

# Australia and New Zealand Micromineral News

Issue 5 – December 2012



Cover photo: Hemimorphite crystal group, 2mm across.  
Photo: J. Haupt. Specimen: G. Lee.



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## Introduction

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Xmas (aka, the Silly Season) is once again upon us. The years seem to fly by. This issue is going out primarily due to the efforts of John Haupt, who once again has provided not just one, but two articles. One is a comprehensive report on the Victorian Micro-Mineral Group, and the second an excellent one on the Muldiva Mines in Queensland. Thanks also to input from Ted Fowler (make a microscope base cover), Suzie Ericsson (report on micromineral meeting in Perth) and Mal Southwood (Munich Show). In addition, there are a few photos and notes about local shows.

## Contributions – We Need Your Input!

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**Dear reader. You may be astute enough to notice that the last issue was published in July, and it is now November. There is a reason for this. LACK OF CONTRIBUTIONS! There is little point in publishing something that is only a few pages in length. When this concept was first mooted, there were promises of articles and information. If you want this venture to continue, CONTRIBUTE! Otherwise, it is doomed to fail.**

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

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

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## Forward Diary

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

## Micro-Mineral Seminar 2012

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by Suzie Ericksson

On Friday 8th of June being the day prior to the Annual Mineral seminar, Ted Fowler along with the Western Australian Mineralogical Society committee held the first ever Australian micro-mineral seminar (that I know of) at the GAA rooms in Claremont, Perth. We started gathering from 8am with our microscopes, swaps and much enthusiasm. As we waited for the door keys to arrive there was a lot of catching up with Micro friends as well as meeting new friends. There were 21 attendees I think from Queensland, Western Australia, Victoria, Tasmania and New Zealand.

Ted Fowler, as chairman for the seminar, started the morning session with “house rules” then highlighting the day’s proceedings. He explained that most of the speakers would be speaking on nickel mining or Rare Earth minerals. Stuart Cole, The Western Australian Mineral Society President, then welcomed the group to the function.

Ted spoke on nickel mining in WA with emphasis on the 132 North nickel mine, Widgiemooltha, referring to an article in Mineralogical Record. The field trip that WA went on was not very fruitful and the recent trip was worse. The original dump is now gone. He also spoke of Poseidon Mine, Mount Windarra, Murrin Murrin, Mount Keith (see the article in AJM Volume 9 no.2) and the Kalgoorlie smelter and others.

The next speaker was Judy Rowe from MinSoc Victoria. Her talk was entitled “A Rare Mineral”. Judy spoke of and showed photos of ernienickelite. She encouraged us to check the Museum Victoria database as a good reference point. Ralph Bottrill from Tasmania followed. His talk was on Nickel Minerals of Tasmania. He outlined the deposit locations in Tasmania showing photos of the localities and of the minerals.

Judy Rowe then spoke on “Rare Earth Minerals of Victoria”. Judy has spent many hours sorting river sands from Mount Cole, Nulla Vale and Thologolong localities looking for and finding monazite and xenotime. Judy showed photos of the areas plus photos of her golden and yellow finds. All of these photos can be viewed on Mindat.

Russell Kanowski presented the last talk on behalf of Theo Klopogge who was unable to attend the seminar at the last minute. He spoke of the Zeolites in Alkaline rocks of the Kaiserstuhl Volcanic complex in Germany. Theo also kindly sent over samples for every attendee which were given out.

Then at last it was time to hit the microscopes showing off our brags pieces and rapidly a swapping frenzy developed. Liz from Canada had several boxes of Mont Saint Hilaire specimens to give away. Clive Daw had several containers of 132 North mine Widgiemooltha pieces to swap. These were just spread across the tray of his ute for the taking, as were emeralds from Mungarri Station.

Too soon 4pm arrived and it was pack up time. Everyone was tired (especially mentally) but extremely happy. The only negative comments were that it was too short...we all wanted MORE!

A huge thanks go to Ted Fowler for being the chief organizer of this wonderful day. I encourage future Seminar hosts to consider having a Micromineral gathering/meeting/seminar of at least one day in length prior to the weekend seminar.

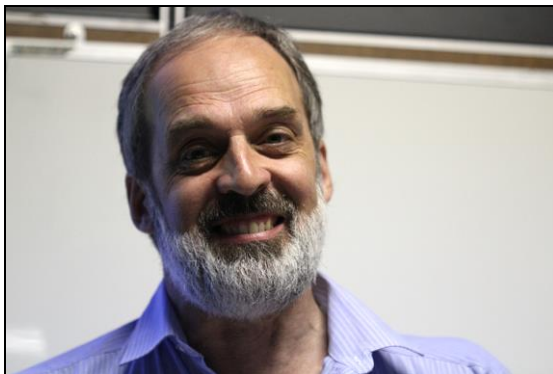




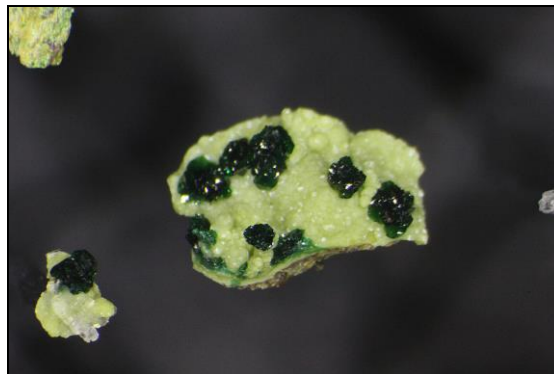
Western Australian President, Stuart Cole



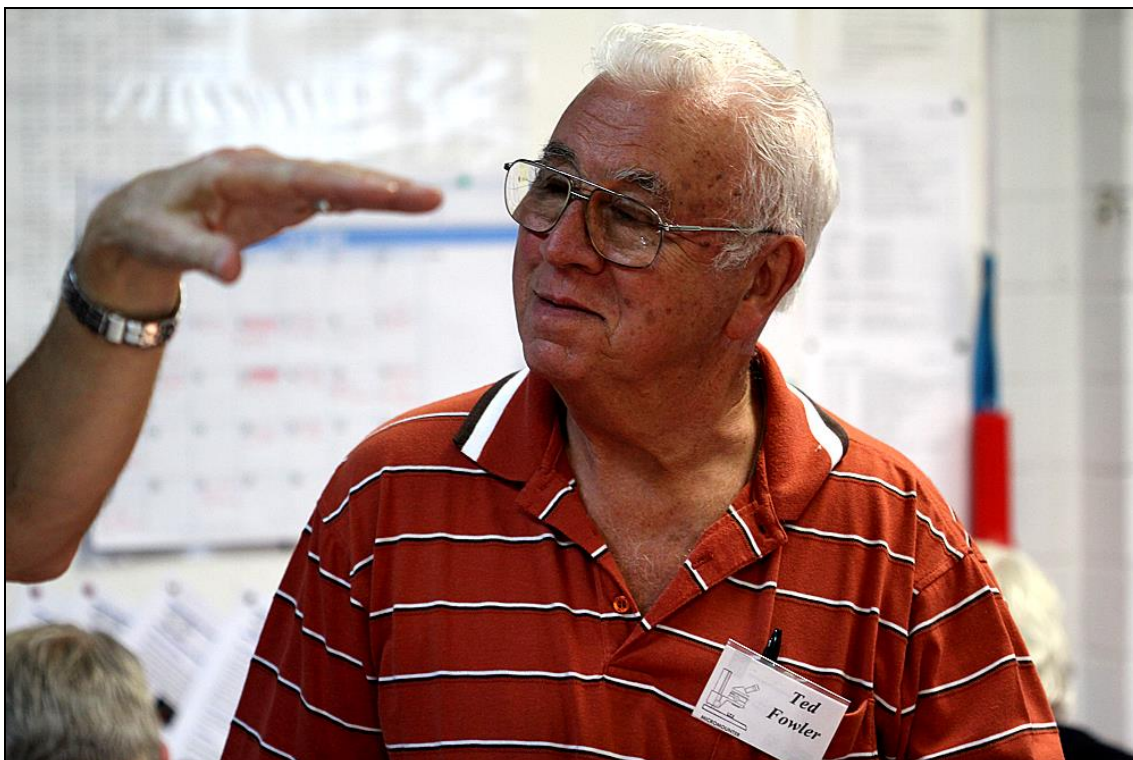
Judy Rowe



Ralph Bottrill



Widgiemooltha specimen



Ted Fowler participating in a Three Stooges sketch! Now is he Larry, Curly or Moe?

Steve Sorrell photos.

By John Bosworth & John Haupt

The subject for the July meeting was “Minerals from Canada, Alaska and Greenland”. The theme for the day turned out to be quite a challenge with regular references to Fleischer’s Glossary of Mineral Species due to the unfamiliarity of species for Australian collectors, unless, of course, you specialised in Mont Saint-Hilaire minerals.

