

SEPTEMBER 2021

**THE CLUB REMAINS CLOSED IN SEPTEMBER.
WE'LL KEEP YOU UPDATED BY EMAIL, WEBSITE OR INSTAGRAM.
STAY SAFE, AND GET VACCINATED AND WE HOPE TO OPEN SOON.**



Width of view - 80 cm

The re-emergence of some Jan Coetzee's

We have had two enquiries about Jan Coetzee quartz crystals this past month. The first was from a guy called Deon. He once bought a house from a deceased estate in Avondale, Parow.

He reckons that the house must have been un-lived in for some while as the agent handling the sale said he used to sell plants he grew there to a big garden centre. To Deon, the backyard looked like a scene from Jurassic Park. It was wild with waist-high grass, there were home-made greenhouses, and the vines were using them to full advantage. All this led to a clean-up of the garden, which in one part revealed a brick path underneath layers of soil. As Deon cleared away the soil, he discovered this crystal. He says:

"I've always wanted to know how it ended up there and where it came from, so I was pleasantly surprised with all the information you provided. It's amazing how quickly you were able to identify it and its possible origin."

Does anyone know who might have owned the Avondale house?



The next Jan Coetzee contact was about the massive crystal cluster above. Odin from Somerset West wrote and asked if it was of interest to us.

This is his story:

"Well, my name is Odin and I am the owner of the crystal cluster. I inherited it from my late father, Odd, who during the Sixties lived in Nababeep. He was a keen stone and gem collector, and had quite a comprehensive collection including this cluster of crystals. Upon leaving Nababeep, he sold his collection to the late Jopie Kotze

of the Springbok Lodge and Restaurant. He kept the cluster as he treasured it and wanted to keep it in the family. So as the only son, I was the lucky one.

I am not sure exactly how my father got the cluster initially, but I do believe it would have been a very legit way, as he was a man with high morals. He has owned the cluster since the early sixties. Over the years many collectors from all over the country came to look at it and offered him good money, but he was never interested to sell. I remember way back a collector offered him R6, 500 for it - at a time when a Mercedes sedan cost less than that.

You asked about the weight of the cluster: it takes 4 men to lift it, so I don't know.

I also have a single crystal measuring 700 mm in length. Photo herewith.

These crystals are known as Nababeep-Wes 1964. The Jan Coetzee mine was located in Nababeep West. When this pocket/cave was blasted open, the miners who witnessed this discovery the first time, described it as amazing and unforgettable as the crystals reflected in their headlights. Apparently, in the pocket there was single crystal that was around 3 metres long. It was too heavy to move, so the miners tried to halve it, and in the process destroyed it.

Besides the cluster and the single crystal, I also have a piece of quartz with a tube (like a level) filled with liquid. Just imagine, this liquid was trapped in the quartz at the time of the forming of the Earth. Someone from the University of Stellenbosch came to look at it many years ago, and he confirmed a possible time period, but unfortunately I cannot remember the exact detail.

Seeing that I am so fortunate to own such rare crystals, my view is to share them with whoever is interested."

And here are some photos he sent us:



