THE MINERALOGICAL SOCIETY OF NEW SOUTH WALES INC

Website: ***www.minsocnsw.org.au***

Please address all correspondence to :-
The Secretary, 58 Amazon Road, Seven Hills, NSW 2147

NEWSLETTER March 2021

The March Meeting will be held by virtual mode on Friday the 5th of March at 7.30 pm

The program will comprise a lecture to be given by Peter Downes on : -

The Whim Creek deposit in W.A.

Whim Creek is in the Pilbara and copper has been mined on and off there for over a period of 120 years.

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PANDEMIC RESTRICTIONS

The current situation with pandemic restrictions is that they have been substantially reduced and according to the Parramatta and Holroyd Lapidary Club there seems to be no problems for the Club to open and be able to allow meetings of a number of people. Unfortunately it is still not clear whether the '*two square meter each person*' rule and '*no more than 25 people in an indoor venue'* may still apply by next Friday so the total number of people who could attend a Society meeting may only be 25.

Accordingly in scheduling the March Society meeting during February and with some restrictions still in place only a week or two ago and possibly still to be applied by the beginning of March a virtual meeting was scheduled for this month. Almost certainly it will be the last one to be held by virtual mode and the April and subsequent meetings should all be held 'live' at the Lapidary Club.

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FORTHCOMING MEETINGS AND PROGRAMS

Society Meetings will be held throughout the year on each first Friday except in April when the Society meeting would be held on the second Friday after Easter. Also in October the first Friday is before the long weekend when the **43rd Joint Mineralogical Societies Seminar** will be held and the Friday meeting may therefore be cancelled.

April 9th : The program for April is not yet finalised but the annual member's Mineral Auction may be held instead of in May.

May 7th : There will be a lecture to be given by Ralph Bottrill on 'The Mt Lyell Mines in Tasmania,.

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The SOCIETY COMMITTEE

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Field Trips 2021

With the continuing number of community acquired COVID cases hovering towards zero.
The Society Field Trip Program will be resumed.
Members can also nominate sites and localities they may want to visit.

Date	**Locality** Trips will be on short notice. Subject to cool weather averaging 24°C for weekend**,** most events will be bush camp based.	**SL: Site Leader** **AL: Asst. Leader**
13/14th March	13/3 Canberra EPIC Rock Swap (optional) 13/3 Camping at Tuena Common Saturday night. 14/3 Cordillera Mine, 9:00 am to finish 2:00 pm. This is on private property Open to all members. Limit 10	SL: Edward Zbik
TBA	Other sites of member's choice arranged and lead by members. Open to all members. Limit 10	?
TBA	The continuation of future field trips will be subject to members coming forward to lead field trips to locations of your choice.	

Until the Pandemic is declared over, field trips will be limited to 10 members.

To register for the above, contact Edward Zbik at edward.zbik@bigpond.com.

The SOCIETY'S COVID FIELD TRIP SAFETY PLAN applies on field trips until cancelled. Limits may change as advised by government authorities. See July 2020 Newsletter for the Society's Covid Field Trip Safety Plan.

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The FEBRUARY MEETING

The February Meeting was conducted by virtual mode and chaired by the Society President, Dieter Mylius. It was attended by about thirty members including a number from outside Sydney and interstate. A few announcements were made.

There was a forthcoming mineral sale organised by Peter Beckwith at the **Turramurra Masonic Hall** over the 27th and 28th of February with a preview sale for Society members on the evening of Friday the 26th.

John Chapman reported that Society member Eric Von Werstak who was a keen photographer had established a **Facebook** page, '**Minerals of New South Wales'** and had been adding a large number of fine mineral photographs to the page.

Graham Ogle announced that the **Micro-Mineral Group** first meeting of the year would be held at 1.00 pm on the 20th of February at his house. The theme would be 'Freebies' but members were also invited to bring other trays of specimens for examination.