Many of the Mont Saint-Hilaire specimens had up to four species present with several type locality species being seen including donnayite-(Y) and hilairite. There are 397 valid species recorded by MINDAT and only a small selection of this number was on the table during the day. Some of the species seen were:

- serandite – typical salmon pink blocky crystals.
- aegirine – dark green prismatic crystals.
- arfvedsonite – bluish-black short prismatic crystals.
- marcasite- bright brass-yellow crystals.
- ancylite-(Ce) – clear bladed crystals.
- dawsonite – colourless crystals on fluorite.
- barite – pale brown rosettes.

Species from some other localities included:

- ferrierite-(Mg) – from the type locality of Kamloops Lake and also from Pinaus Lake, British Columbia.
- vesuvianite – mauve crystals from the Jeffrey mine, Asbestos, Canada.
- grossular – lustrous green crystals from Jeffrey mine, Asbestos, Canada.
- weloganite – a strontium carbonate from St Michel, Montreal Island which is also found at Mont Saint-Hilaire.
- epidote – aesthetic deep green prismatic crystals and quartz from Prince of Wales Island, Alaska.
- latrappite – orthorhombic crystals in a pseudo-cubic habit of this rare calcium oxide containing niobium which MINDAT lists as being found only in the Oka Complex in Quebec, Canada.
- lazulite – deep royal blue crystals of this attractive phosphate from Yukon in Canada often in association with wardite and quartz.
- wardite – well-formed tetragonal crystals of another phosphate also from Yukon in Canada.

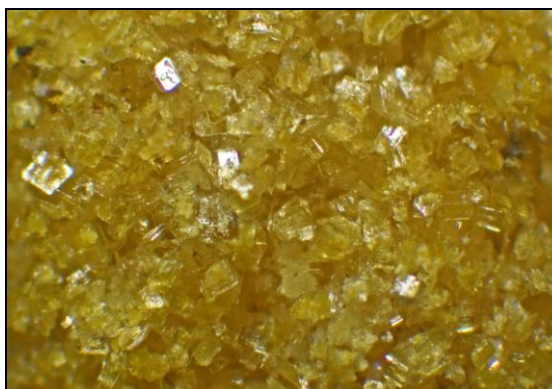
Our August meeting was an informal gathering as several of our regular members were overseas. Several unknown specimens were viewed and discussed with some suggestions given. Olivine crystals from the Anakies were established to be the magnesium dominant member forsterite.





#### Arrojadite

A cream arrojadite crystal with brown siderite rhombs and dark green tabular kulanite on clear hexagonal crystals of fluorapatite. From Rapid Creek, Yukon, Canada. The specimen is 20mm across. Photo & Specimen: J. Haupt.



#### Ferricopiapite

An aggregation of very tiny yellowish, translucent, lustrous crystals from the 4th level, Mount Isa mine. 3mm field of view. Photo & Specimen: J. Rowe.



#### Leucophosphite

Pinkish crystals of leucophosphite to 1mm, from the Mount Oxide mine. Photo & Specimen: J. Haupt.



#### Whiteite

A tan coloured whiteite crystal group, 20mm long, from Rapid Creek, Yukon, Canada. Photo & Specimen: J. Haupt.



#### Vesuvianite

Lemon yellow cluster of vesuvianite, 25mm tall, from the Jeffrey mine, Asbestos, Quebec, Canada. Photo & Specimen: J. Haupt.



#### Libethenite

An attractive specimen of libethenite and turquoise crystals from Mount Oxide mine. 6mm field of view. Photo & Specimen: J. Haupt.

The topic for our September meeting was the minerals from the Mt Isa - Cloncurry region in Queensland. According to MINDAT, this region has produced 227 species and is the type locality for 5 species (barlowite, cloncurryite, pyrosmalite-(Fe), sieleckiite & stillwellite-(Ce). Many of the species contain copper and are attractively coloured green and blue, making an interesting topic to study.

Members brought many species along to view and discuss. Some notable localities were the Great Australia Mine at Cloncurry, with specimens of cloncurryite, connellite, cornetite, gerhardite, henschellite, and (naturally) specimens of the lustrous red cubic crystals of cuprite that were collected from the open cut in the 1990s.

From the Mount Oxide mine were specimens of antlerite, cyanotrichite, leucophosphite, and several specimens of the rare mineral sieleckiite. Also attractive were the combination of sky blue crystals of turquoise with green libethenite. Specimens from the Mount Isa mine included arborescent native copper, lustrous pale yellow barite crystals, cerussite, pyromorphite and yellow tabular crystals of the iron sulphate mineral, ferricopiapite.

The famous Mount Cobalt mine provided beautiful sprays of pink erythrite with mansfieldite and from the nearby Mount Elliott mine came clear gypsum crystals with inclusions of native copper. Specimens from the Monokoff mine included tabular green crystals of torbernite and yellow volborthite and from the Lorena mine were sparkling drusy crystals of conichalcite & pink wupatkiite.

References for some of the mines in the Mt Isa district are in the Australian Journal of Mineralogy, e.g. Vol 1(1) Great Australia mine; Vol 1(2) Mount Cobalt mine; Vol 2(1), Mount Oxide mine.

### **A Micromount Project – Make a Microscope Base Cover**

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By Ted Fowler

(Originally published in the International Micromounters Journal in March 2002, although it was then without any pictures, just the diagrams.)

How many micromounters have wanted to check a larger matrix specimen under the microscope prior to commencing the trimming process? Then you start to worry about that large lump causing scratches or other damage to the base or circular stage plate of your valuable scope.

The following comments describe how I made a “base cover” and solved this concern. Construction details will be easier for readers with access to power woodworking machines [i.e. band, scroll or jig saw and belt, disk or drum sander] but hand tools [coping saw, wood rasp, coarse file and sand paper] will deliver a satisfactory result, although progress will be slower.

Basically we are making a close fitting “lid” [see figures 1 & 2] for our microscope base to the same profile as the existing one [or modified – see later] with edges of Medium Density Fibreboard [MDF] at least 25mm wide. The top surface of our “lid” is covered by a hard wearing laminate [Laminex or Formica are two trade names for this product in Australia].

Measurements and shape of the “lid” will vary depending on the dimensions of individual scopes. My microscope base is already large at 320mm across and 240mm front to rear, hence only a 25mm wide edge for the “lid” was required. My finished base cover now gives me a working area measuring 370mm x 290mm.

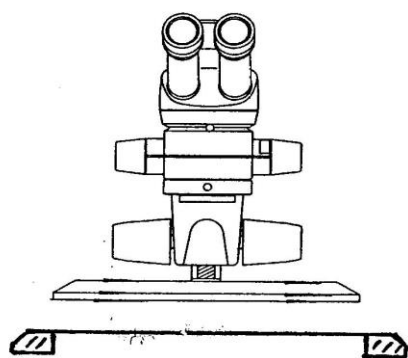


Figure No. 1

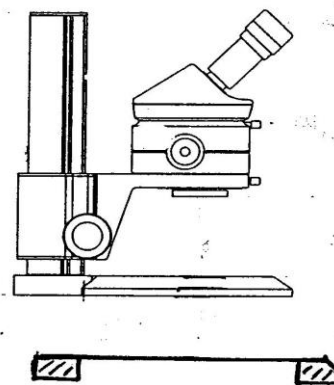


Figure No.2

My good friend and fellow micromounter John Reeve has a scope with a modified hexagon shaped base measuring 160mm x 200mm. When making a base cover for him, we widened the edge measurement from 25mm to 105mm at each side and 45mm at front and rear, giving John a similar sized base cover to mine, with a much larger “work” area.

Here are the steps I took to make a base cover:

1. First measure the thickness [height] of your scope base.
2. With the scope on a table top, place a straight edge across the stage plate and extending over the table. Now measure the distance between the table top and the bottom of the straight edge. My scope base is 21mm deep.
3. Make a template of the shape of your scope’s existing base. Obtain a piece of light cardboard [I used an empty cereal box slit down one side and opened out] and place your scope on it. With a fine pointed pen or pencil accurately trace a line around the circumference of the microscope base. Before removing the scope, mark the cardboard with two reference points at the centre of the front and rear edges of the base.
4. Remove the scope and draw a straight line between those reference points to form a centre line for locating purposes. Cut out the base template with scissors and mark it “#1”. Some micromounters use their scopes with the upright column of the instrument towards them, the focusing controls in the front, with the working area at the rear [see photograph on pages 130 & 192 – Wight]. Others [like us] prefer the upright column and knobs at the rear, and working area in front [see Wight again – pps 110 & 193]. Either way is fine, so we need to make the base cover removable with a suitable gap to go either side of the upright column.
5. Carefully measure the width of your scope’s column base and half this measurement should be used to locate two parallel lines on either side of template #1 centre line. Similarly, from the stage plate side of the column, measure the distance from the edge of the column to the edge of the scope base and transfer this measurement to template #1 centre line. The area just delineated should locate the position of the upright column.
6. Enlarge the “column area” outline by about 3mm for clearance purposes, and use scissors to cut out this “U” shaped area from front/rear edge of the circumference. Try the template for fit around the base of the upright column. A gap of up to 3mm will be satisfactory for clearance and enable easy removal of the finished cover as and when required.