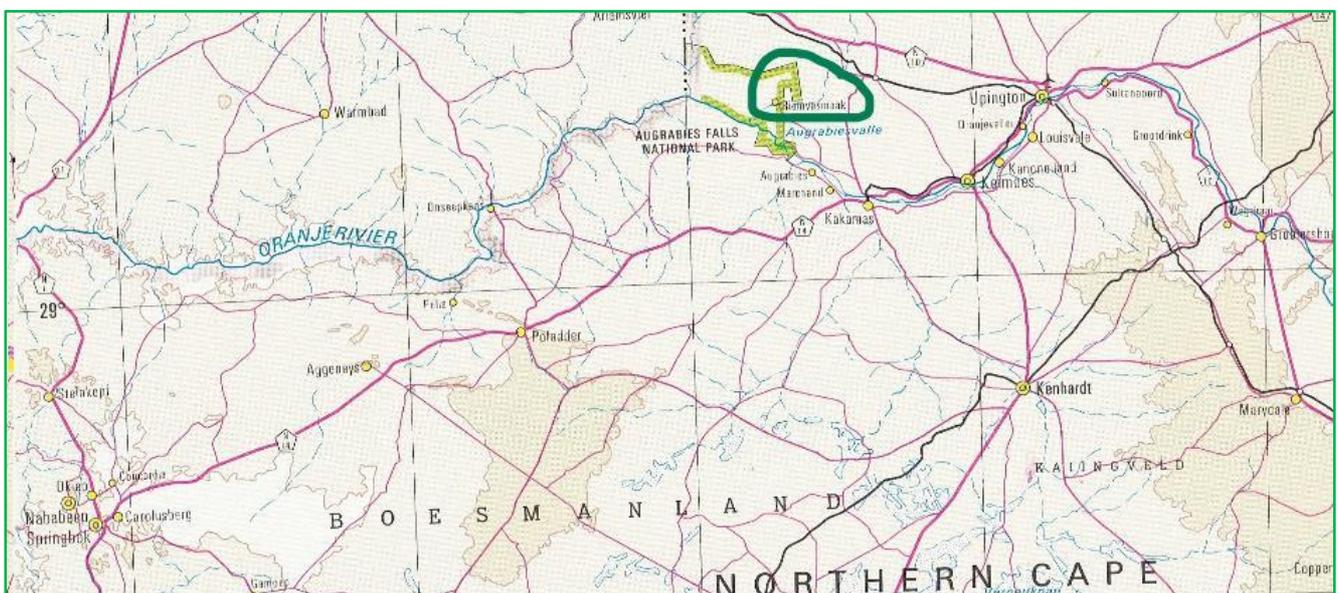
Carrying on with our travels in the Northern Cape, we now cross over the Orange River, take a quick look at some of its quartzes and go on up to the village of Riemvasmaak.



Orange River quartzes with calcite and barite



More Orange River quartzes with some calcite and barite, plus unusual growth habits, and inclusions



Riemvasmaak - resurrected from ashes

Duncan Miller

Riemvasmaak village is remote by any reckoning. The 55 km dirt road from Kakamas on the Orange river makes its way toward the South African/Namibian border between high game fences, part of the Au-grabies National Park, before reaching the Riemvasmaak Conservancy area. Another approach is via the recently completed bridge across the Orange river at Blouputs, and then up the rough track leading to the village itself. Riemvasmaak village used to be a mission station and the central hub of a scatter of smaller settlements in the desert hills north of the Orange river. These were established over a hundred years ago by people of mixed descent – Nama-Damaras, Xhosas and Coloureds – united by their common use of Afrikaans and their subsistence farming.

In 1973 the Apartheid juggernaut destroyed this mixed community in one of its more manic acts of “black spot clearance”. Third generation descendants of Nama and Damara forebears were packed off to Khorixas in northern Namibia. Those deemed of Xhosa descent were despatched to Welcomewood in the Ciskei. And the “Coloureds” were dispersed to various towns and farms in the Gordonia district. Some 700 families were displaced, and in the process families were fractured, their carefully nurtured livelihoods destroyed, and their homes were burnt and demolished. The anguish caused by this callous and ideologically driven destruction has been portrayed movingly in Peter Goldsmid’s 2008 SABC TV production “Riemvasmaak”.

The depopulated land was promptly divided between the South African Parks Board and the South African Defence Force. For twenty three years the people of Riemvasmaak languished as reluctant refugees, with those in Namibia and the Ciskei having to contend with alienation, severe drought, extreme poverty, and loss of dignity and community history. Those in Namibia had a particularly rough time of it, living in make-shift grass shelters and having lions killing their stocks of karakul sheep.

