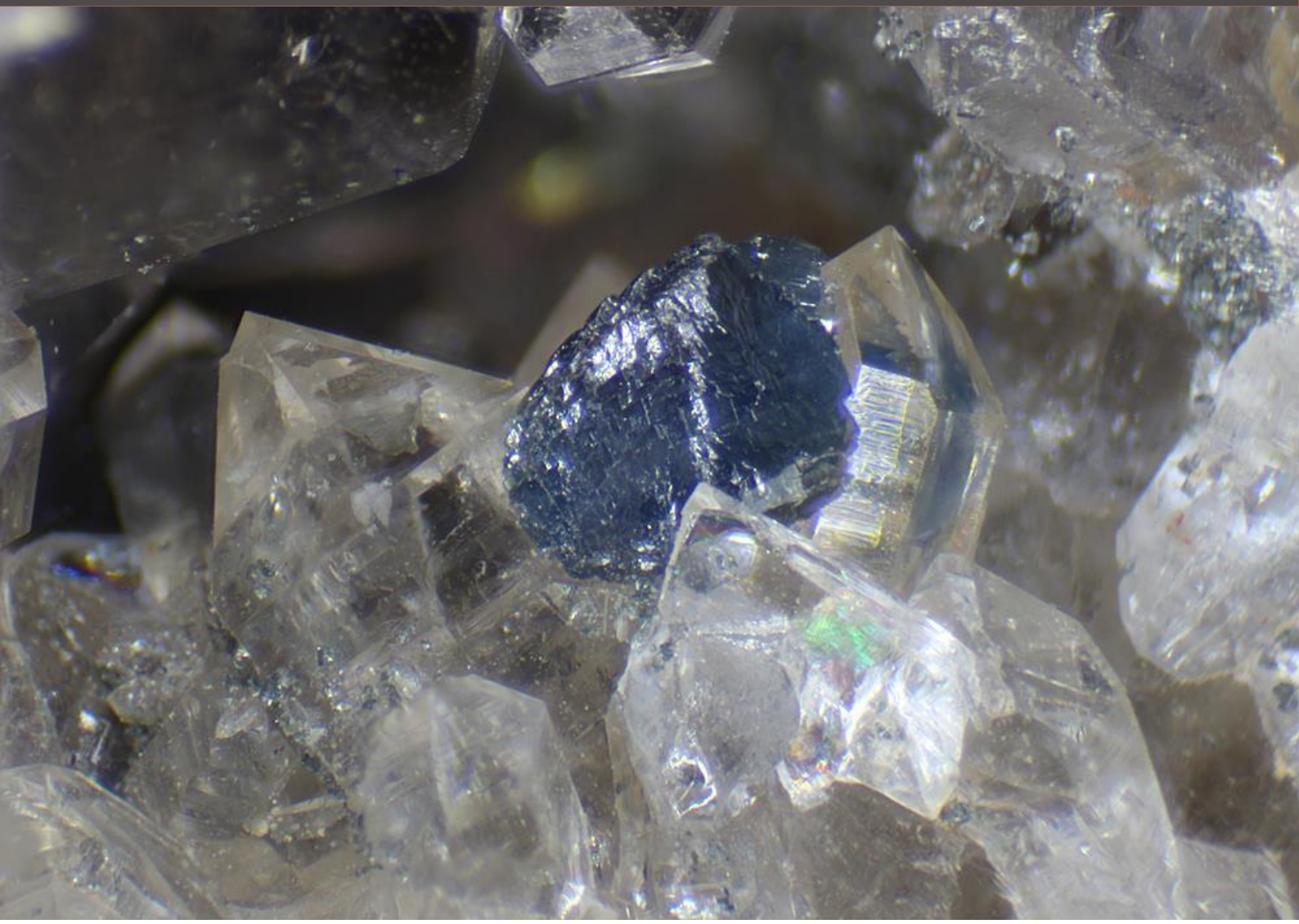
Australia and New Zealand Micromineral News



Issue 7 – August 2013

Editor: Steve Sorrell – steve@crocoite.com

Cover photo: Gelosaite, Kingsgate, New South Wales

Photo width 5mm across

Photo and Specimen: Steve Sorrell

In This Issue

Introduction

Following the call for news-fodder at the recent Mineralogical Society Seminar in Sydney, I can advise that this issue is a bumper one! We have articles from Dehne McLaughlin, John Haupt (again!) and Jo Price, Ann and Noel Kennon, and Neville Berkhan. Thank you all.

But don't rest on your laurels. I will need more for the next issue!

Contributions – We Still Need Your Input!

Articles should be submitted to the editor in Word format, and any photos should be of a sufficient quality for publication. If you believe that you can provide a suitable article for the next issue, please advise the editor as soon as possible. Planning for the next issue begins as soon as the current one is published!

Contacts

If you want to find out what's happening with micromounting or microminerals in your region, get in touch with one of the following:

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Forward Diary

Please send details of micromounting or micromineral upcoming events (up to six months ahead would be good) for inclusion in the next issue of the Australian and New Zealand Micromineral News.

October 2013

October 25th to 29th - New Zealand Micromount Symposium, Omaui Camp, Greenhills, near Bluff, South Island, New Zealand.

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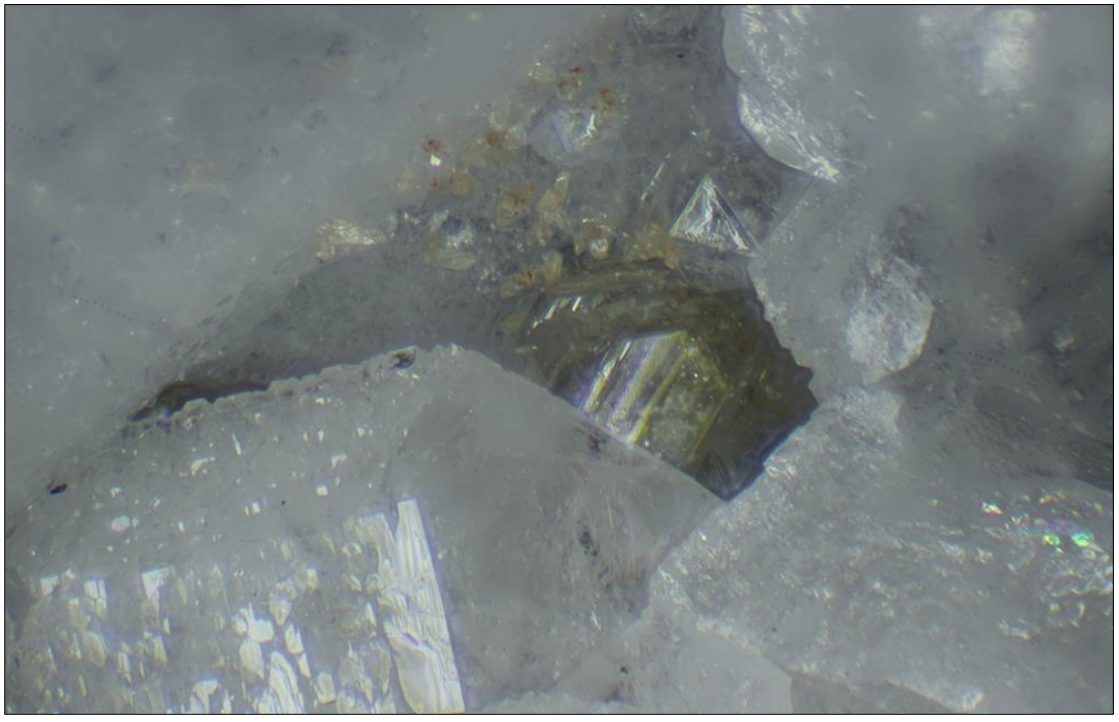
Ludlamite, and Mal's Minerals

Steve Sorrell

Mal Southwood continues to publish Mal's Minerals (If you are interested in receiving Mal's Minerals, get in touch with him directly on mal[dot]southwood[at]bigpond[dot]com), and in the latest issue, discusses ludlamite from the Type Locality, Wheal Jane.

This Wheal Jane ludlamite specimen is in my collection (previously in Bernie Day collection) and has quartz, pyrite, vivianite and fluorite as associates. Photo by Steve Sorrell, photo width 2.5mm.



Trip Report – Malbunka Copper Mine, Areyonga, Northern Territory

Dehne McLaughlin, May 2013

We are setting off tomorrow on our third expedition (T3) into the mine. Struck big rain and a terrible tooth problem last trip (Trip2) and ended up with an unexpected extraction in Alice Springs. And now after a 4 day break, we are ready to face the wilderness again and tomorrow we leave on an 8 day field trip (T3) to break 5 tonnes of rock and collect again from a face we have driven 4.8 metres since 2012 up along the strike of the anticline, following a slump and thrust compression structure (photo attached) .

Maureen and I did our first trip in on our own as it involves setting up camp and getting everything running smoothly again, including chemical bathroom human waste disposal unit, assessing underground timbering needs and preparing the many hammer drills we operate. We found out our brand new Tourer 10 Oz Trail tent leaked and had to put an expensive quality tarp over it involving miles of rope and large star pickets. Our Kitchen tent also leaked and we re-tarped it and we now have a dry day place to cope with the breaking drought out here.

Our Trip 2 in mid-May was assisted by a strong local lad who removed over 10 tonnes of waste rock involving two new cuts into the main working face and continuation of a smaller down dip face that is also paralleling the anticlinal hinge direction. The smaller face has had one cut in it and we found a continuation of azurite roses that we had lost in the main decline as we ran out of quality specimens in the down dip part of the anticline's southern limb.