After the announcements Dieter Mylius introduced the lecture for the evening which he was to give. The lecture was extensively illustrated with a large montage of images and substantial notes from which this summary has quoted.

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Zeolites and Associated Minerals of N.S.W.

Dieter Mylius

The speaker had been working on his lecture about zeolites over some years having first started collecting information about ten years previously. In putting his presentation together, he had realised that it could have also been informatively titled **'Looking into Holes in Basalts'** or, even **'Planning a Road Trip around NSW Zeolite Localities'.**

Zeolites were first named by Baron Axel Cronstedt of Sweden in 1756 who had also discovered nickel and the tungsten mineral scheelite. Some consider him the father of modern mineralogy.

The word ZEOLITE comes from the Greek words zeo = boiling, and lithos = rock, since Cronstedt had observed the mineral steaming when heated. Interestingly there is a mineral named cronstedtite, but is a mineral in the Kaolinite-Serpentine Group, not a zeolite.

Zeolites are a large group of more than 100 natural minerals and over 100 synthetic materials that for the most part are hydrated aluminosilicates. They are among the framework silicates, which includes feldspars, and seem to correspond to hydrated feldspars. Zeolite/s is not a mineral name; it is a mineral group or is also used as a trade name.

Aluminosilicates have some of the silicon atoms replaced by aluminium (occasionally Be), which gives the 'silica' part of the molecule an excess negative charge. A simple formula for a zeolite is $Na_2Al_2Si_3O_{10}.2H_2O$ (Natrolite) or more generally $M_{x/n}$ $[(AlO_2)_x(SiO_2)_y]$. mH_2O. Because of the presence of Al resulting in a negative charge, positively charged cations are needed to balance the charge. In zeolites the most common cations are Na^+ or Ca^{2+}. Others are K, Li, Ba, Sr, Mg and NH_4. Fe is normally absent.

Nearly all zeolites contain water (hence hydrated), and are porous substances, with a regular internal structure of cavities of defined size and shape, allowing them to release, and take in, various elements which makes the substances significant for various industrial processes.

Properties of zeolites

Zeolites are secondary minerals, rare as a primary mineral. They can form at quite low temperatures. They occur in all crystal systems. When pure zeolites are colourless or white – colours are due to impurities. They are light – most have a density (SG) between 2.0 and 2.3 except those containing Ba, Sr, Cs which are up to 3.0. They are not hard – mostly 3.5 to 5.5. Refractive indices for the common zeolites are low – from 1.47 to 1.52. Most are vitreous or silky.

What are zeolites used for?

The microporous, open framework structure of the minerals and ion-exchange chemistry allows reversible dehydration and cation exchange, making them important materials for industry. Of the natural zeolites, it is mainly three that are used in industry – clinoptilolite, chabazite and mesolite.

Many designer synthetic zeolites have been manufactured for specific purposes. There is an International Zeolite Association Structure Commission which examines new zeolite structures to classify them, as they can be designed to trap only certain molecules. Many look like cat litter (which is one of the uses for zeolite/s).

While not glamorous, zeolites are wonder minerals. They are a major component of laundry detergents and kitty litter. They are molecular sieves – they can filter out heavy metals, bad tastes, odours, nutrients, including gases. They are used in water purification and softening and effluent and sewage sludge processing. As slow release carriers, they can improve fertiliser efficiency and increase wettability of soils. Other uses are as feed supplements; in medicine – eg some clotting agents; for the removal and binding of contaminant metals in mining tailings; purification processes in the petrochemical industry; removal of caesium and strontium from nuclear waste water (used in Fukushima to remove radioactive caesium from seawater); and in water quality and ammonia removal in aquaculture, (fish farming).

Major producers of zeolites are China, South Korea, Japan, Jordan, Turkey. Australia is not a major producer although there is a working mine in NSW.

Why would you collect zeolites?

They can be very attractive. They are relatively common to find in good crystals – eg Garrawilla, Ardglen, Merriwa areas in NSW and also Flinders in Victoria. Most members would be familiar with the spectacular zeolites which have come from India but also from Ireland, Iceland, Oregon, New Jersey, and Germany. Most countries have zeolites somewhere.