With the 1994 change of government in South Africa, and help from the Legal Resources Centre, representatives of the former Riemvasmaak community were successful in negotiating their land claim. This led to the first case of land restitution after the 1994 elections. In March 1996 70 000 ha were handed back to the community, and numerous former residents and their descendents returned to Riemvasmaak. The South African Defence Force had demolished most of its own structures, leaving only a barracks building subsequently converted to a school.

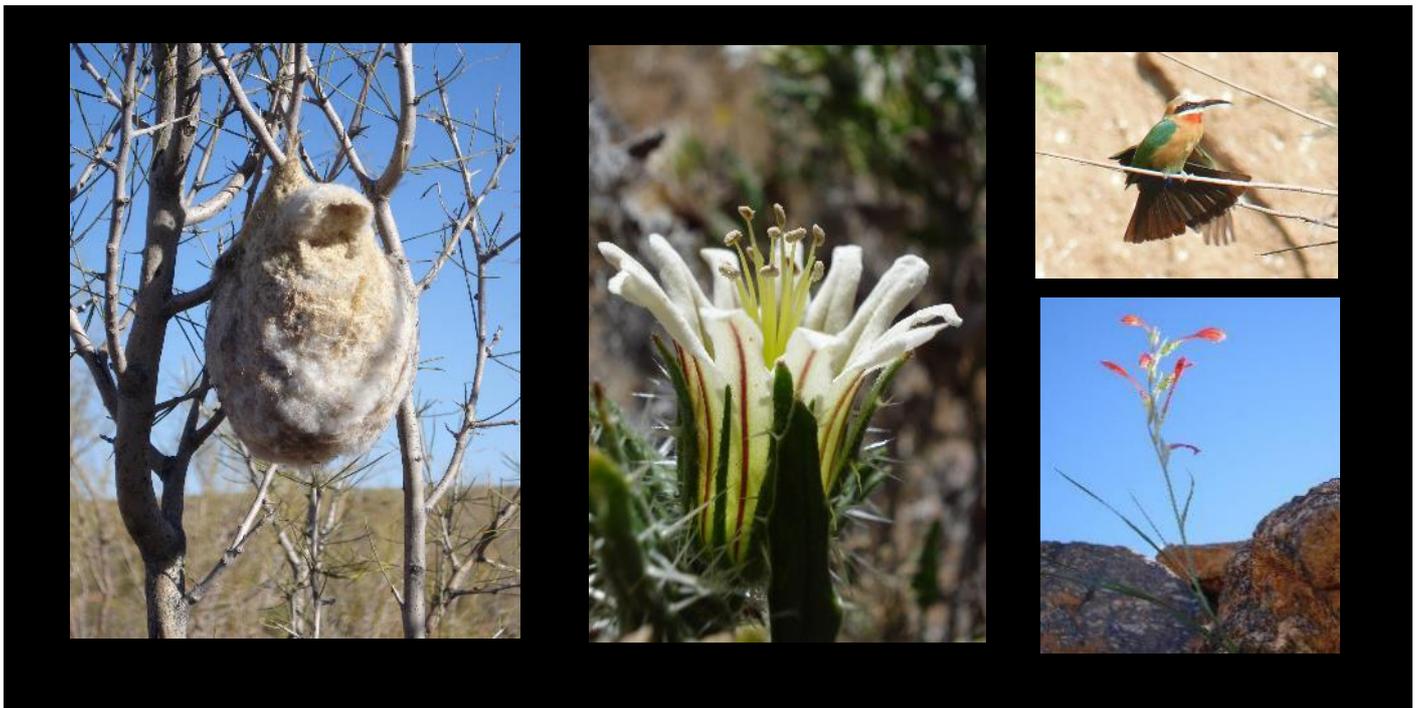
The resettled community had to fight various uphill battles. Their traditional system of water and grazing allocation had been lost. Their village had to be rebuilt largely from scratch, with about 250 families living in tents until houses were built in 1997. And they still had to recover land from the Au-grabies National Park. This was a protracted and sometimes acrimonious struggle, resolved in 2004 when 4500 ha at Melkbosrand was handed over to the community to develop ecotourism.

