

Mineralogical Society of Western Australia Inc.

November 2018 Newsletter

Contents

Editorial	1
Recent Activities	
Annual General Meeting, Wednesday September 12	1
Field trip, Friday September 7	3
Mineral Sale, Sunday October 14	6
Constitution meeting Wednesday October 31	6
Upcoming Meetings and Activity Days	
General Meeting Wednesday November 14	6
Miscellaneous	
42th Joint Mineralogical Societies of Australasia - seminar	7
Report on the Munich Show	8
Contacts	12

Editorial

At all meetings the Society's microscope and UV lamp are available for use by members.

We finally have our own lockable cupboard located in the Lapidary Club premises. The library is currently housed there together with some equipment. To access the books please see the Librarian, John Mill.

The policy that members may submit short advertisements free of charge will remain. Additionally, commercial advertisements will be accepted for a nominal charge.

Recent Activities

The General and Annual General Meetings of the Mineralogical Society of Western Australia Incorporated are now held at 7.30pm on the **second** Wednesday of every odd month at the WA Lapidary Club rooms located at 31, Gladstone Road, Rivervale (corner of Newey Street).

Annual General Meeting, Wednesday September 12, 2018.

At the AGM, the 2017–2018 committee members were elected unopposed. In addition, Peter Willems was elected as a new Committee member. Following the election of office-bearers,

there was considerable discussion about the draft constitution and members voted against accepting it in the current form. Voting was deferred pending further discussion.

Following the AGM and a very condensed General Meeting, Margaux Le Vaillant spoke on "Droplets and bubbles –how the formation of the supergiant Noril'sk-Talnakh nickel-platinum orebodies in Siberia connects with the greatest mass killing in Earth history".

Margaux Le Vaillant is a research scientist working with CSIRO based in Perth, Australia. Her expertise is in Geology, Ore deposits genesis and footprints, particularly magmatic nickel deposits.

Margaux began her talk with a brief introduction to one of the classical ideas of the genesis of magmatic sulphide deposits These include :

- Efficient transport of a M-UM magma all the way up to the crust without fractional crystalisation or sulfide segregation
- Assimilation of crustal S (S saturation) and segregation of a sulfide liquid, forming droplets
- Sulfide droplets mix with the silicate melt and scavenge metals
- Droplets (now enriched with metals) separate from magma and accumulate
- The process is continually repeated.

The largest mass extinction event in Earth's history marks the boundary between the Permian and Triassic Periods at circa 252 Ma and has been linked with the eruption of the basaltic Siberian Traps large igneous Province (SLIP) comprising 3 million km³ of magma erupted over 2Ma from 251 Ma onwards. A large component of this is composed of tuffs.



The Siberian Large Igneous Province (SLIP)

One of the kill mechanisms that has been suggested is a biogenic methane burst triggered by the release of vast amounts of nickel into the atmosphere.

The Noril'sk Ni-Cu-PGE sulfide deposits in northern Russia represent one of the most valuable metal concentrations on Earth and are associated with the Siberian Large Igneous Province (SLIP).

Characteristics of the Noril'sk camp intrusions are:

- Shallow intrusions
- Long but not very thick channels?
- Distributed through the sedimentary sequence
- Volatile and CI rich

The orebodies contain an abundance of globular sulfide ore textures predominantly found within the olivine cumulates that form the lower layers of the intrusions. A variant of this globular ore type, referred to as "capped globules", was interpreted as being the remnants of sulphide melt and vapor bubbles compounds now frozen in place. Flotation of sulfide liquid droplets by surface attachment to gas bubbles has been suggested as a mechanism to overcome this problem and allow introduction of Ni into the atmosphere during eruption of the SLIP lavas.

It is suggested that the Noril'sk ores were degassing while they were forming and consequent "bubble riding" by sulfide droplets in the shallow, sulfide-saturated, and exceptionally volatile and CI-rich SLIP lavas, permitted a massive release of nickel-rich volcanic gas.

This summary was compiled from Margaux's power-point presentation and from an article called "Role of degassing of the Noril'sk nickel deposits in the Permian–Triassic mass extinction event" by Margaux Le Vaillant, Stephen J. Barnes, James E. Mungall, and Emma L. Mungall. The editor has a copy of this if anybody is interested in reading further.