Common Zeolites

Analcime, *chabazite*, *heulandite*, laumontite, natrolite, *phillipsite*, stellerite, stilbite, *thomsonite*

Less common zeolites

Brewsterite, *clinoptilolite*, cowlesite, epistilbite, *faujasite*, *ferrierite*, *garronite*, gonardite, *gmelinite*, harmotome, *levyne*, mesolite, mordenite, offretite-erionite, *paulingite*, scolecite.

The italicized species are further subdivided by major cations -Ca, -Na, -K, -Mg, -Sr, -Ba

Minerals associated with zeolites

Aragonite, baryte, calcite, datolite, fluorapophyllite, pectolite, prehnite, pumpellyite, pyrite, siderite, strontianite, todorokite.

Clay and clay-like minerals

Eg, montmorillonite, nontronite, saponite, stevensite

Where to look for zeolites

The main sources for fine or interesting specimens of zeolites are cavities in volcanic rocks (such as basalts), where they deposit from late stage fluids and/or dissolved pre-existing minerals. They are found in deposits in crevices from hydrothermal groundwater, as alteration products of feldspars and similar minerals in igneous rocks, as a part of sediments (especially volcanic ashes) where they form as part of the rock or due

to alteration of the rock. These deposits can be massive in size and are the economic zeolite deposits but rarely produce pretty specimens.

Zeolites – where can they be collected?

Zeolites and related minerals are the most accessible and available minerals in eastern NSW. Large areas are covered in basalts or intruded by zeolite bearing rocks. These often have cavities which may host interesting minerals. If in basalt country every road cutting has possibilities. A geological or metallogenic map will let you know whether you are in basalt country. In referring to a projected map the speaker pointed out the major basalt areas in NSW, permian rocks around Wollongong, (Unanderra) and Newcastle, mesozoic rocks in the Oxley basin, (Garrawilla), and tertiary basalts in central NSW, (Merriwa, Ardglen etc), and New England, (Ben Lomond and Kyogle).

There is much information on zeolites and zeolites deposits available through the various mineralogical magazines, many of which are in the Society library. Over the years much work has been done and published by people such as Brian England, Ian Graham, Ross Pogson, David Colchester and others. Many localities have been written up in detail in publications such as the AJM, Australian Mineralogist, etc. In Minview you need to look under construction materials or aggregates in volcanic area, that are normally exploited as quarries of which there are hundreds.

Greater Sydney Area

In commencing to refer to specific zeolite locations or areas the speaker described the Prospect Intrusion within Sydney, now finished, which has been well-known to collectors for many years although the quarrying ceased about twenty years ago and the site has been rehabilitated. It was the source of an amount of fine specimens, even although zeolites were not so common in the Prospect rock. The minerals comprised:- albite; analcime; aragonite; augite – (titaniferous diopsidic augite); barite; calcite; chabazite; fluorapophyllite; heulandite-ca - very rare; laumontite; marcasite - in sulphide veins; montmorillonite - after pectolite; natrolite; opal; pectolite; phillipsite; prehnite; pumpellyite-(al) – magnesian; pyrite; quartz; and siderite.

Another well-known and specimen-productive site in the Greater Sydney area is the Hanson's (formerly Hymix) Quarry at Kulnura near Peats Ridge. Minerals identified there have comprised : - Analcime; Aragonite; Calcite; Chabazite; Natrolite; Nontronite; Phillipsite-K; Phillipsite-Na; and Strontianite.

When the Society made a field trip to the site in 2002 members were embarrassed with the amount of natrolite exposed and available for picking up in quantity. Other minerals recovered on that trip and subsequently were some specimens of phillipsite in a variety of colours. An article explaining the colour produced was written up by a number of workers and appeared in the June 2020, Volume 21, Number 1 issue, of the Australian Journal of Mineralogy.

