J. Halpern specimen. J. Scovil photo.

MINERALS

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In this issue also:

I. Brown specimen. J. Scovil photo.

Editor-in-Chief:
Tomasz Praszkier (Poland)

Associated Editors:
Paul Cragan (USA
John Veevaert (USA)

Associated Photographer:
Jeff Scovil (USA)

Contact: *tom@spiriferminerals.com*

Red Lead Mine: a new chapter

Shane DOHNT & Tomasz PRASZKIER

Miner George Quist in front of the Red Lead mine portal after a long day of specimen extraction. S. Dohnt photo.

INTRODUCTION

In recent years, serious new mining operations for specimens have very rarely been opened. Economic and legal limitations render commercial specimen mining so problematic that very few companies decide to undertake such a venture. This is why collectors are very excited and grateful for new projects like the one which has recently begun at the Red Lead mine, Tasmania, Australia. Thanks to a successful partnership between mine owner Shane Dohnt and leading mineral dealer and specimen mining company Collectors Edge, the mine was reopened for specimen mining in 2013.

The last few years have been surprisingly good for crocoite specimen production. After the spectacular "2010 Pocket" and the recent huge "Red River Pocket" finds in the Adelaide mine, the nearby Red Lead mine was reopened. After just a few months of operation some specimens of high quality have been already been found, and prospects for additional world class specimens are very promising. In this short article we would like to preview this new mining venture which hopefully will provide top quality crocoite specimens in the future.

J. Scovil photo.

Brilliant red-orange color, superior luster, and outstanding translucency are characteristic features of Red Lead mine crocoite. L.& D. Cook specimen.

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"Disco Balls" from Rahuri, India

Tomasz PRASZKIER & Muhammad Fasi MAKKI

INTRODUCTION

Maharashtra state in India has been known since the 1970's as a prolific source of specimens containing apophyllite-(KF), a range of zeolite group minerals and several other associated species. Everyone knows that "Indian zeolites" (using the term loosely here, to include apophyllite and other non-zeolite species) are abundantly available; literally tonnes of this material are shipped every year and, inevitably, much of it is of relatively low value. The earliest finds, of course, caused quite a stir in the collecting community, but enthusiasm began to wane when it became clear just how huge the potential for future specimen recovery from the Deccan Traps really was and now, for many collectors, the Indian specimens are no longer among the most desirable of material. The vast majority of these specimens come from the industrial basalt quarries, but there are also small, and usually very limited finds, discovered while digging wells and foundations for various construction projects.

Fasi Makki with a freshly mined specimen inside the huge pocket in the well in Momin Akhada, India. S. Makki photo.

T. Spann photo.

"Disco ball" apophyllite-(KF) on stilbite from the 2001 find in Momin Akhada, Rahuri, India. 13 cm tall. G. and J. Spann collection.

The discoveries of green apophyllite made during the course of well-digging in the Momin Akhada village near Rahuri, were surely one of the rare situations in which specimens from India excited the whole collecting community.

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(Strictly speaking and based on its composition this mineral should be called apophyllite-(KF), but we will refer to it here simply as “apophyllite”). These spectacular and aesthetic spherical arrangements of radiating green crystals quickly became known by collectors as “disco balls”. In the last 12 years, in

About 2000 years old buddist temples carved in basalts in Ajanta village in Deaccan Traps, India. J. Gajowniczek photo.

the Momin Akhada area, there have been three wells that have yielded these high quality green apophyllites. All three finds were relatively small and produced only a very limited number of specimens. The majority of them disappeared from the market almost immediately, readily

Typical view across the Deccan Traps in Maharastra, India. J. Gajowniczek photo.

finding places in private collections and leaving many collectors looking for them in vain.

The most recent of these pockets from the Momin Akhada area was discovered in March 2013 and, once again, delivered some exceptional specimen material.

GEOLOGY AND
SPECIMEN COLLECTING

The Deccan Traps volcanic province covers about half a million square kilometers of western India, including the whole of Maharashtra state, with lavas

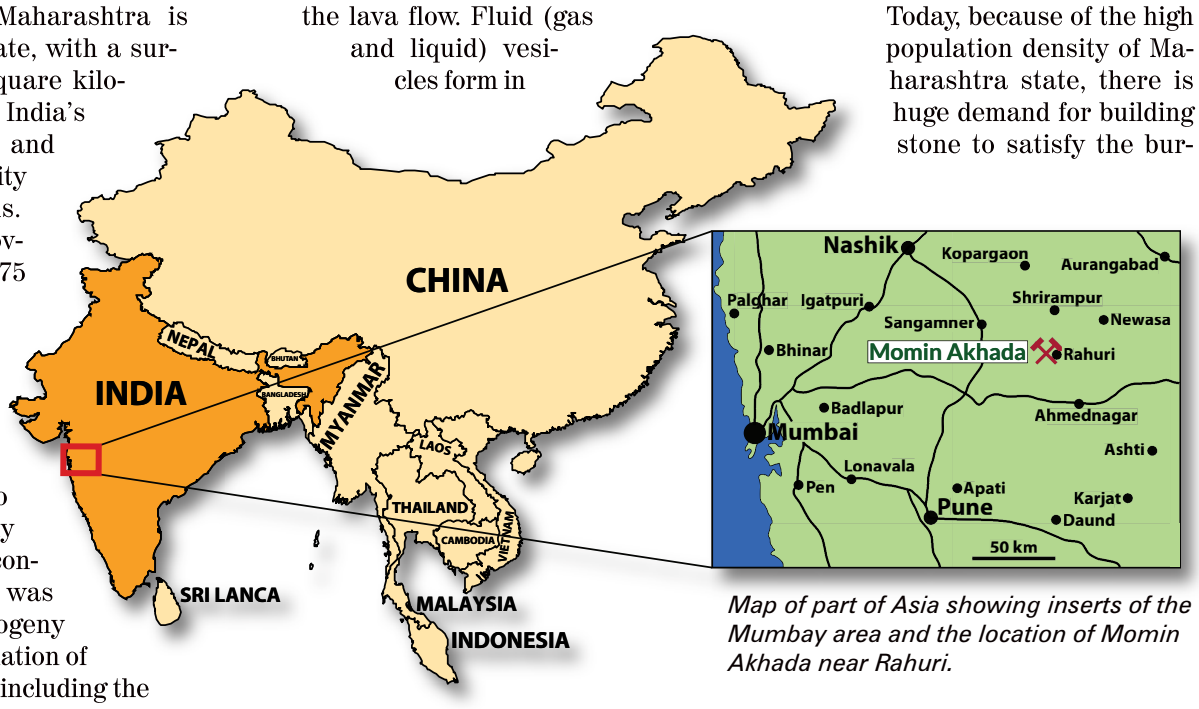
Dirty miners inside the first “disco ball” apophyllite pocket during collecting. Note electric light in use. S. Makki photo.

to a thickness of about 1500 m. To put this in context, half a million square kilometers is larger than the state of California, and roughly equivalent to the land area of Spain. Maharashtra is India’s third largest state, with a surface area of 308,000 square kilometers; it is also one of India’s most populous states and the source of the majority of mineral specimens. This giant volcanic province was forming from 75 million years ago, soon after the time that India separated from Madagascar and started to move to the north, to about 40 million years ago when India had already collided with the Asian continent. This collision was part of the Alpine orogeny that resulted in the formation of major mountain ranges including the Himalayas. The most important period of volcanic activity occurred between about 65 and 60 million years ago, from late Cretaceous to early Paleogene times, when India was moving over the so-called Reunion hotspot. During that relatively narrow timeframe the vast majority of the traps were formed.

“Disco ball” apophyllites in situ *on the floor of the pocket found in 2001 in Momin Akhada. S. Makki photo*

The Deccan Traps comprise literally hundreds of lava flows, stacked in layers, one upon another as successive flows ebbed and cooled. The thickness of individual flows varies from one to tens of meters, and both spilitic and tholeiitic basalts are represented; indeed, the composition of the lava can change, sometimes even within a single flow. But probably the most distinctive and important feature of these lavas was their very low viscosity resulting in the rapid “flooding” of huge areas. Some of the individual flows can be observed over distances of tens of kilometers.

When volcanic eruptions occur and lava is released onto the earth’s surface, the pressure and temperature that caused the magma to be molten change very rapidly. As the lava flows it cools very quickly, initially on the surface of the lava flow. Fluid (gas and liquid) vesicles form in the lava as the pressure drops and the “bubbles” of fluid move towards the cooling surface of the flow. The cooling process, however, forms a thin solid crust on the lava which prevents these bubbles of fluid from escaping so that, in the upper part of the flow, these vesicles become concentrated and eventually they coalesce, forming larger and larger fluid-filled cavities. Later, as the interior of the lava flow cools, the magma solidifies to form basalt, and minerals begin crystallizing from the cooling fluids in the vesicles. This explains why the specimen pockets in the Deccan Traps (and, indeed, in many other lava fields around the world) occur in particular horizons within the volcanic flows. The minerals that can crystallize in such cavities can include silica (as agate, or jasper), zeolites, apophyllites, calcites and others.



Map of part of Asia showing inserts of the Mumbay area and the location of Momin Akhada near Rahuri.

Today, because of the high population density of Maharashtra state, there is huge demand for building stone to satisfy the burgeoning construction industry and the basalts of the Deccan Traps are ideal for the purpose. This is why there are so many quarries around virtually every city or large town in the state and, of course, these quarries are a major source of specimen minerals. Surprisingly, however, some of the most important mineral finds have been made

Well in Momin Akhada (known as Well Number 1) in which the original discovery of the “disco ball” apophyllites was made in 2001. S. Makki photos.

Fasi Makki collecting apophyllites in the pocket in 2001. S. Makki photo.

during the digging of wells, rather than quarrying. India has a very hot and dry climate, and the demand for water for irrigation purposes is enormous, and so hundreds of wells are dug in the state of Maharashtra every year. These diggings are much larger and deeper than the wells that we think of in Western countries. This is because the flow rate of water through the rock is very low so smaller, shallower borings are simply insufficient. Drilling and blasting of the basalt is required to create a big enough well, and this commonly results in excavations of between 10 and 20 m diameter, and up to 50 m in depth. In other words, these Indian "wells" are more like small quarries. Furthermore, the harsh climate which includes periods of extreme heat means that most wells last for only a few years before they run dry. When that happens, new wells are dug in the same area, which explains why well-digging results in so many mineral discoveries. Sometimes, the pockets found in these wells produce minerals of high quality although it is extremely rare that the specimens are good enough to excite the international collecting community. In such rare cases, the exact location of the discovery becomes much more important and this can cause frustrations for collectors, given that most discoveries tend to be attributed simply to the name of the nearest town or, worse, the name of the town in which the local mineral dealer who handles the material happens to live.

For obvious reasons, there is no control or organization of specimen recovery across such a large area, and no single person could possibly keep tabs on all of the diggings. There are many mineral dealers in Maharashtra, each of them seeking the best quality material and, because of this, a system of "runners" has evolved. "Runners", typically, are the small-time mineral gatherers, and miners who roam in hordes on motor cycles looking for minerals in new and old wells and quarries, or perhaps smaller local dealers, who bring new finds or information to the bigger dealers, for payment, of course. Each of the big dealers has a group of "runners" working for him to supply specimens and information. Of course the bigger dealers, with the better reputations, attract the most runners, all of whom are competing to obtain and sell the best specimens. This competition can become extremely fierce. The well-diggers are poorly paid and mineral specimens potentially offer an opportunity to make money well in excess of local wages. Not surprisingly then, fights are quite common, especially when a major find of high quality specimens is made; specimens, perhaps, such as "disco balls"...

Sequence of unique photos showing numerous "disco ball" green apophyllites on stilbite, still in situ*, on the wall of the first pocket with Fasi Makki. S. Makki photos.*

Arguably the most famous "disco ball" specimen from the 2001 find, 11 cm high . B. Larson collection. J. Scovil photo.

"DISCO BALLS" FROM MOMIN AKHADA

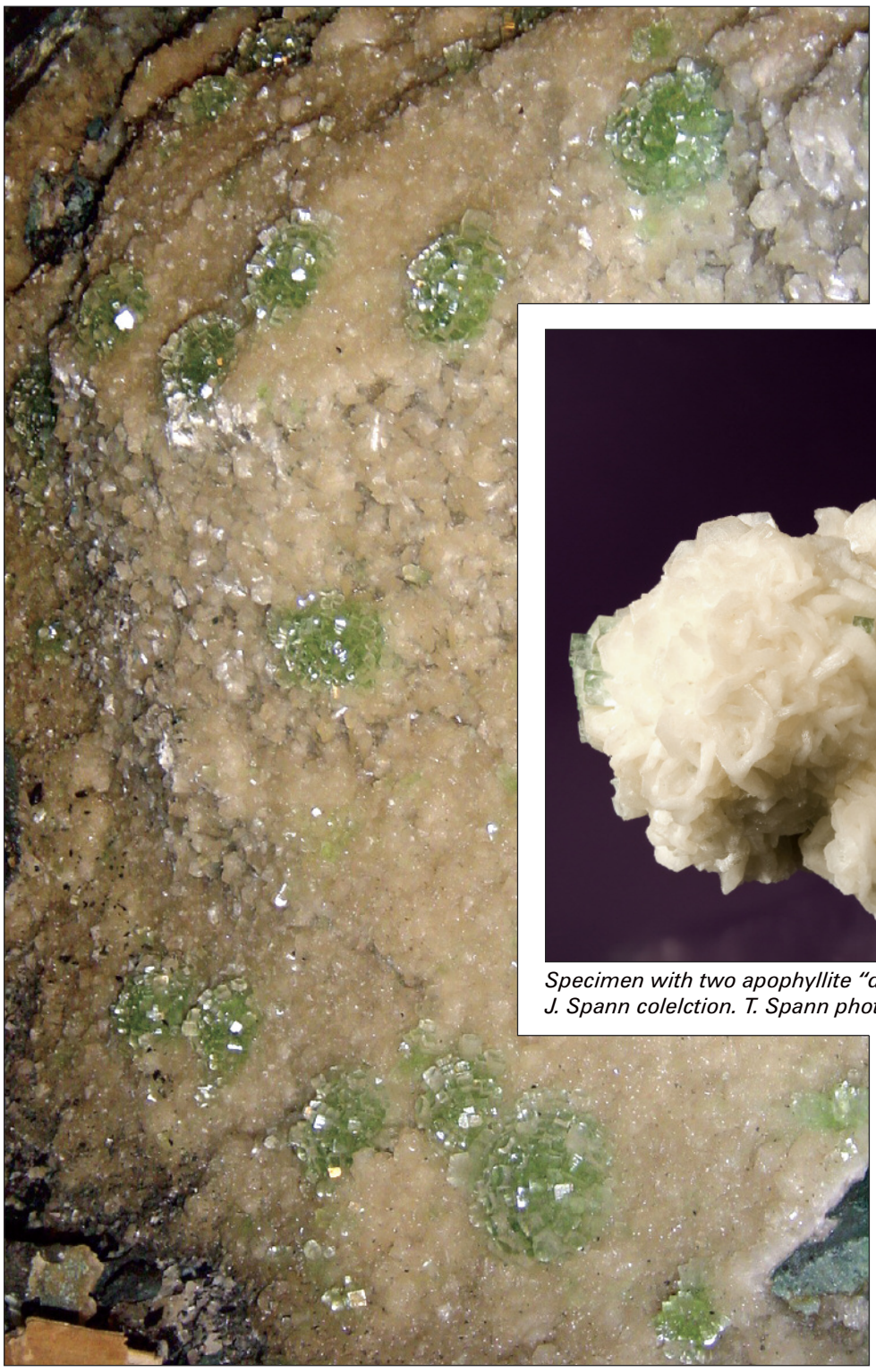
The village of Momin Akhada is located in the central part of Maharashtra state, about 5 km east from the town of Rahuri and 50 km from Ahmadnagar (one of bigger towns in the area). Mumbai, a city more familiar to most Westerners, lies 285 km away to the west-south-west. Momin Akhada is lo-

One of the apophyllite "disco balls" in situ *in the the first pocket in 2001. S. Makki photo.*

"Disco ball" apophyllite on stilbite from the first find in Momin Akhada, field of view 8 cm. S. Smale specimen. J. Scovil photo.

Sami Makki with "disco ball" apophyllite in situ *in the pocket. F. Mmakki photo.*

Fasi Makki with freshly collected specimen of stilbite with apophyllite "disco balls" inside the pcoket. S Makki photo.



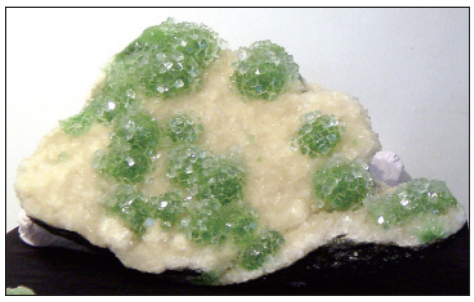
Numerous apophyllite “disco balls” on the wall of the first pocket found in 2001, size of the apophyllite aggregates up to 7-8 cm. S. Makki photo.

cated in an area which depends on water for irrigation sourced from wells excavated in the solid basalt and, because these wells last only for a few years, new ones have to be “dug” on a continuous basis. But while there are dozens of such wells in the vicinity of the village, the vast majority of them do not produce pockets and, even when pockets are encountered, the quality is typically poor, with stilbite and colorless apophyllite as the dominant species. To date, pockets with good quality specimens have been found in only three of the wells in this area. All of them are located close to one another, on an almost straight east-west trend, and over a total distance of about 300 m. These wells have been dug over a period of twelve years. The first, known as “Well Number 1” was excavated in 2001; the second, “Well Number 2” was dug in 2004, while “Well Number 3” was sunk in 2013.