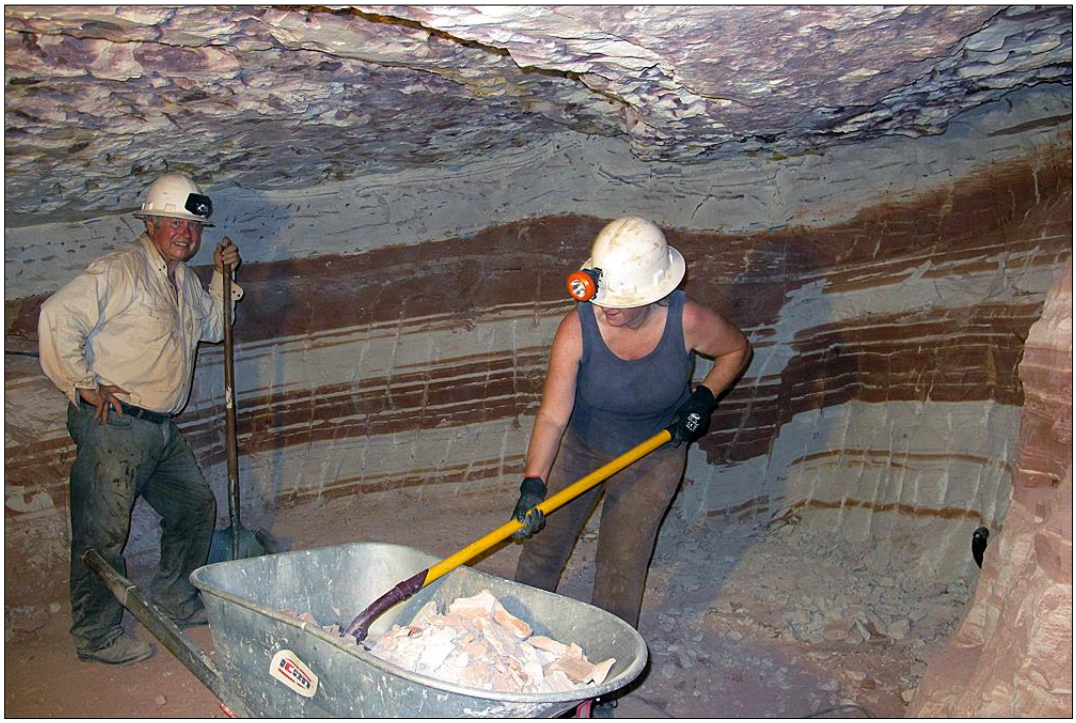
We developed a new technique to cut out and lower larger slabs of azurite containing rock to facilitate our museum size request specimens. We have also developed refined chisels for fine delicate work to enhance face drops. A diamond chain saw would solve a lot of extraction problems but the need for water for lubrication would turn the work face into an very unsafe mud slurry due the prolific clay footwall. For example, we were not able to utilise the external waste rock dump during the May rain due to instant slipping and bogging, so we had to utilize our emergency underground waste rock dumping area. Knowing rain was forecast, Maureen advised to do all waste rock removal on our two working faces before undercutting and sampling (the fun part) so by the time it hit with >45mm rain with gale force winds, we had completed the bulk of waste rock removal for the two cuts we were taking out.

The gale force winds came at midnight and I was up for 2 hours from 3 am retying ropes, banging in star pickets that had become dislodged and redesigning tarp coverage as the night went on. Who wants to operate a mineral specimen mine?

Being camped on the old waste rock dump as well as limiting waste rock placing on the old WRD has eliminated any new footprint on the ML thereby reducing our environmental impact to very low levels. We were advised by Government that our vehicle dust from the access track to the mine was an environmental impact so you cannot please everybody. I have spent as much time doing Government submissions this last 6 months as time that will

be spent actually specimen mining! At least we can collect firewood courtesy of the Traditional owners and a new chain saw this year has eliminated collecting problems and helped deal with the 5 degree temperatures of an evening.

Specimen type and quality changes every half metre on the advancing faces whether you are going across or down dip of the anticlinal limb but we believe, subject to final cleaning, that we have found very interesting and attractive material so far this month.



Above: A woman's work is never done, Dehne and Maureen McLaughlin, May 2013

Below: Azurite suns against hanging wall S St and clay matrix in Cut 2

The field geology of the deposit continues to unravel. I have determined that a copper oxide (malachite and cuprite?) rich fault depicted in the photos cuts across the anticline and may have been the fluid feeder vent for the kaolinite hosted azurite/malachite atacamite mineralisation. I previously thought it was an area of copper stained rock filled with leached copper from the higher elevated azurite deposit and gave it little time but came this year to the site asking why did the richest area of copper mineralisation in the thickest part of the kaolinite lens disappear abruptly to the west.

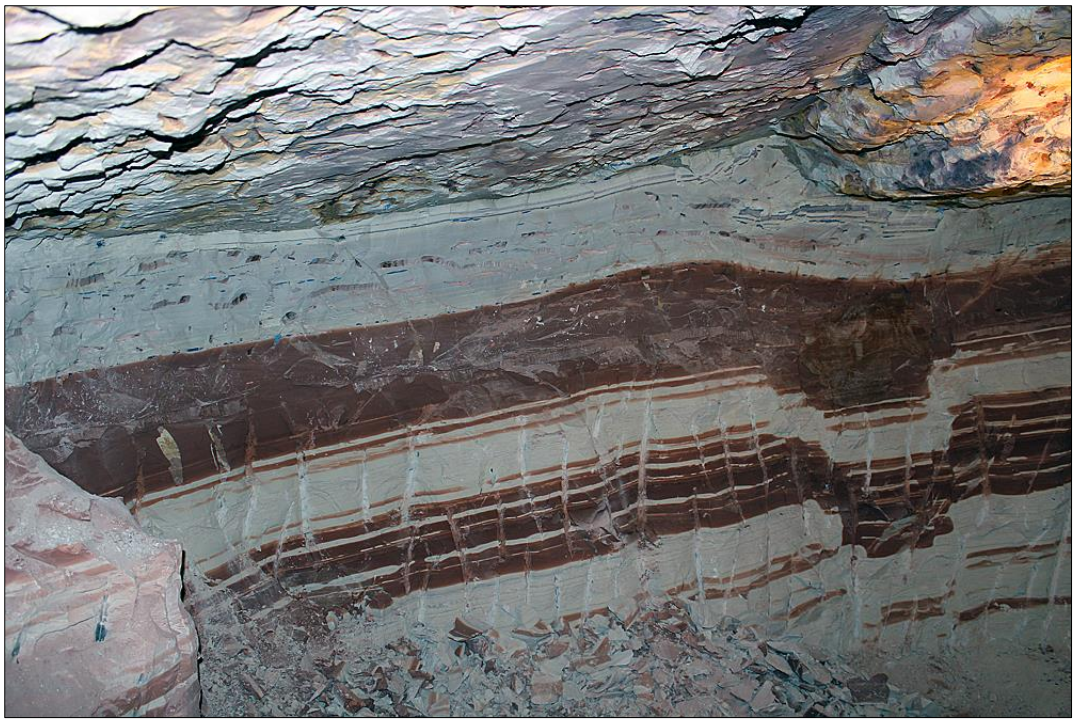
Above: Brecciated sandstone with copper oxide in fractures

The whole rim of the host kaolinite is silicified and rich in fine atacamite crystals, and of course our recent paper in the USA Rocks and Minerals, shows strong evidence in photos of bleaching/hydrothermal alteration of the clay host with accompanying copper mineralisation. The more recent determination of prolific fine < 50 micron euhedral tourmaline throughout the red and white kaolinitic clays adds to the alteration source picture, ie: deep basinal boron rich fluids driven by halotectonics. The faulting and breccia crush zone helps explain why the richest area of azurite mineralisation at the entrance to the underground workings disappears from the anticline cusp to the west. Ray Grant and I could not find a continuation in structurally sound equivalent outcrop within 250 metres of copper mineralisation which has been one of the many puzzles of this copper occurrence. Additional azurite mineralisation was either confined to current area to the east of the fluid feeding fault or it is down faulted on a possible down throw block to an unknown depth.

Thanks to Ralph Bottrill for finding samples with micro tourmaline in 2012 and for allowing me access to Tasmanian government labs in April 2013 to analyse additional clay samples to give some statistical backup to the tourmaline discovery.

Above: Main working face with thrust fault and related compression structures

Below: Main working face with thrust fault, micro faulting and related compression structures



Micro Group Report

by Jo Price & John Haupt

At the April meeting members had a chance to bring some minerals for identification when Stuart Mills generously gave up his Sunday morning to solve some of our puzzles. Many thanks, Stuart. The topic was minerals from France and Germany.

Amongst the French minerals were several from Cap Garonne, Var: bayldonite, carminite, chalcanthite, cornubite, hidalgoite, lavendulan, mansfieldite (blue), mixite, olivenite, parnauite, perroudite, phillipsbornite and tyrolite; from Les Montmins, Allier: gartrellite, iodargyrite, raspite and stolzite; from Falgayrolles, Aveyron: bayldonite and cornwallite; from Perrier, Puy de Dome: phillipsite; from La Lechere, Tarantaise Valley, Savoy: monazite, anatase and senaite-chrichtonite and from Trimouns, Ariege: allanite-(Ce).

There were some slag minerals including lautenthalite and cuprostibite from Vialas, Lozere and elyite from Le Crozet, Loire.

Above: Perroudite, 0.3mm crystal group from Cap Garrone (type locality).

Above: A 1mm bi-pyramidal crystal of jeanbandyite from the Hingston Down Quarry, Gunnislake, Cornwall.

Minerals from Germany which caught our attention were a fine proustite, Schlema Valley, Schneeberg; silver from mine 24, Pohla, Saxony; and a cluster of slender topaz needles from the Eifel. Other Eifel minerals included cristobalite with tridymite, Bellerberg; rhonite, Wannenkopfe; perovskite, Hannebacher Ley; roedderite, Emmelberg and hauyne, Mendig. From other areas there were bertrandite, Saarberg Mine and kermesite, Braunsdorf, Saxony; pucherite and bismutoferrite, Schneeberg; barbasolite, laueite, leucophosphite, phosphouranylite and strengite, Hagendorf; gismondine, Vogelsberg; eulytine and beyerite, Hechtsberg, Black Forest, and gartrellite, Hohenstein, Odenwald.

There were lots more and we really enjoyed viewing and discussing such a large variety of species, many of which we don't find in Australia.

The May topic was minerals crystallising in the tetragonal system. Some of the specimens tabled included anatase on and in quartz from Norway; apophyllite–(KF), Broken Hill; ashburtonite, Ashburton Downs, W.A.; baotite and tripuhyite, Japan; hematite *crystals*, Iron Monarch, S.A.; hafnon, Northern Nigeria; phosgenite, Touissit Mine, Morocco;

kamphaugite-(Y), Paratoo Mine, S.A.; tugtupite (pink), with aegirine, Greenland; stannite, Cornwall, and jeanbandyite, Hingston Downs, U.K.

There were several examples of chalcopyrite from various localities, as well as wulfenites, stolzites, rutiles, scheelites, and vesuvianites, so it was decided to choose a specimen we liked best or found most interesting (not necessarily one's own). The winners were: wulfenite, San Francisco Mine, Mexico; wulfenite, Avondale, S.A.; yellow wulfenite sprinkled with small black mottramites from Broken Hill; tiny euhedral wardites coated with white crandallite, Iron Monarch, S.A.; and scheelite, Tae Wha mine, Korea.

Above: Dyscrasite from Příbram, Czech Republic. Specimen is 15mm tall.

Our June meeting was on the minerals from Austria, the Czech Republic and Slovakia. As usual, there were a range of different species to look at. Austrian specimens included pale yellow crystals of titanite from Undersulzbach and several zeolite species including gonnardite, gismondine, ferrierite and phillipsite.

The Czech minerals included thin pale blue hexagonal crystals of chalcophyllite and blue balls of camerolaite from the ancient mine dumps at Piesky, Špania Dolna. Unusally stable marcasite specimens were from Vintířov. The most species were from the famous Bohemian locality of Příbram. These included dyscrasite, galena, millerite, proustite - pyrargyrite, stibarsen, siderite, sphalerite and silver. There were fewer specimens from the other famous Bohemian locality, Jáchymov (Joachimsthal), these were of proustite, stephanite and pyrargyrite.

Slovakia minerals included libethenite from Libethen. The most notable specimen of the day was deep red lustrous metallic sprays of kermesite from Pezinok.

