Mineralogical Society of Western Australia Inc.



NEWSLETTER
Quarter 2, 2022

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over page: Epidote crystals.

Mineralogical Society of WA Inc.
Meetings held at the WA Lapidary & Rockhunting Club rooms
31 Gladstone Road, Rivervale (corner of Newey Street)
Registered Society No. A1009304P

To encourage mineralogical study by amateur and professional alike and, in so doing, discover, document and preserve the Earth's and in particular Western Australia's natural history.

EDITORIAL

Welcome to the Q2 2022 newsletter.

A lot of you have put a bunch of effort into these newsletters and I want to take this opportunity to thank the contributors to the newsletter. It makes my life a lot easier and provides richer content – so lots of thanks.

National volunteer week happens every year in mid-May and celebrates the work that Australian Volunteers do.

Perth Gem and Mineral show looks set to be another amazing rock fest. The organising committee are currently on the lookout for volunteers to help during the three-day show. Also get you thinking hats on in case you have something that can be donated for the charity auction.

In the upcoming events, please note the July talk, an additional talk in August (at the ChemCentre in Bentley), and the shifting of the September meeting to a week earlier. The September meeting is now going to take place on 7 September at the Lapidary Club and will include our AGM. Please consider nominating for the Committee or putting your hand up to assist in any way you can to make the Committee job easier.

Thank you to all that have already renewed their membership … if you haven't done so yet, details are in the Newsletter.

All the best

Rod

Newsletter Editor

SCHOOL OF ROCK - DR ROBERT MADDEN

Dr Robert Madden is an avid science communicator writing small geology vignettes, geology stories and educational resources on his social media account "School of Rock".

This segment of our newsletter shares some of Dr Madden's incredibly interestingarticles and photos.

You can follow Robert's 'School of Rock' for more geoscience content onInstagram @drrhcmadden.

Robert typically only writes about specimens he has in his collection and takes all his own specimen photos.

Bohemian rhapsody

In geology speak, a massif is a section of the crust that is bounded by faults and flexures. The massif is displaced as a whole, retaining its internal structures. In eastern Czechia and Southwestern Poland is the Bohemian Massif, the eastern end of crustal deformation in Europe called the Variscan belt. The Variscan Orogeny was a major phase of mountain building that occurred ~380-280 million years ago due to the accretion of terranes during the collision of Gondwana and Laurasia that created the supercontinent Pangea.

The Variscan Orogeny resulted in extensive metamorphism from low-grade greenschist facies through to mid-amphibolite facies in what is now the eastern Czech Republic. This newsletter focuses on an amphibolite facies garnet–staurolite–mica schist from Nový Malin in the Czech Republic. This area has a complex tectonic and metamorphic history but the metamorphic conditions this rock represents are roughly 540-570 °C and up to 5 kb of pressure. Radiometric dating of isotopes contained in the muscovite, staurolite and garnet reveal a metamorphic age of 316 to 240 million years, with a likely Devonian aged pelitic (muddy sediment) protolith. The metamorphic age extends past the end of the Variscan orogeny due to thermal overprinting by younger igneous intrusions. In short Devonian muds got smashed by a mountain building episode and then carried on getting cooked giving us a different take on a bohemian rhapsody.

SOCIETY ACTIVITIES

MAY TALK - The unique mineralogy of Australian meteorite impact craters

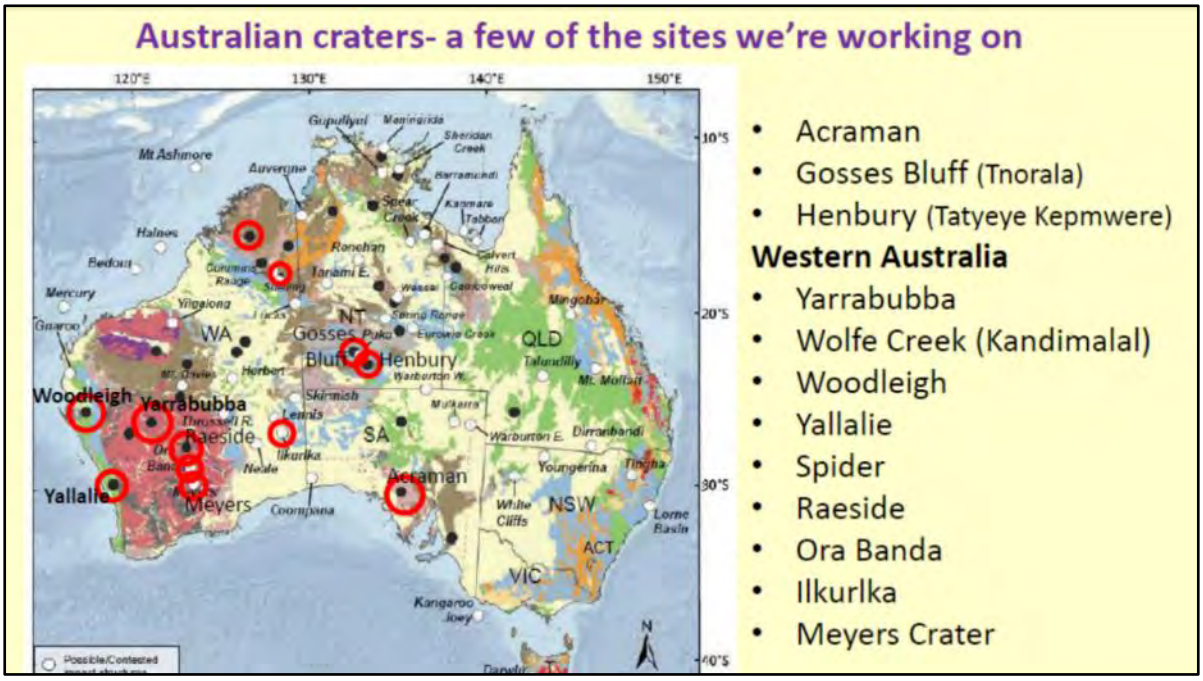
Talk by Professor Aaron J. Cavosie – 11 May 2022

Summarised in the newsletter by Niels Dahl

On the 11th of May Professor Aaron J. Cavosie from Curtin University presented interesting facts about impact craters in Australia, focusing on those from Western Australia. What is an impact crater? How do we recognise it? How can it be proven (certified)?