“Disco ball” apophyllite on stilbite from the first find in 2001, 12 cm high. HMNS collection. J. Scovil photo.

What makes specimens from the Momin Akhada area so special and distinctive from other finds is the presence of the apophyllite-(KF) in the habit of prismatic crystals with flat terminations (dominant pinacoid), and with very small pyramid faces. This contrasts with most apophyllites from the region that are characterized by a dominant pyramid face. Furthermore, these highly sought-after crystals form bow-tie, radial, hemispherical, or even almost spherical aggregates, usually growing on a bed of white to cream-colored stilbite. The color of the apophyllite varies from almost colorless, though pale green (most common), to green. In the majority of cases the color of the central parts of the crystal aggregates is more intense, fading somewhat, or even becoming completely colorless towards the crystal terminations. As a result, the aggregates with shorter, or cleaved crystals feature much better color than those containing longer ones. The green color of the apophyllite from Momin Akhada changes its hue in different types of light, from deeper green to gray-green, and this is one of the reasons why specimens from the same pocket may look quite different in photographs, depending on the lighting conditions. In the majority of cases prism faces are glossy, sharp, clean and very lustrous. The luster of the pinacoid faces varies between finds from glossy, through partly- to completely frosted faces. Specimens in which the pinacoid faces are lustrous, and in which the crystals are arranged in spherical aggregates resemble the mirror balls that used to be hung from the ceilings in the discotheques in the 1970s and 80s, and this is why they are known as “disco balls”

Specimen with two apophyllite “disco balls” on stilbite. 18.7 cm wide. G. and J. Spann colelction. T. Spann photo.



One of the large specimens (c. 45 cm wide) with numerous “disco balls” after extraction from the well and first washing. S. Makki photo.

among mineral collectors. For better or for worse, apophyllite has a perfect basal {001} cleavage, and these cleavage planes can look almost identical to the much more desirable high-luster pinacoids. In some cases these cleaved crystal versions can be quite difficult to distinguish.

Specimens from all three pockets found in the wells at Momin Akhada produced apophyllites characterized by these same distinctive features. However, there are some subtle differences between specimens from the three finds including the size of the individual crystals, the size and symmetry of the aggregates, the abundance of the bow-tie clusters, and the presence of calcite and stalactite-like aggregates of stilbite. The characteristic features of each find are described below.

The history of the three discoveries in Momin Akhada is also an intriguing “three chapter saga” of the fight between two competing Indian mineral dealers which included corruption, threats of violence (with guns!), and litigation. These interesting stories are also told below.

Apophyllite “disco balls” on stilbite from the first find, 26.6 cm tall. ex Hoppel collection. Mark Mauthner photo; courtesy Heritage Auctions.

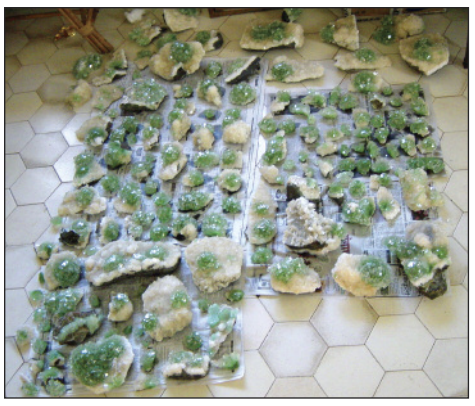
7.2 cm tall apophyllite "disco ball" on stilbite, from the first find in 2001. Heliodor specimen. J. Scovil photo.

In addition to specimens from the three wells alluded to here, dealers have misleadingly labeled material from other finds in the region as coming from "Rahuri" or "Momin Akhada". One of the larger such finds was from a pocket of green apophyllite, but with elongated crystals of a darker color, accompanied by mesolite; in fact this pocket was found over 100 km to the south-east. Another find, which used to be attributed to Momin Akhada, consisted of spheroidal aggregates of green apophyllite on pink thompsonite and this pocket was probably discovered in Vambori, which is actually close to Rahuri. To date, the only important finds that really originate from the Momin Akhada area are those from Wells 1, 2, and 3.

Freshly washed and prepared specimens from the first pocket when still in India, during Makki's preparations for the Munich show. S. Makki photos.

2001: Well Number 1

The first discovery in the Momin Akhada area was made in September 2001. The locality is now known as "Well Number 1" or, informally, as "the original find". This well is located at: 19°23'33.82"N, 74°36'15.92"E and it still exists. Prior to this discovery, the Rahuri area was not known to be a producer of high quality specimens.



When quarrymen or well-diggers come across a pocket with colorful crystals during their work, the "runners" immediately inform trusted local mineral dealers about the discovery. On this occasion the first dealer to be informed about the "original find" at Momin Akhada was Muhammad Fasi Makki (from Matrix India Minerals in Pune; known to many collectors as "Fasi" or "Makki"), a very experienced dealer, who was very well known in the area. Makki had been running a mineral business since the 1970s, and was one of the few mineral dealers in Maharashtra who understood that good quality specimens are not exclusively found in large quarries, but that they can also be sourced from excavations for road-building or construction projects and, of course, from wells. In fact, Makki was already well-known to the well-diggers precisely because he had been sourcing specimens from wells for many years.

Apophyllite "disco ball" on stilbite from the first find in 2001, 12.6 cm high. Pala International specimen. J. Scovil photo.

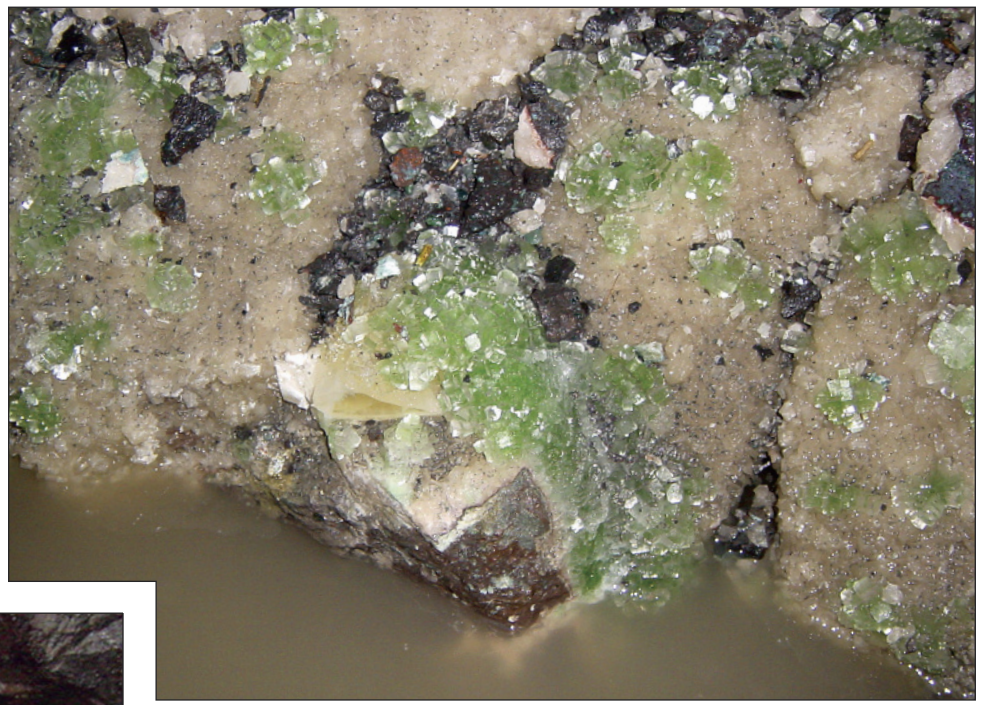
When Fasi (M. F. Makki) received the message about a new find he immediately travelled to Momin Akhada and, on arrival, he was lowered to the bottom of the well using a small crane as a "lift". When he looked inside the pocket he was amazed by what he saw. The quality of the crystals, their color, forms and shapes were extraordinary! He had never seen such apophyllite in his life and he immediately realized that this was one of the most important finds from the Deccan Traps in half a century. The first thing he did was to register the find, pay tax, and get official permission from the local government for collecting specimens in the well. At the same time he made an agreement with the village people and miners. Only once all of these arrangements were completed could the task of recovering the specimens be addressed.

The well, at that stage, was 15 m deep and the pocket was at the bottom. The void was 1.5 m tall, 2.4 m wide and about 9 m long, sufficiently large that a few people could work inside at the same time. The walls, floor and ceiling of the cavity were irregularly shaped and completely overgrown by white-cream stilbite crystals 1-2 cm in size. In some places, mostly on the walls and floor, numerous groups of spheroidal clusters of green apophyllite glittered. They were big, very lustrous and sparkling in the light of the torches. The view was really exciting!

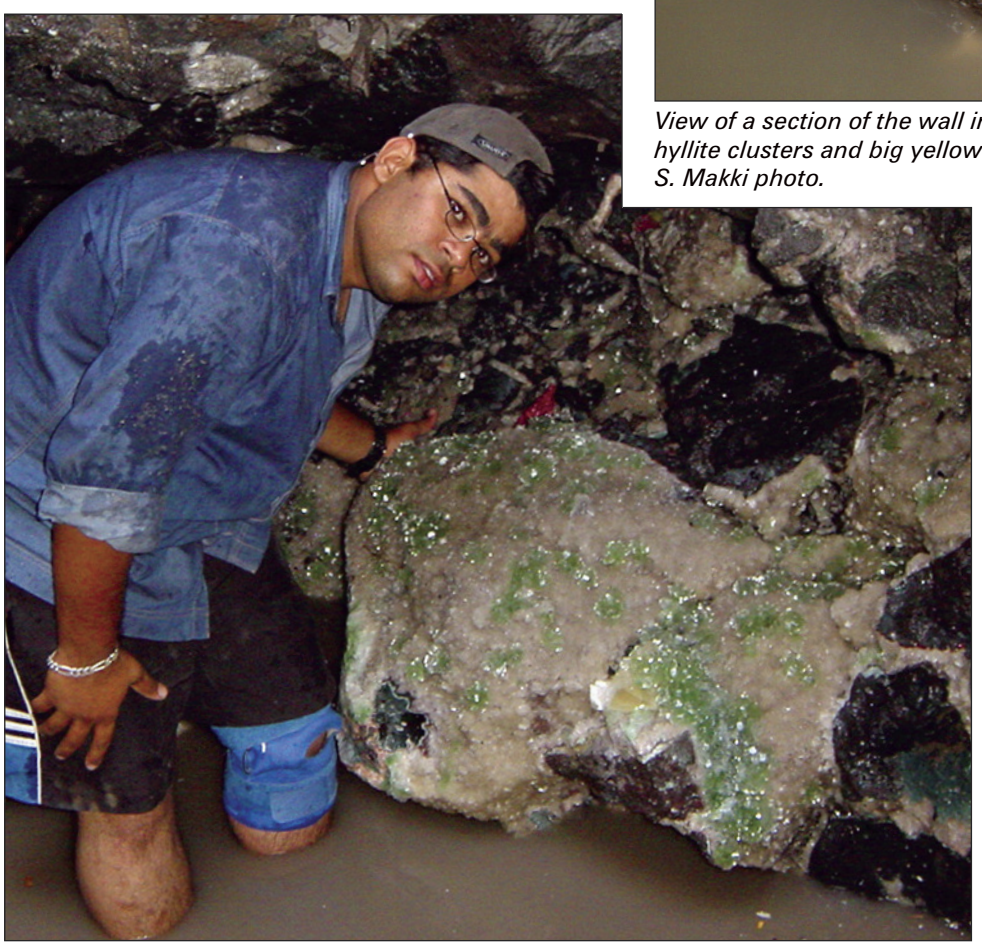
The vast majority of the apophyllite aggregates in the pocket were hemispherical, very symmetrical and lustrous, including the pinacoid faces. The diameter of the groups ranged from a few centimeters to a maximum of about 15 cm, but the majority were in the order of 7 to 10 cm across. To date, this find has undisputedly been the best in terms of the quality, size and symmetry of the "disco ball" type aggregates. In addition, many of the "balls" were placed very aesthetically on the matrix. The excitement among the people involved in the find was so great that the rumors started to spread very quickly throughout the region.

Photos of the Well Number 2 in Momin Akhada where the second apophyllite pocket was found. Note the crane used to lift people and boxes and specimens. In the last photo, Fasi is in the pocket with freshly collected specimen. Makki photos.

Miner inside the second pocket found in 2004 with a large slab with numerous apophyllite clusters. S. Makki photo.



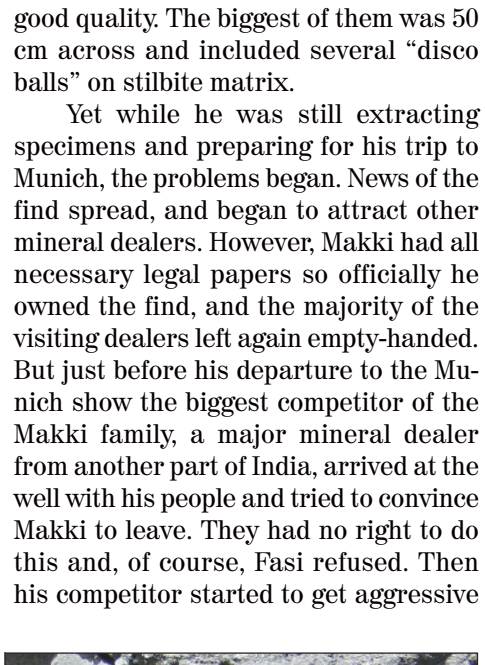
View of a section of the wall in the second pocket with numerous apophyllite clusters and big yellow calcite crystal, field of view around 50 cm. S. Makki photo.



Sami Makki with in situ *apophyllite clusters and large calcite crystals, inside the second pocket. F. Makki photo.*

Miner checking depth of the hole filled by water in the floor of the second pocket. Note numerous in situ *apophyllite clusters in upper photo. S. Makki photos.*

Apophyllite crystals on big rhombohedral calcite crystal from Well Number 2, found in 2004, 12.3 cm wide. E. Boehm specimen. J. Scovil photo.



Photos showing walls of the second pocket found in 2004 completely coated by stilbite, with numerous apophyllite clusters. S. Makki photos.

Miners at the botton of the Well Number 2. S. Makki photo.

was already available, because these are temporarily erected over the workings, for the original purpose of hoisting rock blasted from the bottom of the well, so that it can then be transported to waste dumps.

After a few days of careful collecting there were so many high quality specimens that it became clear that Fasi Makki should travel (for the first time) to the forthcoming Munich Show in late October to present this find to what would surely be an enthusiastic collector community. At this stage he had some 300 specimens including about 150 of very good quality. The biggest of them was 50 cm across and included several “disco balls” on stilbite matrix.

Yet while he was still extracting specimens and preparing for his trip to Munich, the problems began. News of the find spread, and began to attract other mineral dealers. However, Makki had all necessary legal papers so officially he owned the find, and the majority of the visiting dealers left again empty-handed. But just before his departure to the Munich show the biggest competitor of the Makki family, a major mineral dealer from another part of India, arrived at the well with his people and tried to convince Makki to leave. They had no right to do this and, of course, Fasi refused. Then his competitor started to get aggressive

were brought to the site and they operated continuously during the specimen recovery operation. Long pipes were also needed to move the water to the nearest irrigation ditch, some 18 m from entrance to the workings. Once these problems were solved, and the pocket was almost dry Fasi, his son Sami, and 12 other workers started work to remove the specimens. In India, purpose-built mechanical equipment for specimen recovery is seldom available, and the only way to collect undamaged specimens is with hand tools such as hammers, chisels and bars and, of course, a great deal of care and patience. Blasting could not be considered if damage was to be avoided, and everything, including people, tools, specimens and waste rock, had to be transported up and down the shaft with a small crane. Such a crane

Before extracting the specimens could commence, certain technical problems had to be resolved. Firstly, because of intermittent outages in the supply of electricity, generators were installed. This gave the miners some light, but a bigger problem was the removal of water from the bottom of the workings; this was a well after all, but for now the constant inflow of water, both from the bottom of the digging and cascading down the walls, was a problem. Three pumps

Freshly collected "disco ball" from the second find. S. Makki photo.

Specimen with bow-tie apophyllite cluster on stilbite, 7.4 cm tall. G. and J. Spann collelction. T. Spann photo.

and threatened Makki and his miners with a gun! The police were called and the would-be aggressor ended up in court.

Fasi and Sami left for Munich, which turned out to be a more successful show for them than they had expected. The moment they started unpacking specimens, interested dealers started trying to reserve the best pieces. Many of them tried to "help" with unpacking the specimens, at the same time setting aside the best ones. In 45 minutes, even before the show started, everything was sold, although several dealers were unhappy that they didn't get any of the pieces! At the same show many of the specimens were resold, probably more than once. This included arguably the most iconic specimen from the find, which now belongs to Bill Larson. It is a big "disco ball" on a small white "trunk" of stilbite which Bill bought "second-hand" at the same Munich show and of which many photos have subsequently been published. There is no doubt that the Momin Akhada "disco ball" find was the highlight of the Munich show that year, and it was afforded enthusiastic descriptions in several show reports.

But even as Makki enjoyed his success in Munich, all was not well back in Momin Akhada, where his competitor took nefarious advantage of his absence. The competitor returned to the well while Makki was in Europe and worked there illegally for a short time. His team collected specimens in a big rush without the necessary care, and destroyed many pieces. They collected between 100 and 200 specimens and when it was clear that they had to leave the well, they destroyed all of the other "disco balls" that remained *in situ*. When Makki returned from Germany he counted about 200 ruined apophyllite groups in the pocket. The ensuing court case took 8 years and at the end of it Makki's competitor was convicted and sentenced to 8 months in prison. The sentence proved very controversial among the community of dealers in India, and also in Europe and the USA, and many people tried to persuade Makki to resolve the problem in a manner that would avoid imprisonment for his competitor for the sake of preserving the integrity of the Mineral business in India. Finally, he was persuaded to drop the charges, a decision that he would later regret, and the appeal court dismissed the case, once an out-of-court settlement had been reached. The whole story was reported in the Indian press, and an article in the *Pune Mirror*, of

Apophyllite "hedgehog" on stilbite from the second find, field of view 7 cm. The Arkenstone specimen. J. Budd photo.