7. Using another cereal box, draw a duplicate of template 1. Transfer the “centre line” reference marks and make template #2. DO NOT CUT OUT to shape at this time. On template #2 and starting at the tips of the “U” indent, draw a pencil line to enlarge the outline by a minimum of 25mm right around the circumference of the #1 profile. If your microscope has a small base area which you would like to enlarge or is of a base shape you would like to alter to make a more comfortable work area, this can now be accommodated. [Refer to paragraph 4 above, and compare photos {figures 6 & 8} at the end of this article.] Alter the pencil outline to your personal preference, if desired to a more pleasing shape, e.g. a small rectangular base outline could be altered to a base cover shape which will be circular. Any shape goes, as long as you leave at least 25mm between the outline of template 1 and your enlarged pencil shape on template 2.

8. Extend the “centre line” across the enlarged template 2. To ensure symmetry of your finished base cover, place a sheet of paper along the centre line and trace one half of the pencil outline onto the paper. Cut out this shape, turn it over and relocate on centre line, then amend the other side of the pencilled outline to match the shape. Now cut out template 2 to your preferred shape and set it aside.

9. Rather than try to obtain MDF 21mm thick, I opted to use off-cuts of various thickness [3, 6 or 12mm] supplied gratis from a cabinetmaker source. The off-cuts were PVA glued in alternate layers laid crosswise to build up a laminated form 21mm deep and slightly larger in area than template 2. Weights were applied and the form set aside overnight to dry.

10. On the laminated form, draw a centre line and locate template 1 on the line and draw the microscope base outline accurately. Material inside this outline will be removed in due course. Locate template 2 on the same centre line and draw the selected base cover outline. Material outside this line can now be removed by sawing and sanding to a smooth finish. Then carefully remove all the material inside the line of template 1 by drilling, sawing and sanding until your microscope base is a snug fit inside the remaining MDF. The result should be a “horseshoe” shape [see Figure 3] which fits all around your microscope base, apart from the gap at the position of the upright column. We now cover this “horseshoe” with a piece of 3mm MDF, followed by an off-cut of laminate glued on with contact cement. An easier alternate would be to use a 4mm sheet of laminated masonite or similar hardboard, if possible of a colour that closely matches your scope.

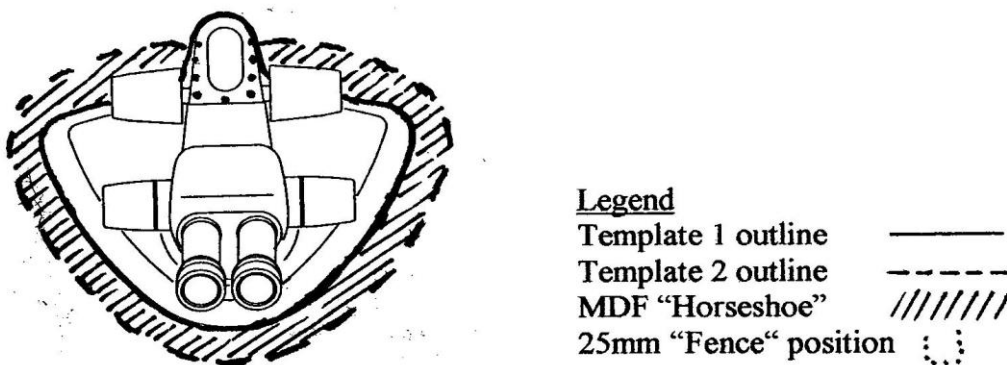


Figure No. 3

11. The laminate and its backing is now sanded and filed back to the outline of template 2 and adjusted if necessary for the laminate to fit around the base of the upright column, where some tolerance is acceptable [the gap of 3mm mentioned earlier].

Isolate the gap with a three sided “fence” 25mm high, cut from a section of PVC rainwater pipe which has a rectangular cross-section of compatible size to the upright column of your scope. A round column “fence” may look better by using a 25mm slice from tubular PVC of suitable diameter, after removing a quarter segment to leave a 270 degree fence for the “U” gap. This “fence” is perhaps cosmetic, but useful in stopping matrix or its crumbs from contacting the column base or rack, also keeping any debris or small crystals from falling off the back/front of the base cover.

12. Paint the PVC flat black, or a colour of choice, and affix the “fence” to the laminate with epoxy cement. The base cover is now nearly complete. It should be a snug fit over the existing microscope base and a neat fit at the upright column, with a fence to protect the latter. As my original microscope base has a 45 degree chamfered edge on the front and sides for comfort, I did the same with the base cover. Draw a pencil line on the work surface, 12mm in from the edge, and another around the circumference, below the edge, marking the area to be removed to form a bevel. Cutting the bevel is done easily on a 30cm sanding disk, holding the laminated form freehand. If available, a router with a suitable cutter would be ideal. More care is required when using a small disk sander, and given time, a satisfactory bevel can be achieved with only a rasp and file. NOTE: The minimum 25mm size variation between templates 1 and 2 is to allow sufficient MDF material to form the base cover “lid” and allow a small margin for a bevel, if desired. There is no maximum variation – make your base cover to whatever oversize or shape you prefer.

13. Three finishing touches:

- Undercoat the MDF and finish with 2 coats of hard wearing enamel paint.
- Glue strips of thin felt to the bottom edge of the base cover.
- Place the base cover in position – rack down the microscope until the laminated surface is in focus at low power. Change magnification to highest available, then mark centre of the field of view with a dot by felt tipped pen. Remove the base cover and with a 3mm drill bit, lightly drill the dot position 1mm deep, to just pierce the coloured [surface] layer of laminate. Mark this centre depression with the ink of a black marker pen, leaving a permanent spot for locating the centre of the field of view at any power.

Conclusion:

This accessory provides a hard wearing, protective surface which will not tilt or move while the microscope is in use. Specimens of all type, shape or size can be placed safely for viewing without risk of any damage to the microscope base. Accidental spillage of paint, ink, cleaning fluids or glues can also be easily cleaned up, avoiding any damage to a valuable instrument. The MDF base covers described above and pictured below have been in continuous use for the past 13 years and are now permanent accessories on our microscopes.

Reference:

Wight, Q. 1993: The Complete Book of Micromounting. pps 110, 130, 192, & 193

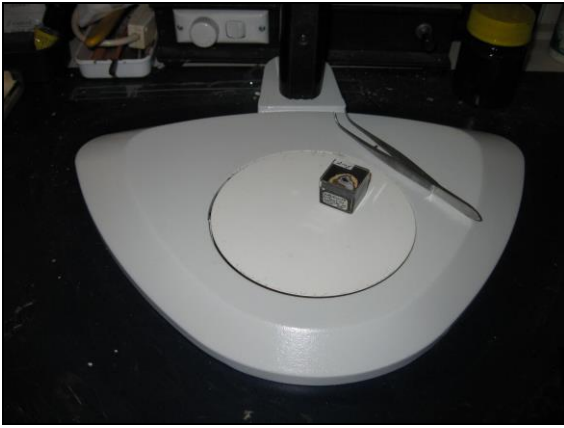


Figure 4. Microscope standard base, with bevelled edge and positioned for use with upright column at rear.



Figure 5. Base cover in place and showing some wear after many years of use.



Figure 6. Base cover view from underneath, showing 25mm "lip" covered with felt. Small wedges of MDF reverse shaped to match original bevel. These wedges reinforce the joint between lip and the laminated sheet.



Figure 7. John Reeve's microscope base, with his base cover in place. Note bevelled edge on 3 sides.



Figure 8. Underneath view of John's microscope base cover and the original hexagon shape of the smaller microscope base.



Figure 9. Close up view of rectangular "fence" on this scope's base cover.



## Minerals from the Muldiva mines, Chillagoe, Queensland

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By John Haupt

A cluster of silver-lead mines were worked at Muldiva in the Chillagoe mining district in North Queensland. These mines are located 13km west-south-west of Almaden. Muldiva was one of the first mining centres in the Chillagoe region and was established by North Queensland mining entrepreneur, John Moffat. The history of the Chillagoe mines and its smelter is full of intrigue and politics. (Haupt et al (2008), Kerr (1979), Plimer (1997)).