Everywhere in the universe, meteors impact on stars and planets; in fact, planets are the results of impacts. Meteors may cause major disruption to the development of the impacted body or to its climate, e.g. our Moon is considered to be the result of an impact on Earth by another planet-sized body at the beginning of the life of our solar system.

Throughout its life, Earth has suffered from major impacts which may have even changed its climate for a period. In the development of Earth's stratigraphy through time earth scientists have recognised abrupt changes that might be related to meteor strikes. The most famous is the impact that completed the extermination of the dinosaurs (except for the birds) about 65 million years ago. Other big impacts have been felt deep in the continental crust (Vredevort Dome in South Africa) or through continental crust to the mantle (Sudbury in Canada) — both of these are associated with the formation of significant economic resources. Worldwide, only 200 impact craters have been confirmed; of these, 31 are in Australia with 14 in Western Australia.



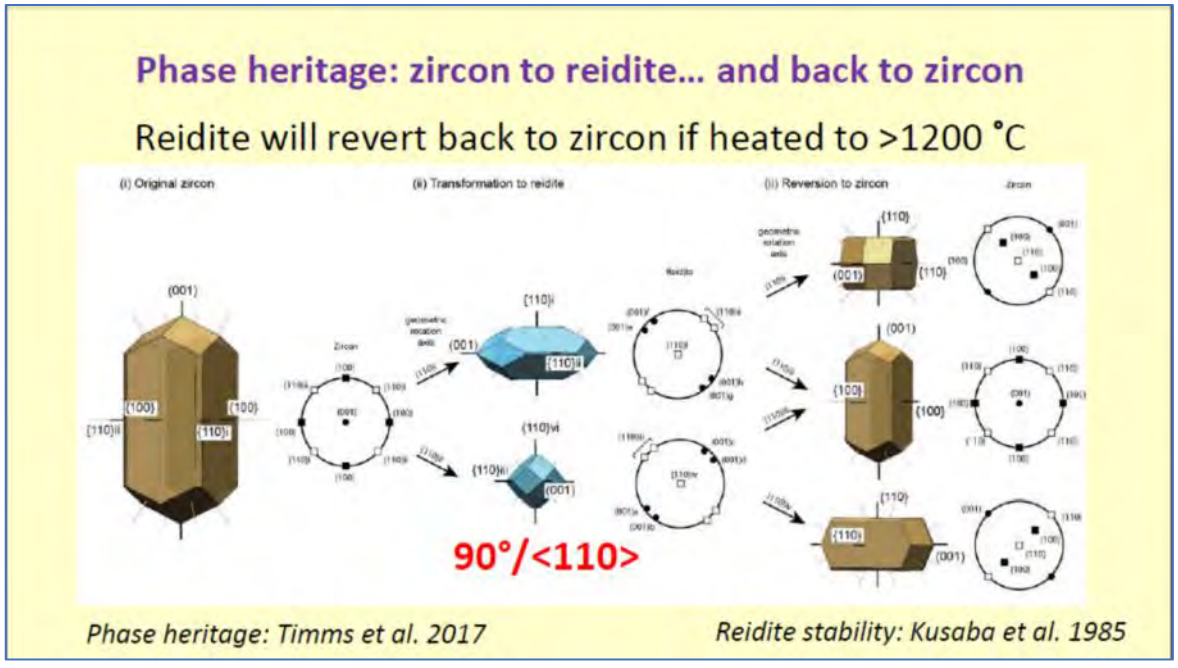
The Yarrabubba impact crater in the northwestern part of the Yilgarn Craton of Western Australia is 30 to 70 km in diameter and is the oldest confirmed impact crater on Earth at 2.23 ± 5 Ma. It might have ended the Huronian Ice Age (Snowball Earth) because no Paleoproterozoic glacial activity on Earth seems to have taken place after this impact. The possibly largest confirmed impact crater in Western Australia is the Woodleigh Crater, located east of Shark Bay. Its diameter has been variously estimated to be between 60 km and 120 km. It has an age of 364 ± 8 Ma and may have caused the recognised late Devonian mass extinction. Other large, confirmed craters in Western Australia are the Spider Crater in the

