THE
MINERALOGICAL SOCIETY
OF
NEW SOUTH WALES INC
C/o School of Natural Science
B.C.R.I. Parramatta Campus, Western Sydney University
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NEWSLETTER

NOVEMBER 2016

The November Meeting will be held on Friday the 4th of November at 7.30 pm in the clubrooms of the Parramatta and Holroyd Lapidary Club at 73 Fullagar Road, Wentworthville.

The program will commence with a mini-talk presentation on : - **Calcite**

The talk will stress the many different forms, crystals shapes, colours and different degrees and colours of fluorescence of the mineral. Members are invited to bring in unusual and varied specimens of Calcite to display to the Meeting and also a strong ultraviolet lamp if available.

The talk and presentation on Calcite will be followed by a lecture to be given by Ross Pogson on : -

'Meteorites'

Members are also invited to bring in specimens of meteorites to display.

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FORTHCOMING MEETINGS AND PROGRAMS

December 2nd : **Christmas Social and 'Swap n' Sell'**

The Society will be holding its Christmas Social and 'Swap n' Sell' as usual this year but at the new venue of the Parramatta and Holroyd Lapidary Club. The program will be the same as in previous years; the evening will be devoted entirely to the sale or exchange of mineral specimens and mineralogical material, books, magazines and equipment. The Meeting would be officially opened at 7.30 pm possibly with a few brief announcements but the Club rooms would be open from about 6.30 pm to allow time for members with material for sale to get set up.

Members are reminded that the Society Committee has previously determined that anyone attending the Christmas Social who was not currently financial may buy but would not be allowed to sell minerals.

It is hoped that sufficient room and table space can be provided for all those members who will have material to sell or display. In order to assess this in advance and arrange for adequate facilities members who intend to sell at the Christmas Social are recommended to register for table space, indicating how much area they will need. Please communicate this before November 15th to the Secretary, George Laking by e-mail to - ***bglaking@tech2u.com.au***. All effort would be made to accommodate any late-comers and members who have not registered but then it may not be possible to allocate as much sales area as they would prefer.

There will be the usual snack food refreshments and drinks provided for which members, guests and visitors will be charged a fee upon arrival. The amount of the fee is yet to be determined but the amount charged in past years has been chosen to balance approximately even against the costs of providing the refreshments and accordingly members may be assured that the charge was equitable.

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Forthcoming Meetings and Programs for 2017

February 3rd 2017: Lecture on **'Radioactivity and Minerals'** by Geoff Parsons.

March 3rd 2017: Lecture on **'The Milton Lavers Collection'** by Paul Carr.

April 7th 2017: Lecture to be given by John Rankin on : -
'19th Century European Minerals in the Australian Museum'.

The above lecture programs will be accompanied by mini-talks on a variety of subjects to be decided and arranged. If any members have suggestions for mini-talks or can provide one, please advise the Committee.

May 5th 2017: Member's **Mini-Auction.**

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The SOCIETY COMMITTEE

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FIELD TRIPS

Registration Tolwong Field Trip Plan 2017.

Open to current financial members for 2017.
This is one of the rare opportunities that the Society's SWMS applies and is open to general members.

We need members to participate in planning, locating and gathering suitable specimens to confirm and possibly identify new specimens. The activities require overnight bush walking and camping into remote areas of Morton National Park were the Tolwong mines are located and into the Bungonia SCA where phosphate minerals, hinsdalite, $PbAl_3(P_{0.5}\ S_{0.5}O_4)_2(OH)_6$, or a similar mineral, has been identified as sourced from the BlockUp mine. The Blockup mines provided some 350t of materials to the smelter.

Requirements:

- Comply with the NPWS Science Licence and Societies SWMS.
- You can do adventurous remote bush walking and camping.
- You have your own backpack (50lt plus) and bush camping gear, carry in your own food and water.

NOTE: Water in the area is heavily contaminated.
Members are encouraged to have a CB radio with a 5km radius, these proved effective in the first trip.

The Challenge:
Nearest access roads are 5 to 10 km away.
The Shoalhaven River flows at about 120m ASL. The plateau on either side is at about 650m ASL.

Plan A: Bungonia SCA – Cross Shoalhaven River – Visit smelter area – Find path to Tolwong mines. Four members are committed.