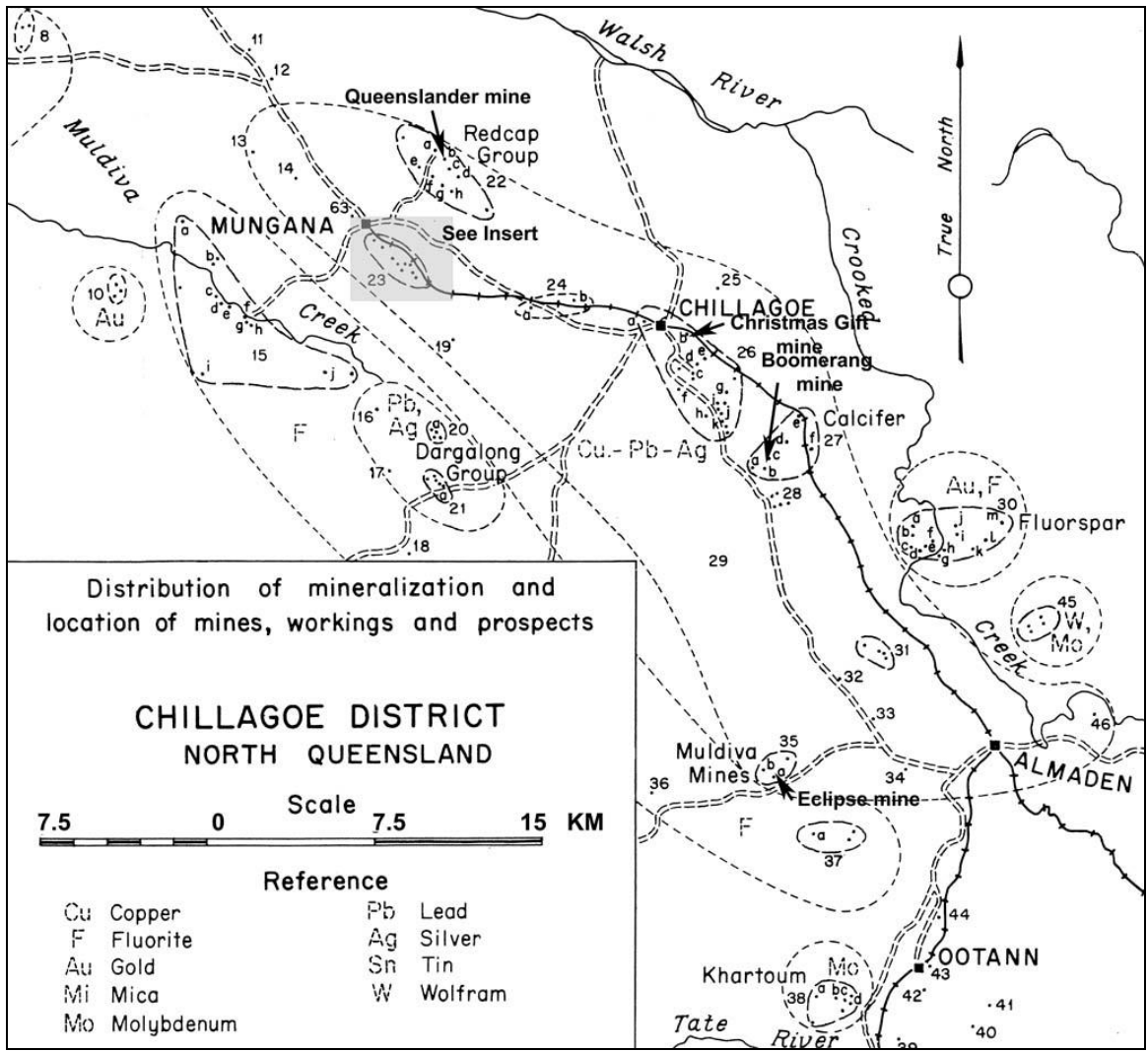
The discovery of silver at Muldiva in 1890 by Moffat's prospector Linedale, led to the development of the Muldiva mines. A public company was floated with a capital of £100,000 (\$200,000) in 10/- (\$1.00) shares. Linedale received 50,000 shares and ten other promoters, including Moffat, who had each contributed \$400 each to acquire the leases, received 40,000 shares. The Muldiva Company was the first to be offered to the public, chiefly attracting Brisbane investors and businessmen from Cairns and Herberton. The New Moon, Paisley and Eclipse mines were developed and a smelter installed in 1892, producing an average of 4,500 oz of silver per week. By this time both Linedale and Moffat had profited by selling their shares. The high cost of transport and a decline in the silver price and depletion of the rich surface deposits resulted in the Company barely covering costs. In May 1893 the failure of the Queensland Bank forced the shutdown of the Muldiva smelters. At that time \$75,000 had been spent on the mines and 1,450 tonne of ore containing 232,000 oz of silver had been produced, but no dividends were paid. The company was wound-up in 1894. In 1897 Moffat acquired the crushing and smelting equipment from the liquidator at a bargain price and relocated it to the Girofla mine and the township of Mungana was established.

The Muldiva mines were worked spasmodically between 1893 and 1912, when the Chillagoe Company acquired the leases. Small scale production continued until 1914 and again from 1918 to 1926, with the ore being sent to the Chillagoe smelters. Total production is recorded as 19 000 tons of ore, yielding 315,000 oz of silver, 1,150 ton of lead and 270 ton of copper (DeKeyser et al, 1964).

Geologically, the deposits display a close similarity with those of the Mungana area with the mineralised zones hosted by limestones and cherts of the Chillagoe Formation along or close to the contact of the sediments with a Permo-Carboniferous adamellite intrusive. Contact metamorphism created a range of calc-silicate minerals (garnet, vesuvianite, wollastonite, diopside, actinolite and epidote). These skarn altered limestones host the irregular sulphide lodes.

The Eclipse and Paisley mines were the most extensively worked in the group. At the Eclipse, the mineralised lode was hosted by garnet and calc-silicate rich rocks and a quartz-hematite breccia along the granite contact. The mineralised zone reached a total width of 20 metres and the strike length was 23 metres. The actual high-grade ores shoots worked were considerably less, being around metre wide. At the Paisley Mine the overall lode zone was 50 metres long and reached a width of 35 metres (DeKeyser et al, 1964).

The early workings were shallow and targeted what were almost certainly supergene concentrations of copper and lead ores, the latter often highly argentiferous and it was the high silver values which prompted the establishment of a smelter at the site in 1891. Cerussite and anglesite were the common oxidized lead species with the copper carbonates, malachite and azurite, constituting the principal copper ores. Bismuth was a common contaminant of the ores in the group and rendered much of the ore uneconomic. At depth the lode was dominated by sphalerite which had little value at the time of working. Mining ceased at Muldiva when the Chillagoe smelter closed in 1927. The recently closed Kagara mine was mining zinc ore in a similar orebody below the Girofla mine and the Red Dome open cut at Mungana.



Map of the Chillagoe mining district. Bureau of Mineral Resources.



Above: Outcrop of the Eclipse mine, 2009. Photo: J. Haupt.





Above: The dumps at the Eclipse mine, 2009. Photo: J. Haupt.

Little has been recorded of the minerals that occurred in these mines, with the following list being mainly from personal observations. Attractive lustrous crystallized specimens of azurite occurred in the original workings and some exist today in collections. The Muldiva mines have been of interest to mineral collectors, mainly because most of the dump material still exists and has yielded attractive miniature and micro specimens of secondary copper-lead-zinc minerals.



Above: Aurichalcite sprays with hemimorphite on drusy quartz. 9mm FOV. From the Eclipse mine.

Photo: J. Haupt. Specimen: M&L Legg.