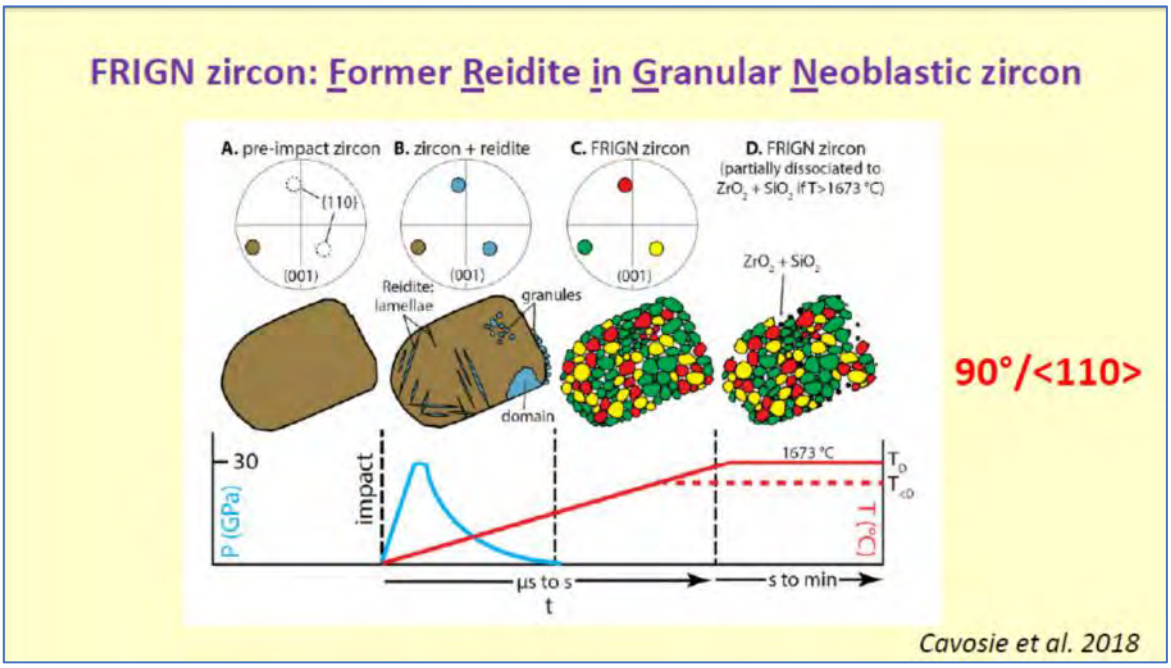
Kimberley (13 km in diameter) and the buried Yallalie Crater at Gingin (12 km in diameter). In comparison, the Wolf Creek Crater south of Halls Creek is only 800 m in diameter.

How do we recognise and verify an impact crater? Generally, an impact crater develops a small cupola in its centre and a ring of soil and/or molten rock around it. These features can vary from tens of metres to many kilometres in diameter. Volcanoes after big eruptions often present similar characteristics, so these are not sufficient evidence for a crater to be called an impact crater. To have an impact crater verified we need to confirm the presence of meso- and micro-structures that develop by pressure shock in impacted rocks — such as shatter cones and micro-fractures, twinning and change of crystal lattice in minerals that can only be explained by such an event. Enrichments of siderophile elements (Co, Cr, Fe, Ir, Ni, Os) on the surface of the Earth with isotope compositions different from the isotope compositions on Earth may also occur at impact sites. The remelting of the rock at a suspected impact crater in association with the above features assists in the certification of the impact site.

Impact melts and shatter cones can be studied in hand specimens, but shocked minerals most often need to be studied by scanning electron microscope (SEM) and electron back scatter diffraction (EBSD) for verification of their shocked state. Apatite, baddeleyite, cristobalite, magnetite, monazite, titanite, xenotime and zircon were mentioned as having been studied for shock-induced microstructures when possible. In particular zircon was discussed.

Impacted tetragonal zircon will develop parallel micro-fractures, along which the high-pressure and high-temperature mineral reidite develops. Reidite has the same composition of zircon but with a denser tetragonal lattice (scheelite structure). Within the mother zircon grain, reidite develops a lattice with three different orientations to the zircon lattice; during cooling reidite reverts to zircon at 1200° C showing micro-sized zircon with new orientations within the limit of the original grain. The presence of kaleidoscopic zircon grains in a rock due to reidite formation and its reversion to zircon is a tell-tale sign of a past meteor impact at that site. Reidite may also form along the edges of a zircon grain. The acronym aptly used for these grains is ‘FRIGN zircon’, which stands for ‘Former Reidite In Granular Neoblastic zircon’.