A. Weekend or weekdays reconnoitre trip (comprising of 3-4 members) to find route into area. No tracks , through steep walled gully, finding paths around at least 4 waterfalls.
B. 3-4 day trip. Camp on the Shoalhaven River. Main group will visit the smelter area at 130m ASL and then Tolwong Mines at 350-400m ASL

Plan B: Repeat of last year's excursion. Access Tolwong Mines from Tolwong Station by walking the Tyres Ridge plateau track (it does not exist apart from some 50m stretches, mostly overgrown).

A. Walk in on plateau track, camp near Sivewright Ridge and descend to upper Tolwong mines. GPS readings from last trip say we got within 50 m of the mines and accessed deposits in the creek bed below the mines.

Plan C: Visit the Blockup mines and Long Gully in the Bungonia SCA. Located on the western plateau with bush camping at the site. Duration 2-3 days.

Specimens collected by the Mineralogical Society of NSW are under a NPWS Science License for research.
Fossicking is prohibited in National Parks and will result in heavy fines, imprisonment or both.

All minerals collected will remain in the custodianship of the Micro Group until June 30th 2017.

For more details contact Edward Zbik at etzed@optusnet.com.au or phone (02) 9638 6586

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OCTOBER GENERAL MEETING

At the commencement of the Meeting the President, Dieter Mylius, reported on the **Joint Mineralogical Societies of Australasia Seminar** held in Brisbane over the long weekend of October and which several Society members had attended. Three of the members were speakers at the Seminar, Lin Sutherland, Ross Pogson and Geoff Parsons. There would have been a fourth NSW speaker, Noel Kennon, who was unfortunately unable to attend and his lecture on the Mullaley Prehnite was read out by Steve Dobos. Lin Sutherland spoke on Unusual Rubies from New England, Ross Pogson spoke on Photographing Meteorite Minerals and Geoff Parsons on the Mt Morgan Gold Mine.

The Seminar was very well organised by the **Queensland Mineralogical Society**. The lectures were held in a theatrette in the Queensland Museum on Southbank, the customary Seminar dinner at a nearby restaurant also on Southbank and mineral trading and exchanging held at the Mt Gravatt Lapidary Club. A number of field trips were also organised for the Monday afternoon and all day Tuesday.

The Seminar next year will be hosted by the **South Australia Mineralogical Society** and held in the historic and now tourism-significant town of Hahndorf near Adelaide and over the now-established period of the October long weekend. Announcing this at the current Seminar the South Australian delegates indicated that they were expecting to organise a program of related activities over a two-week period around the conference.

The President also reported on the **Special General Meeting** which was held during the Seminar on the future of the **Australian Journal of Mineralogy.** As reported previously the AJM Operations Group, (managing and editorial committee), had notified all other Australian mineralogical societies that due to accumulated difficulties it proposed to cease publication of the Journal and that the current operating association, AJM Publications Incorporated, should be wound up.

Given that an amount of discussion may well have been held before the Special Meeting commenced the decision established at the meeting was that the **West Australia Mineralogical Society** would form a new Journal Operating Group and that all operating functions would be taken over by them. There were clearly a number of arrangements to make by the new group which would presumably take some time and members who had been subscribers to the Journal were advised to be patient and wait for publishing to re-commence.

The recent **Field Trip to Muttama** over the 16th to 18th of September was reported. It had not been attended by too many members but those who had attended had worked hard and a rewarding amount of small but bright quartz crystals including a few groups had been found.

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‘Mineral of the Month - Native Copper’

Peter Williams

Native copper would not have been too uncommon in places around the World and would have been known to very early people who would have worked it into tools. It was probably first smelted from secondary minerals about seven thousand years ago and the earliest known examples are from Bulgaria. Over the next few hundred years what was at first the Copper Age turned into the Bronze Age. It is not certain where copper was first alloyed to make bronze but it is known that the Egyptians were making bronze implements over five thousand years ago.

Whilst most bronze made was the alloy of copper and tin there was some production of arsenic bronze, a significant feature of this being that the alloy is much harder than un-alloyed copper. Arsenic bronze also has the feature useful to modern usage due to its large coefficient of expansion.