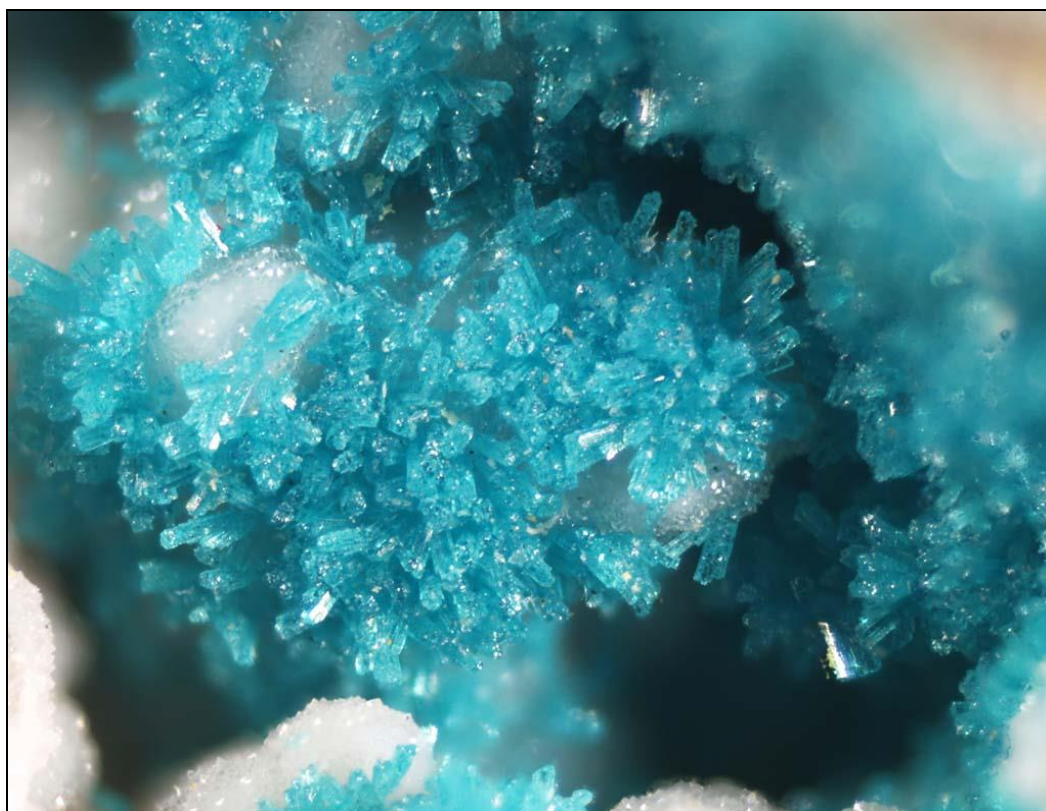


Aurichalcite  $(\text{Zn,Cu}^{2+})_5(\text{CO}_3)_2(\text{OH})_6$

Attractive specimens of sky-blue aurichalcite have been collected on the dumps of the Eclipse mine. It commonly forms small sky blue radiating sprays, up to 5 mm across in drusy quartz lined cavities in an ironstone matrix. Individual slender crystals up to 2 mm also occur in association with tabular malachite crystals. Common associates are hemimorphite and roasite.



Above: Aurichalcite sprays lining a drusy quartz cavity 5mm across in ironstone from the Eclipse mine. Photo & specimen: J. Haupt.



Above: Aurichalcite crystal cluster. 2mm FOV. Photo: J. Haupt. Specimen: M&L Legg.



Azurite  $\text{Cu}^{2+}_3(\text{CO}_3)_2(\text{OH})_2$

The Muldiva mines produced prized specimens of highly lustrous groups of azurite crystals up to 20 mm across. Anderson (1909) described and illustrated a specimen from the Paisley mine as consisting of numerous crystals up to 15mm across, with cerussite crystals. The exceptional clarity and translucence of the Muldiva crystals were described as 'gem' azurite by Robertson (1983).



Above: Azurite crystals from the Eclipse mine. Specimen 4cm across. Photo: J. Haupt Specimen Museum Victoria M25519.



Above: Lustrous azurite crystals from Muldiva, 10 cm across. Photo: J. Haupt. Specimen: R. Sielecki.

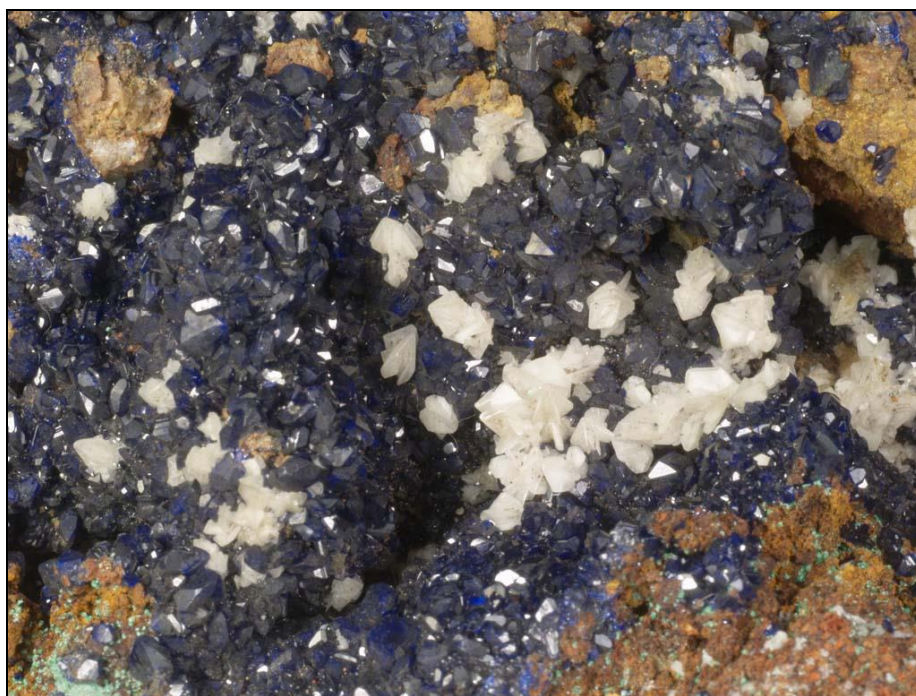


Brochantite  $\text{Cu}^{2+}_4(\text{SO}_4)(\text{OH})_6$

Small clusters of brochantite crystals have been collected at the Eclipse mine, occurring as small light-green striated crystals to 2 mm long in drusy quartz lined cavities in a siliceous ironstone matrix.



Above: Aurichalcite & brochantite from the Eclipse mine. 2mm FOV. Photo: J. Haupt. Specimen: M&L Legg.



Above: Cerussite crystals on azurite. Specimen approx. 10cm across. Photo: J. Haupt. Specimen: Australian Museum D53929.



Cerussite       $\text{PbCO}_3$

Cerussite was common in the oxidized zone. Perhaps the best are the twinned cerussite crystals which occurred on azurite at the Eclipse mine. These were up to 1 cm across and contrasted well with the deep blue lustrous azurite crystals.

Cuprite       $\text{Cu}^{1+}_2\text{O}$

The reticulated form, chalcotrichite, was reported to have occurred in fine needle-like crystals in the Paisley mine (Berge et al 1899). Small octahedral crystals of cuprite have been collected on the mine dumps.



Above: Cuprite crystals replaced by chrysocolla, with 'limonite' coated calcite. FOV 6mm Photo: J. Haupt Specimen: M&L Legg.

Galena  $\text{PbS}$

Galena was the primary silver-lead ore mineral that was mined for its silver content. There are no records of galena crystals being found.

Grossular       $\text{Ca}_3\text{Al}_2(\text{SiO}_4)_3$

A common lime-green to brown garnet occurs in the calc-silicate rocks in the area.

Hemimorphite       $\text{Zn}_4\text{Si}_2\text{O}_7(\text{OH})_2 \cdot \text{H}_2\text{O}$

Hemimorphite occurs in the Muldiva mines where it forms as clusters and sprays of transparent to white tabular crystals, up to 1 cm long, lining cavities in an ironstone matrix. Aurichalcite and rosasite are common associates.

Linarite       $\text{PbCu}^{2+}(\text{SO}_4)(\text{OH})_2$

Small light blue crystals of linarite, up to 3 mm long, have been collected on the dumps at the Eclipse mine.



Above: A 2mm spray of hemimorphite crystals. Photo & Specimen: J. Haupt.

Malachite  $\text{Cu}^{2+}_2(\text{CO}_3)(\text{OH})_2$

Malachite was a common secondary mineral in the oxidized zone and notable specimens were recorded from the Paisley mine. (Berge et al (1899). Small attractive tabular malachite crystals to 2 mm, in groups with aurichalcite were collected from the dumps of the Eclipse mine. The combination of the blue aurichalcite and green malachite makes attractive micro specimens.

Plumbojarosite  $\text{PbFe}_6(\text{SO}_4)_4(\text{OH})_{12}$

Plumbojarosite has been identified by the X-ray analysis of material associated with azurite at the Eclipse mine, Muldiva (Robertson, 1983).

Pyromorphite  $\text{Pb}_5(\text{PO}_4)_3\text{Cl}$

The Eclipse mine has yielded small brown to yellow crystals of pyromorphite up to 1 mm long. Also from the Eclipse mine, small bright yellow infilling small cavities in an ironstone matrix are an arsenian rich pyromorphite (i.e. grading towards mimetite) by x-ray analysis (Birch pers com).