Apophyllite cluster on stilbite from the second find, 13 cm tall. The Arkenstone specimen. J. Budd photo.

Apophyllite clusters up to 7 cm, from the 2004 find. K. Wars specimen. Budd photo.

Apophyllite "disco ball" on stilbite from the second find, 12 cm tall. D. and M. Fiske specimen. J. Budd photo.

Two of the largest specimens from the pocket found in Well Number 2. S. Makki photo.

Well Number 3 where the third pocket was found in March 2013. S. Makki photo.

June 30, 2009, entitled "No, It's Mine!" makes for interesting reading. But sadly, this was not the end of dealers' "war"…

2004: Well Number 2

Three years after the "original discovery", in March 2004, 200 m east of

Dirty miner in the Well Number 3. S. Makki photo.

Well Number 1 a second pocket was discovered in Well Number 2, at the same depth of 15 m. Given his previous success, it was almost inevitable that Fasi Makki would again oversee the removal of these specimens and, as soon as he received the news from his "runners" he travelled to examine the new discovery. After a short visit he knew that this find would probably not be as exceptional as the first one, though close to it, but that the pocket had the potential to produce a greater number of specimens than the first one. Once again, Makki arranged all of the formalities and when the papers were prepared the work commenced. As before, generators, lights and pumps were needed but fortunately the inflow of water was much slower on this occasion.

The pocket in Well Number 2 was wider than the first one, roughly 3 m wide, 1.5 m high and 6 m long. As before, on some parts of the walls and floor there were concentrations of hemispherical aggregates of green apophyllite, although this time they were a little less symmetrical, and the length of the crystals in the same "ball" varied, giving some of the balls a hedgehog-like appearance. Several features distinguished this pocket from the original discovery. Firstly, in this pocket the individual crystals were thicker, so that a "ball" from Well Number 2 comprised less crystals than a similar-sized ball from the "original discovery". Secondly, this pocket displayed a relative abundance of bow-tie shaped crystal clusters and thirdly, a feature of this pocket was the presence of a

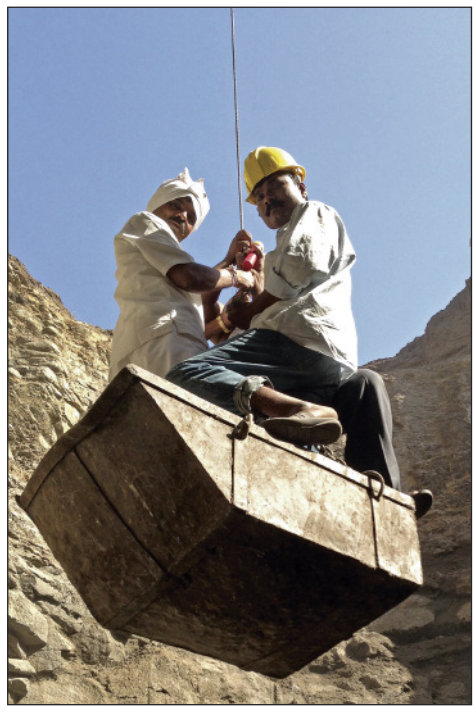
Fasi with freshly collected specimens in the Well Number 3. S. Makki photo.

Use of a mirror as a light source inside the pocket. S. Makki photo.

few large, well-formed yellow crystals of calcite, overgrown by apophyllite. The luster of the crystals on the majority of specimens was very good on the prism faces and some of the specimens also had very lustrous crystal terminations. Slow and careful extraction of the specimens lasted through April and all together about 500 pieces were collected including 200 of good quality and a few giant plates ranging up to 1 m across.

Of course, it was only a matter of time before Makki's competitor made another appearance. First he went to the local authorities in an attempt to outbid Makki for the right to remove the specimens and to try to get Makki's permissions rescinded. Fortunately it was legally impossible for him to do that and his proposition was rejected. Makki's competitor could not risk visiting Well Number 2 himself, because the court case from the "Well Number 1 incident" was still in progress, and he knew that if he made an appearance the police would be called immediately. So he sent his brother to Momin Akhada instead. The brother's first ploy was to delay Makki's progress by placing a lock on the crane over the workings. He then tried all sorts of other tricks to get access to the find and, eventually, he succeeded. According to Makki, he managed to bribe one of Makki's drivers who was transporting specimens from the well to Pune and he stole everything that was in the car. The driver escaped, and there was no direct evidence against the competitor, but Makki still has a photo of the specimens before they had been packed in the boxes and loaded for transport.

Miner at the bottom of Well Number 3.



Transport of miners to the bottom of the well using crane. S. Makki photo.

2013: Well Number 3

Nine years elapsed before the third discovery, in March 2013. Well Number 3 is located just 100 m to the east of Well Number 2. The first traces of the mineralized pocket were found at the familiar depth of 15 m during preliminary drilling, suggesting a pocket at the same depth as the two previous discoveries. This time, however, nature had a surprise in store; when the miners started digging, they hit a big pocket with green apophyllite at a depth of just 9 m. Understandably, this caused great excitement, raising the possibility that two pockets might be present.

Once again, Fasi Makki was called in by his "runners" and he set about arranging the necessary permissions, people and equipment to recover the specimens. But this time new complica-

View looking out of the pocket into the well shaft. S. Makki photos.

Miner with freshly collected specimens in the Well Number 3. S. Makki photo.

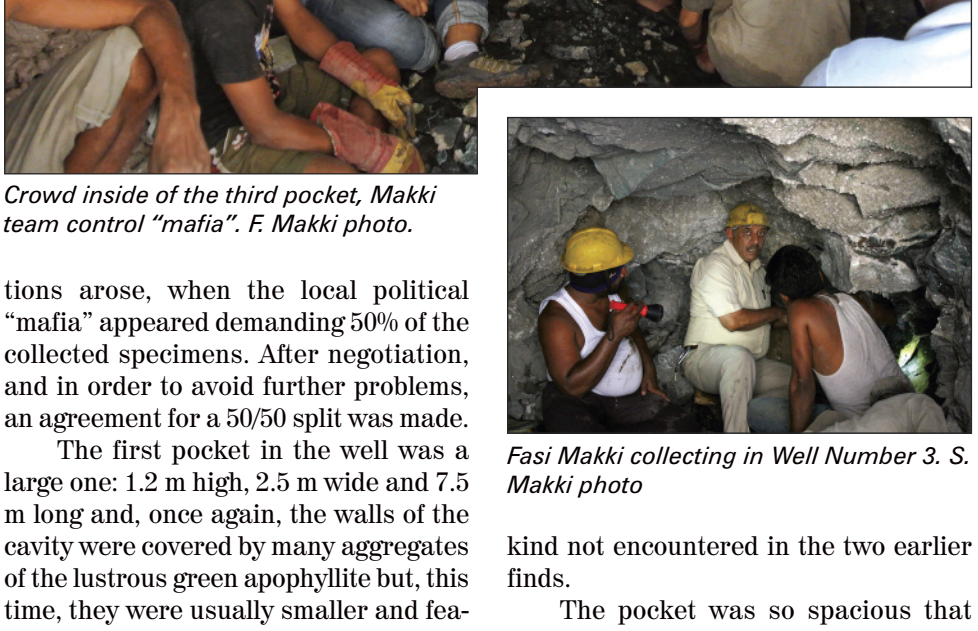
Sami Makki collecting in Well Number 3.

Crowd inside of the third pocket, Makki team control "mafia". F. Makki photo.

tions arose, when the local political "mafia" appeared demanding 50% of the collected specimens. After negotiation, and in order to avoid further problems, an agreement for a 50/50 split was made.

The first pocket in the well was a large one: 1.2 m high, 2.5 m wide and 7.5 m long and, once again, the walls of the cavity were covered by many aggregates of the lustrous green apophyllite but, this time, they were usually smaller and featured generally only medium luster on the terminations. The bow-tie shaped aggregates were very abundant while the "disco balls" were less common. The architecture of the balls was similar to the specimens from Well Number 2, except that the size of the individual apophyllite crystals was rather small, similar to the ones from the "original find", or perhaps even smaller. A distinctive feature of this pocket was the presence of numerous pseudo-stalactitic forms of stilbite, exceptionally up to 20 cm in length, at the entrance to the cavity. Green apophyllite crystal groups were scattered on some of the stilbite structures, forming sculptural, three-dimensional specimens of a kind not encountered in the two earlier finds.

Apophyllite in situ *in the third pocket.*



Specimen with bow-tie clusters of apophyllite, 13.6 cm wide. Spirifer Minerals specimen. J. Scovil photo.

Fasi Makki collecting in Well Number 3. S. Makki photo

The pocket was so spacious that several people could work inside it at the same time and, because of the lack of trust between Makki and the local "mafia", representatives of both teams were present in the pocket at all times to ensure the agreed sharing of specimens. So there was real crowd in the pocket. Extracting the entire pocket took nearly three months, from March through May. All together about 1000 specimens were recovered including 400 better quality pieces and a few big plates up to 1 meter in diameter. In general, the quality was not as high as in the earlier finds but it was still very good and there were a few exceptional, top quality pieces.

The sharing agreement required that the specimens be transported to the surface on a daily basis and divided between the two groups. However, the "mafia" people had no idea about the quality and value of minerals and so, predictably, Makki's competitor sent his people to advise them. According to the agreement, Makki and the "mafia" team each took first choice of specimens on alternate days. The "mafia" ended up with more of the larger pieces, but Makki took smaller and higher quality ones, though each team ended up with material of similar value. When the extraction of specimens was complete, the "mafia" sold their share to Makki's competitor.

Eventually the well was sunk to 15 m where everyone expected to find the "main pocket" and, sure enough, a pocket was found; but it was more or less empty! The walls were coated with white stilbite crystals and a few low quality colorless apophyllites with poor luster. Almost no specimens were collected from this lower pocket, and that was the end of Well Number 3, but not the end of the story.

Washing a specimen inside the pocket.

Miners with huge plate with apophyllite inside the pocket. S. Makki photo.

Sami with huge plate with numerous apophyllite clusters. F. Makki photo.

Specimens from this latest find were offered for the first time at the Sainte Marie aux Mines show in France in June 2013 and again in September at the Denver show in the USA. Both Makki and his competitor were present in Denver and, almost inevitably, the conflict between them resumed. During the show, the other Indian dealer came to Sami, son of Fasi, offering to buy all of his material for less than half of the asking price. Sami refused, and was told by the competitor that he would not get back to India alive… The police were called and the aggressor was warned that if he repeated the threat he would be arrested. By the end of the show the situation had calmed down somewhat and hopefully it

Dividing specimens between Fasi and the "mafia". S. Makki photo.

One of the best specimens collected from the find in 2013, now in the G. and J. Spann collection. The left photo shows the freshly collected specimen. The close-up in the right photo was taken by J. Scovil.

Cluster of apophyllite on stilbite from the third find. Now in the N. Lupescu collection. S. Makki photo.

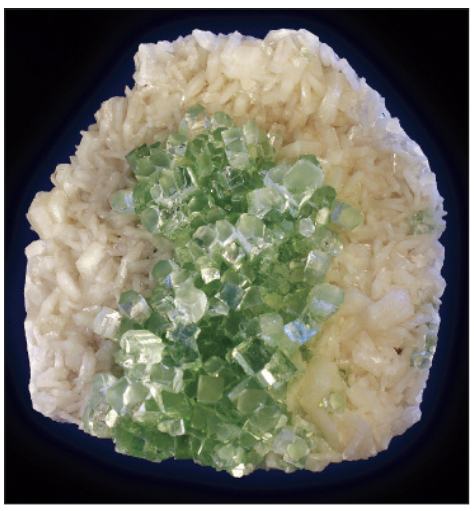
will stay that way… at least until another discovery is made in Momin Akhada…

CONCLUSION

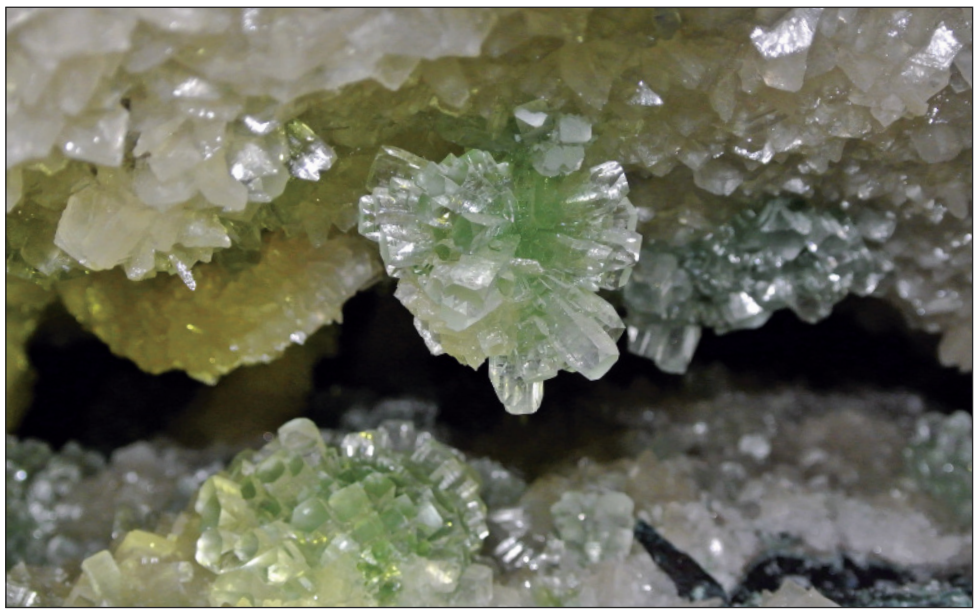
All three pockets in the Momin Akhada were found within a small distance of one another and occurred in one horizon, so several people thought about

Spray of apophyllite crystals, 4.8 cm tall. Spirifer Minerals specimen. J. Scovil photo.

opening a small quarry to mine for these specimens. Unfortunately, this has not been possible due to complex legal difficulties. However, there is still a good chance that when Well Number 3 runs dry, there will be a need to dig another source of water that might, once again, lead to a mineral discovery. This seems to be the only way that more of these



Cluster of apophyllite crystals on stilbite, xx cm tall. S. Maki photo.



Apophyllite crystals inside the third pocket still in situ*. S. Makki photo.*

highly desirable specimens will reach the collector market. To date there have been about 1000 good quality specimens recovered from the three wells. Many of them now reside in famous collections, both public and private, and are highly appreciated by their owners. One thousand specimens sounds like a fairly big number, but it seems that the market has been big enough to absorb them very comfortably and, once again it is difficult to find examples for sale, in spite of the recent replenishment from Well Number

Spheroidal aggregate of apophyllite crystals from the first find, 5.5 cm wide. B. Kantor collection. S. Makki photo.

3. Some of the specimens from Momin Akhada are now being “recycled”, coming back to the market with older collections, but this is a quite rare situation and demand still exceeds supply. So for the majority of the collectors who want to buy a “disco ball” for their collection, the best strategy may be to track the development of fresh well-diggings in the Momin Akhada area and arrive early at the booths of the Indian dealers at future shows.

PERSPECTIVES

During the last 12 years, three wells have been dug in the small area near Momin Akhada hitting three pockets with high quality specimens. On average then, one well with a pocket is being found every four years. Of course, statistics like this are not reliable for predicting mineral discoveries, but it seems inevitable that Well Number 3, like its predecessors, will eventually run dry and, who knows? – maybe it’s successor will provide another large pocket of exceptional “disco balls”!

Probably the best specimen of stilbite pseudostalactites with apophyllite clusters, 14 cm tall. Spirifer collection. S. Makki and J. Scovil photos.

Specimens from three finds in Momin Akhada: 2001, 2004 and 2013 (from left), size from 12 to 25 cm. S. Makki collection and photo.

ACKNOLEWDGEMENTS

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Tomasz PRASZKIER
Spirifer Minerals, Warszawa, Poland
e-mail: tom@spiriferminerals.com

Muhammad Fasi MAKKI
Matrix India Minerals, Pune, India
e-mail: matrixindiaminerals@yahoo.com

View on the Mount Dundas (1090 m), arrow shows approximate Red Lead mine location. D. Gatehouse photo.

Red Lead Mine, Tasmania: a new chapter of mining

Shane DOHNT & Tomasz PRASZKIER

Continued from page 1

LOCALITY

The Red Lead mine is located in the Dundas region, near Zeehan, on the West Coast of Tasmania, Australia. The area in the vicinity of the mine is hilly and covered with a thick rain forest. Access to the mine is by dirt road, which is partly shared with the Adelaide mine located about 1 km north of the Red Lead mine.

Main Red Lead mine gate in 2013. One of the miners opperates mini-mucking machine. Shane Dohnt, mine owner, in the middle. R. Bottrill photo.

By company policy unsupervised visitors are not allowed, and trespassers are prosecuted. Visits can be arranged with the owner, Shane Dohnt, by email at *shanesrocks@ozemail.com.au*

GEOLOGY

The geology of Western Tasmania is very complex. The region is underlain by rocks dating from Mid-Proterozoic to Cenozoic age, a period when this part of Australia was very active geologically. The rocks in the Dundas area have been subjected to metamorphism, orogenic movements, intrusions, faulting, and mineralization.

One of the miners operating a mini-mucking machine. S. Dohnt photo.