Several specimens were from type localities:

- Kaňkite from Kaňk Hill, Kutná Hora and heyrovskýite from Hůrky, both in the Czech republic.
- Leogangite from Leogang mining district, Salzberg, Austria.
- Libethenite from Libethen and tyrolite from the Tyrol region in Austria.
- Stolzite and zinnwaldite from Zinnwald - Cinovec on the Czech - German border,

Once again the topic brought out a range of interesting specimens to study.

Searching for Bournonite Micros in Cornwall

Ann and Noel Kennon – annoelk.gmail.com

The Mineralogical Record, Volume 43, Number 4, July-August 2012 leads off with a brilliantly detailed article on *The Herodsfoot Mine, Lanreath, Cornwall, England* by Roy E. Starkey. Roy is Honorary President of the Russell Society – a British national group of amateur and professional mineralogists who study, record and conserve mineralogical sites, materials and minerals.

According to the superbly researched article, lead-silver ore at Herodsfoot was first mined in the early 1700's, then the mine closed for many years before reopening in 1844 and closing for good in 1884. The mine would have remained undistinguished excepting for the discovery, in the 1850s, of exceptionally fine specimens of bournonite and tetrahedrite. The bournonite (otherwise known as cog-wheel ore) was far superior to specimens from the nearby Wheal Boys mine - the type locality. A local dealer, Richard Talling, played a major role in preserving many magnificent specimens collected between 1858 and 1868 when the supply dwindled. Although bournonite occurs in other countries including Bolivia, France, Germany, Italy, Mexico, Peru and China, Herodsfoot is regarded as the greatest locality and outstanding specimens from this mine are highly sought classics. The best are to be found in major collections and museums around the world.

Reference is made in the paper to the current status of the mine and includes - "Substantial mine dumps remain, largely obscured by vegetation, and all of the mine workings and dumps lie on private land. Interesting specimens still turn up from time to time, mostly in the micromount size range, and future investigations may yet turn up material of interest. Anyone interested in exploring the site must first obtain permission from the land owners."

This paragraph sparked our interest as we were planning a trip in April/May 2013 which included hiring a car in England and driving through the south west counties. The prospect of scratching on dumps with the possibility of finding bournonite, tetrahedrite, pyrargarite, chalcopyrite and other minerals associated with the mine was highly attractive. As Mr Starkey had added his email address to his authorship of the paper, we contacted him asking for information about gaining access. He responded saying that as he lives in Birmingham he had sent our email to a friend in Herodsfoot village and who would be able to help us. Almost immediately we received an email from Mr Richard Humphrey saying that he would be delighted to welcome us to Herodsfoot, that there were plenty of specimens to be collected, that new ground on the dumps is regularly being turned over and that new discoveries can always be expected. So, the visit was put in place for April 21 and 22, and accommodation booked at Liskeard, a large town not far from Herodsfoot. In mid-March 2013, we sent an email to Mr Humphrey about final details for the visit. The first part of his response was – "Herodsfoot mine is part of our garden, so please come to our house Minehouse Farm…….a short drive from Liskeard…..". Wow. The thought of a world class mineral site in your own backyard was mind-blowing.

Our trip proceeded, and on Saturday 20 April this year we arrived at Heathrow where we picked up the car and drove to Liskeard for our 2 days of fossicking.

On Sunday 21 we set off at 8.30 first on a narrow two lane road until we encountered the sign post (Fig. 1) indicating a turn onto a one lane road leading to our destination. On the four trips along this road we encountered only one car and Ann had to back up a little way to a slight widening that allowed passing. Attempting to pass farm machinery would have been another matter altogether – but didn't happen. We found Minehouse Farm in the tiny village and were warmly greeted by Richard and Frances Humphrey. Richard informed us that they had moved there from France about 4 years previously and had mainly concentrated on converting the old counting house into their home (Fig 2). Additionally, some time had been devoted to developing and cleaning up the mine site but Richard said that he had no intention of opening it for general collecting although requests from clubs and friends would be entertained. The property is large, with an area of about 50 acres which covers the entire mine including some 3 acres of mine dumps which, for the most part, are completely overgrown (Fig. 3) and untouched. He showed us the remains of some mine buildings (Fig. 4) including the engine house stack in surprisingly good condition, (Fig. 5) adjacent to a steeply sloping field (Fig. 6) which he believes hides dumps worthy of exploration. Understandably, the old powder magazine (Fig. 7) is located in a remote part of the property.

Above: Fig. 1 – Traditional Cornish signpost showing us the way

A current collecting site (Fig. 8) is near the remains of the 'old engine shaft' (Fig. 9) and so could contain good material. This shaft was originally 1000ft deep but another shaft on the property was sunk to 1200 ft. Near the engine shaft is the spot (Fig. 10) where Russell Society members found bournonite some time ago. After the orientation tour, Richard left us at the collecting site and we set to work.

Above: Fig. 2 – Old Counting House now the home of Richard and Frances Humphrey

Below: Fig. 3 – Heavily overgrown mine dumps

Above: Fig. 4 – Overgrown and partly collapsed mine buildings

As we always try to travel as light as we can, the only fossicking gear we brought were old joggers and wet weather tops and pants, all of which we intended to discard (and did). Our tools comprised one small geological pick, two screw drivers and two tooth brushes for cleaning. Richard lent us a small sledge-hammer and a large pick. As is evident in Fig. 8 and also Fig. 11 the material we were working on was chunks of rock with minor amounts of dirt, soil and clay deposited over perhaps more than a century. The rock was essentially a mixture of shale/slate and quartz country rock together with galena and associated other minerals. Our procedure was to bring down material from the walls with the large pick, select pieces that contained galena, then break those down with the hammers. Small pieces were examined with hand lenses to see what might be present (Fig.11). This all sounds very straight forward, but not so.

Being in Cornwall in April we were subject to the vagaries of the weather which was both irregular and unreliable. We started working at about 10am in cool, clear conditions with even a little sun. Later in the morning and into the afternoon the weather closed in with rain varying from mist to squalls. There lay the difficulty. Trying to see tiny crystals that were not galena in small wet specimens with a wet lens is tricky particularly when wearing glasses spotted with raindrops. Most micro collectors will know all about these problems.

Notwithstanding the weather, by mid-afternoon when we called it a day, we had managed to accumulate a substantial number of pieces for further examination. On return to Liskeard we dried the pieces on newspaper then wrapped them in loo paper and packed them in a strong plastic bag before a welcome shower and dinner.

Above: Fig. 5 – Engine house stack still in excellent condition

The following day, Monday, was essentially the same with showery weather again affecting the progress of collecting. However, despite the conditions we did well and had increased our collection to about 10kg – far too much to take home, but we had a plan.

We said our goodbyes but not before we had a look at part of Richard's mineral collection of Cornwall cassiterite. He has some spectacular pieces and ultimately wants a specimen from every tin mine (no matter how small) in the county.

Above: Fig. 6 – Steeply sloping field adjacent to the old engine house

Below: Fig. 7 – Remains of powder magazine

Above: Fig. 8 – Noel at the collecting site before the rains came

Below: Fig. 9 – Remains of the engine house shaft

Above: Fig. 10 – Site where members of the Russell Society found bournonite

Below: Fig. 11 – Ann at the collecting site searching for a collectable

From Liskeard we continued west to Truro on the Tuesday to visit the County Museum and inspect the mineral room which includes the Rashleigh collection and several nice Herodsfoot bournonites. The next week was spent in the west and midlands finishing on the following Tuesday at Lavendon, a town several kilometres west of Bedford. Here we stayed for three days with a lady friend of some 45 years. And here we put our plan into action.

The 10kg of specimens were all washed and set out in the sun (yes, sun) to dry. Each piece was examined as thoroughly as we could with our 10x hand lenses to identify what we wanted to keep. Using the geological pick as a chisel and a small hammer belonging to our friend we managed to break up the larger pieces and trim those that needed material removed. By this process we reduced the amount to take home to about 3kg. These specimens were rewrapped in loo paper, packed into two heavy-duty plastic bags and taped tightly.

The two bags travelled in our suit-cases for the remainder of our trip. On leaving Lavendon we drove to London where we stayed a week, then flew to New York for another week then to California for final week before flying home. In all of this there was one glitch. On arriving in San Francisco, Noel found that his suitcase had been opened and a 'Notice of Baggage Inspection' left in the case by the Transport Security Administration. The tape had been removed from the bag of specimens and one specimen had been unwrapped. That's all. Everything else was OK. We presume that the case had been randomly selected for X-ray examination, that a suspicious inclusion had been detected and the inspection had been carried out.

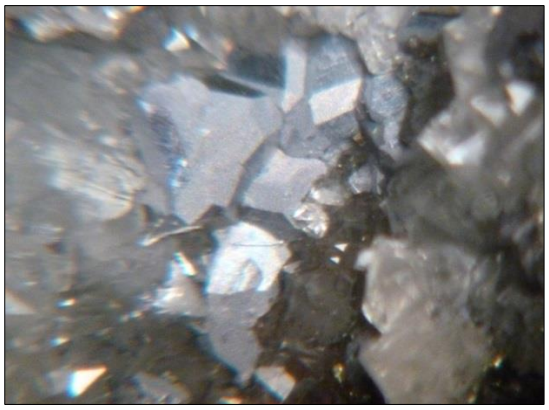
In London, at the Natural History Museum we saw several excellent Herodsfoot bournonites and in the New York Museum of Natural Sciences, the truly superb minerals and gems rooms also have several similar specimens on display.

On arriving home, the specimens were thoroughly washed again and further cleaned with a water jet. After drying, the specimens were examined microscopically. We are pleased to report that of the 75 specimens all but a few were worthy of collection. Four contain nice, small, tetrahedrite crystals identified by the morphology (Fig. 12), and of these, one is coated with a thin dusting of chalcopyrite (Fig. 13). Several of the specimens contain possible bournonite and of these, one may have the cog wheel morphology (Fig. 14). In addition we found cerussite (Fig. 15), crystals of pyrite (Figs. 16 and 17), chalcopyrite, nice quartz, siderite, dolomite, possible malachite, possible marcasite but no pyrargarite which would have been the icing on the cake. On the other hand, many specimens do contain excellent crystals of galena. Most of these are octahedra comprising triangular {111} faces but for some crystals those faces are separated by narrow {110} faces (Fig. 18). In a few specimens the galena occurs as cube-octahedra having the six additional {100} faces (Fig. 19).

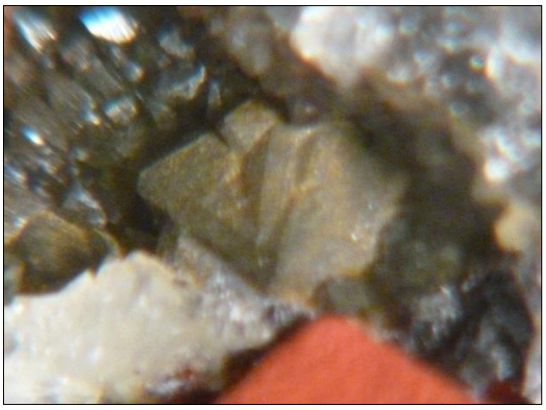
We thoroughly enjoyed those two days on the mine dumps and, despite the inclement weather, the visit was a highlight of the entire trip, made all the more enjoyable by the hospitality of Richard and Frances Humphrey. When we were there, Richard was very optimistic that there are still good specimens to be found and, from time to time, will be using a backhoe to expose new material for examination. A recent email from him brought the exciting news that since our visit, the dig had been progressed and just above where we

had been collecting, bournonite specimens were found in large numbers, one with 1-2cm cogwheels together with quartz pseudomorphs after barite. Some of these specimens may be viewed on Richard's website http://www.northherodsfootmine.co.uk. Should we return to England we will again seek his approval to spend more time looking for one of those good specimens.