Rosasite  $(\text{Cu}^{2+}, \text{Zn})_2(\text{CO}_3)(\text{OH})_2$

Small blue-green hemispheres of rosasite have been collected on the dumps of the Eclipse mine. It occurs in cavities in an ironstone matrix with hemimorphite and aurichalcite.

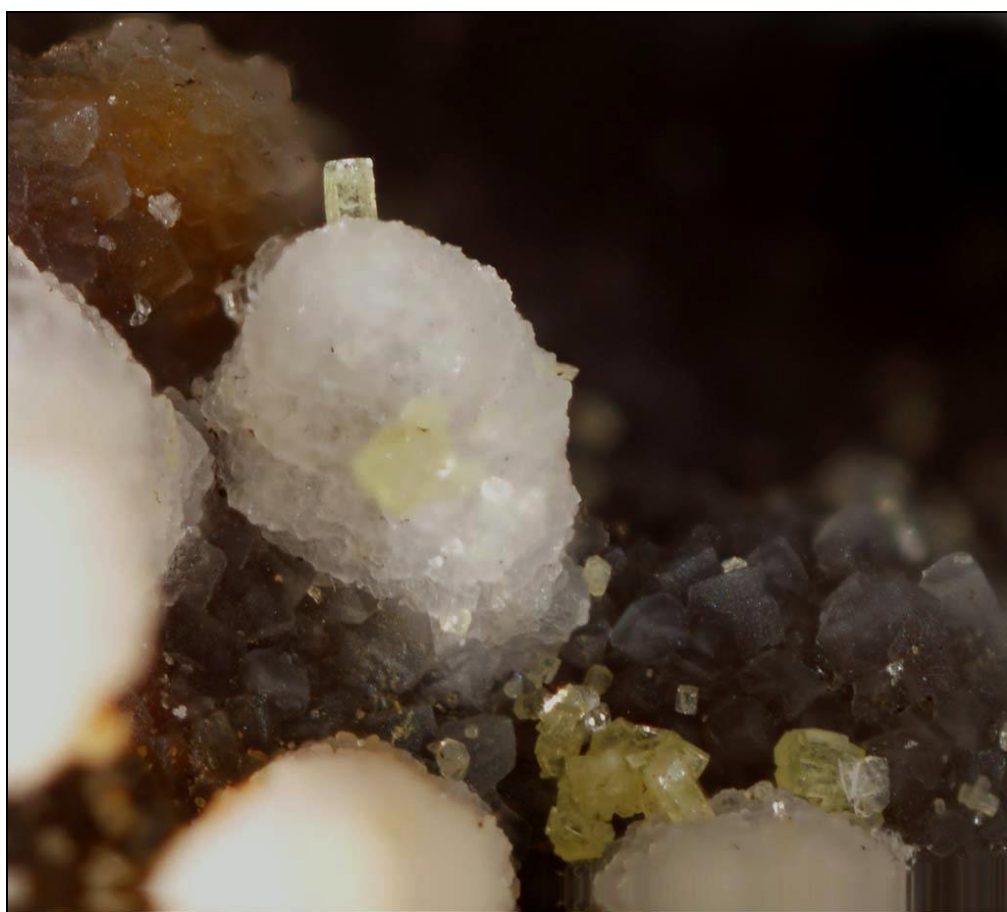
Smithsonite  $\text{ZnCO}_3$

Smithsonite occurs as yellow-green tear-shaped crystals in cavities in an ironstone matrix at the Eclipse mine. It also forms cream botryoidal coatings on the ironstone.





Above: Arsenian rich pyromorphite from the Eclipse mine. 2mm FOV. Photo: J. Haupt. Specimen: M&L Legg.



Above: Hexagonal pyromorphite to 0.3mm from the Eclipse mine. Photo: J. Haupt. Specimen: G. Lee, Ex R&B Wallace collection.





Above: Rosasite and calcite on hemimorphite. 6mm FOV. Photo & specimen: J. Haupt.



Above: Rosasite with hemimorphite. 7mm FOV. Photo: J. Haupt. Specimen: G. Lee. Ex R&B Wallace collection.





Above: Rosasite balls with smithsonite. 7mm FOV. Photo: J. Haupt. Specimen: G. Lee Ex R&B Wallace collection.



Above: Yellow 'teardrop' crystals of smithsonite on ironstone, 15 mm across. Photo & Specimen: J. Haupt.

### Sphalerite      ZnS

Berge et al (1899) specifically mentions sphalerite occurring in the Eclipse and Paisley mines. Whilst crystal specimens are unknown, it is the common sulphide primary ore in the mines. It was uneconomic to produce at the time of mining and attributed to the closing of the mines.





Above: Smithsonite crystals to 2mm from the Eclipse mine. Photo & Specimen: J. Haupt.

### Other Minerals

Several other minerals have been reported from the Muldiva mines and most are likely to have occurred in the secondary zone, but as no specimens exist, they have not been confirmed. These include acanthite, anglesite, atacamite, barite, chlorargyrite, diopside, minium, natrolite, olivenite, proustite, pyrargyrite & stephanite (Berge, 1900).

### ACKNOWLEDGEMENTS

The following people kindly provided specimens for photographing: M. Day, G. Lee, M & L. Legg, M. Newnham & R. Sielecki. Dermot Henry, Museum Victoria & Ross Pogson, Australian Museum, kindly permitted the photographing specimens in their collections and Colin Hooper provided access to old mining reports.

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Above: Green fibres of agardite?, 4mm across from the Eclipse mine. Photo: J. Haupt. Specimen: M&L Legg.

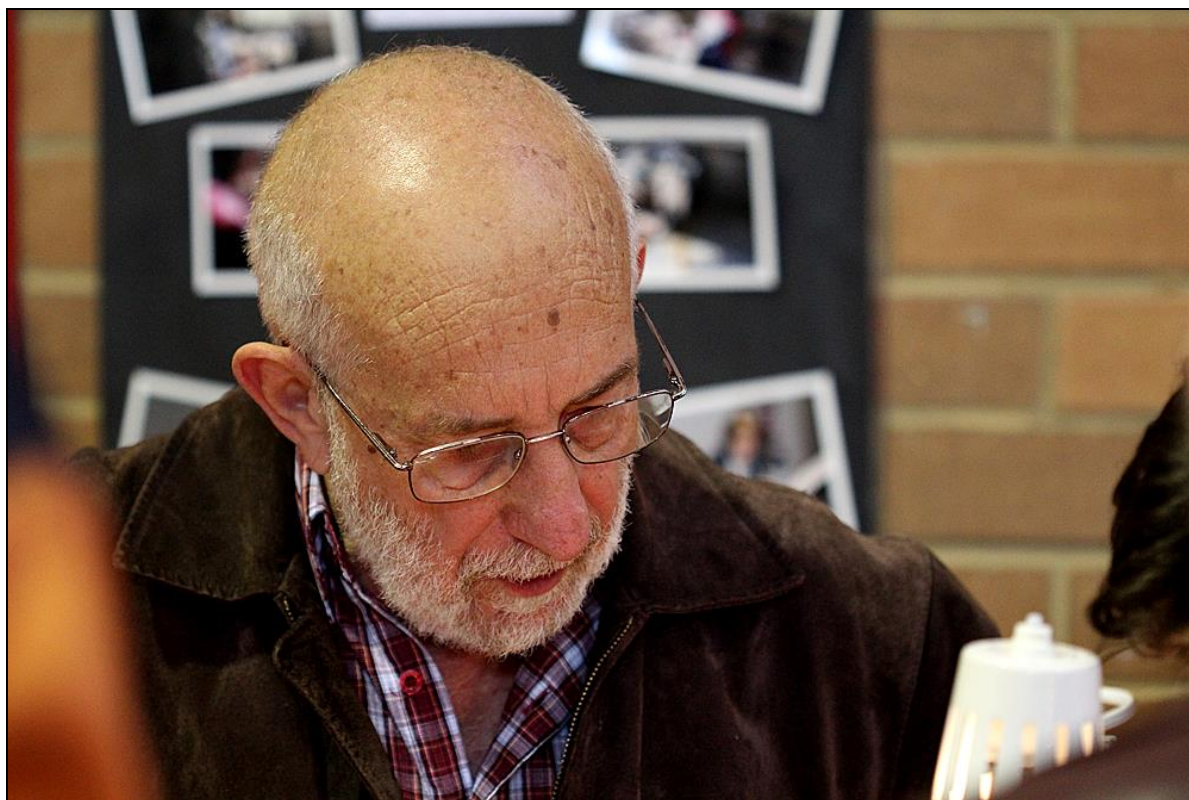


## Around the Australian Shows in 2012 – Bendigo Show

by Steve Sorrell

The Bendigo Show was once again on in September. This country show is always a pleasure to attend. And this year, it was nice and close! There are a number of mineral tables, some are dealers such as Peter Beckwith, Chris Ah Yee, Ann McDonald and others, and then there is the Bendigo Club stall. This is always a good hunting ground for micromineral specimens at ridiculously low prices.