Only very limited farming is possible in the present Riemvasmaak Conservancy. Rainfall is sparse and away from the Orange river people are dependent on boreholes for water. Many of these are seasonally dry. Apart from some stock farming, mostly sheep and goats, the only economic activity for the town is ecotourism and very small-scale mining.



The ecotourism is focussed around **the Molopo gorge (left)**, which plunges from the plateau on which the town is situated, to meet the Orange river several kilometres downstream. A hiking trail follows the gorge, but for those less energetic there are four extremely **well-positioned chalets (right)** near the beginning of the scenic gorge.

These overlook a natural warm spring, developed as a series of small bathing pools, surrounded by towering granite cliffs, inhabited by a twitcher's paradise of birds, including black eagles. At the head of the gorge a 4x4 trail leaves the outskirts of the town, winding its way through the Orange River hills before climbing onto the Nama plateau. In contrast to the bare, carunculated granite hills, with their streaks of white quartz pegmatites, the Nama plateau is completely flat and covered in milk bush euphorbia, seeming like a different world.



The trail plunges back to Riemvasmaak itself down a steep canyon. In sight of the town, the widening walls of this canyon are pocked with small excavations, worked by a group of young men excavating fluorite. This mineral occurs in seams in the granite and is excavated by hand, using hammers and picks to remove blocky crystal masses covered in a coating of opaque white quartz. The crystal lumps are lugged down the hillsides, transported to the town by donkey cart, and sold to mineral dealers from as far away as Cape Town. The fluorite crystals then have to be cleaned in highly toxic hydrofluoric acid to remove the encrusting quartz, revealing the bright apple-green fluorites.



Above: a cleaned Riemvasmaak fluorite. Width of view 50 mm
 Right: A rough piece from a garden. Width of view 450 mm



These sell on the international mineral market for thousands of US dollars, only a small fraction of which ever reaches the miners themselves. Because this informal mining is the only obvious source of local income for the youth, most of them leave the town for employment elsewhere, either on farms along the Orange river or in South African cities. As a result the village community depends largely on remittances and government grants, with more than three quarters of the inhabitants living below the poverty line.



The village itself reflects this state of affairs. Most transport is by foot or donkey cart, and most of the homes are corrugated iron, with an external stand pipe and toilet cubicle. Nevertheless, the people are friendly, cheerful and proud of their achievement in regaining their ancestral land. Many domestic plots have small gardens and the town is clean and neat. As most of the inhabitants are either very young or elderly, there is a junior school and a new, recently equipped clinic building. The Riemvasmaak community as a whole is not short of external support, but most of the present development is happening along the Orange river.

In 2007 the Blouputs bridge, part of a R85 million development, was completed across the Orange downstream of Augrabies. This links Blouputs to Vaaldrift on the northern bank, where in 2008 the Vaaltd/Omdraai farm was handed over to 657 Riemvasmaak households. The established export peaches and grape farm, worth R28 million, had been bought by the state from Mr Dries

Steyn, and a further R3 million was made available for development. The purchase of more farms for the community is promised if this one is well managed.

This may leave Riemvasmaak village itself stranded high and dry, but it presents new opportunities for the community as a whole. There is a lot of historic sentiment attached to the village, and local ecotourism and fluorite mining can sustain a small resident population. But without any other obvious income generating potential, the village population is likely to decline as life along the Orange river becomes economically more attractive. The scenic beauty of this mountain desert wilderness area will remain though, and it is well worth a visit.