Field trip, Friday September 7, 2018

DeGrussa Mine Field Trip

By Lesley Daniels

On Friday 7th September thirteen members of the Mineralogical Society of WA were treated to an exceptionally good tour to the DeGrussa copper mine at the Doolgunna Project Area, owned and operated by Sandfire Resources. DeGrussa is approximately 900km north-east of Perth and is one of the Asia-Pacific region's premier, high-grade copper mines and the largest copper producer in Western Australia.

Our day started very early and in the dark as we all gathered at the Network Regional Terminal at Perth Airport for our 6am flight on a Network Aviation Fokker 100. After a pleasant flight of about 90 minutes we arrived at the DeGrussa Aerodrome. The weather changed from rainy, cold Perth to clear skies and cool for our arrival warming up to a perfect temperature for fossicking.

From the aerodrome we were taken by mini bus to the Sandfire site offices for a visitor induction and a comprehensive presentation of the regional geology for the DeGrussa mine and surrounding areas. The talk was presented by Site Geologist and Exploration Manager, Ian O'Grady, with Murray Thompson also giving another aspect of the presentation. After the very informative and detailed presentations we went to the outdoor core sample area and had a close up look at a large number of core samples. We had our group photo taken at this location.



Group photo in front of the core storage area Photo by Peter Willems

We then boarded the mini bus again and were escorted to the Open Cut Mine Pit which was part of DeGrussa's initial two year project and completed in 2013. The mine now focuses on underground mining and comprises over 38km of lateral development, allowing for the simultaneous extraction of ore from multiple faces, on multiple lenses. The mine will produce up to 300,000 tonnes of high-grade copper concentrate annually.

The DeGrussa mine is in a typical volcanogenic massive sulphide (VMS) deposit and lies within the Narracoota Volcanics, a stratigraphic unit that hosts DeGrussa, Conductor 1, 4 and 5 deposits. Spread across a strike length of 22km, Narracoota Volcanics is a two kilometre-thick sequence of volcano-sedimentary rocks. The DeGrussa deposit represents a 20m thick steeply dipping to almost vertical body of high grade copper-gold mineralisation with zinc and silver hosted in lesser amounts. The deposit stretches over a 180m lateral strike length and extends to a known vertical depth of more than 300m. Geological modelling shows the Conductor 1 deposit as a number of stacked lenses instead of one lens. The Conductor 1 deposit measures 15m in thickness and extends over a lateral strike length of 350m and is characterised by a steep 75° south-west trending dip and has a known vertical depth of 400m.



Panoramic view of the Open Pit Mine. Photo by Lesley Daniels



Sign at the Open Pit with cross-section showing DeGrussa and Conductor 1 Lode positions. Photo by Lesley Daniels

From the core area it was on the bus again to head to our first stockpile, Stockpile 10 (Gossan), to search for specimens. Everyone was finding interesting specimens and made the most of the time there with their heads down searching, examining and bagging specimens. After a good length of time here it was on to the next stockpile, Stockpile 9 (Native Copper), to collect some copper samples. By now everyone was getting hungry so it was back to the offices for lunch. We all brought lunch as instructed but Sandfire very kindly and generously put on a wonderful spread of platters for us in the Mine Training room.

Once revived and ready to go again we inspected the Sandfire mineral collection cabinet which contained specimens of virtually every mineral found on site. There were specimens of azurite, aragonite, calcite, chrysocolla, cuprite, dolomite, native copper, copper pseudomorphs, malachite, bornite, chalcopyrite, tenorite, mcguinnesite, jasper and quartz druse.

Driving to our last stockpile of the day we saw the solar panels that provide power to the mine site. Sandfire Resources is a leader in Australia using renewable energy in an off-grid mining application supplying around 20% of the annual power requirements of the mine. Covering a total area of over 20 hectares and comprising 34,080 solar panels connected to a lithium battery storage facility and to the existing diesel fired power station at DeGrussa, it is the largest integrated off-grid solar and battery storage facility in Australia and reportedly the largest in the world.

Our last stockpile for specimen collecting, Stockpile 6 (Malachite, Minor Cuprite), contained beautiful, brightly coloured chrysocolla and malachite specimens. Some of them were huge. We had a brief time here but long enough to get some interesting specimens before heading back to the offices again. It was now time to sort and weigh our specimens ensuring that we had no more than 7kg of samples each. There was a lot of bag rearranging going on to prepare our bags for the flight home. We were then driven back to the aerodrome and breathalysed, as is Sandfire's company procedures before each flight. We then boarded the aircraft for another pleasant flight back to Perth enjoying more of the beautiful outback colours on the way.