A view of a face in the Kulnura Quarry showing the impressive columnar jointing.

Other zeolite localities in the Sydney area include the Hargraves quarry at Racecourse Hill, 3km south of Oberon where fluorapophyllite-K and phillipsite have been found; Bowral and Peats Ridge with natrolite and the Woy Woy Quarry with Siderite

In moving away from the Sydney area the speaker proceeded to describe with the aid of images of the minerals a large number of other zeolite locations throughout New South Wales. These included : -

The Greater Hunter Valley

The Mountain Industries quarry on the outskirts of Tea Gardens. Zeolites are found in a dolerite dyke intruding Carboniferous marly shales. Minerals include Ankerite; Calcite (orange); Chabazite-Ca; Laumontite; Pyrite; Stellerite; Stilbite; and Thomsonite.

Diemars Quarry, Salamander Bay, Port Stephens. The rock is largely devoid of cavities but is an amazing pink rhyodacite.

Barrington Tops. On the Pheasant Creek Rd, in road cutting, 500m W of Manning River picnic area. Minerals include : - Calcite; Chabazite-Ca; Cowlesite; Fluorapophyllite; Mesolite; Natrolite; and Phillipsite-K Other localities in the Hunter Valley area include Allandale, Pokolbin and Muswellbrook.

Merriwa/Tamworth Area

Moving further westward into the Merriwa/Tamworth area of central NSW the zeolite localities are Bunnan with minerals in weathered basalt, in the road cutting on the Merriwa-Scone Rd near Bunnan.

The Krui River Road quarry, 23km NW of Merriwa.

The Borambil & Willy Wally Gully sites 32-35km NNW of Merriwa on the Golden Highway.

Liverpool Ranges

The Coolah area 20km NE of Coolah on the Norfolk Falls Rd; Ardglen Railway quarry; Coomoo Coomoo and Yarraman Creek quarries on the Bundarra Rd, between Quirindi and Bundella.

Garrawilla/Tambar Springs Area

Zeolite properties include Portabella, Garrawilla, Mt Mitchell, and Glendowda. This area has been very productive for Society field trips of amounts of stellerite and other minerals.

Quirindi Area

Castle Mountain; Boggabri; Carroll, east of Gunnedah; Currabubula; Werris Creek.

New England Area

Ben Lomond Hill road quarry, (right at speed camera on New England Hwy, quarry now rehabilitated), but there are some zeolite bearing boulders at base of the old bench.

Elsmore area. Elsmore-Newstead Junction shaft; MacIntyre River, 3.2 km west, adjacent Inverell Rd; River Bluff, Emmaville, Reidy's Shaft, 9km west;

Glen Innes, Wellingrove, 23 km NW; Herbert Park (Armidale). Inverell area with Analcime, Aragonite, Quartz and Siderite. Puddledock; Swan Vale and Inverell

Tamworth Area

Old Goonoo Goonoo Creek; Tamworth area (recorded in basalts) - chabazite, and gmelinite.

Tenterfield Area with stilbite and the Walcha Road with stilbite-Ca

North Coast

Kyogle (Tindale's) basalt quarry. On Minview map it's called Chadburn's Quarry at end of Quarry Road: Durhams (Dyer's) Lookout Quarry ~20km S of Kyogle. Kyogle town quarry; Mt Warning; Terranora-Banora Point and Terranora CSR quarry

South Coast

Cringila (State Metal) quarry, Cringila. There are several quarries close to Cringila, Unanderra and Kembla Grange. It's not always clear where specimens came from.

Unanderra, Kembla Grange; Albion Park/Oak Flats - Cleary Bros quarry; Kiama & Dunmore area (including Bombo quarry); Dapto – F6 Freeway south; Moruya, Congo Headland

Other Localities in NSW

Broken Hill; Gulgong; Hartley, south of Jamberoo; Mt Osborne (ref: Mindat); Lord Howe Island, (chabazite-Ca and natrolite reported in road gravel at base of Mt Lichbird). Nimmitabel Basalt Quarry; Queanbeyan area; London Bridge; Rock Flat Quarry near Cooma; West Wyalong.