Society members had brought in a number of native copper specimens nearly all from sites and mines in Australia including several quite impressive examples of sheet copper, notably from the Girilambone deposit in the Cobar area in central NSW. At the commencement of his talk Peter Williams pointed out three of what he termed the stand-out specimens among the pieces on display. Graham Ogle had brought in an ancient artefact of native copper, a knife made by an Amerindian culture in Wisconsin several thousands of years ago.

Peter Williams had also brought in a number of specimens of native copper and various copper minerals from locations around the World such as the Keweenaw Peninsula in Michigan which he handed around to the members to illustrate the difference between primary and secondary minerals. He further described the chemical differences between the minerals referring to the environments in which they formed. A few unusual and interesting specimens from the Red Dome mine at Mungana near Chillagoe in Queensland were referred to and demonstrated. A phenomenon of certain minerals from the area, including the Great Australia Mine, had been noted by earlier workers in the late 1920s in that specimens of native copper from Cloncurry were found to turn green after only a few weeks. The phenomenon also occurs on bronze statues. The speaker and Jim Sharpe had established that the specimens were actually coated with a layer of nantockite which is colourless and looks like quartz but which once exposed to air and moisture will convert within a few weeks to atacamite which is green. It was apparent that nantockite was not nearly as rare as originally thought.

Native copper also pseudomorphs after other phases and these are common under both oxidizing and reducing conditions. Examples were referred to from Cora Cora in Bolivia and from one of the speaker's favourite new locations, the Rubtsovskoe mine in Altaiskii Krai, Western-Siberia. The deposit was originally mined for primary copper ores but an oxidised zone was discovered which was choc-a-block with native copper, sometimes associated with cuprite, sometimes with silver, and sometimes with marshite, all in the same specimen. Members familiar with marshite from Broken Hill were advised that the Rubtsovskoe marshite made the Broken Hill marshite look sick.

An curious phenomenon associated with the elements, copper silver and gold, is that whilst silver and gold can be mixed together in any proportion forming an infinite solid solution of the two elements and copper and gold can be mixed together in any proportion, silver is virtually insoluble in copper at any temperature or pressure and copper is insoluble in silver. Accordingly if the two elements are being smelted together they will remain separate and crystallise separately.

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'4.6 Billion Years of Mineral Evolution'

David Colchester

The concept of Mineral Evolution is not new and was addressed substantially by an American mineralogist, Robert Hazen and his colleagues in Washington who have published articles on the subject in the American Mineralogist in 2008. (***American Mineralogist* 93, 1693-1720).** Upon reading the article David Colchester was prompted to compile his talk on mineral evolution or how the Earth got its diverse mineral heritage. Since he would be covering 4.6 billion years in about an hour there would be a lot left unsaid and the lecture would have to be a brief review.

Mineral evolution involves a number of changes over time, a diversification of mineral species, an increasing abundance of minerals of various compositions and with some minerals reflecting previous conditions which no longer exist. Given that 4.6 billion years is an unimaginable long time a better way to appreciate it was to relate it to a more familiar time-scale such as a single year. Accordingly the speaker indicated that his lecture would commence with 4.6 billion years ago being reduced to one year and his lecture would commence on a New Year's Eve and continue to the 31st of December a year later.

The Earth was formed 4.6 billion years ago, the generally accepted theory about the formation of the Solar System postulating an interstellar cloud of gas and dust which coalesced into first the sun, then the major planets and then the minor ones. The young Earth may have come into being at about 4.5 billion years ago or about the 2nd of January. Then over the next half a billion years to about the 17th of February it gradually accumulated more mass from the bombardment of planetisimals and large meteorites which would have been careering through the System. These bodies would have added various substances to the young Earth including some water and also a few minerals and the speaker showed a short list of fifty of the likely ones including spinel, forsterite, rutile and corundum, various iron-nickel alloys and other minerals which would not be found today. The inventory of minerals would get larger and larger as the Earth aged.

An early important event in the history of the Earth occurred due to the supposed presence of a planetary body orbiting nearby called Theia which is thought to have collided with the Earth about 4.3 billion years ago. This caused the Earth's axis to be tilted 23 degrees, the iron core of Theia merged with that of the Earth and an amount of the silicate outer shell of the Earth was blasted into space with over the next thousand years much of it falling back but the rest forming the Moon. By that time the Earth had been cooling sufficiently for some minerals to have formed on the surface and a list of some 250 were shown. Cooling continued with the formation of more minerals.