Our thanks to Richard Humphrey for proof reading this article and confirming that the facts we present are correct. The photographs shown in Figures 1 to 19 were taken by Ann and Noel Kennon. We thank Steve Sorrell for assisting to obtain worthwhile photographs for Figures 12 to 19 from the specimens we brought home.



Above: Fig. 12 – Tetrahedrite crystals 1.5 mm across.

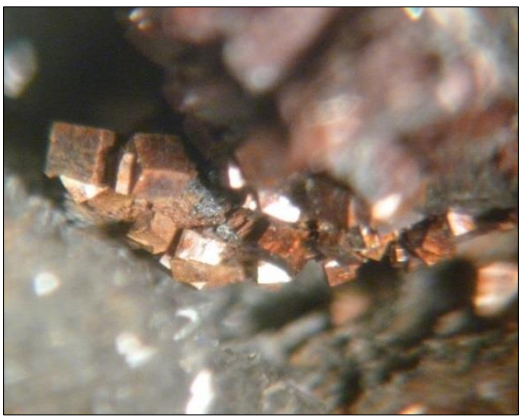


Above: Fig. 13 – Tetrahedrite crystal, 1 mm across, with a thin coating of chalcopyrite. The red area is part of a marker arrow.

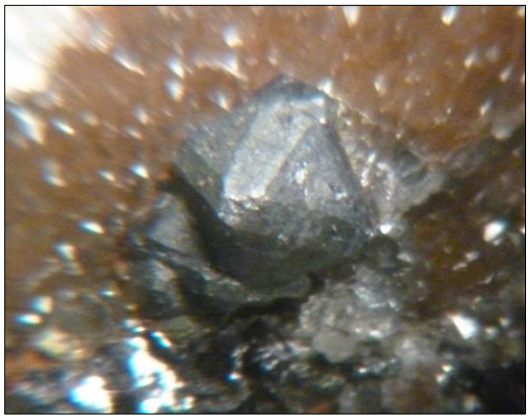
Above: Fig. 14 – Bournonite crystal 1.5 mm long.

Above: Fig. 15 – Cerussite crystal 0.7 mm long.

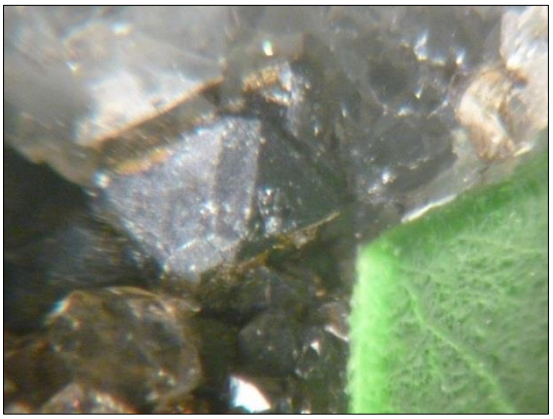
Above: Fig. 16 – Pyrite crystals 1.5 mm across.



Above: Fig. 17 – Pyrite cubes 0.4 mm on edge.



Above: Fig. 18 – Galena crystal, 2mm across, with {111} and {110} faces.

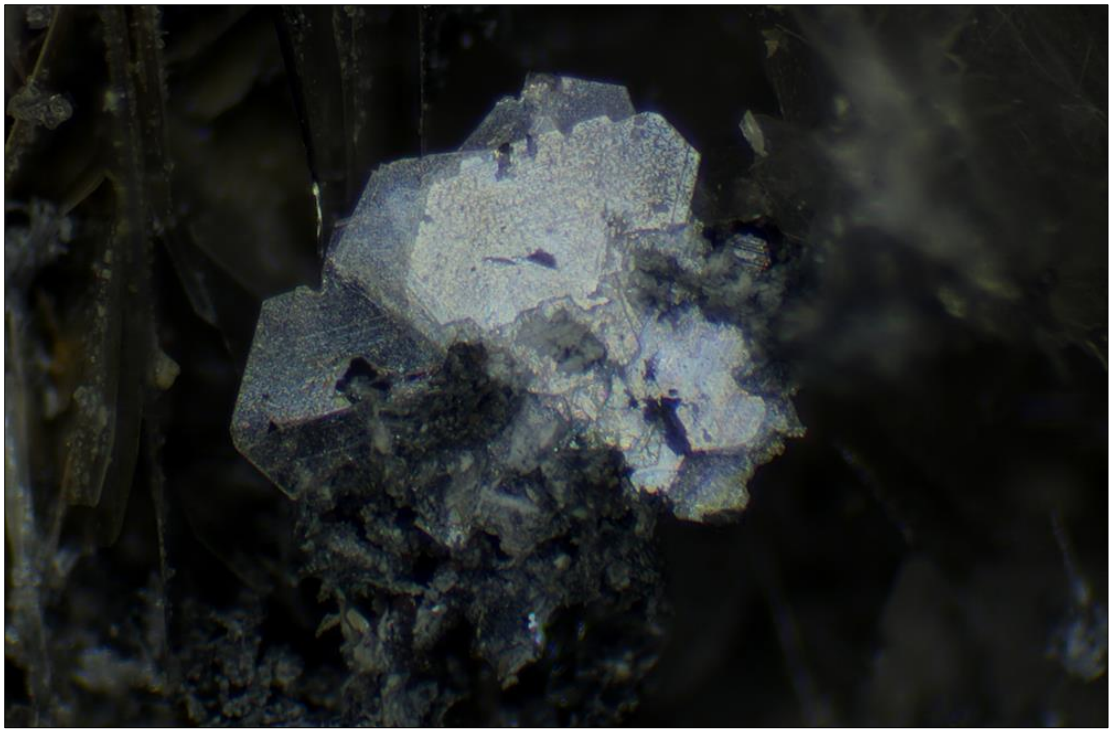


Above: Fig. 19 – Cube-octahedral galena crystal, 1.3mm across, with {111}, {110} and {100} faces. The green area is a part of a marker arrow.

A Cornish Oddity – Abhurite

Steve Sorrell

The mineral that should not be a mineral. Abhurite forms from the reaction of seawater with native tin. The species was approved in 1983, but under current IMA rules, it would be unlikely to be approved. It is exclusively found associated with tin ingots from shipwrecks, and therefore does not fit the current definition of a valid mineral species. Nevertheless, it is an interesting mineral. This specimen comes from the SS Cheerful that was shipwrecked on 20th July, 1885 and carried 28 and 56 pound ingots of Cornish tin bearing the marks of the smelting houses of Treloweth - St Erth, Carnvedras - Truro, Trethellan - Truro, and Tamar - Bere Ferres (Mindat). The wreck lies in 35 fathoms of water, 18 miles NNW of St Ives. Steve Sorrell photo and specimen (previously in the Bernie Day collection), photo width 2.5mm.



Pyrite Twins from Todd's Quarry, Northland, New Zealand

Neville Berkahn

I discovered Todd's Quarry for the very first time, some thirty years ago while I was looking for skarn minerals in the local volcanic area of Dargaville, on one of my mineral discovery field trips as I used to call them. In those days you could count the New Zealand micromineral collectors on one hand. Before long I had a fellow micro collector interested in pioneering, rock climbing and a lot of the time just getting lost, but we had a lot of fun along the way.

We used to study geological maps to work out the best areas to go to, and then determine what minerals we should find in certain rock types. These areas mostly consisted of volcanic rock in the regions of the Coromandel or Northland. We would then go out and find the minerals, sometimes having to bush crash through dense bush, holding just a hand held compass, a topographical map, and a geology hammer, to find the right area. Streams were a great source of new minerals, as were the 500 plus quarries found mostly north of Auckland. Of those quarries we would have only visited about 20% of them to date.

The Auckland region is a great source for zeolites and therefore I have specialised in them over the years, and have in the past exchanged with zeolite collectors all over the world.

Todd's quarry is now a disused farmers quarry as the rock was only quarried for the famer's own use for his farm roads.

Twinned pyrite specimens were generally found in the calcite seams in a very localised area, being only two metres long, by one metre deep, which pinched out at the back like an almond. Associated minerals found with the pyrite are barite, calcite, and limonite after pyrite.

It was very much sought after by collectors for its athletically looking right angled octahedral twinned micro crystals, so the deposit only lasted for a short time before being completely worked out.

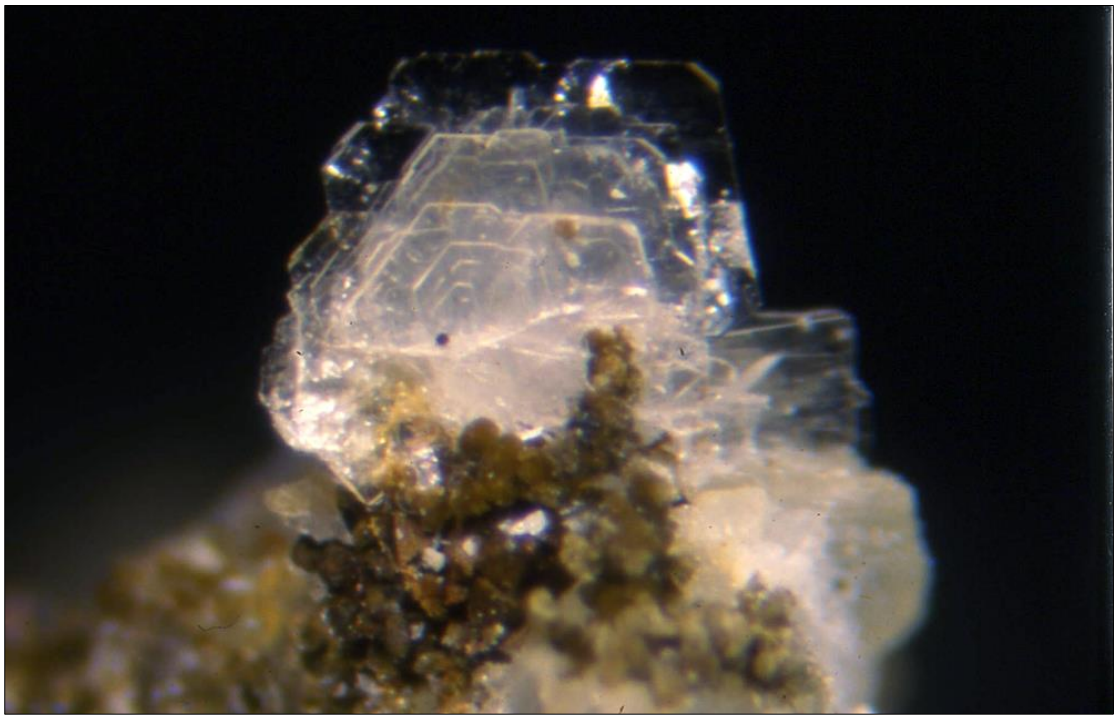
These photos were taken a long time ago using a Canon SLR camera with 35mm professional ASA tungsten film. The size of my micro photos are from 2 to 4mm. In those days I could easily spend a day taking a 36 exposure film to set everything up correctly to get good photos, and then you did not know for a few days if you had captured a good image or not. Lighting was much more important than it is now using digital cameras.