It is also a great place to catch up with not-often-seen friends. This year, I managed to find a few interesting pieces, a number of which are shown below. The Brazilian stolzite and respite specimen was particularly interesting. These two dimorphs don't occur together at too many localities. And looking at what I got, it must have been native elements weekend!



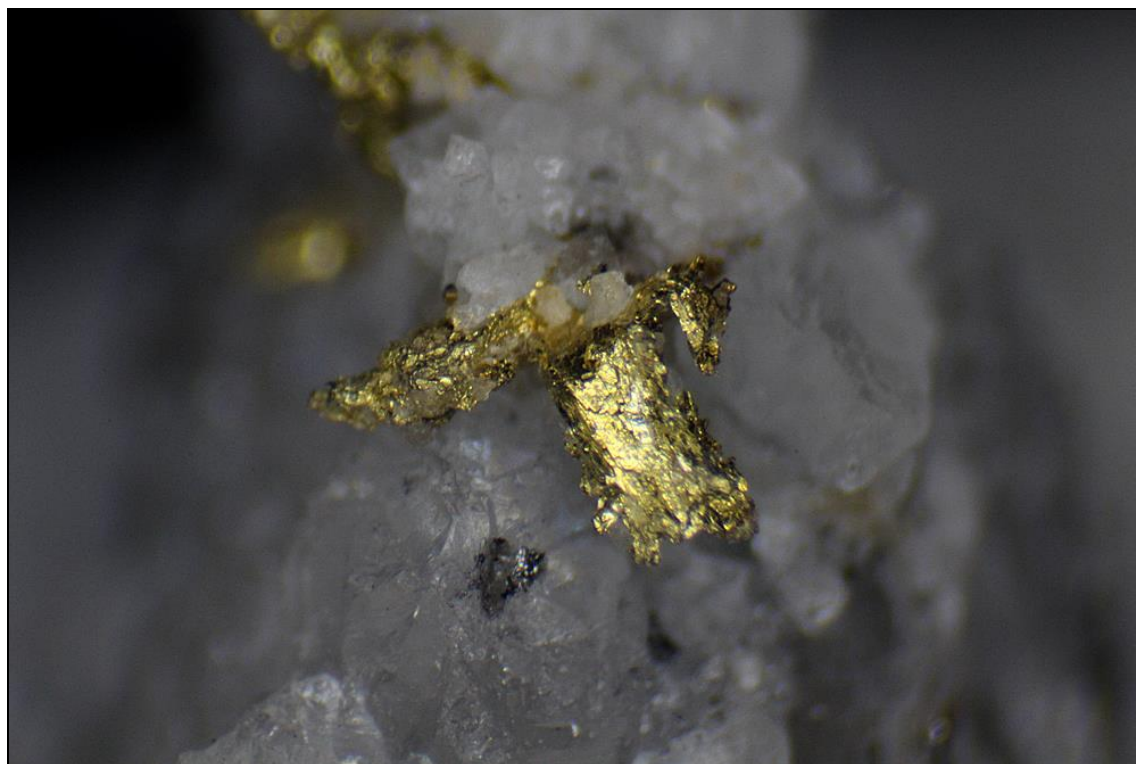
Above: Pat Sutton



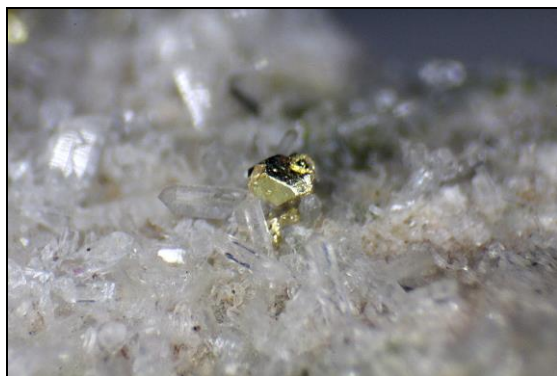
Above: Peter Beckwith



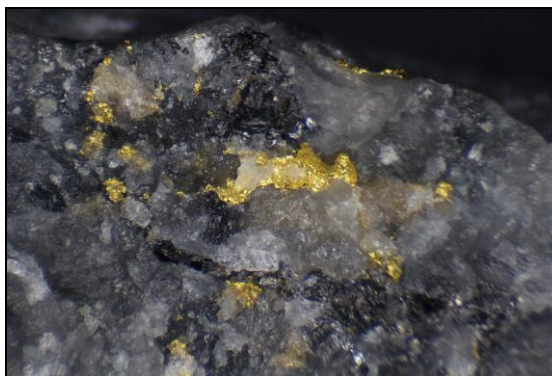
Above: Col Wilkie on Bendigo Club stall



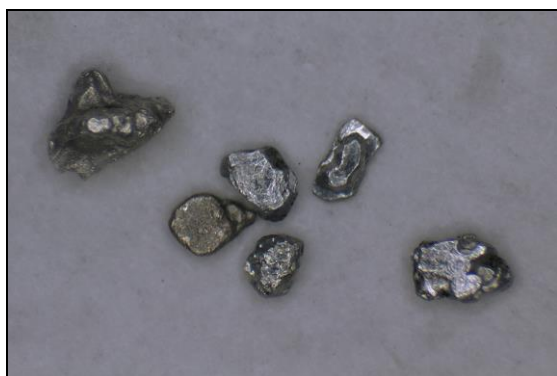
Above: Gold, Quartzite Mine, Kofa District, Yuma Co., Arizona.  
Photo width 5mm. Steve Sorrell specimen and photo.



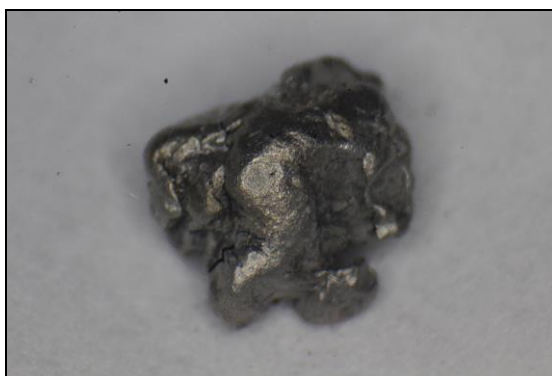
Above: Gold, Olinghouse District, Washoe Co., Nevada.  
Photo width 5mm. Steve Sorrell specimen and photo.



Above: Gold, Mt Baldy, Springs Junction, South Island, New Zealand.  
Photo width 5mm. Steve Sorrell specimen and photo.



Above: Osmium, Big Bar, Delloma, Trinity River, Trinity Co., California.  
Photo width 5mm. Steve Sorrell specimen and photo.



Above: Platinum, Fox Gulch, Salmon River, Goodnews Bay, Alaska.  
Photo width 5mm. Steve Sorrell specimen and photo.





Above: Stolzite, Sumidouro, Mariana, Iron Quadrangle, Minas Gerais, Brazil. Photo width 5mm.  
Steve Sorrell specimen and photo.

### **Around the Australian Shows in 2012 – Nunawading Show**

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by Steve Sorrell

It has been more than 20 years since I last attended the Nunawading Show. It is now not only held in a different location, but in a different suburb! One wonders if a future Croydon Show might be held in Nunawading.

A number of mineral dealers were present, and a reasonable crowd in attendance. The show is however a fair bit smaller than the Waverley Show held a few weeks earlier.

The club stall is always a source of some interesting specimens, and I managed to pick up a few zeolites from obscure or older localities.

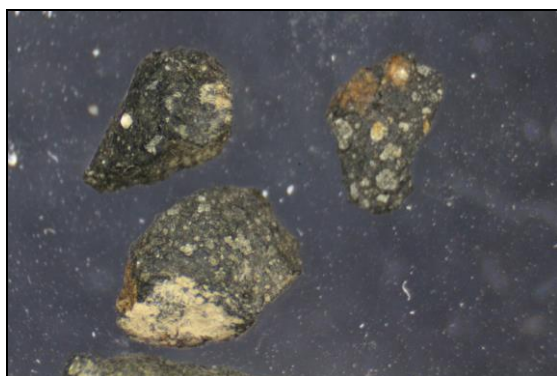
Cyril Kovacic (CK Minerals) had a large range of minerals to suit most tastes, including some quite nice Broken Hill pieces.

Possibly the most interesting dealer table was Rocks on Fire, run by Norbert and Heike Kammel. Here, for not a great outlay, you could acquire a piece of the Murchison meteorite, a piece of Moon rock from a Lunar meteorite, or even a piece of Mars from a Martian meteorite. How cool is that!