OFF THE BEATEN TRACK: SOUTH AFRICAN NATIONAL MONUMENTS WITH A GEOLOGICAL THEME

Peter Rosewarne

There are thousands of national monuments¹ in South Africa, mostly associated with historical buildings and places. However, some of them are associated with geological themes including fossils, glacial pavements, mining and rock types. In this article we will be looking at four national monument sites that I have visited that cover mining and rock types, namely, the Sea Point Contact in Cape Town, Orbicule Hill and the Van der Stel Shaft, both in the Northern Cape Province, and Dwars River in Limpopo Province. Two of these sites featured in my previous article on the Springbok area but the text and figures have been expanded for this article. All photographs are by the author.

The Sea Point Contact (intrusive granite contact zone)

This site was declared a national monument in 1953 and is located on the beach in the Sea Point suburb of Cape Town. It has been visited by such eminent persons as Charles Darwin who stopped by in 1856 on his voyage around the world in the Beagle. Exposed in a wave-cut platform is a 150 m wide contact zone between porphyritic Cape Granite and Malmesbury Group sediments, mainly shales. The latter have been metamorphosed by the heat of the granite intrusion into a dark grey rock called hornfels.



Figure 1 above shows part of the contact zone with the lighter coloured granite, comprising of quartz, feldspar and biotite, contrasting with the dark grey hornfels. On close inspection one can pick out detail of the contact zone which shows **stringers of granite intimately intruding the sediments**, many in parallel growth to the bedding structure of the latter, a feature termed *lit par lit* (**Figure 2**). Fragments of Malmesbury sediments are also enclosed in the granite as xenoliths. **Another feature is the growth of large feldspar crystals in the hornfels (Figure 3)**, presumably by migration of suitable fluids from the granite, i.e. metasomatism.

¹ I'm a bit confused about terminology between national monuments and national/provincial heritage sites. For this article I'll stick with the former as this terminology is not of material importance.



Figure 2

The site has been held up as an example of proof for an intrusive origin of granitic rocks as compared to the 'granitisation' theory which holds that granites are formed by *in situ* alteration of existing rocks, not intrusion of magma. Both theories are probably correct for different granite occurrences and environments, and a combination of both in some instances. Some researchers describe the contact zone as a migmatite (i.e. mixed rock) whereas the Geological Society plaque description states that this isn't a migmatite as the Malmesbury rocks did not undergo partial melting.

A plaque erected by the Geological Society of South Africa (Figure 4 right) describes the features of the contact zone. As with the Dwars River national monument plaque, it has been vandalised.



Figure 3



Orbicule Hill (rare orbicular diorite occurrence)



Figure 5

Orbicular granite or diorite is a rare rock type found in only a few places in the world and only two in South Africa, one of which is Orbicule Hill near Springbok in the Northern Cape. I thought the site was just off the N7 but found that it was quite a bit further than this. I turned off the N7 at the Okiep sign and expected to see some directions but

it was only after about 10 km on tar to Concordia that I found a sign to the site and turned onto a gravel road that soon meandered out of habitation and then another sign showing “Orbicule ↑” as shown in **Figure 5**. I followed this track for another 2 km or so and was wondering where I was when I saw some parking areas marked out with whitewashed stones but no other signage. This is a proclaimed national monument so I expected a bit more guidance but couldn’t find an official plaque, although there was a rectangular area with some holes that looked like where a plaque could have been situated. **Figure 6** shows the diorite *koppie*. The site is a bit underwhelming, but you can see the orbicular texture quite well on the exposed rock faces (**Figure 7**).



Figure 6



Figure 7

The rock consists of two components; a matrix and the orbs and was apparently formed by granitoid magmas separating while in a fluid state. The orbicules are darker and finer grained than the matrix, which has a more ‘normal’, coarse grained granitic/dioritic appearance. There is a lot of what appears to be iron staining and most of the outcrops have extensive brown staining. The orbicules are of large but variable size and shape, up to 8 – 10 cm across. **Figures 8 and 9** show images taken with a Celestron digital microscope of the fine grained and coarse-grained parts of the rock, respectively. My interpretation, assuming the rock is a diorite², is that the grey crystals are quartz, the white crystals plagioclase feldspar and the black grains could be biotite and amphibole. I haven’t seen a polished section of this rock, but it doesn’t appear to be as well developed as the examples in granites from Finland (Kangasala) and Australia (Mount Magnet).