All specimens were collected and photographed by me.

Regards

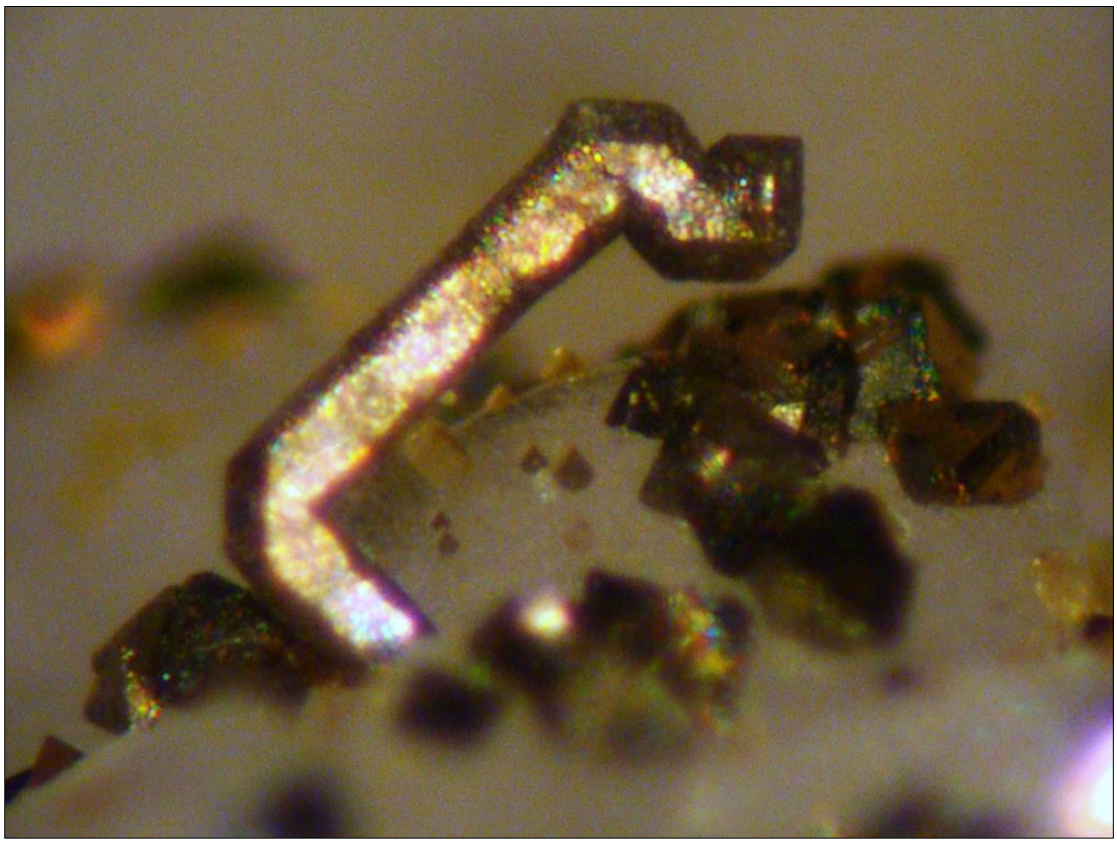
Neville

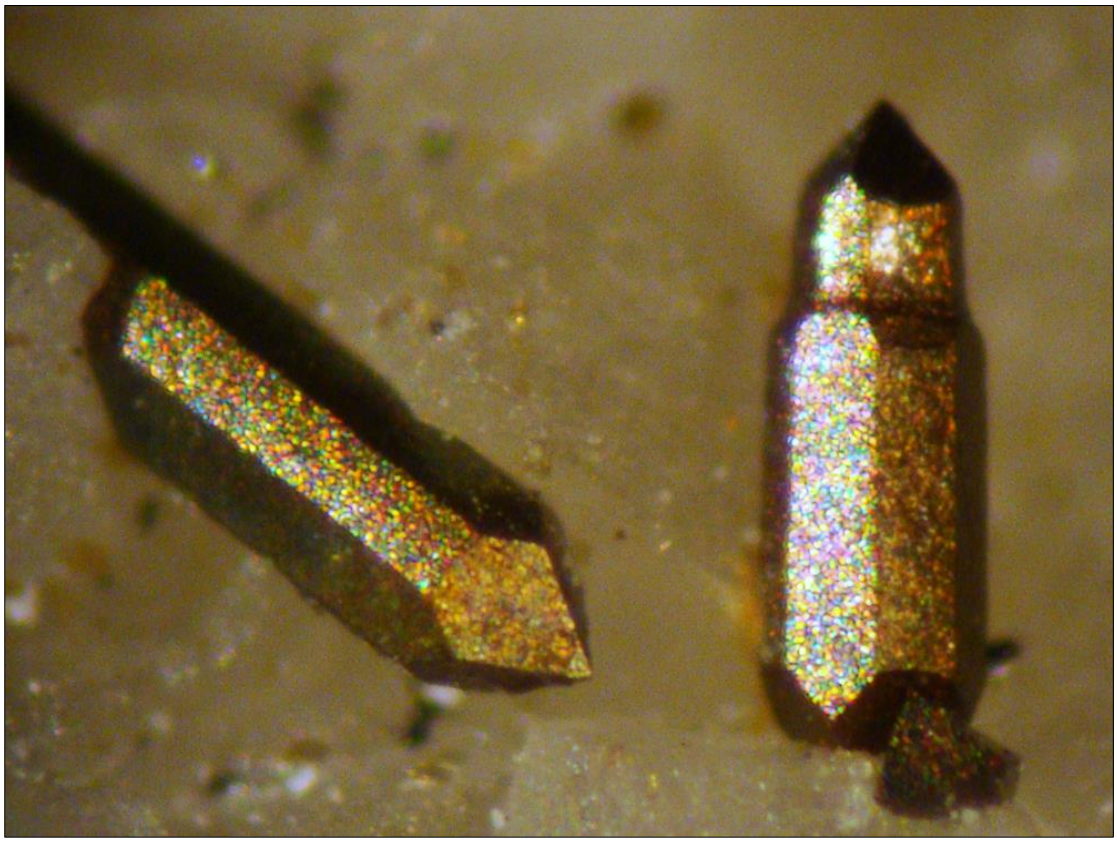
Above: Pyrite, Todd's Quarry



Above: Barite, Todd's Quarry

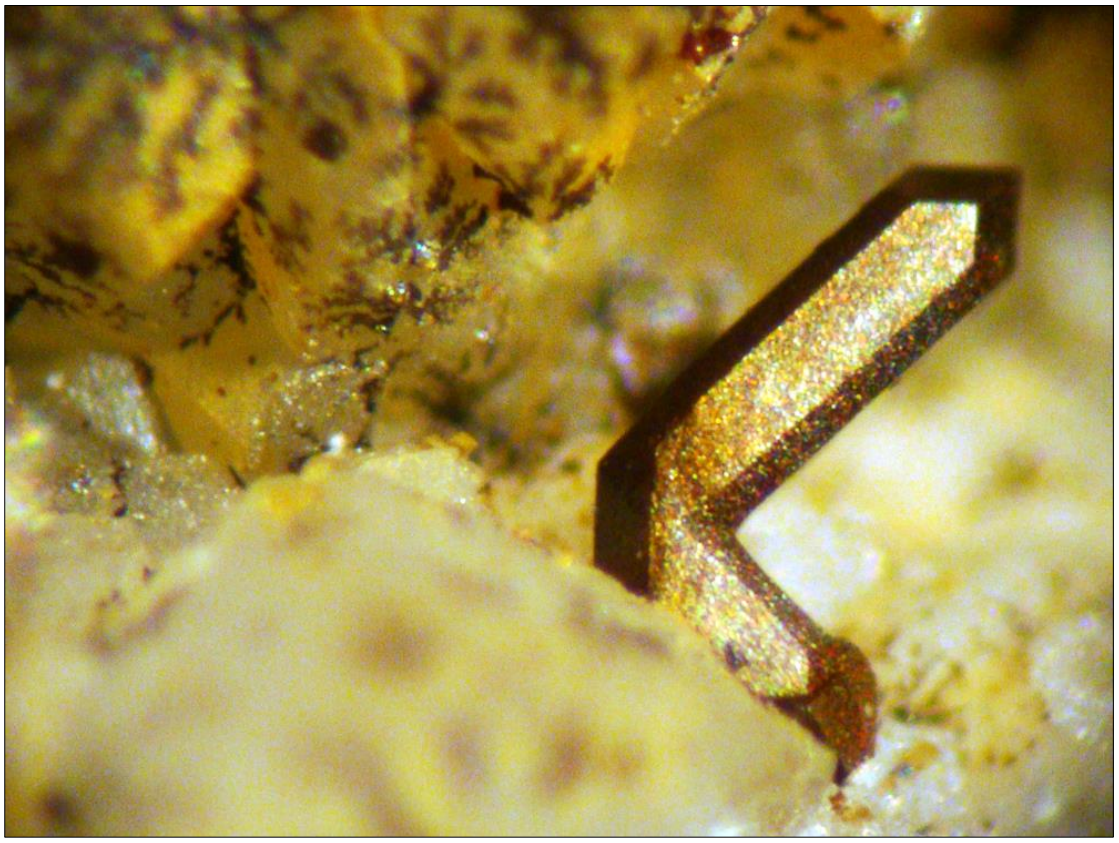
Below: Pyrite, Todd's Quarry





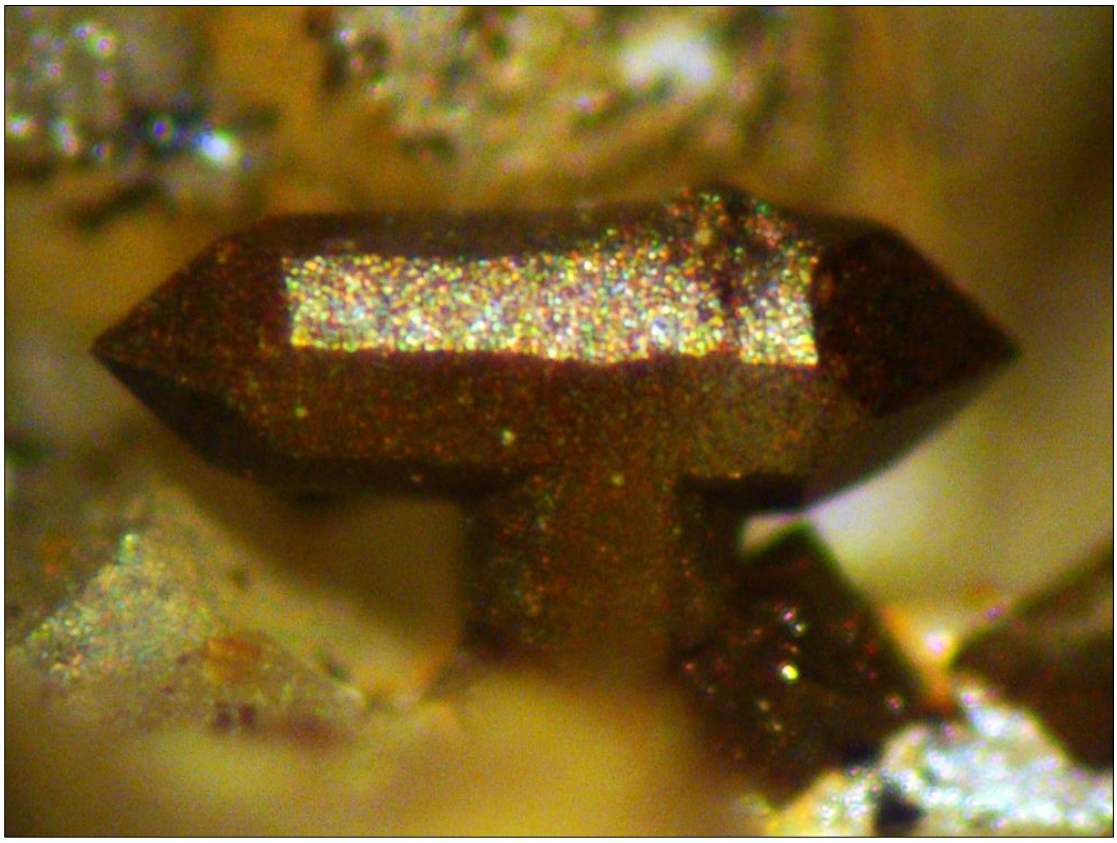
Above: Pyrite, Todd's Quarry

Below: Limonite after pyrite, Todd's Quarry



Above: Pyrite, Todd's Quarry

Below: Pyrite, Todd's Quarry



Above: Pyrite, Todd's Quarry

"Kingsgateite" and Gelosaite

Noel Kennon – annoelk@gmail.com

The Kingsgate Mines, located some 30km east of Glen Innes in the New England area of New South Wales, cover an area of about 5km^2 and comprise remnants of shafts, a few tunnels and open cuts into about eighty quartz pipes. They were abandoned for many years but are currently subject to detailed exploration for possible future development. In the first instance, the pipes were mined for bismuth minerals and molybdenite was described by England (1985), but more recently the mine dumps have been a favoured fossicking locality for those and other minerals and for quartz crystals which occurred in cavities within the pipes.

Originally, the pipes were identified by numbers and by names relating to a characteristic pipe feature or the name of the lease holder. The first map of the distribution of the pipes, prepared by Andrew (1916), contained numerous errors which were perpetuated until corrected by Brown (1995) and Henley *et al*. (2001).

Primary minerals identified in the dumps were reported by Lawrence and Markham (1962), and a number of secondary minerals formed by weathering have been described by Sharpe and Williams (2004). They pointed out that very few of the Kingsgate deposits have been thoroughly examined and so the possibility exists that "*more species await discovery, perhaps including new phases*".

Many of the minerals described in these papers occur only as micros and so the assembly of a comprehensive collection of Kingsgate minerals is a worthy challenge for micro collectors.

This account concerns material recovered from the dump associated with Pipe 13, commonly known as the 25 North, and designated GXO571 by Brown (1995). This pipe is adjacent to, and about 50m from, Pipe 14, the Old 25 and designated GXO570, which was the source of much of the material used in the work by Sharpe and Williams (2004). England (1985) reported that the 25 North pipe was large, suggesting that, at least initially, the dumps were very extensive. However the dumps are now dispersed, almost certainly as a consequence of heavy fossicking over several decades. In early September 2004, during a visit by members of the Illawarra Lapidary Club Inc., I found several pieces of uniformly dark grey miarolitic material about 40m from the pipe. These pieces were presumed to have originated in the pipe dumps but this cannot be proven. It is curious that some four weeks later, Merv Legg found one larger piece of very similar material about 80m from the pipe and despite concerted effort by several persons, including Merv and Lil Legg, Marg and Bernie Day and Ann Kennon and myself, no additional pieces of this material are known to have been collected.

The two lots of material comprised a friable, open aggregate of anhedral and subhedral quartz together with obvious molybdenite and a complex array of other minerals within the vesicles. Microscopic examination showed that among these minerals were ferrimolybdite, bismuthinite, bismite, bismutite, koechlinite, muscovite, anatase, scheelite, wulfenite, brookite, cerianite and several others similar to those described by Sharpe and Williams (2004) and by Rankin, Lawrence, Sharpe and Williams (2002) for another locality. Other minerals, mostly small and apparently having regular morphologies, could not be identified visually. One such mineral occurred as deep blue crystals, mostly from 0.1mm to 0.5mm in size (Figures 1 and 2), but with a very few to about 1mm (Figure 3). Others, with similar morphology and size, were coloured yellow to light blue and shades of green. Two specimens contained clusters of yellowish crystals (Figure 4).