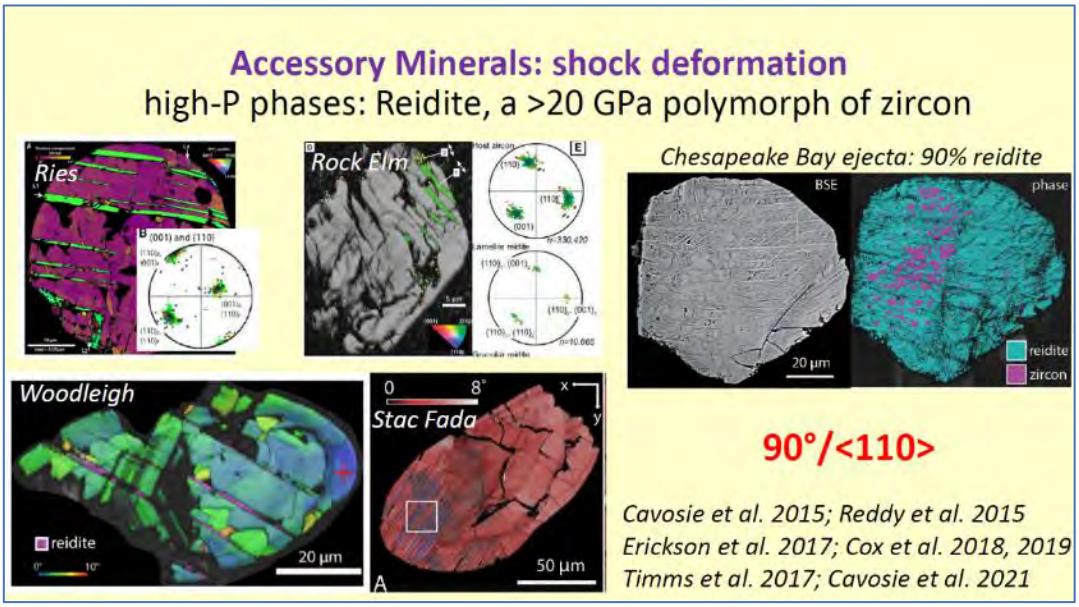




Impacted monoclinic monazite forms twins with tetragonal high-pressure polymorphs of the mother grain, but when reverting to monoclinic monazite, it too shows several lattice directions instead of reverting to the single crystal that was the mother grain.
Coesite is a high-pressure form of silica dioxide developed from quartz and cristobalite and may be found at impact craters.

The speed of these processes is measured in milliseconds for the penetration of the shock wave and in seconds for the reversion of the high-pressure forms of the minerals to their low-pressure forms, which by this process will have attained changed mineral lattice orientations.

In summary, to confirm the presence of an impact crater, high pressure meso- and micro-features as described above must be present at the studied site, apart from a recognisable macro-structure in both or in either of the geological and geophysical expressions of the impact site. The wonderful examples of shatter cones and slides demonstrating transformed mineral grains brought along by Aaron Cavosie were enjoyed by all.



Mineral Market – 10 May 2022

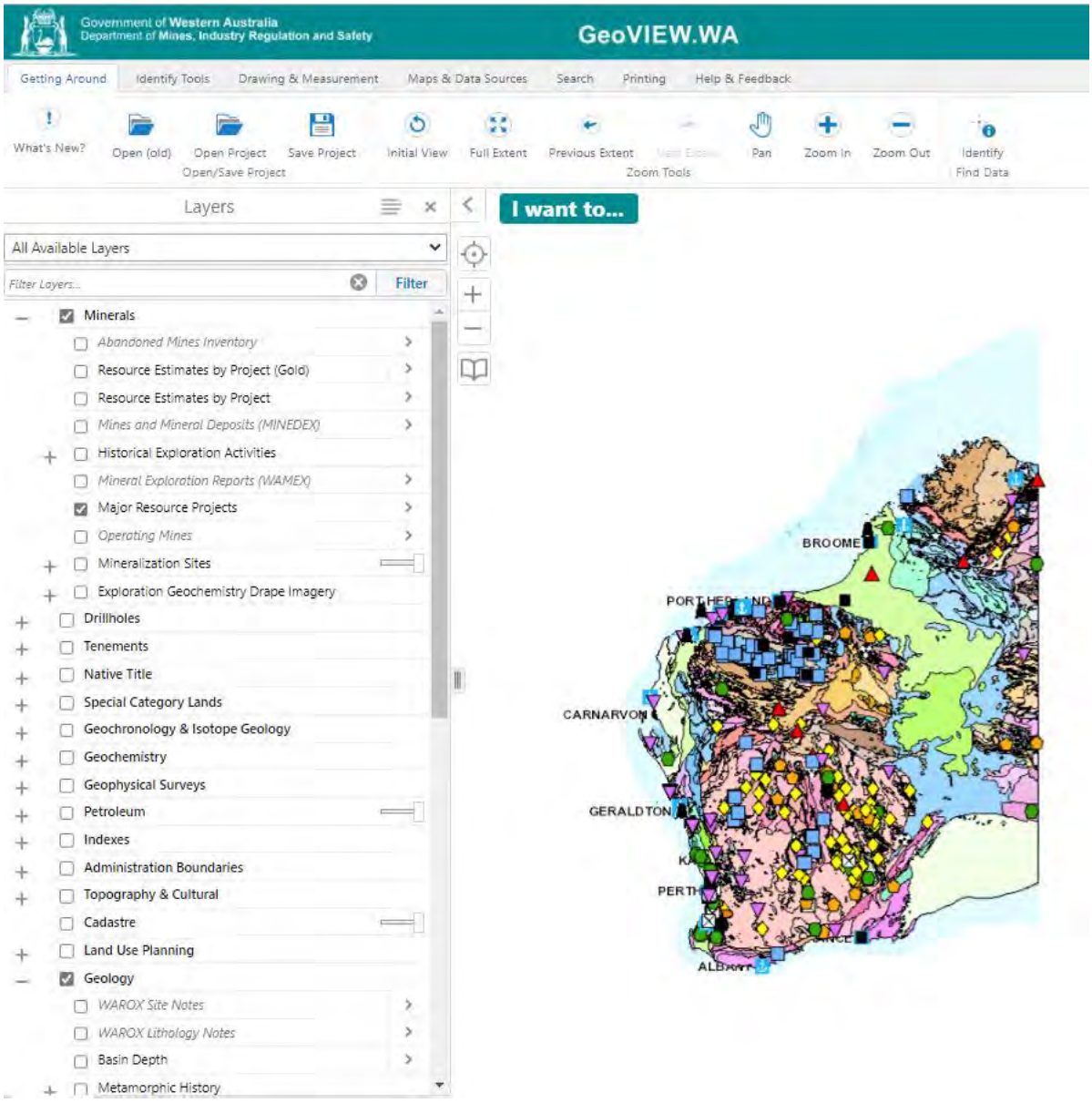
A Mineral Market was held by the Mineralogical Society of Western Australia on the 8th of May 2022.