At the end of his very thorough lecture Dieter Mylius answered a number of questions and promoted a brief discussion about zeolites and locations in NSW. Ed Zbik reported that he was gathering information on Field Trip-accessible sites and was planning trips to be held later in the year.

Stellerite from the Garrawilla area, central NSW

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FORTHCOMING EVENTS

The Glen Innes Minerama

Being held in the Glen Innes Showground from Friday 12th March to Sunday 14th March.

Quoting from the Minerama Website : - The Minerama Fossicking, Gem & Jewellery Show in Glen Innes is NSW's largest annual gem and jewellery show, attracting visitors and dealers from all over Australia. Held every year on the 2nd weekend in March, Minerama is perfect for all gem and jewellery lovers, rockhounds and outdoor adventurers. There are over 100+ stalls trading in gemstones, fine jewellery, faceting rough, lapidary tools & supplies, crystals, beads, fossils, mineral specimens, arts, crafts and more.

Minerama also features gem cutting and beading displays, advice from gemmologists, dealers, lapidaries & jewellers, and plenty of entertainment throughout the weekend.

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ROCK SWAP by the Canberra Lapidary Club Inc

The Canberra Lapidary Club has circulated a leaflet listing three events for the year. The Rock Swap will be held over the weekend of the 13th & 14th of March and the Winter and Spring Shows over the weekends of 29th and 30th of May 10am and the 30th and 31st of October. In the EPIC Showground in Canberra.

Quoting from the Canberra Lapidary Club Website: 'The Rock Swap venue is normally held in the Wagtail Way at EPIC (between the grandstand & Flemington Road), but this will be confirmed closer to the date. We may need to relocate to another site at EPIC (Acton Park – between the Markets & main camping ground) if the COVID-19 Testing Station remains open'.

At this time it is not clear whether many, or any, pandemic restrictions will be still in place and affecting the Rock Swap but it is likely that if any are still extant they will be minimal. Visitors will be informed of any pandemic requirements when they arrive at the event.

Participants in the Rock Swap who intend to camp in the Showground must register with the organisers before February the 26th. Information about the Rock Swop including a map of the venue, invitation and registration forms has been circulated by the Canberra Club on the Website : - *www.canberralapidary.org.au* or Mobile phone : 0407 718 347

Event Organiser: Norm Menadue, Email : *nmenadue@optusnet.com.au* Ph : 02 6258 6631

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30th Annual Gem and Craft Show

By the New England Lapidary and Fossicking Club Inc over the weekend of Saturday the 20th of March,
From 9 am to 5 pm and Sunday the 21st March, from 9 am to 3 pm. In the Armidale showground.
Gems, Rocks, Jewellery, Crafts, Beads, Lapidary Books, Supplies,
Lapidary Equipment and much more on sale at the show.
For information Contact the organisers on (02) 67722161 or e-mail *info@nelfc.net*

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LISMORE GEMFEST 2021

The annual Gemfest is being held in the Lismore showgrounds on Alexandra Parade in Lismore over the weekend of Saturday May 15th and Sunday May 16th 2021. Entry $5 Adults 1 Children (under 12) Cash Only. Open from 9:00am – 5:00pm Saturday 9:00am – 3:00pm Sunday. Camping within the showgrounds is available upon application.

Information on the Gemfest from the Lismore Lapidary Club Website : -

'The Annual Lismore Gemfest was started in 1990 by the Lismore Gem & Lapidary Club Inc. Since then it has evolved into one of Australia's largest Annual Gem and Mineral shows with over 140 Tailgaters and Dealers over two massive days of selling and displaying Minerals, Gems, Fossils, Jewellery and Equipment from all over the world. The Gemfest is Celebrating 30 years in 2021 and is a major fundraiser for the Lismore Gem & Lapidary Club.'

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