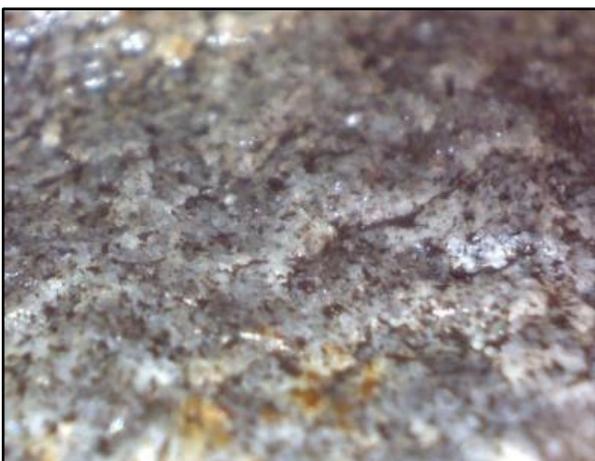


Figure 8



Figure 9

² Quartz-feldspar-mica association is a tonalite.

The Van der Stel Shaft (historical copper exploration in Namaqualand)

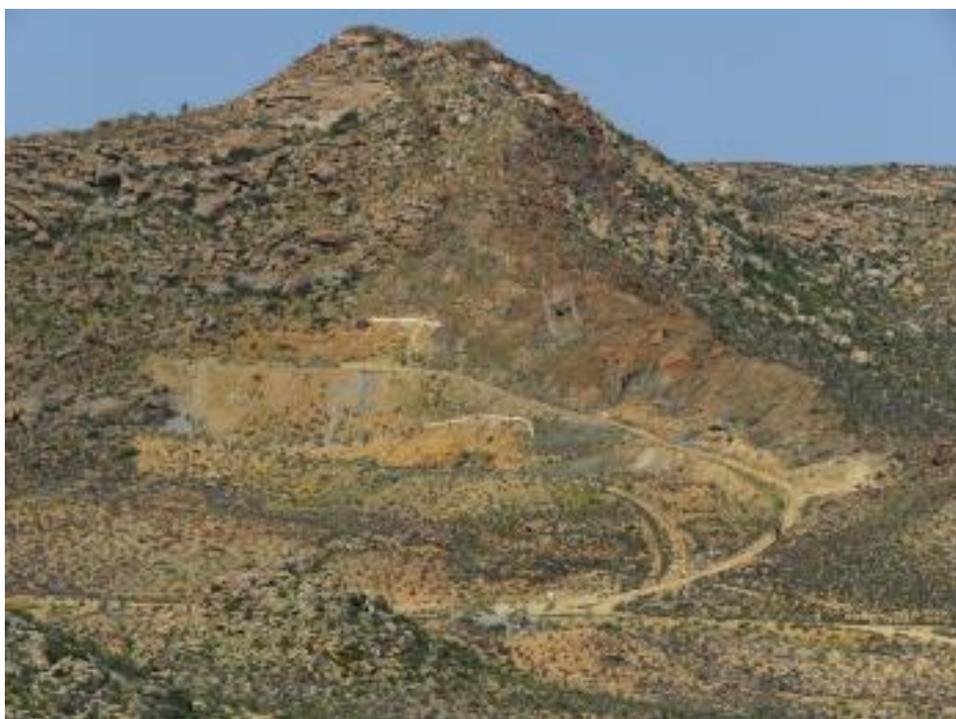
First, some background. The copper mineralisation in the Springbok area is hosted in noritoid rocks of the Koperberg Suite (c.1 160 Ma) which have been intruded into the granites and gneisses in irregular lenses. These intrusions are often associated with so-called 'steep structures' where the fabric of the granite-gneiss steepens on both sides becoming near-vertical in the centre (see Figure 10). There are about 1 700 of these intrusives in the area. The oxidised parts of the ore bodies are characterised by green and blue films and patches of copper oxides, as seen extensively at the Van der Stel shaft (Figure 10). Approximately 2 million tonnes of copper worth about R130 billion in today's money were mined from about 32 concession areas in the period 1852-2004. This was the first commercial mining to take place in South Africa and as with many mining areas, included boom and bust periods. I read recently that mining is going to start up again to access the lower grade ore left behind by the earlier miners.