The photos below, by Allan Hart, show the vendors setting up their tables, and some of the fares on offer.

Introduction to GeoVIEW activity, 25 June 2022

Angela Riganti and Wendy Hampton introduced a few of our members to the wealth of geological and mineral information that is available for free in GeoVIEW. WA.

GeoVIEW.WA is the Geological Survey of Western Australia's online GIS-based mapping tool that allows users to view, query and map various geoscientific and resource information. The datasets are updated on a regular basis. Users can construct and print a customised geological map and incorporate other mineral and petroleum exploration datasets including mines and mineral deposits, petroleum wells, and active leases.



USEFUL TIPS - Cleaning specimens at home by irrigation

By Susan Stocklmayer

- To keep the plastic filter basket of the salt-water swimming pool in position, an unprepared specimen of DeGrussa secondary copper ore was placed at the base as ballast.
- After a few days, of which only about 12 hours would have had a flow of water, it was a surprise to see the specimen now showing the vivid green and blue-green colours of secondary copper minerals resulting from the irrigation process of flowing pool water.
- The images below show one specimen before treatment (LHS) with radially developed malachite and after treatment (RHS) with bright green-blue specimen displaying extensive botryoidal chrysocolla.
- This small and informal trial has shown that the cleaning processes of irrigation have removed surface dust and loose particles without the use of brushes that potentially could damage soft minerals and disrupt crystals in cavities. Although the pH of the water was not tested, the extensive malachite shown in one example indicates that it was not damaging to the carbonate mineral.

Hand specimen from DeGrussa – secondary copper minerals.
LHS before treatment RHS after irrigation treatment

Two specimens from DeGrussa copper mine WA shown after irrigation treatment.
Malachite and chrysocolla well developed.

SIMPSON PROJECT UPDATE

A quote from the MinSocWA newsletter Volume 1, Number 1, September 2000.

"In common with the other State Mineralogical Societies, Western Australia has adopted a set of Objectives that includes "to establish and maintain a register of mineral species and their occurrences".

This statement underlies the Simpson Project we launched mid-2020; it has taken the Society time to begin the collaborative work and we have been working to attract members from all Mineralogical Societies of Australia and New Zealand as well as extending the invitation to all interested geoscientists to participate and work with us from wherever.

Project update June 2022

Progress on the project has been reported steadily through our newsletters and within the past year two meetings have been held for those members who have contributed drafts.

Work continues, at a slow pace. To date, preliminary write-ups have been completed for 86 minerals with the principal contributor having completed 55 drafts. Total number of minerals reserved is 177 by 18 members.

Samples of draft contributions have been part of an editing process and at the rate of current contributions it has become apparent that the scope of the project will need to be reviewed so as to concentrate on editing, standardisation of content and how best to present the completed writeups.

The list of WA minerals that we have has grown from 300 one year ago to approximately 405 at present. The reason for the approximate total number is the need to remove those minerals that have been renamed or remain unidentified. The WA mineral list can be emailed to you or searched from our website and a valuable contribution all members can make would be to read through the list and, if you are aware of additional minerals, please send in the information with the literature reference to: - simpsonwa@minsocwa.org.au.

John Haupt recently shared several images of WA minerals in the newsletter from the Victoria Mineralogical Society. Viewing these reminds us of the beauty of the microworld in mineralogy. The image on the left, with 1mm field of view, is tentatively identified as wadeite and is from the Walgidee Hills, Kimberley where several rare minerals are noted.

Susan Stocklmayer

PERTH GEM AND MINERAL SHOW - UPDATE

Preparations for PGMS are going ahead with gusto.

It will be held again at the Curtin Stadium on **14–16 October 2022**, and it will again showcase many of the wonders that the mineral, gem and geoscience communities have to offer, with a special focus on Western Australia's mineral heritage and gold in particular.

We are continuing to add many excellent sponsors to our show, as well as a variety of new and exciting vendors.

If you have already put in your application - we look forward to seeing you and thank you for your participation.

If not … Applications close on the 30th of September 2022 – please book soon to secure your spot – Well over 100 tables have already been sold!

Check the PGMS Vendor or Exhibitor Prospectus 2022 to find out how to book a table, be a sponsor, help as a volunteer, or contribute to the charity auction. Please be generous with your time and consider contributing a specimen to the auction!

You can also apply online via our PGMS webpage and follow us on Instagram, Facebook and LinkedIn.

For further inquiries please contact us at PGMS@minsocwa.org.au

PGMS Organising Committee

perth_gem_mineral_show
fb.me/PerthGemMineralShow
PGMS@minsocwa.org.au
www.minsocwa.org.au/pgms

Can you help with/at the MinSocWA table?

MinSocWA will again have its own space at the PGMS, and we are looking for people to help manning the microscopes and address enquiries from the public.

If you have surplus books or journals that are free to a good home, consider making them available at the MinSoc table.

Equally, we'd like to be able to gift some mineral specimens to help young collectors along the way to become mineral enthusiasts, so please peruse your drawers or those old boxes from a long-ago trip that are just gathering dust in the shed and consider donating some specimens to send our youngest PGMS visitors home with an extra smile!

NB please don't forget to provide a location; we do want to teach best practises!

Thank you in advance!