Pb-Zn-Ag vein deposits at Dundas are associated with a Devonian intrusive event that emplaced granites into the host Cambrian serpentinites and sedimentary rocks, and to a lesser degree into Precambrian slates. These veins are the primary ores for the metals in the Red Lead mine. The host rocks have been altered due to hydrothermal activity related to the granitic intrusions and vein mineralization. Such alteration of sheared ultramafics is manifested by Fe-Ca-Mn carbonates, quartz, and chromian muscovite in an unusual rock type called listwanite. Close to the present day surface, the ore veins are strongly altered due to deep Cenozoic weathering. Ca-Fe-Mn carbonates frequently dissolved during the process of weathering and were replaced by gossans. The gossans formed during oxidation are very porous with numerous open spaces. These are ideal places for the growth of crocoite and other secondary minerals.

In the Red Lead mine area the primary ore and the products of its alteration (gossans) occur as veins and pods in carbonate-rich fault zones between Cambrian serpentinites and sedimentary rocks. Alteration in that area is very deep and reaches about 150 m below the surface.

Crocoite crystals and other associated minerals occur in the vugs and joints in gossans. According to historical reports the size of these bright red crystals reached 15 cm. Some of the crystals are very lustrous, completely transparent, and very well-terminated. In contrast with the nearby Adelaide mine, hollow "jackstraw" habit crystals are almost unknown at the Red Lead mine. Recently, several other secondary minerals have been reported from the mine including anglesite and twins of light green cerussite.

Crocoite crystals from the Red Lead mine are probably the best in the world in terms of quality and gemminess. Unfortunately this mine has never produced an abundance of specimens like those found in the famous, huge, specimen rich pockets at the Adelaide mine. But hopefully with the new operation many great specimens will be found and offered to the collectors market in the next few years.

HISTORY

The gossans mined at the Red Lead mine were discovered in 1890. The mine, originally known as the Dundas Extended mine, was established shortly thereafter and operated for about 4 years. During that time a 25 m shaft was sunk and a 90 m adit was driven. Despite extensive tunneling on this and several smaller lodes, no un-oxidized ore was found and the mine was abandoned with no production recorded.

View of the underground workings soon after the water was removed from the tunnels. Note the poor condition of the timbers. S. Dohnt photo.

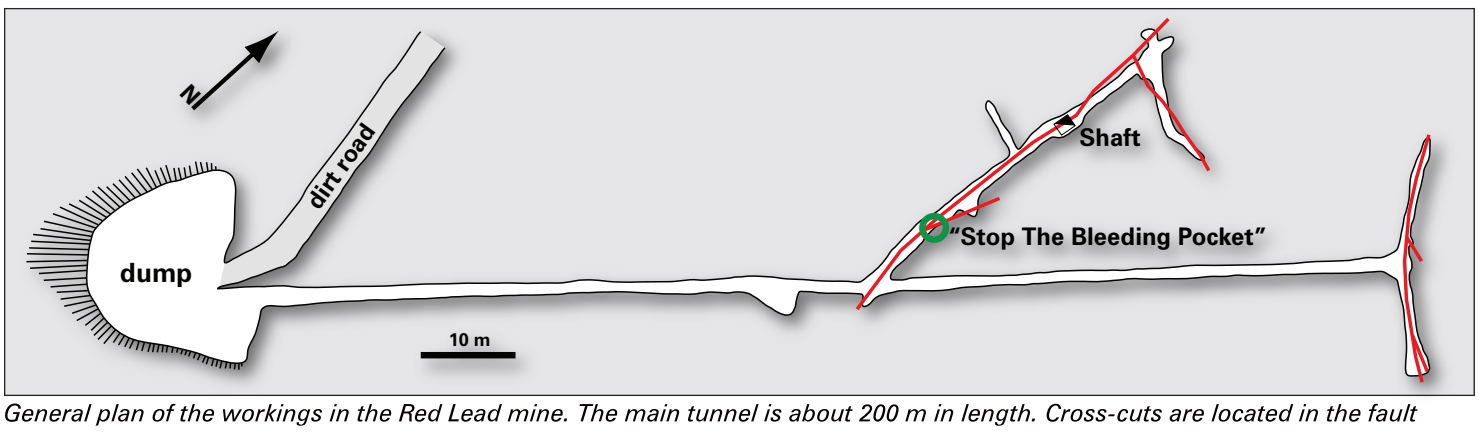
The first mention of crocoite from the mine appeared in the *Zeehan & Dundas Herald* in 1894. It described spectacular crystals in the roof of the main adit. This was the first recorded occurrence of crocoite in the district. Because of their exceptional quality the crystals created a sensation among mineralogists at the end of the nineteenth century.

Surface workings with use of the big excavator in the pre-underground mining era. R. Bottrill photo.

The Red Lead mine was reopened in 1902 and worked for the next two years. In this time over 2400 tons of flux were trucked to the smelters, yielding approximately five grams of silver per ton. During that time an adit was built which connected the base of the shaft to another lode approximately 100 m to the east. A large quantity of crocoite crystals must have been sent to the smelters, because crystals recently found in this area commonly range up to 10 cm in length. Recent exploration has shown that large sections of this lode are still available for mining, this time for crocoite specimens.

After this period of activity, the mine lay idle for nearly fifty years, until the mid-1970's, when a succession of miners tried their luck searching for crocoite specimens. This time the idea was to open cut the hill in the vicinity of the lodes using modern machinery. Over the

Recent view (2013) of the main tunnel with proper timbering and ventilation system. S. Dohnt photo.



General plan of the workings in the Red Lead mine. The main tunnel is about 200 m in length. Cross-cuts are located in the fault zones with rich crocoite mineralization (red color). Location of the "Stop The Bleeding Pocket" is marked (green circle).

Looking out of the Red Lead mine portal. Note the ever present flow of water in the floor of the adit. R. Bottrill photo.

Auger attachment on the "Dingo" is used to advance the tunnel in the relatively soft gossan. S. Dohnt photo.

last thirty years this has resulted in an open cut over 3 hectares in extent, to a depth of 20 m below the top of the hill.

Shane Dohnt, the current owner, purchased the mine in 1986 and has worked it since that time for crocoite specimens, continuing the open cut and other surface workings. For many years his desire to reopen the underground workings, to reduce environmental impact and to access potentially rich deeper areas of the lode, was more a dream than a real possibility. Finally after many years, in 2012 his dream was realized.

RECENT ACTIVITY

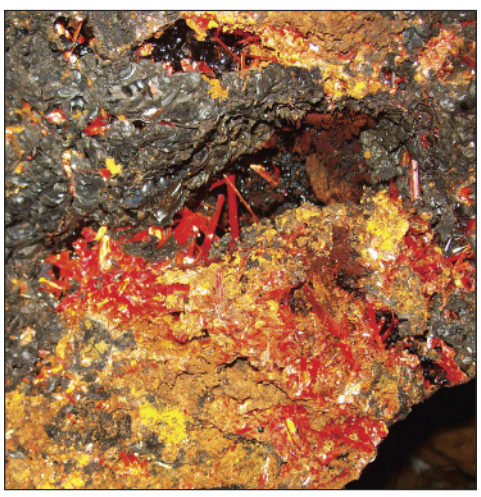
In October 2012, the partnership of Shane Dohnt with Collectors Edge (probably the most experienced specimen mining company in the business) started underground mining operations.

The first task was to reopen the old tunnels which had been closed, collapsed and flooded for many years. After breaking a natural dam, which formed near the main entrance when a tunnel collapsed, a huge amount of water flowed out of the mine forming a temporary river. When all the water was gone miners began examining the tunnels and stopes to identify the most productive zones. A detailed map of the geology and existing mine workings was also made. Quickly it became clear that there are two main fault zones exposed in the mine, each with abundant traces of crocoite.

Working in old mines usually creates a lot of safety and technical problems, and it was the same in the Red Lead. The existing tunnels were narrow and small, generally about 2.4 m high and 1.5 m wide, making them inaccessible to larger mechanized mining equipment. Since gossans are unstable and prone to collapse, especially when wet, the stability of the walls and hanging walls was also uncertain.

To resolve the problem of the narrow tunnels, the partners researched and purchased smaller "micro-machinery" that would fit into the existing tunnels. The most important new machine is a small loader known as a "Dingo" which uses augers and rock breakers to advance the tunnels. The auger is a spiral cutter that will drill a hole 300 mm wide and 1 m deep at a time as the Dingo machine advances into the face. Several holes are drilled this way and then a rock breaker, a type of large mechanized jackhammer fitted to the Dingo, breaks out the remaining rock. When accumulated waste rock prevents further advancement, the Dingo goes to the next heading and a second Dingo machine loads a buggy, which removes the waste rock from the mine. These three machines working together enable the miners to progress about 2 m per day for each heading.

Shane Dohnt and George Quist employing a diamond chain saw to extract crocoite specimens. Collector's Edge photo.



Iron-oxide rich clay frequently fills the crystal lined vugs when found. Crocoite crystals in situ *in the vug (left) and soon after removing and first cleaning. S. Dohnt photo.*

Same specimen prepared and cleaned. This is one of the biggest pieces extracted so far, 16.4 cm wide. Collector's Edge specimen. J. Scovil photo.

With these solutions in place full time mining with 3 miners commenced. In the beginning the work was very slow as everyone was learning a new style of mining. Now, most of the mining efforts are concentrated in the fault zones with crocoite indications. Initially prospecting took place along crosscut 1, finding a very promising area at the end of the crosscut where the original miners lost the lode. Access to this area required a lot of timbering, so work was diverted to stope 5a, where a drift was dug along Hannah's Lode for about 15 meters. This drift intersected the first major pocket, now called "Stop The Bleeding Pocket", which was quite small, only about 60 cm by 30 cm deep and about 10 cm high. The color and form of the crystals in this pocket was wonderful, and work continues along this stope using the "cut and fill" method. Mapping has revealed that this lode is visible on the surface for about 400 meters, and that it extends vertically for about 100 meters. The partners are confident that another great pocket will be found in this area. Since all of the work in this area has to date been done using hand tools, a new inclined raise was recently dug to provide access for machinery, thereby speeding up the work.

The main lode in the mine is called Megan's Lode. It is over 200 m long and about 1 m wide. In the past this lode regularly produced large vugs, and a fair quantity of good quality specimens. Currently a team of 3 miners is drifting in both directions along the strike of this lode at a rate of 5 m per day and in September 2013 they found a 2 m long pocket in the ceiling. This ceiling pocket is a continuation of an open fissure mined in the past on the surface from the

Bright red-orange crocoite crystals filling a 10 cm long vug. S. Dohnt photo.

"Fan-like" cluster of doubly terminated crocoite crystals; 4.5 cm high. Collector's Edge specimen. R. Jackson photo

open cut. It will probably produce crocoite continuously up to the surface about 15 meters above. Historically, this zone produced large plates with gemmy red crocoite crystals on a distinctive bright yellow matrix composed of micro crystals of crocoite.

Extracting crocoite specimens is very difficult, especially in the narrow tunnels. Crocoite crystals are extremely fragile and have very small attachment points to the matrix, which makes them very susceptible to vibrations. Two methods are used to extract these delicate specimens. In low-grade areas where clay filling the pockets often cushions the crystals and reduces vibration, large sections of a pocket can be successfully removed using small hand held jackhammers. In areas with high value specimens, a chainsaw is used to cut out entire pockets from the host rock. After extraction, the blocks of dirty and muddy gossan containing pockets are packed carefully in styrofoam boxes for transport to the surface where Shane cleans and grades them. Medium and low-grade material is cleaned, trimmed and packed in Tasmania. All pieces with the potential to produce high quality specimens

Gemmy crocoite crystal, note phantoms, 1.5 cm high. Collector's Edge specimen. R. Jackson photo.

are sent directly to the Collectors Edge lab in the USA for preparation. There they are carefully trimmed and cleaned to reveal the high quality specimens within.

The first year of operations has produced a fair number of specimens, including some of really good quality.

Although a "world-class" pocket has not been hit yet, with the new equipment this is probably just a matter of time. However, collecting low-end material is slowing down the production of higher quality specimens. Therefore, the partners have decided to minimize low-end collecting, in order to concentrate on finding high quality pockets containing more valuable specimens which can fund the operation. Up to now about 400 flats of mostly low-end specimens have been collected with only a few high quality specimens. The best were from rather small vugs. These crocoite crystals were almost completely transparent, bright red, and lustrous reaching up to 7.5 cm and containing numerous very distinctive phantoms. The biggest matrix specimen collected so far is 17 cm high and contains a medium size vug with numerous bright red crocoite crystals which contrast with the black or dark brown matrix. Crocoites from the Red Lead mine have well formed, sharp and lustrous terminations, which make them quite easy to distinguish from crystals from the Adelaide

One of the best specimens collected so far from the recent underground workings, 7 cm high. L. & D. Cook specimen. J. Scovil photo.

quality specimens have been produced. In the near future it is likely that many good quality specimens will be collected. There is also a chance that specimens of

Rich crocoite specimen, 11 cm wide. Collector's Edge specimen. R. Jackson photo.

mine (which are almost never terminated and usually have "jackstraw" habit).

In addition, light green cerussite crystals to 1 cm have been found recently in spectacular association with red crocoite. Furthermore, some of these cerussites are twinned forming "arrowheads". In the past, light green cerussites to 2.5 cm were found so, with some luck, combination specimens with larger green cerussites and red crocoite might be encountered in the near future.

For several months, this new specimen mining operation at the Red Lead mine was kept secret from the collector community. Specimens from this mining project were first shown at the Denver mineral show in September 2013. A small showcase containing 4 high-end specimens provided a small "taste" of the specimens yet to come from this new venture. All 4 specimens were superb quality neon-red gemmy crocoite crystals on contrasting dark matrix. This small showcase generated a lot of excitement among collectors at the show.

PERSPECTIVES

Mining has just begun at the Red Lead mine and already several high "world class" or "world's best" quality will be produced soon. We will all keep our fingers crossed!

Shane DOHNT
Kapi Minerals, Tasmania, Australia
e-mail: shanesrocks@ozemail.com.au

Tomasz PRASZKIER
Spirifer Minerals, Warszawa, Poland
e-mail: tom@spiriferminerals.com

Newly mined specimens from the Red Lead mine were shown to the public for the first time during the Denver show. Collector's Edge Photo.

Mineral photography: Jeffrey A. Scovil (USA)

New series

In this issue we start a new series of articles presenting mineral photographers showing their best, most famous photos and presenting the style of their work. We begin with our associate photographer, and probably the most famous photographer in the mineral world – Jeffrey Scovil.

Jeff Scovil showing photos on his camera to kids in Madagascar.

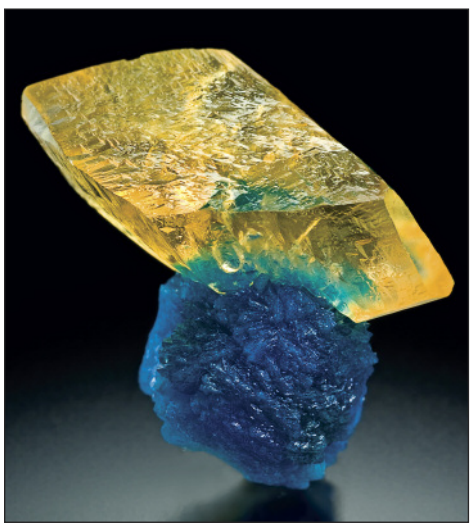
Jeffrey Scovill has been a professional photographer specializing in minerals, gems and jewelry for 23 years. He was a serious amateur photographer for 15 years before that. Jeff has been using digital equipment for the last 5 years. He uses a Nikon D2xs camera and a 55 mm Micro Nikkor lens, although sometimes he prefers a 105 mm Micro Nikkor lens. For lighting he usually uses a studio flash. Jeff has about 60,000 35 mm slides in his archives and over 18,800 digital photos.

Jeff travels all over the United States photographing at shows and in private homes and businesses. He regularly attends the Tucson, Denver, and Cincinnati shows and also travels to Europe twice a year to shoot at the Munich and Ste. Marie-aux-Mines shows. People can bring specimens to Jeff at shows but it is a good idea to contact him first if you have a large quantity. He charges by the piece at shows and offers a discount with a daily rate (plus expenses) if he comes to the client. Jeff shoots about 20 pieces in a day and requires a minimum of one day's work to come to you. He can be contacted by email at or by phone – cell (+1) 602-692-0944.

Tourmaline cut and rough, crystal 7.1 cm high. Jonas mine, Minas Gerais, Brazil. S. Rudolph collection. J. Scovil photo.

Malchite, 7.1 cm wide. Katanga, Congo. M. Budil specimen. J. Scovil photo.

Rhodochrosite, 4.5 cm wide. N'Chwaning Mine, South Africa. W. Mann collection. J. Scovil photo.



Calcite on cavansite, 2.4 cm high. Wagholi, Maharastra, India. J. Gajowniczek specimen. J. Scovil photo.

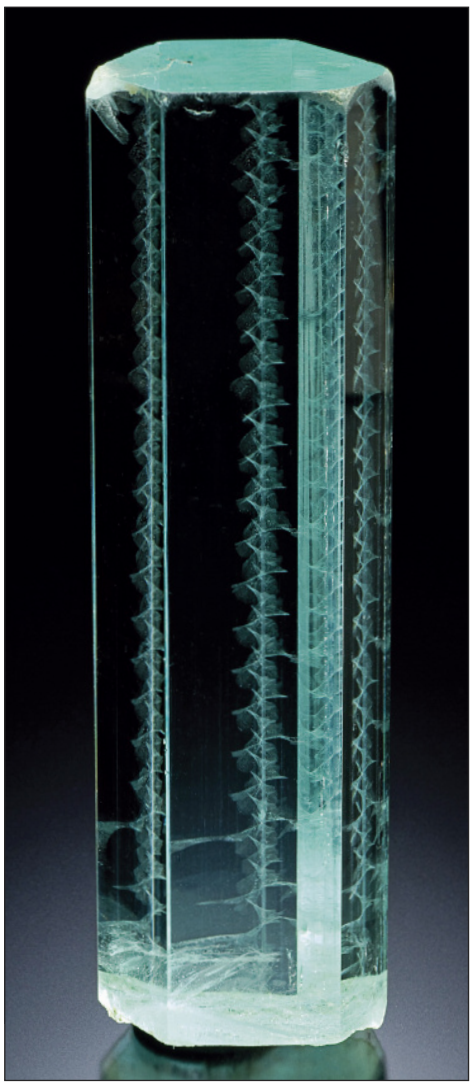
Apatite, 13.5 cm high. Panasqueira, Portugal. M. Budil specimen. J. Scovil photo.