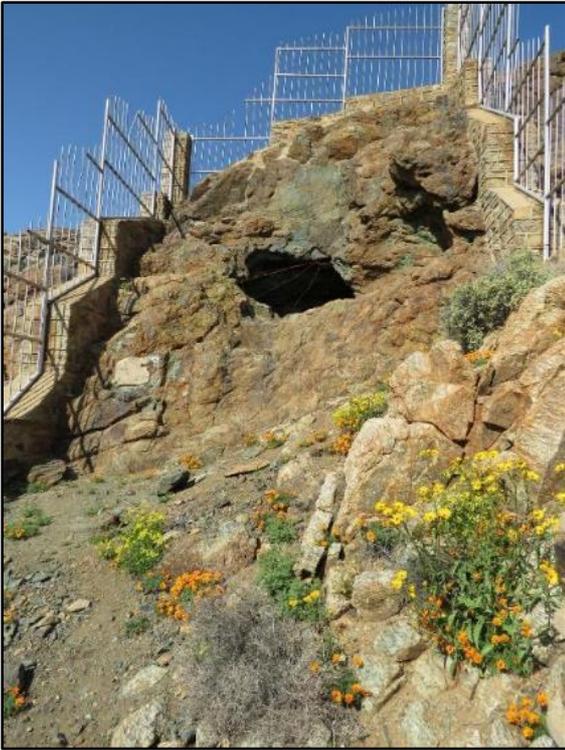


Figure 10

This national monument near Springbok marks where Commander Simon van der Stel and his expedition sank some shafts into malachite-stained norite in 1685. He organised this expedition to the Namaqualand area to search for the origin of the copper ornaments worn by the local population. The party left Cape Town on 25 August 1685, reaching the copper mountains of Namaqualand on 21 October the same year. They pitched camp at the foot of the aptly named Koperberg, five miles east of the present-day town of Springbok.

A steep walk up the path on the side of the Koperberg from the parking area (**Figure 11 at right**) takes you past some piles of norite with green, presumably malachite, stains, patches and films. A shaft just before the main one (framed by rectangular fencing in Figure 11) shows an example of the so-called 'steep structures' that characterise the noritoid occurrences of the Koperberg Suite (see **Figure 10**).





The main Van der Stel shaft and date plaque are shown in **Figure 12 and 13**. They sank the shaft to a depth of “three fathoms” (about 5,4 m) and took samples which were sent to Holland for assaying. The results were disappointing, however, yielding 7,5 to 11 per cent copper; the party had unwittingly passed within a few kilometres of the richest copper-bearing ground which has yielded up to 60 per cent copper. Because of the remoteness of the area, lack of water and the apparent low grade of the ore, commercial exploitation of the Namaqualand copper deposits only started in 1851.