LIBRARY

The Society receiver the following two journals:

1. Rocks and Minerals Vol. 97 No. 3
2. The Mineralogical Record November – December 2021 Volume 52, Number 6


Beryllium Minerals

in New Hampshire

DONALD DALLAIRE
829 Candia Road
Chester, New Hampshire 03036
dadallaire@hotmail.com

Of all the rare elements, beryllium is the most widespread in granitic pegmatites

(Černý 2002). Beryl is a beryllium aluminum silicate, $Be_3Al_2Si_6O_{18}$, containing approximately 5.3 weight percent beryllium in ideal beryl with slightly less in common beryl, a sufficient concentration for beryl to be considered an ore of the metal. Beryllium metal is light and strong, and its alloys are used in the aerospace, automotive, computer, defense, medical, and other modern industries. Because of its use in the defense industry, it was classified as a

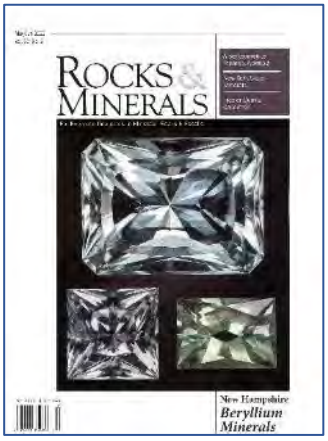
Figure 1. View of Moat Mountain looking west across Saco River in Conway. Collecting areas are mostly in the area approximately left of center to the ledges seen on right slope one-third up from base of the mountain. Localities on Moat Mountain are in the towns of Albany, Hales Location, and Bartlett.

Figure 2. Three gems faceted from New Hampshire beryl. *Top:* Light blue beryl, 12.7 carats, from the Palermo No. 1 mine in Groton. *Lower left:* Light blue beryl, 6.38 carats, modified French cut faceted by Donald Dallaire, from the Fletcher mine in Groton. *Lower right:* Light green 2.56-carat E-Z cut rectangle faceted by Donald Dallaire, from the Island mine in Alstead. Donald Dallaire specimens, Mark Mauthner photo.

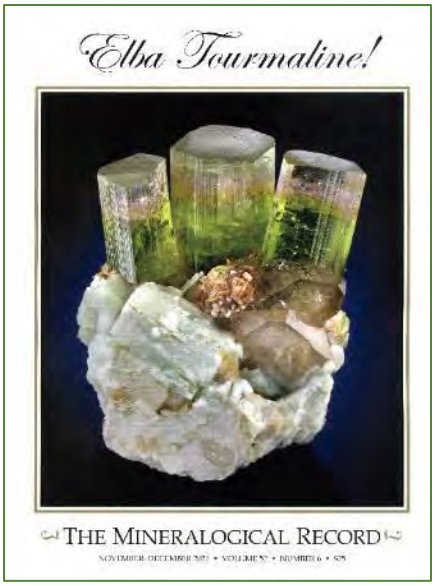
Donald Dallaire is a member of the board of trustees of the Maine Mineral & Gem Museum in Bethel. He has been collecting minerals since 1971 and specializes in apatite and New Hampshire minerals.

208 ROCKS & MINERALS

Rocks and Minerals Vol. 97, No. 3 concentrates on New Hampshire beryllium minerals which occur in pegmatites throughout the state of New Hampshire. The article also references 22 other beryllium containing minerals that are also associated with the pegmatites. There are subsidiary articles on arsentsumebite by Malcolm Southwood, Mineralogy of the Dafoe Property, New York by Michael R Walter and George Robinson and an article on Strange Scepter Quartz from the Lyndhurst Area, Ontario, Canada by Inna Lykova, John Montgomery and John Biczok. There is also an article on the amazing quartz collection of Ann and Si Frazier which will be featured in the East Coast Show in West Springfield, Massachusetts later this year.



As usual all articles are illustrated with beautiful photographs sketches and diagrams.



The Mineralogical Record Vol. 52, No. 6 contains a feature article on The History of Tourmaline from the Island of Elba by Federico Pezzotta. On the island of Elba, multicoloured tourmalines occur in miarolitic cavities in the pegmatite veins distributed along the eastern margin of the Monte Capanne monzogranite pluton. While the monzogranite has been mined for over 2000 years, the presence of multicoloured tourmalines was first noted in 1784 and mining of these unique specimens continues to this day using sophisticated mining techniques. The article includes intriguing sketches of historic specimens and collectors and excellent photographs of modern specimens. There are also subsidiary articles on Thumbnail Collectors in China by S. Yu and Gold and Silver Ingots! Bars of History by W, Wilson. As usual, at the rear of this volume, there is a What's New in Minerals section by Tom Moore.

John Mill

ONLINE RESOURCES –

Minerals Day Career Videos

MSA recorded a series of videos on careers in the geosciences on Minerals Day 2021 (Oct. 11) and throughout Earth Science Week. These are now available on the MSA YouTube Channel. The careers include forensic geoscience (FBI Labs), gemmology, mining and aggregate, environmental consulting, gem and mineral museum curation, glass and ceramics research and development, mineral collecting, working as a scientist for NASA and being a rotator at the National Science Foundation.

Thanks to Ken Ireland for the notice above.

Heading off to Spain?

Now that our borders are open, for anyone heading off to Spain, here's a not-to-be-missed mineralogical locality to be visited.