Tourmaline, quartz and albite, 18 cm high. Paprok, Nuristan, Afghanistan. Collectors Edge specimen. J. Scovil photo.

Beryl var. aquamarine, 18.2 cm high. Pakistan. M. Budil specimen. J. Scovil photo.

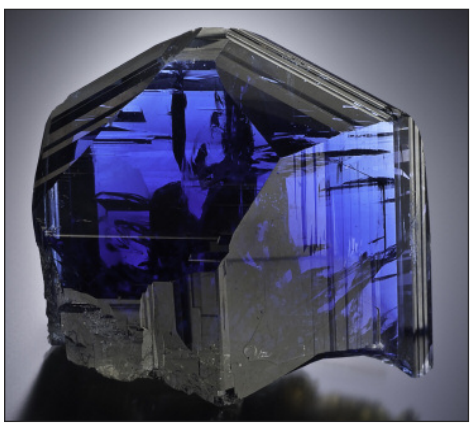
Silver on native arsenic, 6.9 cm high. Poehla, Saxony, Germany. W. Wendel specimen. J. Scovil photo.

Diopside on graphite, 5 cm high. Merelani Hills, Arusha, Tanzania. M. Budil specimen. J. Scovil photo.

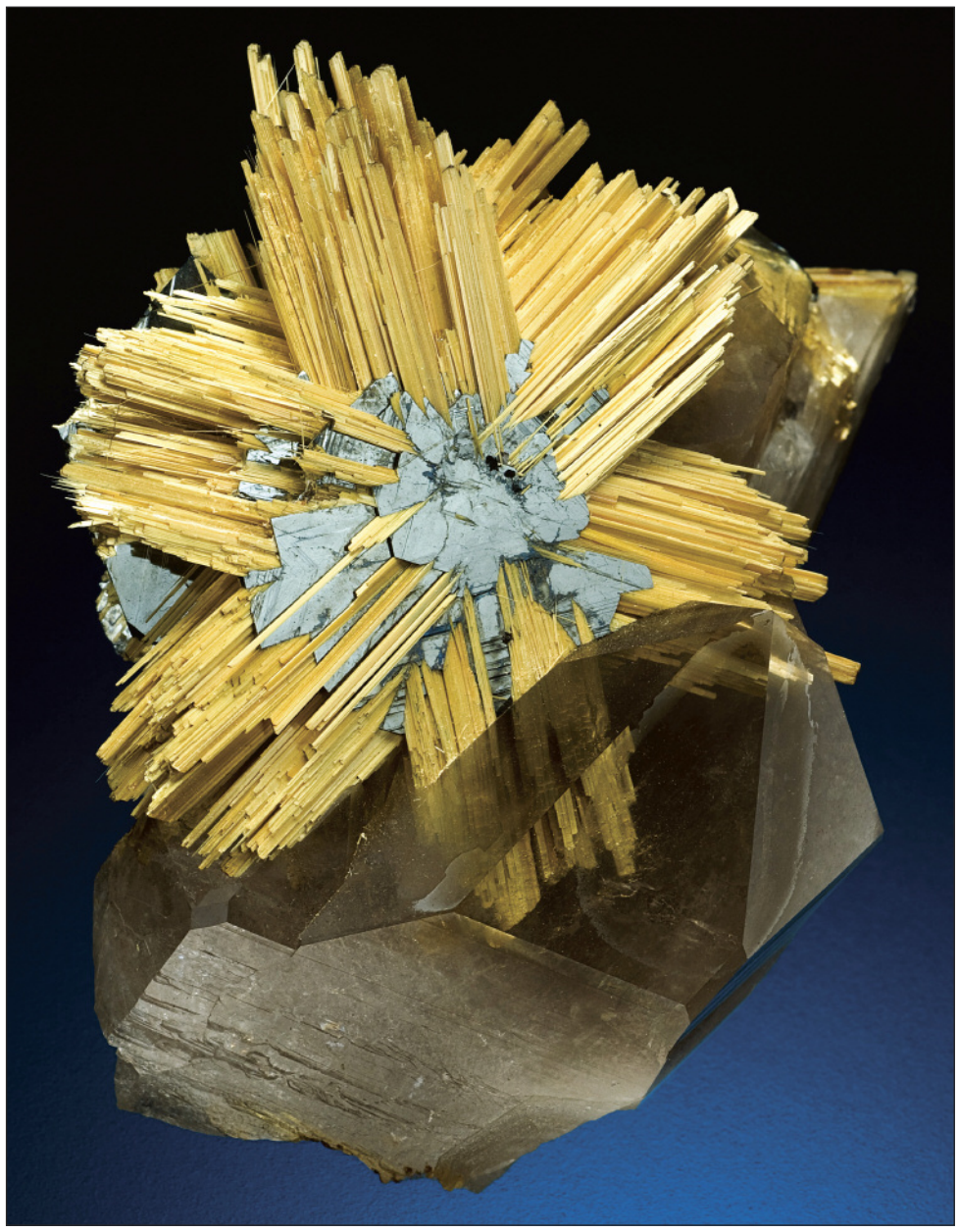


Beryl var. aquamarine with spiral inclusions, 9 cm high. Pakistan. Gem Artisans specimen. J. Scovil photo.

Fluorite on muscovite, 14.5 cm high. Chummar Bakhoor, Pakistan. M. Budil specimen. J. Scovil photo.



Zoisite var. tanzanite, 6.1 cm wide. Merelani Hills, Arusha, Tanzania. S. Rudolph collection. J. Scovil photo.



Epitaxial rutile with hematite on quartz, 7 cm high. Novo Horizonte, Bahia, Brazil. T. Bonisoli specimen. J. Scovil photo.

Tourmaline, lepidolite and albite, 19.6 cm high. Pederneira mine, Minas Gerais, Brazil. S. Rudolph collection. J. Scovil photo.

Pyromorphite, 7.7 cm high. Daoping, Guilin, China. S. Rudolph collection. J. Scovil photo.

Calcite, 5.1 cm wide. Verchniy mine, Dal'negorsk, Russia. M. Budil specimen. J. Scovil photo.

Fluorite, 2.5 cm high. Minerva #1 mine, Illinois, USA. T. Huinzing collection. J. Scovil photo.

Gold; 7.7 cm high. Round Mountain, Nevada, USA. K & M Proctor. J. Scovil photo.

Collector interview: Bruce Cairncross (SA)

Bruce Cairncross – geologist, collector, author and photographer. T. Cairncross photo.

This time in our *Collector Interview* series we interview well known South African collector Bruce Cairncross. Bruce is a professor of Geology and Head of the Department of Geology at the University of Johannesburg. He is an accomplished traveler, collections curator, photographer, and the author of many books and articles. In this interview you can read not only about Bruce's personal collection and passion for minerals, but also about the mineral community in South Africa.

Bruce with huge (500 ct) Cullinan diamond. T. Cairncross photo.

Tomasz Praszkier (Minerals): *Bruce, let's start with your personal history. You are of Scottish origin living in South Africa. How did this happen?*

Bruce Cairncrosse: I am a fifth generation Cairncross living in South Africa. My great-great grandfather came from Scotland and arrived in Table Bay (Cape Town) on 27th May 1826. In addition, my mother's ancestors also originated from Scotland so I have Scottish blood flowing through my veins derived from both parents. Her maiden name of Duchart McGregor Johnson, attests to her Scottish lineage! Of interest is that my grandfather fought in the Anglo Boer War (1899-1902). He was farming at the time in the eastern Free State Province. Even though he was a second generation Scot, he fought against the British! He subsequently got captured and was interned in the prisoner of war camp in Ladysmith for two years. After the war ended, he moved to the farming community of Standerton (now in Mpumalanga Province), where he lived until he died in 1952. During that time, he served as the town Mayor for several years and there is a street named after the Cairncross family in the town. My father was born and died in Standerton as well, and that is where my elder brother and I grew up.

Bruce in front of one of his showcases with mineral specimens. T. Cairncross photo.

Bruce, in traditional Scottish outfit, with his wife Theresa. B. Cloete photo.

TP: *At the University, you specialize in the geology of coal deposits, and you have published many papers about this topic. You are also Head of the Department of Geology at the University of Johannesburg. Tell us about your work and how you find time for minerals.*

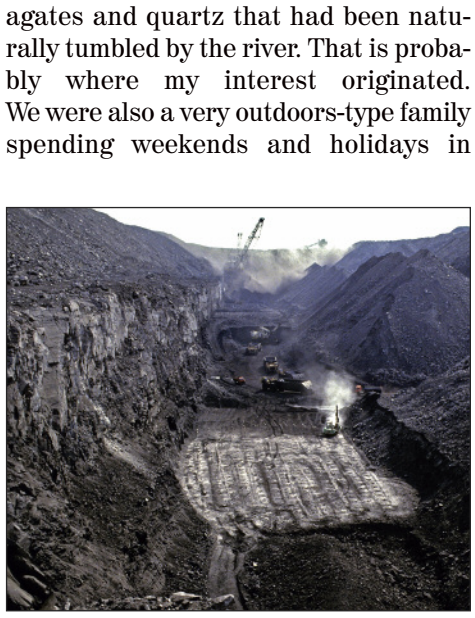
BC: Yes, both my Masters and Doctoral degrees focused on the sedimentology and stratigraphy of coal deposits in South Africa. I had a study bursary from Rand Mines Ltd coal division for my masters project and then went to work for them after I completed the degree. After working for the mines for a couple of years I joined the coal research unit at the University of the Witwatersrand where I completed my PhD.

Bruce working in his office as Head of the Department of Geology at the University of Johannesburg. N. Beukes photo.

I have been Head of the Department of Geology at the University of Johannesburg since 2003 and the position is somewhat onerous, especially regarding administrative duties. I oversee a staff contingent of 30 academic and support staff and we have approximately 300 geology students in our various degree programs. In recent years, my coal research has been driven primarily by my post-graduate students, but I do find time to "steal" for mineral related work. For example, I took 6 months sabbatical leave during the second half of 2011 to complete the new Kalahari manganese field (KMF) book and the Field Guide to Southern African rocks and minerals book. I also tend to work during my spare time over weekends on mineral topics. I belong to the local mineral club and we meet twice a month and that keeps me active as well. I have official ties to the Johannesburg Geological Museum and we try to assist the museum when and wherever we can. I suppose it's a case of the old *cliché* "a busy person finds time to work".

TP: *So what is the origin of your interest in minerals and how has it evolved?*

BC: Growing up as a youngster in Standerton, I used to walk along the banks of the Vaal River that flowed through the town and pick up various agates and quartz that had been naturally tumbled by the river. That is probably where my interest originated. We were also a very outdoors-type family spending weekends and holidays in places of interest like the Drakensburg Mountains and other geologically interesting places that were often localities where one could collect various rock and minerals. In later years, and after seeing various geological/mineral collections at local museums during school tours, I was exposed to quality, aesthetic specimens and this made me realize that there was more to collecting than just "*lapidary-type*" material.



South African coal mine, one of the places where Bruce does his scientific research. B. Cairncross photo.

First specimen in Bruce's collection, quartz from the Witwatersrand, SA; 7.5 cm wide. B. Cairncross photo.

Mixed South African minerals, mostly thumbnails, from Bruce's collection. B. Cairncross photo.

TP: *What was your first specimen?*

One of the drawers with small size specimens, small part of Bruce's collection. B. Cairncross photo.

Bruce collecting staurolite crystals at Gorob Mine, Namib Desert, Namibia in 1975. J. Ward photo.

Bruce (first to the right) buying minerals in 1986 in Johannesburg. K. Sprich photo.

BC: Well, I actually have three "first specimens", the first one self-collected, the first one given to me and the first one I ever bought. The first self-collected specimen is probably some agate or rock that I picked up as child and I would be hard pressed to find it now. The first mineral I was given is a Witwatersrand gold mine quartz/calcite specimen that a friend of my father gave to me as a youngster, and which I promptly broke a piece off to give to a friend! The first mineral(s) I ever bought was from Sid Pieters' famous "House of Gems" shop in Windhoek, Namibia in 1975. I actually bought three specimens at once so I suppose they all qualify as firsts – all from Tsumeb; a mimetite, dioptase and azurite. I still have all three.

Recent photo of Bruce in the field in South Africa. T. Cairncross photo.

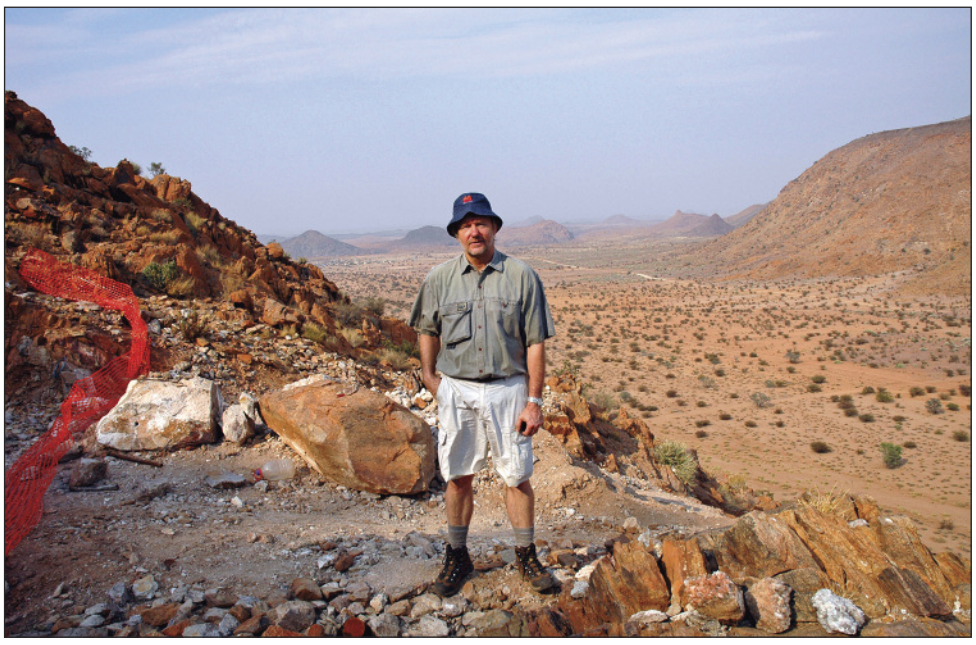
TP: *What is the focus or theme of your collection? How many specimens do you have?*

BC: When I first started buying minerals in the mid-1970s, I did not really have any focused theme. I was on a learning curve and bought whatever took my fancy, whether it was a local specimen or one from overseas. Once I started subscribing to the *Mineralogical Record* and saw all the dealer advertisements, I started buying minerals through the mail, and in particular from one dealer, David Hahn, who had a dealership in Maine called "The Crystal Habit". He had excellent Tri-State fluorites, galena and associated minerals. So by the late 1970s I had a relatively small collection of mixed minerals of various sizes.

When I moved to Johannesburg in 1980 that all changed. There were, at that time, some very reputable mineral shops in Johannesburg and my collection grew in leaps and bounds. No one locally was collecting thumbnail specimens and I started specializing in these, buying especially from one shop "Carlton Gems". Tsumeb and the Kalahari manganese fields (KMF) were very productive at that stage. I attended my first Tucson Gem & Minerals Show in 1986 with local dealer Rob Smith. That's also when my overseas collection started to grow substantially. About the mid-1990's, like many collectors, I found that I was running out of space. I sold most of my overseas collection and kept only a small suite of non-African thumbnails and some miniatures and cabinet-sized specimens that have special interest to me.

Bruce (left) with Rob Smith at the topaz site in Wah Wah Mts (USA) in 1986. Bruce is showing his thumb after he has smashed it with a hammer. M. Manship photo.

My collection today numbers over 7,605 catalogued specimens from the southern African region, mainly South Africa and Namibia. Of this, about 2,000 are thumbnail sized, most of the remainder are miniature-sized, and then I have some large cabinet specimens, but not many. I have substantial Tsumeb and Kalahari manganese field sub-collections. I have a lot of duplication of minerals – probably a few hundred Messina copper mine specimens with all the different inclusions. For a while from 2000-2003, I visited the now-famous "cactus quartz" locality at Boekenhouthoek, northeast of Pretoria, and bought several hundred specimens directly from the local diggers. I have most of these packed away for future reference. One of my favorite localities is Berg Aukas in Namibia. The mine did not produce a great variety of different mineral species, but the descloizite from there is acknowledged as being the best in the world. I love the various crystal habits of this mineral and have always bought good specimens when I see them – I have about 200-plus descloizites in the collection.



Bruce in the Riemvasmaak (SA) fluorite workings in 2008. P. Balayer photo.

Collecting in the Erongo Mountains (Namibia). U. Bahmann photo.

TP: *Which specimen do you consider as your best one?*

BC: That's like asking a parent who is your favorite child! A very difficult question as I have many desirable specimens in my collection. I don't have many self-collected minerals and if I did have one that was really great and that had good memories attached, I would probably choose such a specimen. But your question is: which do I consider my "best" one. That would probably have to be one that comes from a classic locality, has high scientific and monetary value coupled with rarity, and that would always be in high demand by any knowledgeable collector. In that regard, I have a miniature alamosite, which is a very rare species, from the Tsumeb mine in Namibia. The specimen is 3.5 cm (see photo).

