusters of blooms, typically ranging from pea-sized to 10 centimetres (4 in) in diameter. The ambient sand that is incorporated into the crystal structure, or otherwise encrusts the crystals, varies with the local environment. If iron oxides are present, the rosettes take on a rusty tone. The desert rose may also be known by the names: sand rose, Sahara rose, rose rock, selenite rose, gypsum rose and barite (barite) rose."

Mainly little rosettes were formed at the Port Nolloth desert rose deposit, varying in size from 1 cm to 6 cm. Interestingly some of the rosettes developed leaf-shaped crystal extensions which stand up like bunny ears. The sand which was incorporated during the crystal growth forms interesting patterns inside the leaves when held into the light. Rims of the crystals are sometimes glassily transparent whereas the rosettes and leaves display a yellowish grey colour.

Desert Rose Gallery

1 cm to 6 cm

3,5 cm

2,5 cm

8,5 × 4 × 2 cm

7 × 5 × 3 cm

7 × 5 × 3,5 cm

11 × 5 × 3 cm

3 × 3 × 2 cm

9,5 × 4,8 × 4,5 cm

7,5 × 4 × 4 cm **4,5 × 4,5 × 3 cm**

The internal fabric of broken gypsum leaves reminds me of fish skeletons.

Below: 9 × 1,5 cm **Right: 5 × 2 cm**

After having looked at some of the naturally formed desert roses from Port Nolloth I would like to introduce you to some desert roses shaped by humans. The American company Skullis (worth a look at their website) came up among others with carving skulls out of desert roses and that is totally up my alley.

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Rutile: A Mineral of Many Habits

by Peter Rosewarne

Introduction

Rutile, a *titanium oxide*, comes in as many habits as a fashion-conscious monk; from included needles, to straw-like growths, to drab brown to lustrous dark reddish-brown and reddish-grey crystals and twins. A photograph in the April 2023 offerings from Hummingbird Minerals, reproduced as **Figure 9**, got me thinking about this mineral that most of us only know of as occurring in *rutilated quartz*.

The name comes from the Latin *rutilus* for reddish because of its characteristic deep red colour. Rutile is one of the main ores of titanium and is mined on an industrial scale from heavy mineral sands, along with *ilmenite*, *zircon* and *garnet*, particularly in Australia and South Africa, the latter at the Tronox heavy mineral sands mine near Brand se Baai up the West Coast, probably better known to most as Namakwa Sands. Titanium is a strong, corrosion-resistant metal used as a white pigment (titanium dioxide) and in many strong, lightweight metallic alloys in the aerospace and military fields.

Rutile is probably not high on many collector's wish-lists but its many varied crystal habits make for fascinating viewing and some crystal habits are very collectible, and most of us probably have a piece of rutilated quartz amongst our more prized crystals. It crystallises in the tetragonal system and varies from prismatic to acicular in habit, elongated along the *c*-axis. Its Mohs hardness is 6,0–6,5 and it is a common accessory mineral in high temperature and pressure igneous and metamorphic rocks.

For completeness, mention is made here of the other two naturally occurring titanium oxide minerals, *brookite* and *anatase*. The former often forms platy brown crystals while the latter often forms small, blocky, striated, dipyramid crystals.

Crystal Habits

We'll start with what I would term 'normal' crystal habits and move through various forms to its ultimate, bizarre incarnation. Fine, lustrous, dark reddish-grey crystals, often twinned, are found at Graves Mountain in Georgia, USA and rank as the best-of-species in the World. They occur in a *kyanite*-rich quartz granofels[1]. A nice twinned example is shown in **Figure 1** while **Figure 2** is of a single crystal and **Figure 3** is of a group of reddish, striated crystals, looking very much like brookite.

[1] A medium to coarse grained metamorphic rock without foliation

Figure 1: Twinned Rutile Crystals, Graves Mountain USA (John Betts Fine Minerals, ex The Rosey Collection)
Figure 2: Rutile Crystal

Figure 3 left: Rutile Crystal Group (Wikipedia)
Figure 4 right: Rutile Crystals on Hematite, Zambia (ex The Rosey Collection)

Figure 4 shows small reddish rutile crystals, with striations, embedded in hematite crystals, from Zambia. (Apologies for my poor photograph.)

Figure 5 below shows rutile 'crystals' as most of us know them; acicular and embedded in quartz. One of the theories of its origin is that quartz permeates a vug and then the rutile precipitates and grows within the quartz as it cools. The other one is that as a quartz pegmatite is cooling, it develops microscopic cracks which allow the rutile to grow within the crystals (any other theories, →Letters to the Editor). Rutilated quartz can take on a lovely golden colour and has trade names such as Bahia Gold, Venus Hairstone and Cupid's darts. An example of golden rutilated quartz from Brazil is shown in **Figure 6**. This form of rutile is known as *sagenite* and some examples are shown in **Figures 7** and **8**.

Figure 5: Rutile Needles in Quartz (Internet image)

Figure 6: Golden Rutilated Quartz (J Palmer)

Figure 7 left: Rutile Hairs, Bahia, Brazil (photograph by Zbynëk Buřival)
Figure 8: Sagenite, Switzerland (photograph by Zbynëk Buřival)

Figure 9 has to be one of the most bizarre crystal associations and habits known – acicular rutile growths or needles on *hematite* crystals from the classic locality for this association, Novo Horizonte, Bahia, Brazil.