Collecting specimens at Stockpile 10 (Gossan) Photos by Peter Willems

It was a very successful trip for everyone as we all collected some wonderful specimens and I'm sure we all learnt something new after the generosity of Sandfire Resources in presenting us with a very enjoyable and educational day. Thank you very much to Sandfire Resources and all the organisers who made this field trip possible.

It is possible that this article by Lesley will be reproduced in first issue of the AJM for 2019. The AJM Editorial Committee would like to add a few photographs of mineral specimens obtained during the visit; if you have a great photo contact either the editor or Angela.

Mineral Sale Sunday October 14, 2018

The Mineral Market went well. There were 11 members selling mineral specimens, jewellery, cut and polished gemstones and opals as well as copies of the Australian Journal of Mineralogy. Another 5 members attended as well as 48 adult visitors and several children. One little boy brought along a box of specimens to be identified and was ably assisted by Geert Buters who showed him how to use our microscope.

Constitution meeting Wednesday October 31, 2018

A meeting to discuss the draft constitution took place on Wednesday October 31st at the Lapidary Club hall. Thirteen members attended. General (although not unanimous) agreement was reached on rewording of the draft constitution to address concerns raised by members including concerns with aspects of the current constitution that were brought into the draft. As there was insufficient time (14 days needed) to advertise a Special General meeting for November 14th and circulate a revised draft to members prior to the meeting for a vote, it was decided that the January meeting would be the special general meeting for a vote on the constitution

Upcoming Meetings and Activity Days

General meeting Wednesday November 14, 2018

Following the meeting Jason Bennett will talk on "Teasing apart the cassiterite multi-tool".

In 2011, Jason completed an Honours Thesis in experimental petrology examining the effects of Ni and Cu on the Sulfur Content at Sulfide Saturation of Basaltic Magmas at the

Research School of Earth Sciences (ANU). In 2012 he moved to Perth to join the BHP Billiton Graduate Program, where he worked in both exploration and mine geology roles in Iron Ore in the Pilbara. In 2015, Jason joined the Centre for Exploration Targeting at UWA to start a PhD on the use of cassiterite as a multiprocess recorder of Sn-bearing mineral systems. Jason has been a member of the Mineralogical Society of Western Australia since coming to Perth in 2012.

Cassiterite (SnO₂) is ubiquitous in many mineralising systems related to highly fractionated reduced granitic magmas, including the metals W, Mo, Li, Nb, Ta and In which are deemed 'Critical Metals' for 21st Century technology. In order to find more exploitable deposits for these resources, we need to develop more detailed and nuanced models that can describe how and why the existing known deposits are where they are. As cassiterite is a direct product of the mineralising event in many cases, changes in the chemical and isotopic signatures recorded during growth might be of use to develop a sort of 'timeline of events' during the formation of the deposit. In this talk, I will present a summary of some of the work I have done during my PhD thesis, a few key findings, and where I hope to take this research in the future.

Miscellaneous

42th Joint Mineralogical Societies of Australasia - seminar update

EVENT	Date	Venue	Cost
Micromount session	Friday 30 August	WA Lapidary Club –	\$5.00/table
		Rivervale	Bring your own lunch
Crystal Universe –	Friday 30 August –	Crystal Universe -	Sponsored
Welcome to Perth	evening	Subiaco	
Seminar Day 1	Saturday 31 august	State Library, Perth	See below
		Cultural Centre	
Conference dinner -	Saturday 31 August	ТВС	Around \$60
with auction			Donations for auction are
			welcome
Seminar Day 2	Sunday 1 September	State Library, Perth	See below
		Cultural Centre	
Evening function	Sunday 1 September	MinSocWA Patron	Sponsored
		Mark Creasy venue	
Swap and Sell	Monday 2	WA Lapidary Club –	\$5.00/table
	September	Rivervale	Gold coin for tea/coffee
			Lunch sponsored (Allan Hart)
Field trip	Tuesday 3	Murchison Mineral	Self-drive, with some
	September start	Field	accommodation provided.
	Length around 7-10	Negotiations in	Details and itinerary TBC;
	days	progress with	may require entry payments
		tenement holders	to some sites.

