THE
MINERALOGICAL SOCIETY
OF
NEW SOUTH WALES INC

C/o School of Natural Science
B.C.R.I. Parramatta Campus University of Western Sydney
Locked Bag 1797 Penrith South DC N.S.W. 1797
Website: ***www.minsocnsw.org.au***

NEWSLETTER

NOVEMBER 2015

The November Meeting will be held on Friday the 6th of November 2015 at 7.30 p.m. in the LZG14 lecture theatre on the ground floor of Building LZ in the Science campus of the University of Western Sydney on the corner of Victoria Road and James Ruse Drive in North Parramatta.

The program at the November Meeting will commence with a talk given by Jim Sharpe on : -

Mineral of the month – Smithsonite

The talk will be followed by a lecture given by John Rankin on :-

'The Block 14 Mine, Broken Hill'.

Members are invited to bring in mineral specimens of smithsonite and of minerals from the Block 14 Mine to display and help illustrate the lectures. We would like to see specimens of smithsonite from anywhere in the World, especially any showing variations in colour.

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FORTHCOMING MEETINGS

December 4th : **Christmas Social.**

2016: Some Meeting programs for 2016 have already been scheduled; others are yet to be confirmed. The Society does not hold General Meetings in January and the first Meeting in 2016 will be on February the 5th. Meetings will be held on the first Friday of each subsequent month throughout the year. The long weekends in 2016 do not coincide with Society meetings on the first Fridays.

February 5th 2016: The program in February will include a talk to be given by Dieter Mylius on:- '**Collecting Minerals from the Clara Mine in Germany**'.

The talk will be followed by a lecture to be given by Ross Pogson on :-
The **Cliefden Caves and Speleological Themes at the Australian Museum.**

March 4th 2016: Lecture on **'Blood Diamonds from Sierra Leone'** by Peter Buckley

April 1st 2016: There will be a talk on **Mineral of the Month – Calcite.**
The talk will be followed by a **Mineral Quiz** presented by Ann & Noel Kennon

May 6th 2016: Member's **Mini-Auction**

June 3rd 2016: (First Friday, the Queen's Birthday in 2016 is on the 13th) Open night, interactive forum on : - **'Kingsgate Re-visited'**. Member's collections, re-collections and discussion.

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FIELD TRIP TO Mt KNOWLES near MUDGEE

Date: 21/22nd November, 2015

Visit to a commercial quarry near Mudgee, central N.S.W., to collect 'Mudgeeite', a new mineral presented by Society members to the IMA. The trip is a follow-up to last month's presentation to the Society on Mudgeeite.

Requirement; Members to be SWMS/SOP Certified, guests/partners to be SWMS/SOP aware and seconded by a Certified member. To register and obtain details, email etzed@optusnet.com.au or call (02) 9638 6586 until 10:00 pm.

FIELD TRIP TO OBERON & DIAMOND HILL,

Date: 12/13th December, 2015

A State Forest field trip visiting a skarn and Mo deposits.
Requirement: State Forests Fossicking License (One license covers a family). Open to all members.
To register and obtain details, email etzed@optusnet.com.au or call (02) 9638 6586 until 10:00 pm

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The SOCIETY COMMITTEE

PRESIDENT:	Dieter Mylius	Tel: (02) 9477 1060
VICE-PRESIDENT:	John Chapman	Tel: (02) 9808 3481
SECRETARY:	George Laking	Tel: (02) 9636 7145
	E-mail:	*bglaking@tech2u.com.au*
TREASURER:	Graham Ogle	Tel: (02) 9868 4446
	E-mail:	*grahamo@diabetesnsw.com.au*
COMMITTEE MEMBERS:	Peter Beddow	Tel: (02) 8810 8446
	David Colchester	Tel: (02) 9449 3862
	Geoff Parsons	Tel: (02) 9548 3289
	John Rankin	Tel: (02) 9482 7474
	Edward Zbik	Tel: (02) 9638 6586
	E-mail:	*etzed@optusnet.com.au*

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WELCOME

Welcome to new member Robert Lewis of Eden

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The OCTOBER MEETING

Ed Zbik announced details about the next **Society Field Trip** which would be a camping trip to be held over the weekend of the 24th & 25th of October to the **Mogo State Forest** near Batemans Bay. Old goldfields in the area are now part of the Bimbimbie Gold Exploration Project by Comet Resources. There were gold deposits, associated materials and turquoise in the locality. The trip would be open to all members and gold prospecting equipment was optional but could include metal detectors and screens as well as normal fossicking tools, hammers and picks etc.

In November there would be a field trip to the **Mt Knowles quarry** near **Mudgee** to look for more specimens of mudgeeite. The trip had been organised to follow the presentation to the Society on Mudgeeite at the previous month's Meeting. The quarry is the type locality and currently the only known source of the new mineral in Australia.

Ed Zbik announced that two more members, Jo Collas and Greg Andrews had completed their **Work Safety Certificates** which were handed out at the Meeting.

N:B: The **SWMS, - Safe Work Methods Statement**, is the Society's Guidelines to the practices, protocols and controls needed to reduce any known hazard or risks that may be encountered on site in the pursuit of gaining mineral specimens.

Arthur Roffey addressed the Meeting to thank Graham Delaforce for his help in representing the Society at the recent **Gemkhana** at **Clarendon**.

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Mineral of the month – Stibnite and other antimony minerals

Gary Sutherland and Peter Williams.

Gary Sutherland commenced his talk by referring to a small specimen of stibnite which he had bought from Albert Chapman in 1976 at a Society Christmas party then held at the house of the late Betty and Jim Clark in Bankstown. Acquisition of the specimen served to generate a substantial interest in the particular mineral for the speaker who estimated that he might now have about 120 specimens. A number of other stibnite specimens from his collection had been brought in as well as some by other members.