Examining "cactus quartz" in KwaNdebele (SA) in 2002. G. Bronn photo.

Selection of the "cactus quartz" specimens from Bruce's collection, field of view 25 cm. B. Cairncross photo.

TP: *You like going to the field. Where have you collected? Which famous localities have you visited?*

BC: I do enjoy field trips, including the annual field schools we undertake with our geology students, although these are usually to mineral-uninteresting localities. Self-collecting sites in South Africa are very scarce when it comes to collecting high quality mineral specimens. There are places to go to self-collect agates and other lapidary material, but most of our specimens come from operating mines and it is nearly impossible to get permission to visit these mines to collect minerals.

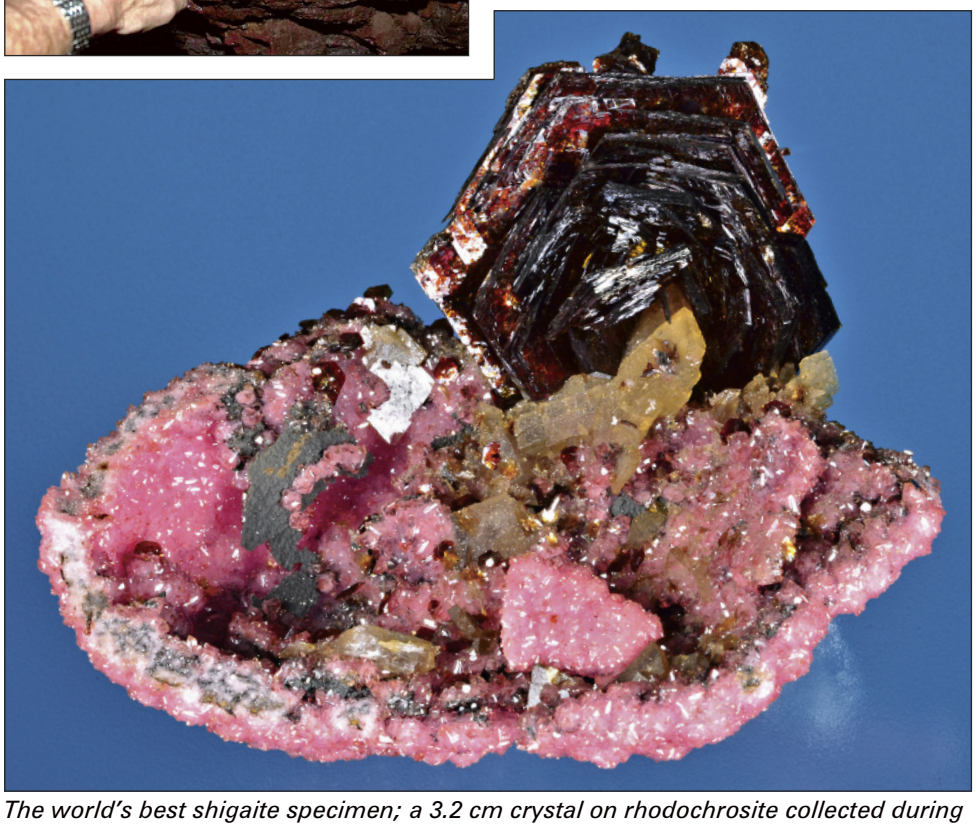
Having said that, these are some of the localities and mines I have been to, and sometimes managed to collect something of interest. If it's a mine, you have to track down the miners in the area and see if they have anything to sell. In South Africa and Namibia I've been to Messina, Klein Spitzkoppe, Brandberg, Goboboseb, various Karibib-Usakos pegmatites, N'Chwaning I and II, Erongo Mountains, and most of the other important mines and mining districts.

Sunset at N'Chwaning mine (SA), one of places where Bruce collected several times. B. Cairncross photo.

TP: *You have been lucky to visit many South African mines. Have you ever seen some of the famous pockets containing high quality specimens?*

BC: Yes, the best field experiences I have had have been underground visits to the N'Chwaning I and II mine with Paul Balayer who had a contract with the mine to legally mine for specimens. And I might add, most of the good Kalahari minerals that came out during the mid-2000's came from his mining efforts. I was fortunate enough to be invited by Paul in June 2006 to assist him in his mineral mining venture at N'Chwaning mine in the Kalahari Manganese Field when he rediscovered the shigaite zone. On the one day I was there, we opened a small pocket that yielded arguably the finest two specimens of shigaite ever found – huge crystals, up to 3.2 cm (!), that just happen to be sitting on a bed of crystalline pink, drusy rhodochrosite associated with barite and calcite. We discovered some spectacular specimens that day. It was interesting for me to see the pockets *in situ* after the blasting. One expects to see nice big hollow geodes, but in fact the pockets are relatively small, a few centimeters to perhaps 15-20 cm in size, yet they often yielded many crystals. As I was helping Paul, I could not keep the specimens that I helped remove from the pockets, but he did kindly let me purchase some others later at a discounted cost. That still did not take away the amazing sensation of reaching blind into a pocket, dirty and sweating, and retrieving some astonishing shigaites, some of which are pictured here.

Bruce underground in N'Chwaning I mine (SA), examining and pointing to rhodochrosite pockets. B. Cairncross and P. Balayer photos.



The world's best shigaite specimen; a 3.2 cm crystal on rhodochrosite collected during one of Bruce's collecting trips to N'Chwaning I mine (SA). D. Sacco collection. B. Cairncross photo.

We also visited the olmiite zone and that was entirely different. Here, the hanging wall (roof) of the mine contained a fracture zone that ran for several meters in the roof and wherever space permitted, olmiite together with associated minerals occurred. Thousands of specimens (many of low quality) existed in this zone.

One of the most exhausting underground visits I have experienced was to the Messina copper mine in the early 1990's, just before it closed down. There used to be several mines in the region, exploiting copper ore from several ore bodies. These are hosted in rocks of the Limpopo belt and geothermal gradients

Unique photo of a freshly opened pocket with olmiite at N'Chwaning II mine (SA). B. Cairncross photo.

are relatively high there. We spent an entire day underground, in intense heat and humidity, in mine workings that in places resembled *Dantés Inferno*. Rickety wooden ladders led from one level to the next and we finally exited the mine by riding in a skip/waste bucket via the vertical service shaft. Today, with all the safety regulations in place, that would be absolutely impossible to do.

TP: *Your involvement in minerals is not only collecting. You are the author of tens of articles and several books, mostly about South African minerals. Can you tell us about your most important publications from your point of view?*

2.8 cm wide specimen of shigaite collected by Bruce. B. Cairncross photo.

BC: This is also a difficult question because as you correctly say, I have produced a fair number of articles and eight books to date. I think from a reference standpoint, the first book I wrote with my friend and co-author, Roger Dixon, on the "*Minerals of South Africa*" stands out. It was the first book I wrote and it was sponsored by the Geological Society of South Africa to coincide with the Centenary celebrations of the discovery of gold on the Witwatersrand and the founding of Johannesburg. My single-authored field guides are also very popular with the general public and I enjoyed writing and photographing these.

Bruce with his family ready to go down in the N'Chwaning II mine. P. Balayer photo.

From an article standpoint, the issue of the *Mineralogical Record* that featured Erongo (*Mineralogical Record* 2006, vol. 37) stands out. This article subsequently won the Friends of Mineralogy award for the best article in the *Mineralogical Record* in 2006. From an academic standpoint, Nic Beukes and I won the Geological Society of South Africa's Jubilee medal in 1992 for an article we researched and published in the *South African Journal of Geology* that dealt with the sedimentology and stratigraphy of the Archean Mozaan Group rocks in northern KwaZulu-Natal in South Africa.

Photo of a freshly opened pocket with olmiite, bultfonteinite and celestine at N'Chwaning II mine (SA), 15 cm wide. P. Balayer photo.

TP: *Your new book has just been published. Please describe it for our readers?*

BC: My latest book, published in 2013, is co-authored with my colleague here at UJ, Professor Nic Beukes, who is a world authority on manganese deposits. It is titled "*The Kalahari Manganese Field – the Adventure Continues*". We, together with Professor Jens Gutzmer, did a book on the Kalahari manganese fields in 1997 that was quite well received. It was sponsored by ASSORE, one of the major manganese mining companies in South Africa, whose Chairman just happens to be Desmond Sacco, a very well known mineral collector. In 2010, Sacco and I

Amethyst, 6.1 cm wide. Goboboseb Mountains, Brandberg, Namibia. B. Cairncross collection and photo.

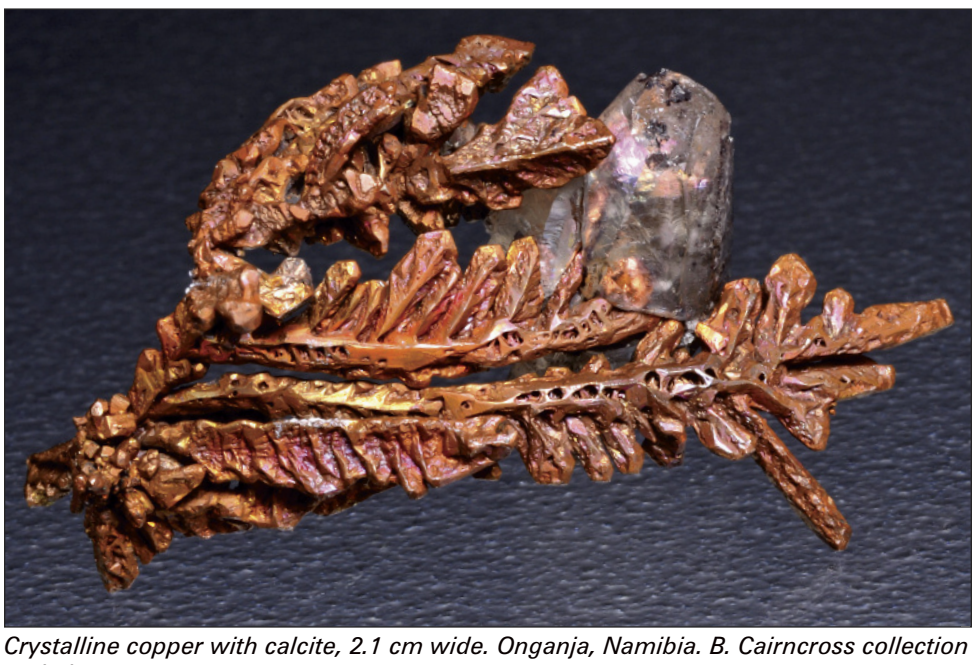
Smithsonite, 2.8 cm high. Berg Aukas, Namibia. B. Cairncross collection and photo.

discussed doing an update of our first manganese book as much has happened in the intervening years since the first book was published, and that is how the latest book took shape. ASSORE again sponsored the book. We think that it will probably not be updated a third time, so this latest book is more comprehensive than the first one and also has many more mineral pictures. Nic re-wrote the geology section with all the latest up to date information. I photographed several hundred mineral specimens from the Kalahari manganese fields, most of these from local South African collections. The book was published by Random House Struik who did a magnificent job in designing and printing. I would go so far as to say that it is the best book I have ever written and photographed.

Polished specimen of quartz with hematite, papagoite, ajoite, shattuckite and kaolinite inclusions, 6.4 cm high. Messina Mine, South Africa. B. Cairncross collection and photo.

TP: *You are also on the editorial boards of the most important mineralogical journals. Which ones do you work with?*

Pseudomorph of bayldonite after mimetite, crystals up to 1 cm long. Tsumeb Mine, Namibia. B. Cairncross collection and photo.



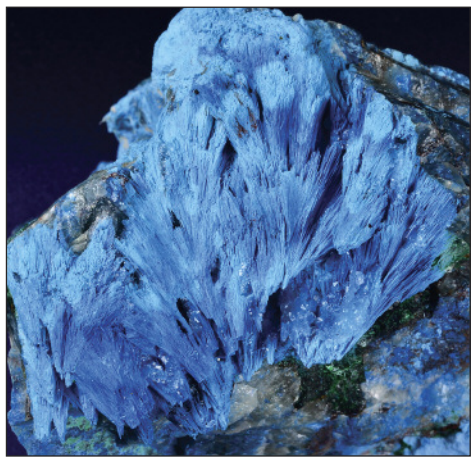
Crystalline copper with calcite, 2.1 cm wide. Onganja, Namibia. B. Cairncross collection and photo.

BC: I am a Consulting Editor for *Rocks & Minerals* and Associate Editor for *The Mineralogical Record*. There are also other magazines and publications that I have worked with although I am not on their editorial staff. These include *Lapis*, *ExtraLapis English*, *MINERALIEN-Welt*, *Le Règne Mineral* and the *Australian Journal of Mineralogy*. I am also a consulting editor for our local South African magazine – *Southern African Gems & Minerals*. I enjoy writing and photographing minerals so for me this editorial work is not really work as such.

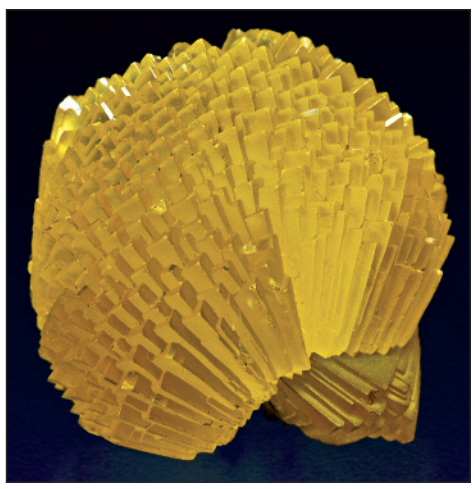
TP: *Apart from all of that you are also a mineral photographer (see majority of photos in this interview) and winner of several prizes in that category. Tell us about that part of your activity.*

BC: I always remember that when I had to undergo aptitude tests in order to apply to study at university, I peaked in the arts, not the sciences! Maybe that was fortuitous and why I have always enjoyed the creativity of photography. I have never had formal training or lessons in photography and I am completely self-taught. That's not a bad thing, as it teaches one to research and read up about photography and learn by trial and error.

My mineral photography came about almost by default. In 1992, when I was working with my friend Roger Dixon on my very first book "*Minerals of South Africa*", I was not doing any mineral photography. I had to obtain the services of other photographers to take the pictures for the book. I watched them while they were taking pictures, noting how they were lighting the specimens, what sort of film they were using, etc. I then went away and decided to teach myself. I bought a Pentax Super A 35 mm camera and a 65 mm Pentax macro lens and three extension rings. I can tell you that in those days of film, I must have spent thousands of rands (hundreds of dollars) on film and processing film. What I learned was to take the best picture with the fewest number of exposures. Today, with digital photography, we are really spoiled as one can take dozens of exposures, check them immediately on the computer and select the best one. And then fiddle around with them in Photoshop if necessary. Through trial and error, I learned what the best film was, the best type of lighting, and also what sort of minerals should be photographed on what type of background. Once I had bought a copy of Jeff Scovil's 1996 book "*Photographing Minerals, Fossils and Lapidary Items*" my learning curve steepened dramatically. When the digital age dawned, I bought first a Nikon Coolpix 995 camera. I currently use a Nikon D7000 and have two macro lenses, a Nikon 60mm f/2.8 AF-D and a Nikon 105mm f/2.8 G-VR. I recently bought a Stackshot apparatus to use for smaller specimens.

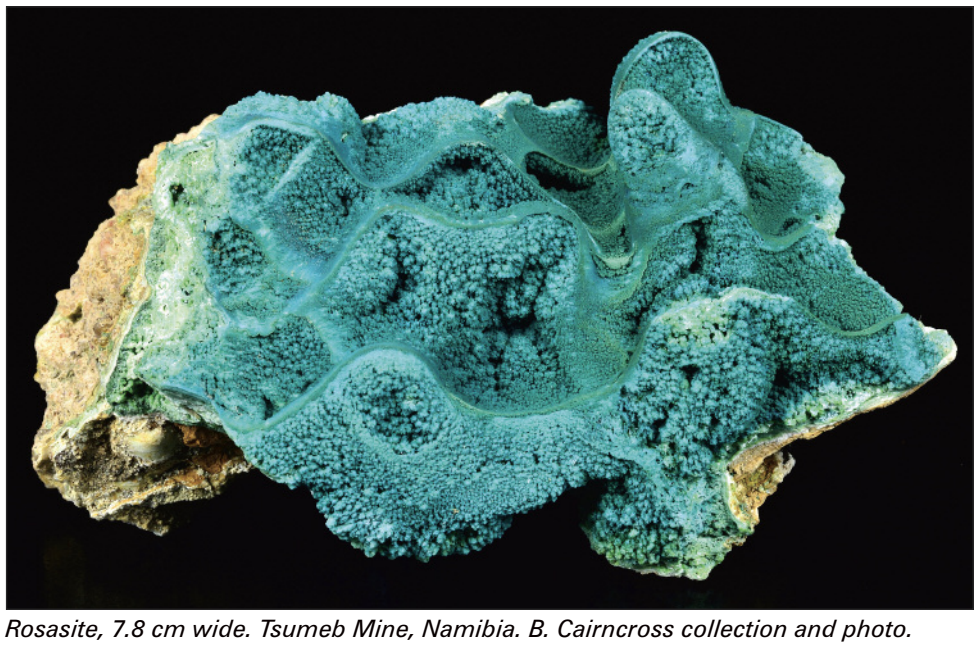


Pseudomorph of shattuckite after malachite, field of view 6 cm. Omaue mine, Kaokoveld, Namibia. B. Cairncross collection and photo.