Planning for the 42nd seminar *Traps in mineralogy* – *pseudomorphs, look-alike, fakes and synthetics* to be held in Perth in 2019 is well underway. **Events** confirmed include:

Costs to attend the seminar:

Early bird – MinSoc members – closes 28 February 2019	\$135		
Early bird – Non-members– closes 28 February 2019	\$170		
MinSoc members (and like-societies)	\$150		
Non-members	\$185		
Students	\$75		
Registrations via TryBooking will open in late November on our			
website <u>http://minsocwa.org.au/</u>			

Registration costs (but not conference dinner) will be waived for speakers – email <u>lee_notebook@msn.com</u> if you are interested in presenting a talk related to the seminar topic.

A mineral photo competition is being coordinated by John Mill, with 3 main categories:

- Category 1 subject less than 5 mm
- Category 2 subject between 5 and 30 mm
- Category 3 subject greater than 30 mm

Digital entries to be submitted by 30 June 2019.

Detailed guidelines are being finalized and will be posted on the website http://minsocwa.org.au/.

The Munich Show

John Mill submitted the following report on the 2018 Munich Show.

Report on the Munich Show (Mineralientage München) - 2018

The Munich Show is an annual event at the huge Munich Trade Fair Centre, Munich held in late October. This year's show was open between Friday 25th – Sunday 27th October. Friday is traditionally a 'Trade Day' with Saturday and Sunday being retail days and open to the general public. I was lucky enough to attend all three days of the show.

The Munich Show is the second largest mineral show in the world, second only to Tucson, Arizona. It is quite different in format to Tucson in that it runs for 3 days whereas Tucson runs for 2 weeks and is spread far and wide over the city of Tucson. Many mineral dealers attend both shows.

Now the Munich Fair site is huge consisting of 16 pavilions serviced by a freeway and 2 underground stations. The Mineral Fair occupied 5 pavilions shown at the lower right hand side of figure 1.



Figure 1. Aerial view of the Munich Trade Fair Centre.

The Fair consists of four main categories: minerals, fossils, gemstones and jewellery. Generally the exhibitors are clustered in their individual categories but there was some overlap especially between minerals and fossils.

There were very few Australian exhibitors present; a few opal dealers staffed by German speaking assistants and Rob Sieleki who teamed up with Crystal Classics.



Figure 2. Display on an opal dealers stand.

The main dealers were congregated in a central area of the main hall. These included Crystal Classics (Ian and Dianna Bruce), The Arkenstone (Rob Lavinski), Weinrich Minerals (Dan Weinrich), and Kristalle (Wayne Leicht) and many others. These were surrounded by other well known dealers who were in turn surrounded by dealers from India, Morocco and China.

Some of the main dealers had spectacular displays of specimens which totalled into the millions of dollars. I was accompanied by Paul Melville and his partner Trish for some of my time at the show. Paul's opinion was that prices were quite high and much higher than the previous year but many exhibitors told me that sales were going quite well.



Figure 3. One of Rob Lavinski's display cabinets. The rhodochrosite central to the display has a 6 figure price tag.



Figure 4. Another attractive display of high priced minerals.

Indian exhibitors were there in force with the usual excellent displays of zeolite minerals. I was told that the quarries at Wagholi are now closed and as such the flow of cavensite and pentagonite has ceased, at least for now. There has been an excellent find of scolecite with huge radiating crystal balls being extracted from large vughs.



Figure 5. Large scolecite specimen – out of my price range.

Morocco dealers were also there in force with mixed fossil and mineral exhibits. Popular minerals include the usual specimens including blue barite, vanadanite, cerussite, native silver, azurite and more.

There was a lack of quality Congolese specimens but some dealers had a wide variety of malachite, much of it bruised and damaged.



Figure 6. Bruised and otherwise damaged malachite.

There were many activities for kids including this one where small children are encouraged to sieve sand for some sort of reward – probably gold nuggets.



Figure 7. Treasure Hunters.

So that's it from this year's show. Until next year watch out for Pterodactyls.



Figure 8. Thank goodness it's only a fossil!

Contacts

The Committee for 2018/2019 is shown below.

President	Stewart Cole	0414904169
Vice President	Sue Koepke	0417990688
Secretary/Treasurer	Lee Hassan	93975197
Field Trip Leader	Rodney Berrell	0407081025
Committee Member/	Vernon Stocklmayer	92919043
Newsletter Editor		
Committee Member	Angela Riganti	92437472
Committee Member	Peter Willems	0467040409