On observing those crystals and not being able to identify them, I rang Jim Sharpe then working part-time with Professor Pete Williams at the University of Western Sydney. I described what I saw and asked what they might be. Jim's response was to request a specimen containing the blue crystals so that he could attempt an identification. A few days later Jim rang back, thanking me for the specimen which he and Pete had inspected carefully. He then admonished me for 'getting two old guys all worked up looking at a new species' (his words). For that is what it was. It was agreed that Pete, Jim and the University of Western Sydney team would do the work-up ultimately leading to submission for approval by the IMA CNMNC as a new mineral. As the discoverer, I was offered the naming rights and chose "*kingsgateite*".

Work started in 2005 and the blue crystals were quickly shown to be a hydrated basic bismuth molybdenum oxide. The monoclinic crystal system and space group $P2_1/n$ presented little difficulty nor did the array of property values required for the submission. The big problem was the crystal structure usually determined from X-ray crystallographic analysis of a single crystal. Unfortunately, nearly every one of the crystals in the specimens that Pete and Jim were working on was twinned. Finally, however, an apparently untwinned

crystal was located and used for further x-ray study. Even so, while the structure was solved, it could not be refined. It displayed a crystallographically impossible pseudo-mirror and this suggested the possibility of the wrong determination of space group. Over the next few years, much effort was expended in trying to solve the problem but to no avail.

In the meantime, an Italian group working on a specimen of the same material from Sardinia, cracked the crystal structure and submitted the mineral for approval as a new species with the name *gelosaite* to acknowledge Mario Gelosa (1947-2006), an Italian mineral collector. This approval was given in 2009 and it was decided to publish the description of the new mineral from both localities together (Orlandi *et al*., 2011). In this paper it was shown that the space group is indeed $P2_1/n$ and the source of the earlier difficulties has been traced to a subtle but important choice of the starting coordinates for the Bi atoms in the structure refinement. Further, it was shown that yellow, light blue and green crystals in the original material were also gelosaite with the variation in the colour attributed to Mo being present in both pentavalent and hexavalent states in the crystal structure.

In early 2011, on examining every specimen from the two mirolitic pieces in the Kennon collection, I came across a single piece sporting several bluish crystals that I couldn't distinguish visually from hexagonal prisms with basal pinacoids. Pete Williams was suitably impressed when he examined the specimen. "Maybe," he said "we do have 'kingsgateite' after all". But it was not to be. Some x-ray work soon showed the crystals to be in fact pseudo-hexagonal, twinned monoclinic crystals of gelosaite. The curse of twinning had struck again.

But let there be no doubt, with all the weathering that is occurring in the massive dumps at Kingsgate, sooner or later "kingsgateite" will surely turn up.

My thanks to Pete Williams for ensuring that the descriptions and chronology of the UWS work are accurate. I also thank Steve Sorrell for assistance in obtaining the four photographs.