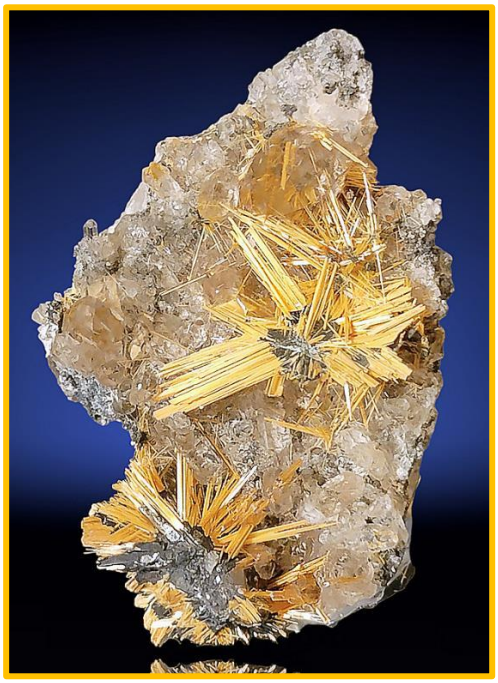


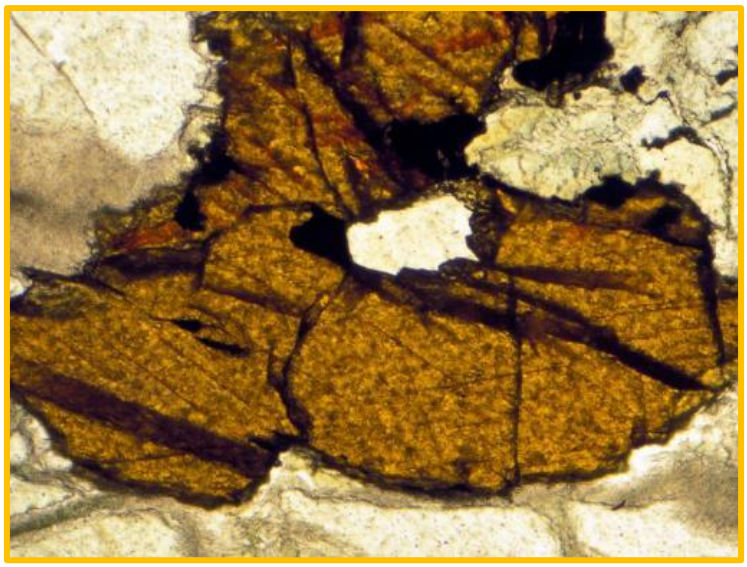
Figure 9 left: Acicular Rutile Crystals on Hematite, Bahia, Brazil (courtesy of Hummingbird Minerals)
Figure 10: Rutile Sprays on Hematite and Quartz, Nova Horizonte, Brazil (courtesy of the Mineral Gallery)

Fine rutile needles are also responsible for phenomena such as *silky*, *cat's eye* and *asterisms* in some gemstones. These features can enhance their value. Asterism is seen in some gemstones such as star *sapphire* and *ruby.* Here, the rutile needles intersect to form a six-sided star formation when viewed with a single overhead light source. An example is shown in **Figure 11a**. Other orientations of the rutile inclusions can give gems a silky lustre and in the case of *chrysoberyl*, a *chatoyant,* cat's eye effect. This form is known as *cymophane* and an example is shown in **Figure 11b**.

11a

11b

Figure 11: Star Sapphire (10a) and Cat's Eye - Cymophane (10b) (Wikipedia)



To round-out this article, **Figure 12** shows rutile in thin-section through a polarizing microscope. It is characterized by very high relief and a brownish colour.

Figure 12: Rutile in Thin-section in an Eclogite (Internet image)

Concluding Remarks

So, there you have it, a habitual chameleon of a mineral species in rutile, ranging from an orthodox habit to the bizarre, and I'd never heard of sagenite or cymophane before researching for this article.

Is there another mineral species that exhibits such extreme dimorphism and how many other dark-coloured minerals can produce a brilliant white pigment? And produce prized gems such as star sapphire and ruby and cat's eye? Watch this space to find out or send examples to the Editor.

References

Palmer, L. (2013), *Rutilated Quartz*. Gem Profile.
Ridgley, V. (2018), *Rutile – The Titanium Crystals*. Mineral Expert.Org.
Schumann, W. (2001), *Gemstones of the World: Revised & expanded edition.* NAG Press. Germany.

From the Cabinet of Curiosities

This month's **Curiosity** is the **MIM Museum in Beirut**, Lebanon. I've come across many references to this institution in, e.g. the Mineralogical Record, with superb mineral specimens being illustrated and wondered what it is and who is behind it and the name. I've since found out that it is a private collection and is regarded as one of the best such collections in the World. M is the 24th letter in the Arabic alphabet, the equivalent of the Latin M, and is the first letter of the words museum, mineral and mines in Arabic, and also in English and French, the two other official languages of Lebanon. It opened its doors in 2013 and houses >2 000 specimens and were assembled from 1997 by Salim Eddé, owner of computer company Murex4. **Figure 1** shows some displays in the museum, including what look like large kunzite crystals. **PR**

Figure 1: Displays in the MIM Museum, Beirut (Internet image)
https://www.mim.museum/

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

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 from http://ctminsoc.org.za/articles.php for those interested in having all the articles together.

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