By about 4 billion years the Earth had cooled sufficiently for water to accumulate on the surface and gradually sedimentary and metamorphic rocks formed adding about five hundred new minerals to the inventory. Also at about 3.8 billion years or about the 5th of March the first forms of life appeared. These would have been sulphur-utilising bacteria but later oxygen-producing cyanobacteria appeared which began to change the composition of the atmosphere. At that time there would not have been much surface water since due to the higher temperature most of the water was in the atmosphere but with more cooling large amounts of water collected on the surface. Vegetation on the land had started proliferating, in the process was absorbing much of the CO_2 and with at first no herbivores to graze on it was further changing the atmosphere. By the end of the next billion years the number of minerals had increased to about 1,500.

The proliferation of life on Earth was marked by a series of mass extinctions and the speaker referred to the most serious, the Permian/Triassic Extinction which occurred about 250 million years ago when about 90% of all life became extinct. However minerals species over the period from about 2.5 to 1.5 billion years with all the changes in atmospheric conditions had increased to over 4,000. The last half a billion years have seen a further increase to over 4,300 although modern authorities are predicting many more are yet to be identified. An article in the October 2015 edition of the American Mineralogist predicted that there were 1,563 minerals yet to be described with 25% of these being aluminium, boron, carbon, chromium, phosphorus, silicon and tantalum minerals and 35% were sodium minerals. The article also suggested that only 20% of copper minerals had been described so far.

(***American Mineralogist, Volume 100, pages 2344–2347, 2015*** – Earth's "missing" minerals. Robert Hazen et al. Abstract: '*Recent studies of mineral diversity and distribution lead to the prediction of >1563 mineral species on Earth today that have yet to be described—approximately one fourth of the 6394 estimated total mineralogical diversity. ……..*"

FORTHCOMING EVENTS

ILLAWARRA LAPIDARY CLUB INC presents the

2016 - 54th ANNIVERSARY EXHIBITION

JEWELLERY, GEMS AND MINERALS FESTIVAL

Over Saturday 5th November 9am - 4pm and Sunday 6th November 9am - 2.30pm.
Being held in the Heininger Hall, 109 Princes Highway, Dapto. (Part of the Ribbonwood Centre).
Parking access from Heininger Street off Fowlers road.
Featuring: Mineral Group, Jewellery Valuations, Cabochon Cutting, Jewellery Making, Gemstone Faceting, Silvercraft, Club and Fossicking Information, Refreshments.
Dealers selling Lapidary Supplies, Jewellery, Minerals, Findings, Crystals, Fossils, Beads and Opals.
$3 admission - Children under 12 free - Lucky Door Prizes - Children's games – Raffle
Information: David 02) 4234 1468 or *http://www.illawarralapidaryclub.com.au/*

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ANNUAL EXHIBITION
By The Parramatta And Holroyd Lapidary Club

Over Friday to Sunday, the 11th to 13th of November from 9.00 am to 5.00 pm each day
in the Clubrooms at 73 Fullagar Road, Wentworthville.
'Demonstration of Club Activities; Rocks & Minerals for Sale; Members Work for Sale;
Activities for the Kids. In case it is possible this year we are Featuring Fossils.
We will have a sausage sizzle with onions and plenty of rocks and minerals
and fossils for sale as well as jewellery.'

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WINDSOR GEM & MINERAL FAIR

Being held in the Windsor Function Centre on the corner of George & Dight Streets, Windsor.
Over Saturday 26th November from 9.30 am to 5 pm and Sunday 27th November from 9.30 am to 4 pm.
The Fair is proudly supported by the Hawkesbury Valley Lapidary Club.
Presenting Gem, mineral, jewellery & lapidary dealers. Minerals from all over the World, fossils, jewellery, rough & cut gemstones, opals, carvings, beads & lapidary supplies.

Entry fees $7 for adults and children under 16 accompanied by parents are free. Light refreshments.

There will be a lucky door prize of a 9ct Gold and Sapphire Pendant. Raffle tickets will be available on entry to the Fair and the winning ticket will be drawn on Sunday afternoon.

For more information telephone Peter on mobile 0412 333 150 or email *peterrare@optusnet.com.au*

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