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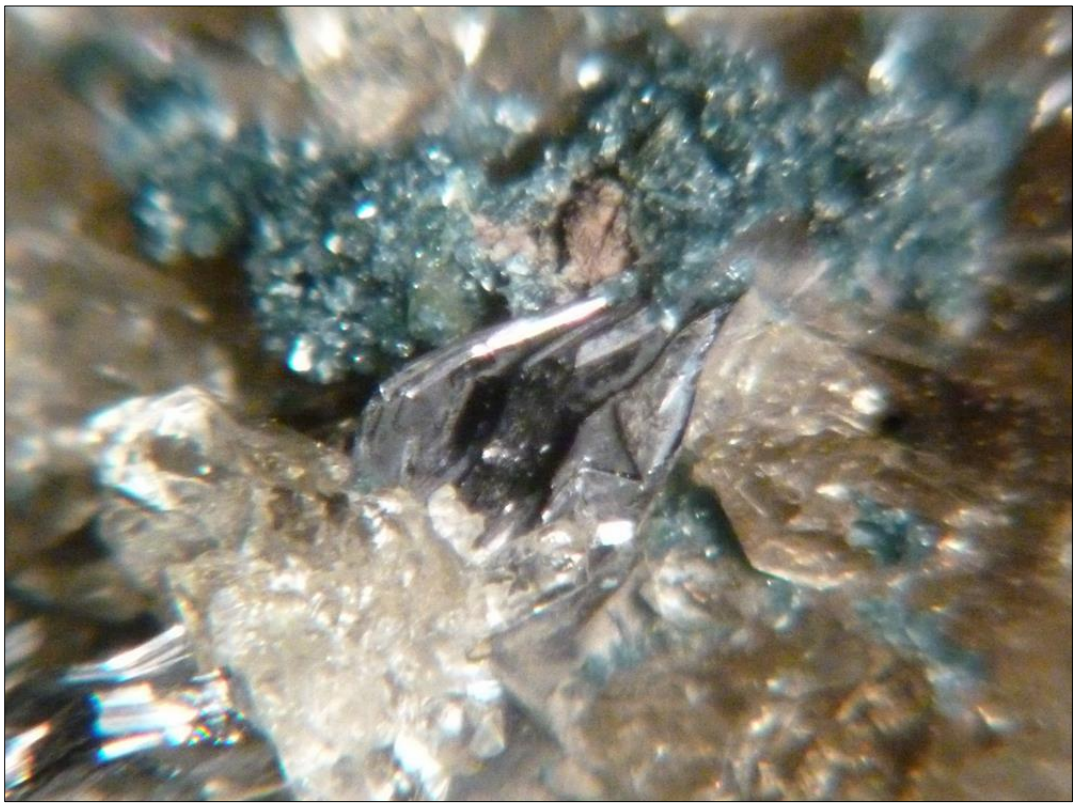
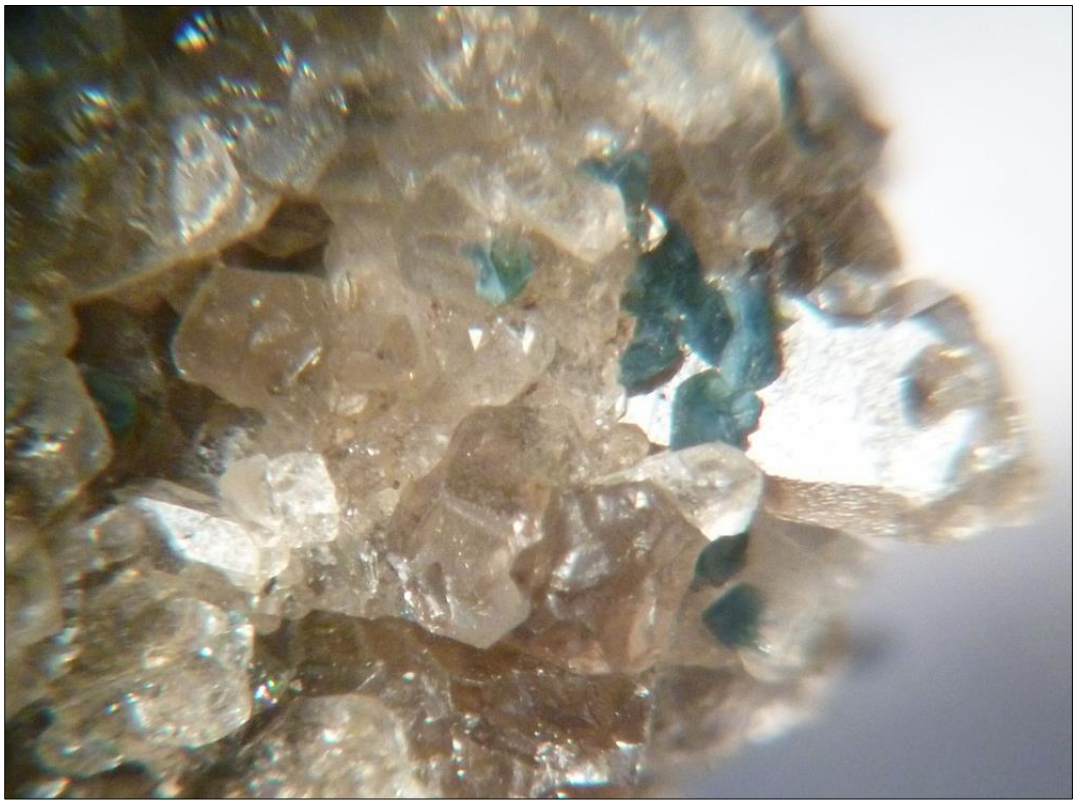
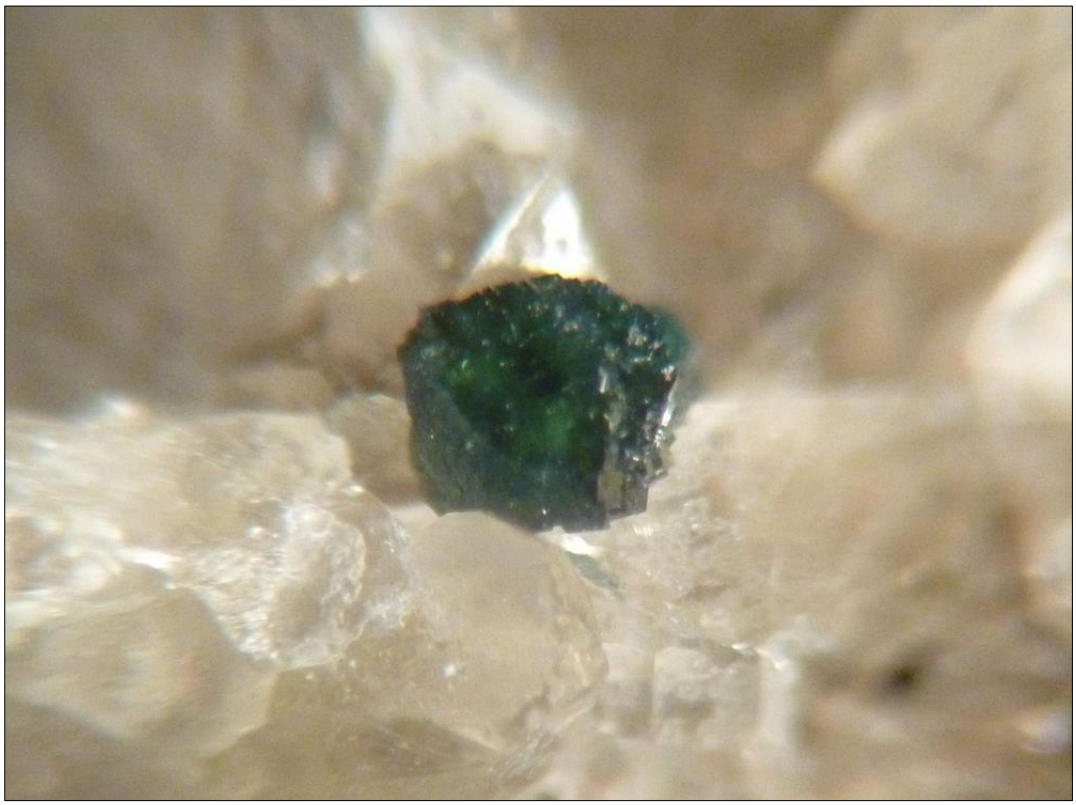


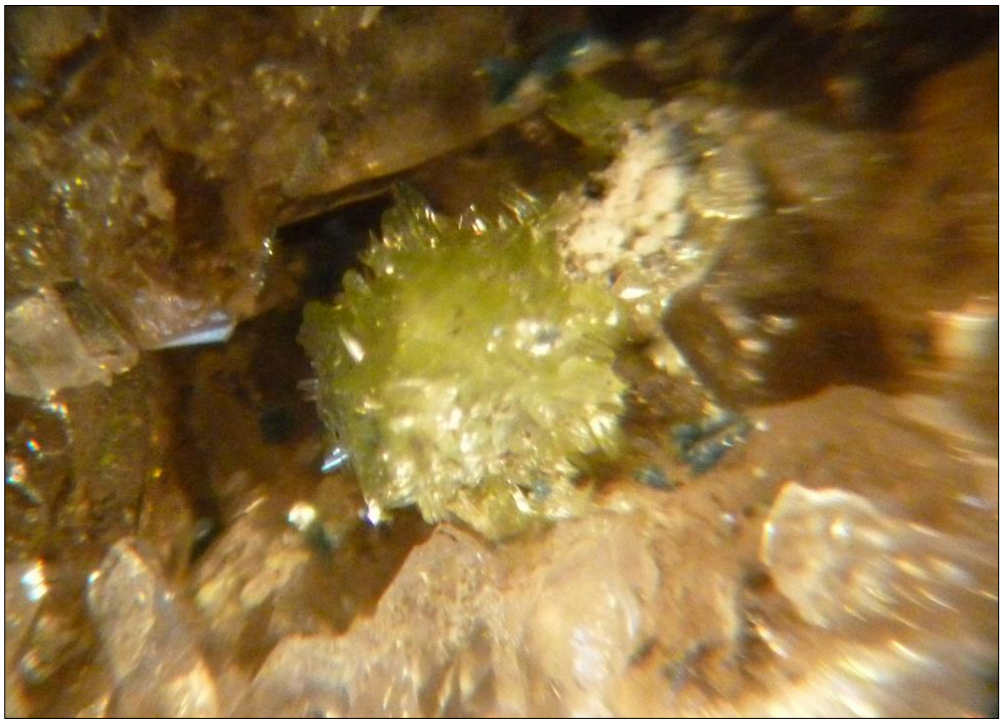
Above: Fig. 1 – An aggregate of blue crystals of gelosaite in mirolitic quartz. Individual crystals are about 0.1mm across. Specimen and photograph, Noel Kennon.



Above: Fig. 2 – A few crystals of gelosaite in mirolitic quartz. Individual crystals are about 0.05 across. Specimen and photograph, Noel Kennon

Below: Fig. 3 – Single crystal of gelosaite in miarolitic quartz. The crystal is about 1mm across. Specimen and photograph, Noel Kennon.



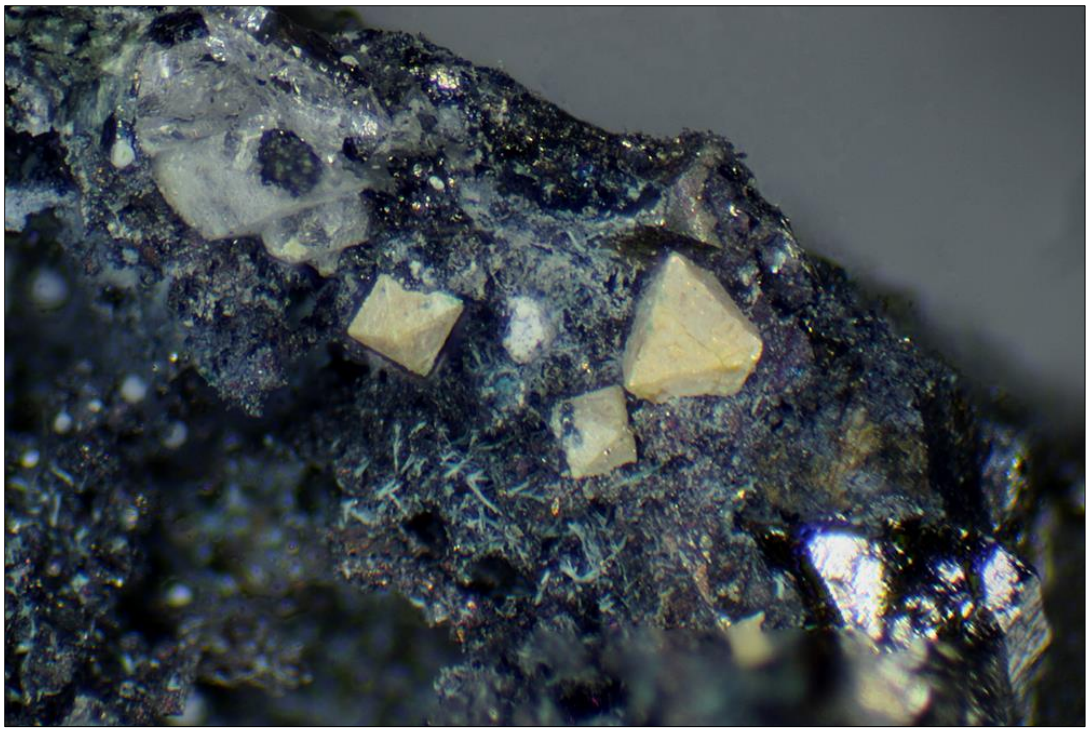


Above: Fig. 4 – Cluster of yellow gelosaite crystals in mirolitic quartz. The cluster is about 2 mm across. Specimen and photograph, Noel Kennon.