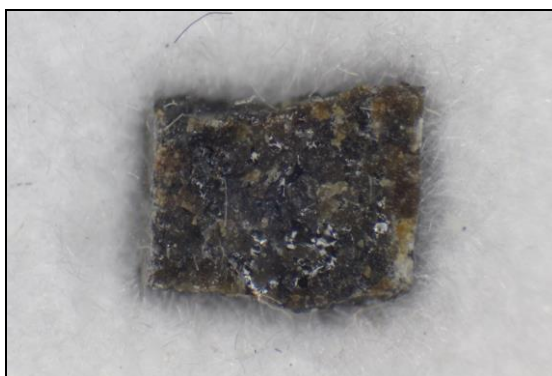
So a few nice pieces to take back on the long trip home...



Above: Calcite, Emperor Mine, Vatukoula, Tavua Gold Field, Viti Levu, Fiji. Photo width 11mm. Steve Sorrell specimen and photo.



Above: Murchison carbonaceous meteorite. Photo width 11mm. Steve Sorrell specimen and photo.



Above: Martian Olivine-Phyric Shergottite meteorite (NWA 4925). Photo width 5mm. Steve Sorrell specimen and photo.



Above: Lunar Achondrite meteorite (NWA 4881). Photo width 5mm. Steve Sorrell specimen and photo.



Above: Chabazite, Jindivick, Victoria. Specimen width 85mm. Steve Sorrell specimen and photo.





Above: Nunawading Show: Malachite showcase featuring the Creature from the Green Lagoon (my tag!). Steve Sorrell photo.



Above: Norbert Kammel, Rocks on Fire. Steve Sorrell photo.



Above: Victorian Mineralogical Society President Alex Blount. Steve Sorrell photo.

## Around the Australian Shows in 2012 – Waverley Show

by Steve Sorrell

I have only attended the Waverley Show on two previous occasions, both of which were over 25 years ago. But I can still remember a specimen that I bought at each. The first was a Broken Hill respite from Rob Sielecki, and the second, a Harts Range sceptre amethyst from Don McColl. I still have both.

Now the show is at a different venue and it is in quite a large hall, meaning plenty of room for tables. There is also a club stall here, the sort of place where you might find something from an obscure locality, or from a place where you can no longer collect. Good micro material too.

There were quite a few mineral dealers too. A great way to while away a few hours. Cyril (CK Minerals) had a few half-sized flats being sold as a lot. There were quite a few interesting individual pieces. I bought a couple to keep just three or four specimens. The rest have since gone to other collectors.

Again, I gravitated to a couple of Australian gold specimens, one from Weddeburn (pictured) and the other from Tennant Creek in the Northern Territory.



Above: Trays of mineral specimens on the club table. Prices at most were a couple of dollars.  
Photo Steve Sorrell





Above: Peter Hall. Steve Sorrell photo.



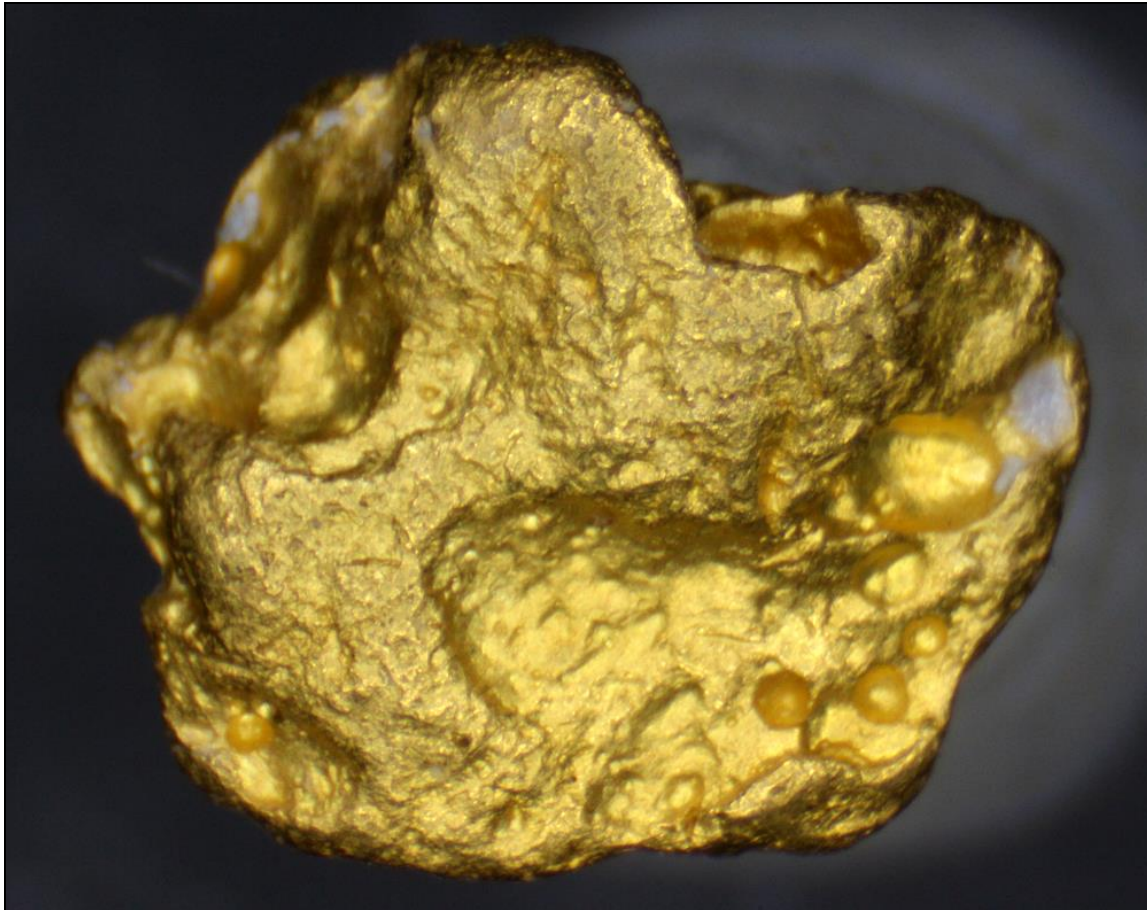
Above: Mal Southwood. Steve Sorrell photo.



Above: Searching for a bargain. Steve Sorrell photo



Left: Tourmaline slice, Madagascar, 65mm across. This is the termination of a crystal. Steve Sorrell specimen and photo.



Above: Gold, Weddeburn, Victoria, specimen is 9mm across. Steve Sorrell specimen and photo.



## Around the Australian Shows in 2012 – Zeehan Show

by Steve Sorrell

The 2012 Zeehan Show was a good excuse to go back to Tasmania for a visit. This is one of the best (if not the best) shows in Australia. There are around 60 stalls with various things for sale (minerals, fossils, lapidary equipment, gemstones, etc.) and usually something new to see. This year was no different with the recent find of a new pocket of crocoite at the nearby Adelaide Mine. And, surprisingly, an overseas visitor, one John Cornish. It makes a change to see John this side of the planet instead of at Tucson.

Evan and I went out to the mine to have a look underground. There are two (probably related) pockets and they appear to go back some way. This find will provide lots of nice crocoite specimens to the market. Adam Wright is hopeful that other mineral species will also be found as they work their way through it.

One very large specimen has been recovered (see photo), and congratulations go to John and Bruce Stark for what must have been a mammoth effort.

There were some interesting minerals other than crocoite for sale, and some that made their way back to Ballarat included a pseudomorph of copper after a cuprite crystal from the Red Dome Mine, Queensland. It looks like a miniature version of the Russian material. Also acquired were a couple of nice US wulfenite specimens and a calcite with chalcopyrite, barite and fluorite from the Ernest Henry Mine, North Queensland.

The Zeehan Show also includes a couple of social events, the Saturday night dinner at the Heemskirk Hotel and the fireworks display. This year was no disappointment for either event and lots of fun was to be had. Looking forward to next November already.



Steve Sorrell (left) with John Cornish



“Bear” Parker



Adam Wright



Crocoite specimen from the newly-discovered pocket



Elizabeth Latham at the dinner



Ambros Kissling at the dinner



John Cornish and a very excited Marnie Pope at the dinner. Marnie. Put that man down!



Bruce Stark (right) and Evan Sorrell



John Cornish rugged up ready for a Tasmanian summer





New pocket of crocoite *in situ* underground at the Adelaide Mine



Left: Evan Sorrell with a small sample to take home.

This is the piece that was removed by Bruce Stark and John Cornish. Some feat! It measures around a metre top to bottom.

## Classifieds

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