< **Figure 12**

Figure 13 >



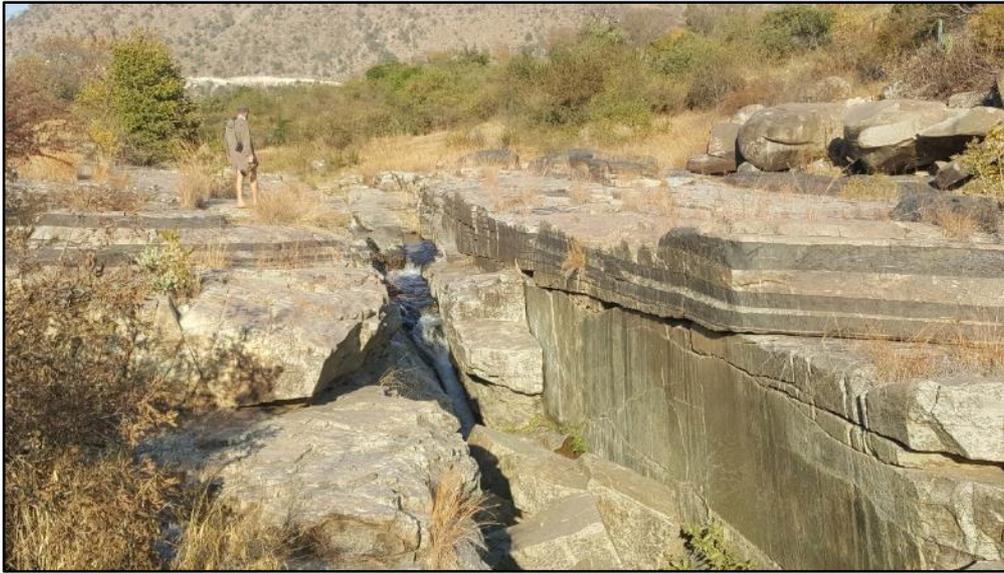
Dwars River (Bushveld Complex enigma)

This spectacular site, declared a national monument in the early 1980s, is located in the Kennedy’s Vale area along the road from the R555 to Lydenburg. It is in the Eastern Limb of the Bushveld Complex, the largest mafic/ultramafic igneous intrusion in the world. It occupies an area of about 66 000 km² and comprises of four main ‘lobes’ with the best exposures occurring in the so-called Eastern Limb where the entire succession of about 8 km is present. The rocks range from mafic norites and gabbros to ultramafic pyroxenites and peridotites, and anorthosites. These rocks show regular rhythmic layering and are termed the Rustenburg Layered Suite. They contain layers rich in platinoids (platinum, palladium, rhodium, osmium, iridium and ruthenium), chromite, vanadium and magnetite. However, detailed petrological and mineralogical description of this incredible feature will have to wait for another article.

At the Dwars River site, the river has cut-down through a major joint zone and exposed the Upper Group Chromite No. 1 seam or UG1. This has given rise to the striking exposure of black chromite layers within light coloured anorthosite, as seen in **Figure 14**. The main chromite layer is on the far bank with the thinner footwall chromite layers exposed in the joint face. **Figure 15** shows the main joint eroded by the Dwars River. One chromite layer can be seen bifurcating into thinner layers (**Figure 16**). The origin of these chromite layers is still being debated but it would appear that the mechanism may have involved intrusion of the differentiated chromite ‘magma’/crystal mush into an already partially solidified and differentiated plagioclase crystal cumulate.



Black chromite layers within light coloured anorthosite. Figure 14



The main joint. Figure 15



One chromite layer can be seen bifurcating into thinner layers. Figure 16



Chromite is a member of the spinel group and crystallises at high temperatures and is therefore normally euhedral, i.e. octahedral. A thin-section of chromite-rich anorthosite is shown in **Figure 17³ at left** with black chromite octahedra in a matrix of twinned plagioclase with minor pyroxene (stippled). The presumably earlier-formed chromite octahedra towards the base of the section are larger. However, this occurrence shows a gradational build-up of chromite sinking under gravity (high specific gravity) through the differentiated magma, quite different to the sharp boundaries of the chromite layers in Figure 14.

³ Hatch and Wells²

This is a world-famous exposure and is visited by earth scientists from around the world. As such it was rather shocking to see that someone must have taken a sledgehammer to the commemorative plaque and plinth that had been erected jointly by Wits University and the Geological Society and demolished it, as shown in **Figure 18**.

A sad note to end on.



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