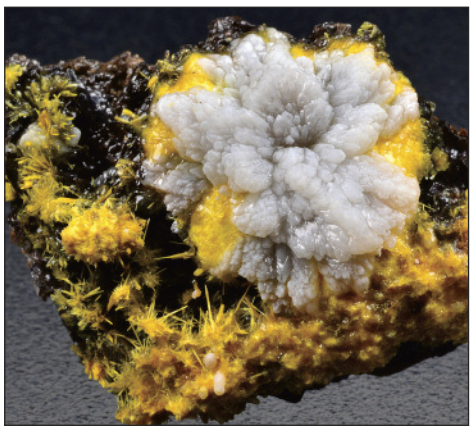


Smithsonite, 3.4 cm high. Berg Aukas, Namibia. B. Cairncross collection and photo.

There are many professional photographers around who are specialists in all sorts of media, for example, portraits and landscape. But I am a firm believer that you need to have an in depth knowledge of minerals and crystal structure, in addition to being a competent photographer who takes great mineral pictures. One needs to understand which crystal faces should be lit, which should not, how the specimens should be oriented, why some minerals are better to photograph than others. So in recent years, I have had my pictures of minerals (and some



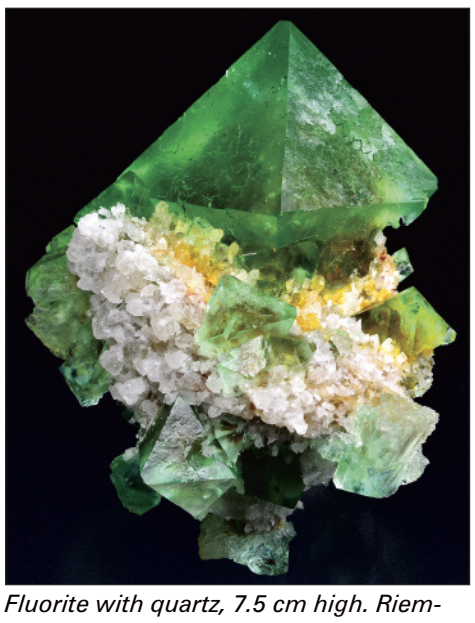
Rosasite, 7.8 cm wide. Tsumeb Mine, Namibia. B. Cairncross collection and photo.



Boltwoodite with gypsum, 4.8 cm wide. Goanikontes, Namibia. B. Cairncross collection and photo.

gemstones) featured in most media including books, magazines, calendars, company reports and websites.

I still have most of my 35 mm slides of mineral specimens – about 5,000 of these. When it comes to digital images I have about 12,000 backed up. These include pictures other than minerals, but



Fluorite with quartz, 7.5 cm high. Riemvasmaak, South Africa. B. Cairncross collection and photo.

related to geology, mines, geological scenery and other geological-mineralogical related subjects. I have won a few photographic competitions recently including three of the macro category competition pictures from the Tucson Gem & Mineral Show (2009, 2011, 2013) and first prize in the "Science as Art" category in the National Research Foundation/South African Agency for Science and Technology Advancement South African Science Lens Photographic Competition in 2011.

Inesite, 8.6 cm wide. N'Chwaning II mine, South Africa. B. Cairncross collection and photo.

TP: *You have also helped to build mineral collections for the University and for private collectors. As a collector yourself, were you ever jealous that you could not own those specimens? Which collections did you work on?*

BC: The biggest project I have worked on to date involving someone else's collection was when Desmond Sacco commissioned me to write and photograph a book highlighting some of his favorite southern African minerals. This was ultimately published in 2000. I spent many weeks at his house photographing several specimens per day and writing the text at the same time. Working with such world class specimens was truly an experience!

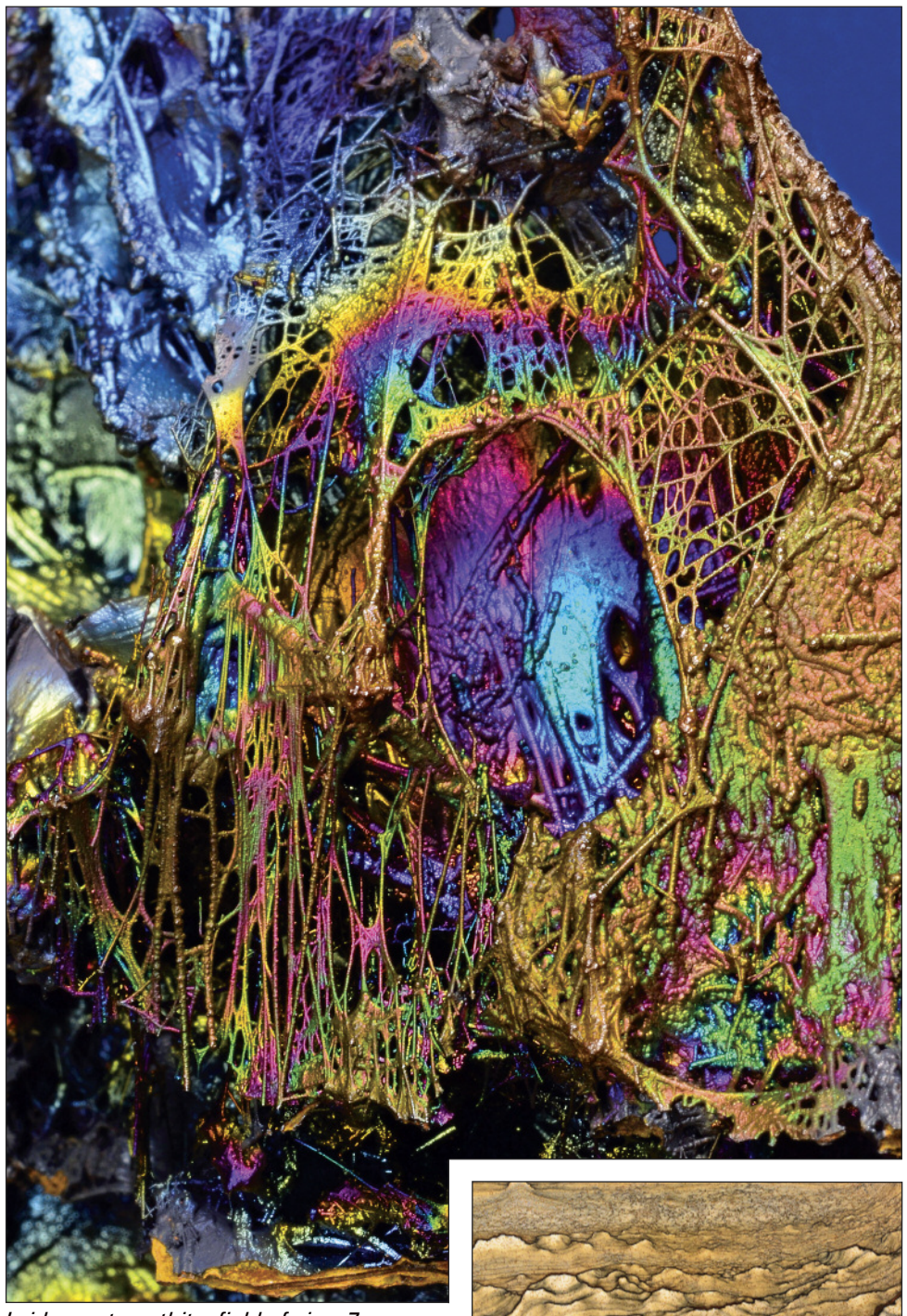
I photographed most of the top Erongo specimens in Uli Bahmann's collection for our Mineralogical Record article. That was a rewarding experience as he allowed me to take the specimens home to photograph at my leisure.

Then I have worked with several other local collectors, not so much helping to build their collections but photographing their specimens for various projects. This was the case in 2011 when I borrowed specimens from local collectors to photograph for our latest Kalahari manganese field book.

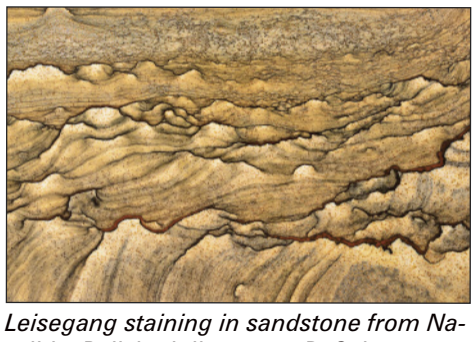
My most recent project this year (2013) was photographing about 100 meteorites that belong to Dr. Ronnie McKenzie who lives in Pretoria. He commissioned me to do this work for him as he is busy writing a book on meteorites.

Having worked with and often handled specimens that may be worth several hundred thousand dollars each, I have never been possessive of such specimens. Every collector collects according to his or her means, and some collections are going to be better than yours, some are going to be inferior. The first time I ever saw the Sacco collection in 1980, I was somewhat depressed as it was the first really world class private collection I had ever seen. But I soon got over that. I collect what I can afford and sometimes you get lucky and get good specimens at affordable prices. One of the early reasons I focused on collecting thumbnail-sized minerals was because no one else was doing so, at the time, in South Africa. So they were proportionally much cheaper than larger specimens, and that was what I could afford.

TP: *You are involved in the collectors' community in South Africa. Can you tell us how big and active this community is? For instance, how many serious collectors and how many mineral shows are there?*



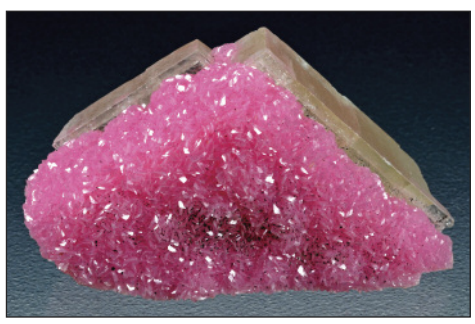
Irridescent goethite, field of view 7 cm. Vergenoeg mine, South Africa. B. Cairncross collection and photo.



Leisegang staining in sandstone from Namibia. Polished tile 10 cm. B. Cairncross collection and photo.

BC: South Africa has an amateur organization called FOSAGMS – the Federation of Southern African Gem and Mineralogical Societies. The Federation consists of eight regional clubs scattered around the country but mainly in the

Calcite coated by rhodochrosite, 6.5 cm wide. Wessels mine, South Africa. B. Cairncross collection and photo.

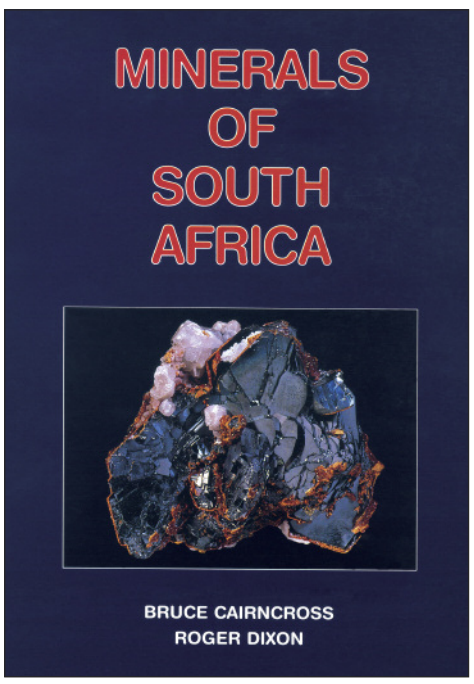


Rhodochrosite on barite, 4.4 cm. N'Chwaning II mine, South Africa. B. Cairncross collection and photo.

The best specimen in Bruce's collection in his opinion – alamosite and melanotekite, 3.5 cm wide. Tsumeb Mine, Namibia. B. Cairncross collection and photo.

Ettringite with calcite, 5 cm high. N'Chwaning II mine, South Africa. B. Cairncross collection and photo.

major cities, and these clubs keep and promote a healthy interest in minerals, lapidary material and gemstones. The current total membership is about 600 members. The Internet also does a lot to foster a continued and sustained interest in South African minerals, and there are several South African dealers who sell minerals via the worldwide web. There are definitely several very serious mineral collectors in South Africa, and not only in the Johannesburg area. If you look at the books I have produced over the years, you will see acknowledgment to these individuals who have loaned me specimens to photograph. I can think of at least half a dozen South African collectors/collector-dealers who regularly participate in international mineral shows such as Tucson, Munich, Sainte Marie, and Tokyo.



Cover of the first book written by Bruce Cairncross "Minerals of South Africa", published in 1995.

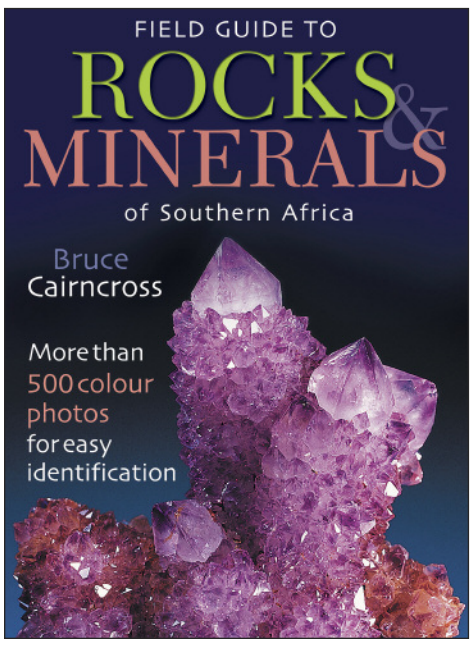
Without doubt, the finest private mineral collection in South Africa belongs to Desmond Sacco. It is not huge, but contains world class specimens, notably from Tsumeb and the Kalahari Manganese field. All the other "classic" southern African localities such as Erongo, Berg Aukas, Goboboseb, Onganja, to name a few, are featured as well. Add to this world class international specimens sprinkled about in amongst the African specimens and it is indeed a collection of note.

TP: *Recently a new mineral was approved and named after you to honor all your mineralogical work. Can you tell us some details?*

BC: To date, only one single specimen of *cairncrossite* is known. It was collected on the dumps at the Hotazel mine, but in dump material that originated from the Wessels mine. The specimen is slightly smaller than fist-sized and superficially resembles brucite as it has a foliated fabric. It has a pearly lustre and is off-white in color. It is associated with richterite, manganoan sugilite and pectolite.

Celestine with bultfonteinite, 3.2 cm high. KMF, South Africa. B. Cairncross collection and photo.

As I mentioned I've been researching and publishing on southern African minerals for the past 27 years. My special interest in the Kalahari manganese field has culminated in two substantive books. So I suppose when Dr Ludi Von Bezing realized that he had found another new mineral from the Kalahari manganese mines, he proposed to use my name for the new mineral. I was flattered and greatly appreciated his recommendation, especially when the proposal was officially accepted.



Cover of one of the popular field guides written by Bruce Cairncross.

TP: *What are your plans for the future? Next travels, books, articles?*

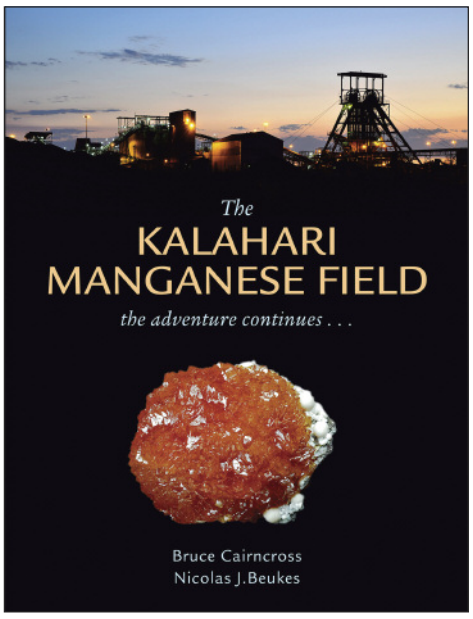
Willemite with calcite, 6.7 cm. Tsumeb, Namibia. B. Cairncross collection and photo.

BC: I am currently working on two new books, one with a friend of mine, Professor Spike McCarthy from the University of the Witwatersrand, dealing with a textbook on mineralogy for undergraduate university students. The other is an ongoing project documenting the micromount minerals from the Bushveld in South Africa.

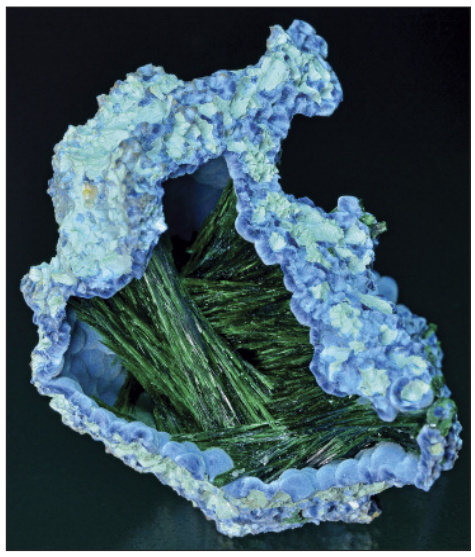
TP: *And almost at the end, a difficult question. South Africa had a horrible chapter in its history known as Apartheid. How do you see the relationship between black and white people now? Is the society still so strongly divided? Are there a lot of black students at the University? Are there any black mineral collectors? Why are most mineral collectors white, when white people are less than 15% of the society? Is it a question of culture or multi-generational economical differences?*

Fluorite with quartz, 13.8 cm wide. Riemvasmaak, South Africa. B. Cairncross collection and photo.

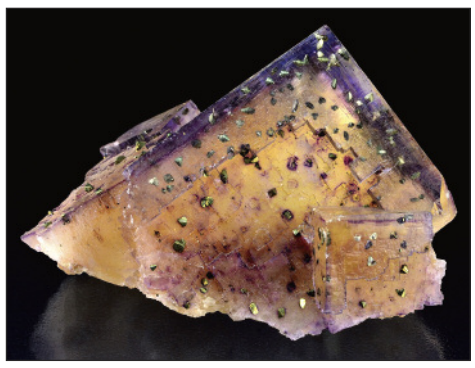
BC: As an academic at one of the leading Universities in South Africa, I am exposed to a more liberal culture than perhaps is generally present in South Africa. Since the democratization of South Africa in 1994, we have seen a steady and large increase in the number of African (black) students studying at universities. For example, when I joined the university in 1989, less than 5% of our undergraduate students registered for geology were black South Africans. Today, approximately 90% are black, so we have seen a radical shift in the racial profile of our students. This may have come about due to their parents having access (since 1994) to a



Cover of the newest book by Bruce Cairncross, published in 2013.