Inside the world's largest crystal 'cave' - BBC Reel

UPCOMING EVENTS – TALKS

July talk - The mineral EPIDOTE - Wednesday 13 July 2022, 7.30pm

by Craig Bosel — B.Sc. (Honours Geology), MinSocWA Vice-President

I've been collecting mineral specimens on and off since age 8 but it was only a few years ago that I took the advice to lay aside the idea of collecting 'a bit of everything pretty' and instead specialise in one mineral. Long story short, I chose the relatively common (and inexpensive) rock-forming mineral epidote. With reference to examples in my collection, this talk will cover what I've learnt about epidote since then, and specifically cover some of the great aesthetic epidote specimen locations of Australia and the world, namely Mitchell Plateau and Harts Range in Australia, Green Monster Mountain in Alaska, the Lefkopetra skarn in Greece and the Ras Koh Mountains in Pakistan. A light-hearted talk with lots of photos guaranteed and a bit of mineralogy thrown in for good measure.

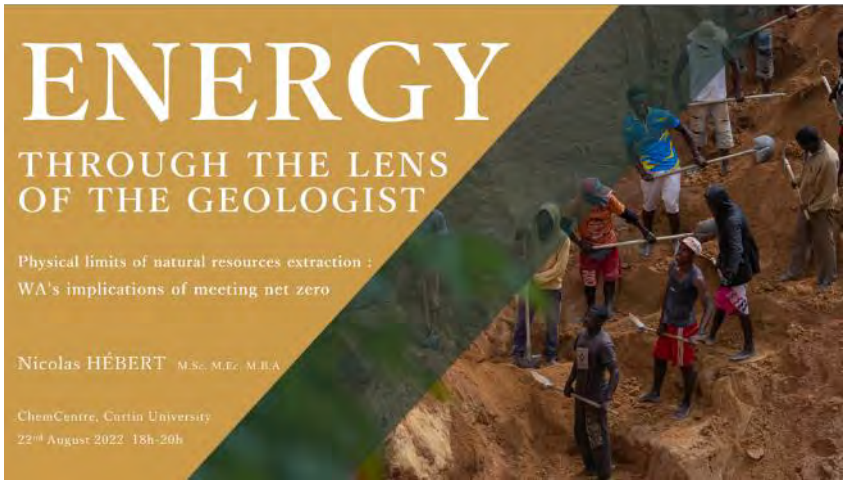


About the speaker

Craig Bosel is a retired geologist (1982-2020) and long-time mineral collector who has been a member of the Mineralogical Society of Western Australia since 2008 and is the current Vice President. Graduating from Otago University in the country of his birth, employment in the mining industry has taken him to Fiji, Queensland, New Zealand, Northern Territory and Western Australia, working in commodities such as gold, iron ore, lead, diamonds, manganese and nickel. Part-time rideshare driving now keeps him busy most mornings, taking FIFO folk to the airport after nineteen years of being taken himself.

August talk – Energy and climate through the lens of a geologist Monday 22 August 2022, 6 – 8 pm

by Nicolas Herbert — MSc. M Econ M.B.A
MinSocWA PGMS Committee member



Energy has become so present in every aspect of our life that we nearly forgot what it is and where it comes from.

More than just a bill, counting energy enables tracking a physical quantity linked to transformation of the world around us.

Machines and engines have enabled mankind to free time to (among others) undertake PhD in mineralogy, attend conferences, travel across long distances for field trips to collect specimens from bigger holes in the ground than what our ancestors were capable of digging.

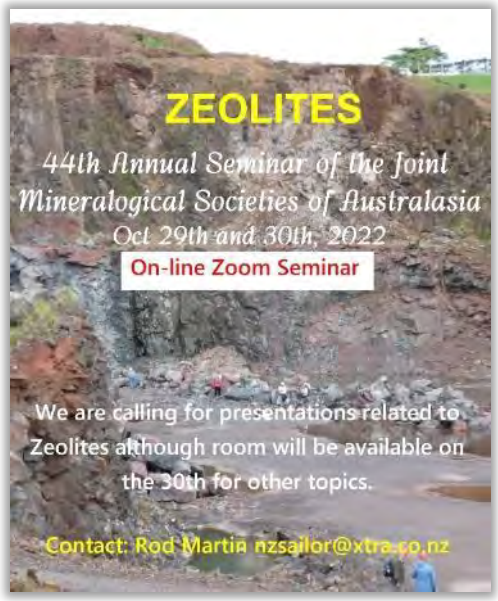
Yet, our current use of fossil energy isn't without negative impact, and questions about the depletion of finite stock of resources, and subsequent peaks need answering.

Exploring Kaya's equation, this talk invites attendees to reflect on the energetic, demographic, economic growth we've been living in to draw conclusions on the future of (the mineralogical) society, as the Earth's diameter remains the same.

This 2-hours journey across different mining practices starts by assessing the energy profile of an WA fossicker, benchmarking against artisanal small-scale miners in gem-producing areas, to eventually provide answers about the future of prospecting and mineral collecting in 2050.

AGM – Please note change of date to Wednesday, 7 September 2022

Do consider nominating!



44th Joint Seminar of the Mineralogical Societies of Australasia – October 29-30

As in the past two years, we will try to secure a venue for those interested to gather together in Perth for this virtual seminar from across the Tasman Sea. Stay tuned!

NEW MEMBERS, MEMBERSHIP AND MEETINGS

The Mineralogical Society of WA would like to welcome the following new members:

- Margaret Beal,
- Philippa Jahn,
- Leonie Rennie
- Ella and Peggie Reindler

Roberta Neame

David Phillis

All members are asked to ensure that all your contact details are up to date with the Secretary. If you change your email address or phone number, please let us know so that you continue to receiveall MinSocWA communications. Membership forms can be downloaded from the MinSocWA web page here: www.minsocwa.org.au/membership.