A Cornish Rarity – Jeanbandyite

Steve Sorrell

Found at only a handful of localities around the world, jeanbandyite is a rare Fe Mn Sn hydroxide. Interestingly, it has been recorded at two Cornish localities. This specimen is from Hingston Down Quarry and is in my collection (previously in Bernie Day collection). Photo by Steve Sorrell, photo width 2.5mm.



Short Report on the Murray Bridge Gemboree and Olary Field Trip

By John Haupt

The 2013 Gemboree was held at Murray Bridge in South Australia over the Easter period. Several members of the Mineralogical Society of Victoria attended on one or more of the days. The weather was generally fine and mild and the show appeared to be well attended.

There was the usual range of activities, with displays, dealers, tailgaters, meetings and field trips. From a mineral viewpoint, there were opportunities to add to the collection either from a range of dealers and tailgaters or by swapping at the micro session. Whilst there was nothing particularly new noted, a number of dealers had fine specimens from Pakistan, Afghanistan and China.

There was a range of minerals available in the tailgating area. The tailgaters included Vince Peisley who had a number of rare minerals from Tom's Quarry, Paratoo and other South Australian localities. John Rankin had some choice Broken Hill specimens including cerussite, anglesite and pyropmorphite. Min Soc members Merv & Lil Legg and Graham Lee had a wide range of smaller sized specimens. These are always worth looking through for specimens to add to the micro collection. Several specimens of the new mineral putnisite from Widgiemooltha were also available. The busiest stall was of mineral cakes, yes edible cakes made to look like minerals, which really sold like hot cakes and quickly sold out!!

There were several excellent display cases of minerals, with one by the South Australian museum featuring Ruth Coulsell's contribution to Australian mineralogy. It was nice to see her recognised again, especially as she had contributed so much to the establishment of the Victorian society and for many years was the mainstay of the Newsletter.

We had arranged a field excursion with the South Australian Society to follow on after the Gemboree, Several of our members met at the Olary pub on the Wednesday afternoon for 2 days of collecting around the Radium Hill area. The sites were mostly on Tikalina Station. The first day saw us out on station tracks to a recently located outcrop of kyanite. The kyanite occurs in quartz with associated minerals of staurolite, magnetite and limonite pseudomorphs after pyrite. Lunch was had at the Radium Hill mine site. Here extensive dumps still remain but few specimens appear to have been found.

The Friday saw us travel to the Winkler, Queen Bee and Luxenburg (Lux) mines. These were a group of small gold mines which were worked in the late 1800s (see reference). Micro specimens of secondary copper and lead minerals were collected from the dumps, including anglesite, cerussite, jarosite, malachite, mimetite and wulfenite.

We travelled to Broken Hill on the Saturday, with a look around the town and a visit to the Geocentre. That night we went to see the collection of Trevor Dart. On Sunday, permission was obtained to go onto private land at the 9 mile area north of Broken Hill. After some travelling up and down bush tracks and creek beds, we eventually located a small copper prospect where some nice gahnite crystals were collected.

Thank you to Ashleigh Watt, Members of the SA Min Soc and Trevor Dart for their assistance.

Reference:

Kakoschke, K.R., & Francis, G.L., 2013: Radium Hill & New Luxemburg Mining Areas. Self Published, 64p.

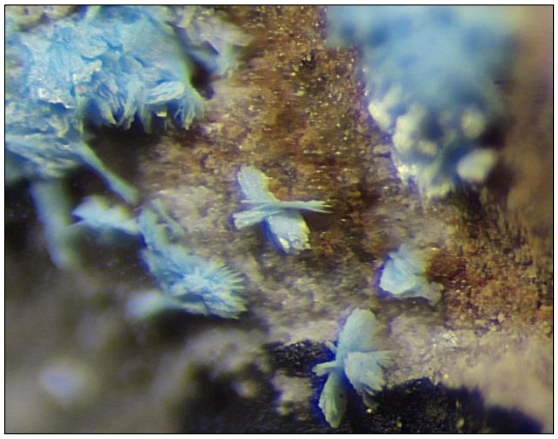
Above: The South Australian Museum's display featuring Ruth Coulsell.

Above: Micro meeting discussions.

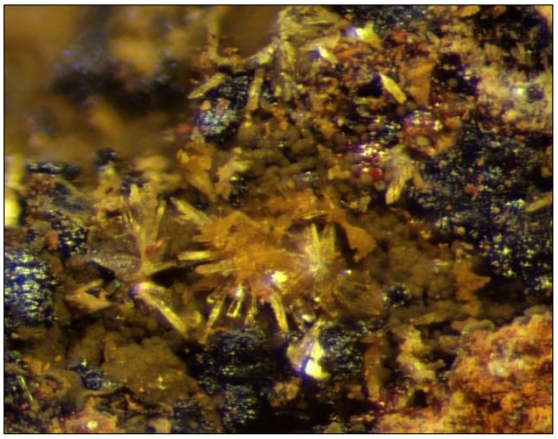
Above: Always room for more specimens!!

Above: An edible specimen of pyromorphite on malachite from Browns Prospect.

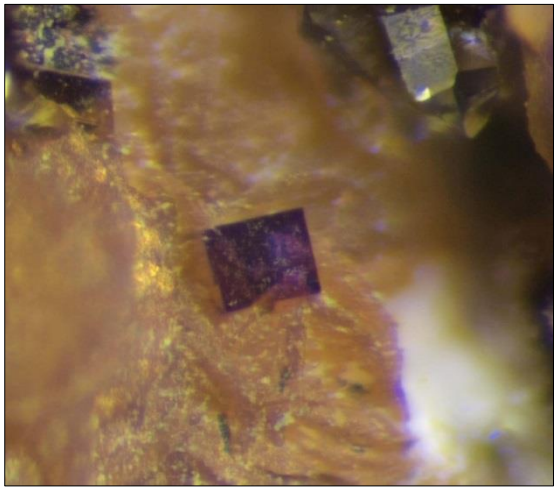
Above: Display of copper minerals from the De Grussa mine in Western Australia.



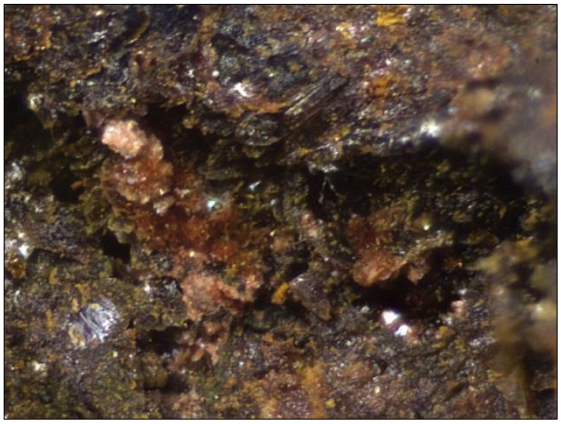
Above: Sprays of paratooite crystals to 0.2mm. From the Paratoo copper mine.



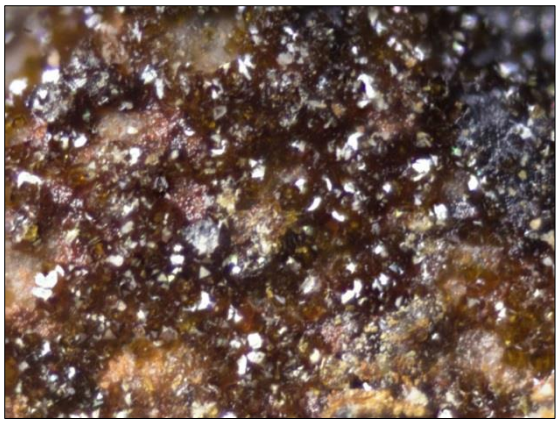
Above: Golden yellow sprays of jahnsite from Tom's quarry at Kapunda. 2mm FOV. The forthcoming issue of the Australian Journal of Mineralogy will feature Tom's Quarry.



Above: A 0.2mm crystal of putnisite from the Armstrong mine, Widgiemooltha.



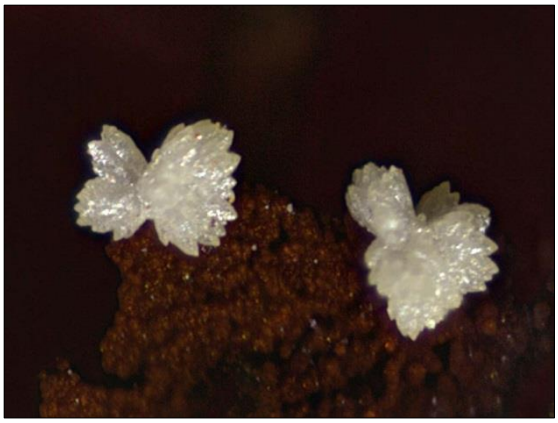
Above: Robertsite crystals from Tom's quarry at Kapunda. 1.5mm FOV.



Above: Jarosite crystals from the Winkler mine. 5mm FOV.

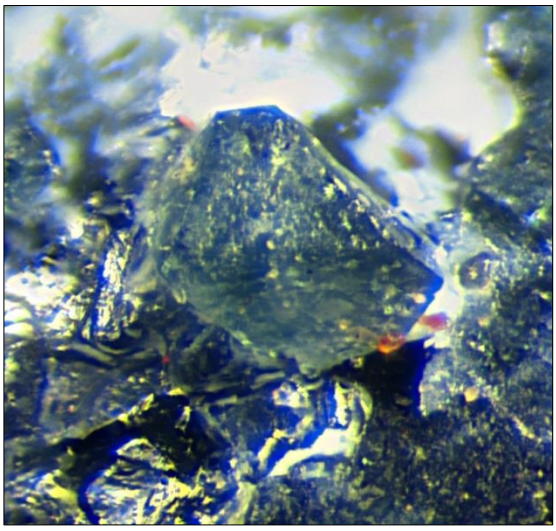
Above: Anglesite crystals on a boxwork of cerussite from the Winkler mine. 10mm FOV.

Above: Searching on the dumps of the Winkler mine.



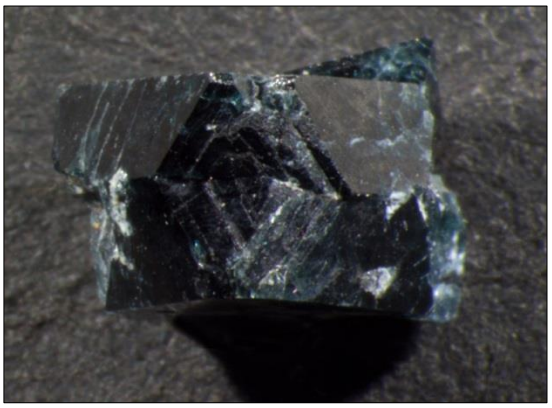
Above: Sprays of mimetite from the Winkler mine. The crystals are 0.2mm long.

Above: Yellow wulfenite, 0.2 mm crystals from the Winkler mine.



Above: Blue-green bi-pyramidal gahnite crystal, 1mm tall from 9 mile, Broken Hill.

Above: Collecting gahnite crystals at a copper prospect at 9 mile, Broken Hill.



Above: Twin gahnite crystal (spinel law), 8mm across from 9 mile, Broken Hill.

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