Malachite with shattuctkite, 5.4 cm high. Omaue mine, Kaokoveld, Namibia. B. Cairncross collection and photo.



Fluorite with chalcopyrite, 7 cm wide. Denton mine, Illinois, USA. B. Cairncross collection and photo.

Cairncrossite – new species named in honor of Bruce Cairncross, 7 mm wide. B. Cairncross collection and photo.

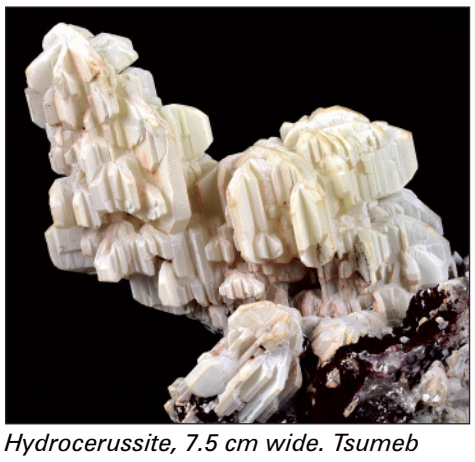
Bruce also photographs nature. Here is his photo of a cheetah.

"normal" society and employment sector. Hence, they have the financial means to send their children to university, a situation that was not prevalent 20+ years ago. In general, there are still pockets of racial tensions between certain groups in South Africa, particularly the extreme left and extreme right political groups, but that is probably true for most countries.

To my knowledge, there are very few black mineral collectors in South Africa, or globally for that matter. What the reason is for that, in our case, may

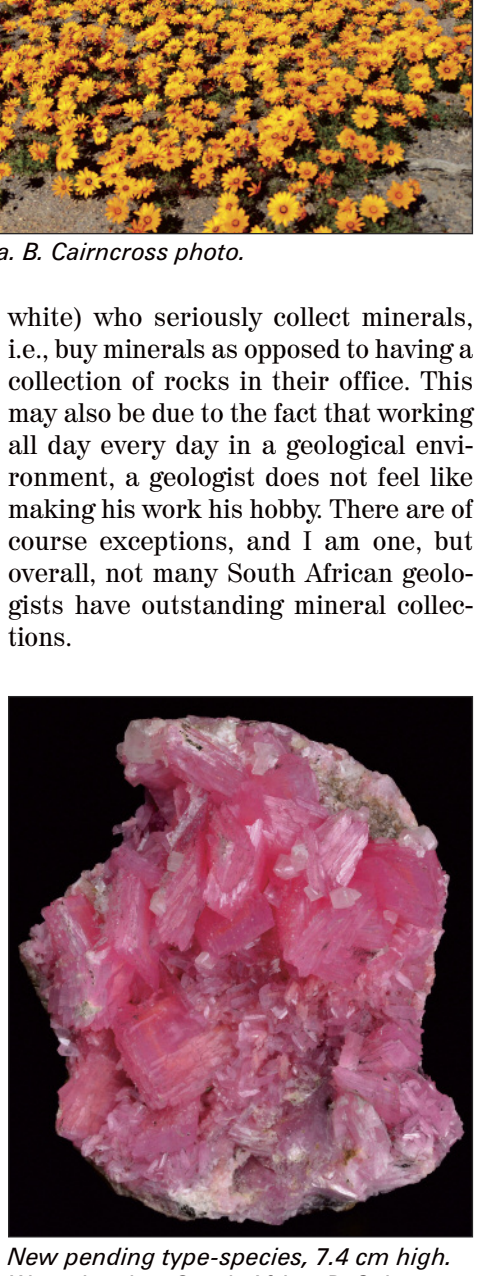
Flowers on dumps in Nababeep, South Africa. B. Cairncross photo.

relate to economic means, but historically, mineral collecting does not seem to be of much interest. Perhaps the legacy of working for decades in the South African mines as migrant laborers under the old regime discouraged an in-



Hydrocerussite, 7.5 cm wide. Tsumeb mine, Namibia. B. Cairncross collection and photo.

terest in rocks and minerals. I belong to a local Johannesburg gem and mineral club and we have no black members. I have been to several Tucson and Munich shows over the years and the absence of black collectors at these shows is quite obvious. Coming from South Africa it is probably dangerous to make suggestions as to why this is, because the old schooling system under the apartheid regime systematically and deliberately precluded black school children from being taught proper mathematics and science at school. But we are now 20 years into the "new" South Africa, with no discrimination in teaching, yet there are still very few black South Africans collecting minerals. Yet, and again to my knowledge, there are also few professional geologists (black or white) who seriously collect minerals, i.e., buy minerals as opposed to having a collection of rocks in their office. This may also be due to the fact that working all day every day in a geological environment, a geologist does not feel like making his work his hobby. There are of course exceptions, and I am one, but overall, not many South African geologists have outstanding mineral collections.



New pending type-species, 7.4 cm high. Wessels mine, South Africa. B. Cairncross collection and photo.

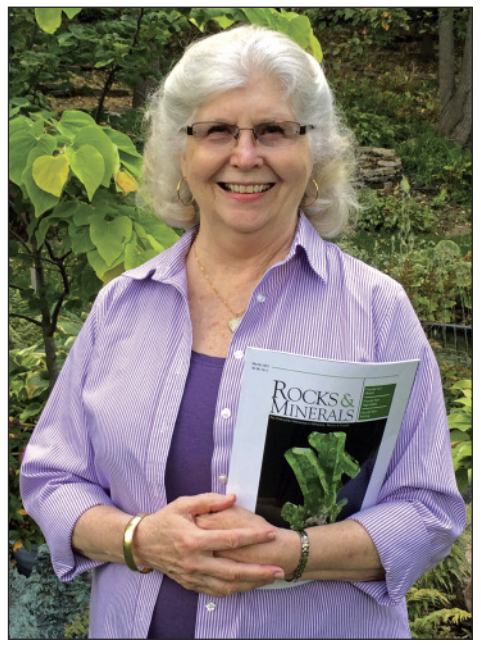
Perhaps another reason why there are more "white"/European mineral collectors in South Africa relates to our European cultural heritage. Mineral collecting in Europe has been going on for centuries and the European settlers who came to South Africa from the mid-1600s, were already, at that time, expressing an interest in things geological. They brought with them a legacy of collecting objects of scientific interest, including rocks and minerals. It's no coincidence, therefore, that one of the first type minerals was discovered by Europeans in South Africa in 1788. Most of our major museums, in Cape Town, Johannesburg and Pretoria were well established by the late 19th Century and all were founded by Europeans.

Bruce with his wife Theresa in Knysna, South Africa. C. Felet photo.

Panorama of Gross Spitzkoppe, Namibia by Bruce Cairncross.

TP: *Bruce, thank you very much indeed. We look forward to your future publications and we wish you many great adventures during your travels, and many great new additions to your collection*

Journal presentations: Rocks & Minerals

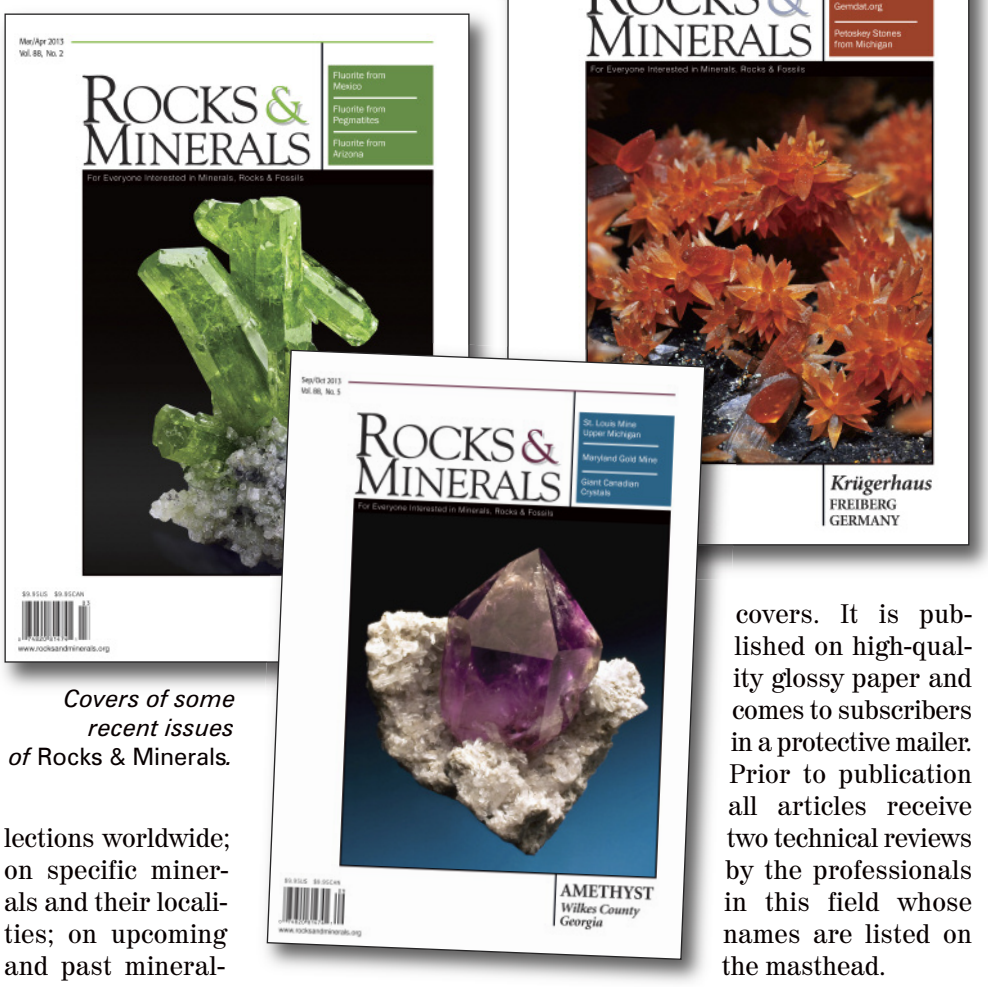


Marie Huizing – editor of Rocks & Minerals *for the last 35 years.*

UNIQUE NICHE

Now (2013) in its 88th year, *Rocks & Minerals* is America's oldest popular magazine catering to the needs of both the professional and the hobbyist in the field. Each issue delivers timely information on important discoveries and collections worldwide; on specific minerals and their localities; on upcoming and past mineralogical events, and on historic and present personalities, as well as regular columns featuring microminerals, museum news, media reviews, and an Internet directory. Coverage is broad based and, in addition to minerals, includes articles on fossils and geology in general.

Rocks & Minerals is distributed by subscription and is also available on U.S. newsstands and in bookstores coast to coast.



Covers of some recent issues of Rocks & Minerals.

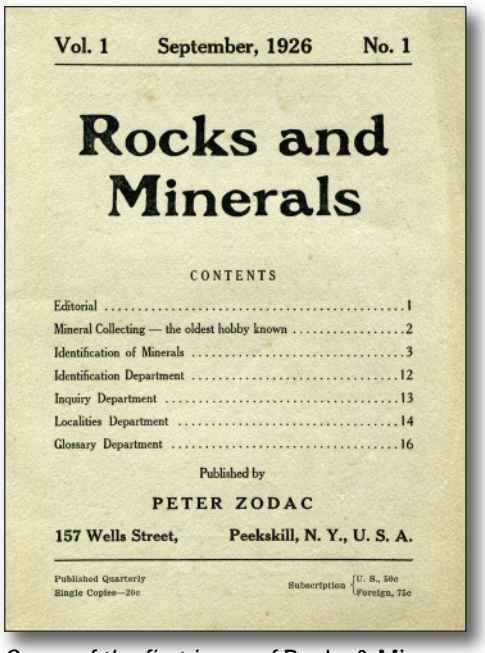
QUALITY

Rocks & Minerals is a bimonthly full-color publication with each issue having 100 pages (or more) including covers. It is published on high-quality glossy paper and comes to subscribers in a protective mailer. Prior to publication all articles receive two technical reviews by the professionals in this field whose names are listed on the masthead.

HISTORY

Rocks & Minerals was founded in 1926 by Peter Zodac in Peekskill, New York, as a small-format (15x22 cm), black and white publication. Two issues (the first at 20 cents, the second at 30 cents) were published the first year. After that, the number of issues varied from four to twelve issues per year. Zodac, a "one-man band," continued as editor, publisher, circulation and advertising manager, and frequent author until his death in 1967. Family members unsuccessfully tried to maintain the magazine but finally, in 1975, sold it to the Helen Dwight Reid Educational Foundation (HELDREF) in Washington, D.C. Under HELDREF's ownership, *Rocks & Minerals* went to its present peer review system, was redesigned into a larger (20x28 cm) format, and became a bimonthly publication.

Marie Huizing, of Cincinnati, Ohio, became the managing editor in 1978, a position she continues to hold to this day, although her title is now editor-in-chief. Based on her work as managing editor, she received the Cincinnati Mineral Society's Educational Foundation Award in 1979, the Carnegie Mineralogical Award in 1996, and the Mineralogical Society of America Public Service Medal in 2007.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Cover of the first issue of Rocks & Minerals *published in 1926, price 20 cents!*

In the summer of 2009, *Rocks & Minerals* was purchased by Taylor & Francis, an internationally acclaimed UK-based publishing company with more than two centuries' experience and over seventeen hundred journals in its portfolio. A leader in the industry, Taylor & Francis has a well-established tradition of excellence in academic publishing and provides a strong support staff for *Rocks & Minerals*. Taylor & Francis has expanded the number of pages per issue and increased circulation, promotion, advertising, and funding for color photography. The magazine continues to thrive under its banner.

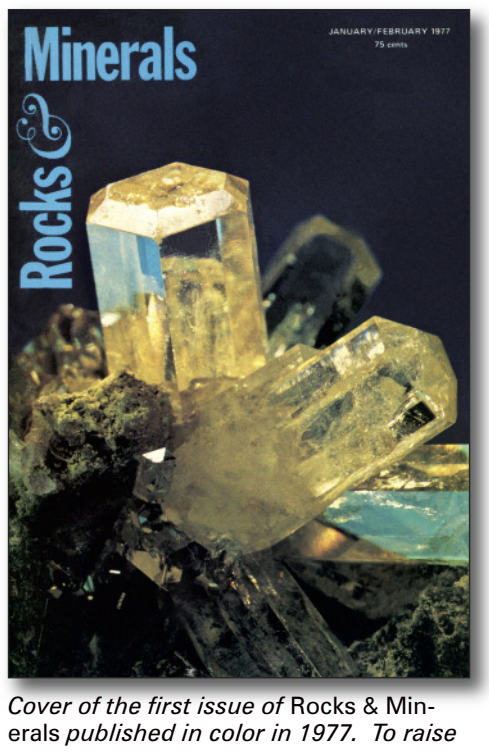
It is interesting to note that *Rocks & Minerals* had its origin as a spin-off from the *American Mineralogist,* which was founded in 1916 under the auspices of the Philadelphia Mineralogical Society, the New York Mineralogical Club, and the Mineral Collectors' Association. In 1919 the fledgling *American Mineralogist,* which at that time was principally a collectors' journal designed to replace *The Collector* (which ceased publication in 1909), was given to the newly established Mineralogical Society of America (MSA). At the organizational meeting of the MSA, those present voted overwhelmingly to take over the *American Mineralogist* as the official journal of the new society. It was also decided that the journal would be devoted to mineralogy, crystallography, and the allied sciences and would include original research papers and abstracts "but at the same time retain the valuable features of this publication which has become recognized as of permanent interest to such collectors and amateurs who are eligible for membership but not fellowship [in the MSA]". By the mid-1920s it was clear that the *American Mineralogist* would be evolving into a more scientific journal. Peter Zodac recognized that with this new direction the *American Mineralogist* would no longer fulfill the need for a publication geared toward the mineral enthusiast community, so in 1926 he started publication of *Rocks & Minerals*.

INTERNET

As part of their subscription, all subscribers also receive online access to each issue. The *Rocks & Minerals* website, *www.rocksandminerals.org*, posts the table of contents of the current issue as well as the full text of some of the regular columns and offers the opportunity to purchase back issues and advertising in upcoming issues. Visitors to the website may also subscribe to the magazine; view supplementary materials including videos, tables, and graphs; and read about the staff. Authors have online access to their published articles and can provide free online eprints, thereby giving others the chance to read and download copies.

STAFF

Marie Huizing is the internationally recognized editor-in-chief, working closely with the three executive editors, Dr. Robert B. Cook, Dr. John Rakovan, and Dr. Carl A. Francis, who assist in setting editorial policy and planning special issues. Twenty-four consulting editors conduct the first review of each article, and the executive editors finalize the review process.



Cover of the first issue of Rocks & Minerals *published in color in 1977. To raise money for color printing a special Color Fund has been established.*

SUBSCRIBING

Subscriptions are $61 for one year, $102 for two years, and $153 for three years. Each subscription includes both in-print and online issues. There is no extra charge for non-U.S. subscriptions, making the magazine unique among mineral publications. Readers can sign up for new and renewal subscriptions online at *www.rocksandminerals.org*, or by phone, fax, mail, or at any of the shows or symposia where the magazine has a booth: Tucson, Rochester, Cincinnati, West Springfield, Denver, Detroit, and Munich.

ROCKS & MINERALS

Logo of Rocks & Minerals.

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Daniel Trinchillo