2022 – 2023 Membership renewals

Membership of the Mineralogical Society (MinSocWA) is open to anyone with an interest in minerals, mineralogy, fossils, gems, geology and related topics. Amateurs and earth science professionals alike are welcome, as are students, junior members and simply anyone with a desire to learn more about minerals — _no prior knowledge of mineralogy is required. Membership must be ratified by the Committee.

If you have not yet renewed for the financial year 2022-2023, a reminder that you'll receive an early-bird discount of $5 for an ordinary membership and a $10 for a spousal membership if you pay before midnight on 30 June 2022.
Normal rates (see below) will apply from the 1st of July and are as follows:

- • Ordinary $35.00
- • Junior $15.00
- • Spousal: $ 60.00 per couple (does not include children). If your spouse is already a current financial member, additional membership fee is $25.00.

Notes — Membership year is 1 July to 30 June. If you joined after 1st January 2022, your membership already extends to 30 June 2023.

Pay your annual renewal fee to the Commonwealth Bank:

Account Mineralogical Society of WA Inc.
BSB 066 124
Account 10168786

Do not forget to put YOUR NAME and CONTACT DETAILS in the transaction reference.

If you have paid the full amount before 30 June 2022 and would like a refund, please contact John Mill at treasurer@minsocwa.org.au

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Meetings - Meetings of the Mineralogical Society of Western Australia Incorporated are usually held from **6.30pm on the second Wednesday of every odd month** at the WA Lapidary & Rock hunting Club rooms at 31 Gladstone Road, Rivervale (corner of Newey Street). A Show & Tell, refreshment and socializing are followed by a talk starting around 7.30 pm.

The Society's microscopes, UV lamp and refractometer are available for use by members.

COMMITTEE MEMBERS FOR 2021/2022

President	Peter Willems	president@minsocwa.org.au
Vice President	Craig Bosel	
Secretary	Angela Riganti	secretary@minsocwa.org.au
Treasurer	John Mill	treasurer@minsocwa.org.au
Field Trip Leader	Vacant	fieldtrips@minsocwa.org.au
Newsletter Editor	Rodney Berrell	newsletter@minsocwa.org.au
Committee Member	Kylie Matonia	
Committee Member	Niels Dahl	stormpfan@gmail.com
Committee Member	James Sherborne	jamessherborne@hotmail.com

Patron - *Mark Creasy*

MinSoc WA LINKS

Web: http://www.minsocwa.org.au
Facebook Group: https://www.facebook.com/groups/minsocwa
Facebook Page: https://www.facebook.com/MINSOCWA
Instagram: https://www.instagram.com/MINSOCWA
YouTube Channel: https://www.youtube.com/channel/UC0S2TFVFIBLU-2zlEzE5VNA

ADVERTISING

The Australian Journal of Mineralogy

www.ajmin.org.au

The Australian Journal of Mineralogy now has its own website. It lists all the issues of the journal, and visitors can use the site to pay for subscriptions or purchase past issues. There is a free index,and a PDF of the now out-of-print V1.1, also free of charge. It has photo galleries, a mineral events calendar, handy links, and more. Below is the next issue, hot off the press!

Australian Journal of Mineralogy

Volume 23 | Number 1 | 2022 | A$17.50

A joint publication of the State Mineralogical Societies in Australia

Contents

Featured articles

Other items

Society News

Cover photograph

Minyulite pseudocubic crystal, 1 mm in width, from Tom's quarry, North Mount Lofty Ranges, South Australia. Photo Peter Elliott.

Cover and contents of Volume 23, Number 1, 2022

Dinosaurs of Patagonia

Perth Gem and Mineral Show

CSIRO Discovery Innovation Minerals Exploration Seminar

https://events.csiro.au/Events/2021/November/5/DIME-Seminar-STD-2022

Seminar Programme (08:30 - 17:30)	
Welcome to Country	Mary Tyler
Introduction	Sandi Occhipinti
Session 1: Regolith & Landscape Evolution	
Using landscape evolution and 3D modelling to target to prospective areas	Nishka Piechocka & Erick Ramanaidou
Mapping the hydrothermal alteration footprint of gold deposits in regolith	Walid Salama
Evolution of hydrogeochemistry indices processing and the doors it opens	Alex Hunt
Morning Tea	
Q&A: What's new in regolith geochemistry?	Chloe Plet & Anicia Henne
Session 2: Geophysics	
Overview of the Deep Earth Imaging FSP & application to minerals industry	Tim Munday
Potential fields 'sweet spot' mapping: what next?	Clive Foss
Probabilistic mapping of the sedimentary basin architecture in the Olympic Domain; combining MT and AEM geophysics	Hoel Seille
Mobile Petrophysical Laboratory: using petrophysics to inform your geophysical models	Shane Mule
Lunch	
Session 3: Mineral Systems Science	
Mineral systems models: a review and how will we improve them	Fariba Kohan Pour & Gerhard Visser
Hydrolytic alteration in high-grade IOCG deposits	Tobias Schlegel
Using ML in exploration programs	Andrew Rodger
Autonomous Sensors Future Science Platform	Yulia Uvarova
Afternoon Tea	

Session 4: Commercialisation Updates	
Rosetta: progress on unsupervised hyperspectral image analysis	Fang Huang
Interpreting drill core data: automated splitting and lumping with Data Mosaic	June Hill
Indicator minerals for the exploration of magmatic nickel sulfide deposits	Louise Schoneveld & Margaux Le Vaillant
UltraFine+ update	Anicia Henne
Our digital strategy: uplifting efficacy through digitalisation, data analytics and uncertainty quantification	Mark Lindsay
Panel Discussion	
Close	
Networking & Sundowner	