Stibnite is antimony sulphide, Sb_2S_3, of orthorhombic crystal structure and hardness of two. Crystal forms vary a little but are usually elongate with sometimes sharply pyramidal terminations. The mineral colour is grey and crystals or crystal groups are usually shiny or even sparkly. Crystals up to 60 cm in length have been reported in the literature. The mineral is so soft that crystals have been known to bend readily and are sometimes found 'concertinaed' or with splayed ends.

Gary Sutherland referred to some of the specimens brought in for display and then to a number of images of others from his collection including a substantially deformed specimen from Hillgrove before showing images of a number of other antimony minerals, also from his own collection. Good specimens of stibnite have come from a large number of locations around the World including China, Japan, Quebec, Peru, Bolivia, Algeria, South Africa, Romania, Switzerland, Italy, France and Germany.

In answer to a question Gary Sutherland advised that Japan as a source of good specimens had been finished about 1890 and currently there did not seem to be much material coming from China. Accordingly prices have risen substantially over the past few years.

The second speaker was **Peter Williams** who initially stated that there nearly four hundred primary antimony minerals. Primary minerals are formed at high temperatures and low oxidising conditions and include the native metal and with stibnite the most common. By contrast when primary antimony minerals are exposed to water and oxidizing conditions nearer the Earth's surface secondary minerals are formed which are much less common, only about ninety are known with some having been found only in one locality. Only a few such as the oxides senamontite and cervantite are fairly common. Otherwise the secondary minerals are usually white or colourless, difficult to identify and have uninteresting appearances. Most are reactive and are probably in the process of forming other minerals.

Peter Williams then mentioned a mineral stibiconite which he suggested some members might have examples of in their collections but which unfortunately probably does not exist! The mineral has an interesting history due to chemists in the 1920s and 1930s attempting to describe what stibiconite might be by describing the structure of a synthetic material that they had manufactured.

It has turned out that all specimens of stibiconite that have ever been properly investigated do not have the chemical formula which has been ascribed to it, supposedly $Sb^{3+}Sb_2^{5+}O_6(OH)$. Nearly all specimens contain essential calcium and are members of the romeite group, - calcium antimony oxide-hydroxides. The calcium in such minerals can have been replaced with certain other elements and if there is more lead than calcium the mineral would be bindheimite, $Pb_2Sb_2O_6(O,OH)$, or if the calcium is replaced by silver the mineral would be stetefeldtite $Ag_2Sb_2(O,OH)_7$.

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Mudgeeite. Establishing a New Mineral

David Colchester and John Chapman

David Colchester spoke first to explain that the aim of the presentation was to outline how researchers would go about obtaining official recognition of a new mineral. He initially noted that several people had been working on establishing the new mineral 'mudgeeite' but acknowledged that there was still a little way to go. Specimens of the mineral had first been found and collected by Society members on a field trip to the Mt Knowles limestone quarry in 2006 and was first presumed to be the mineral ranceite, $(Ca,Mn^{+2})Mn^{+4}{}_4O_9 \cdot 3H_2O$. The specimens were pieces of limestone with small concavities containing dark silver-grey flat foliated sheet-like crystals. In later examining the material in U.W.S. laboratories the speaker found that the specimens did not give completely correct X-ray diffraction patterns for ranceite. The analysis showed that there was only about 2/3rds of the amount of CaO in the material compared to analyses published for ranceite and there was about ten times the amount of MgO.

In explaining, 'What is mudgeeite?' David Colchester referred to the two other known minerals in the series, ranceite and takanelite. All conform to the simple formula $(N^{+2})\ Mn^{+4}{}_4O_9 \cdot ?H_2O$ where 'N' represents a two-valent cation, Ca^{+2}, Mn^{+2} or in the case of mudgeeite, Mg^{+2}. If the Ca^{+2} is the majority cation the mineral is rancieite, if Mn^{+2} is the majority the mineral is takanelite and if Mg^{+2} is the majority the mineral is mudgeeite.

A few images of the Mt Knowles quarry were shown, of the quarry workings and processing plant, a map indicating its location, about eleven kilometers east of Mudgee and larger-scale geological maps showing the distribution of rocks in the area. The new mineral specimens were found in small vughs at the base of the main quarry cliff and in dumps. Geologically the quarry contains dolomitized biostromal limestone which means that the limestone is the same middle-Devonian age as the surrounding country rock compared to biohermal limestone which would be derived from a reef pre-dating the surrounding strata. The process by which limestone becomes dolomitized is not well known but would have occurred later. Vughs are fairly plentiful in the Mt Knowles limestone and due to slightly acidic waters containing manganese and silica having percolated through the limestone, dolomite rhombs have been precipitated at the edges of vughs as well as quartz, calcite and mudgeeite.

After an amount of analytical work had been done, *"Now came the hard part",* as the speaker said, - establishing the mineral as a new species by submitting an application with details to the Commission on New Minerals, Nomenclature and Classification, CNMNC, - a branch of the International Mineralogical Association, the I.M.A. The CNMNC provides a check-list of requirements to establish a new mineral which can be down-loaded from the Internet and the researchers would tick off all the appropriate boxes. Upon receiving applications the Commission would send out these to about twenty referees to be examined after which the applications would be returned to the Commission chairman with recommendations to accept or refuse them. Up to the end of last year Peter Williams was chairman of the Commission but has since handed over to a professor in Stockholm.

The CNMNC mineral checklist indicates all the properties required to identify any mineral, optical, chemical, physical, crystallographic, powder x-ray diffraction (XRD) pattern etc. Some of the analytical methods were described in a little detail, notably the principles underlying x-ray diffraction which provides diffraction patterns unique for any mineral. One small technical problem encountered by the researchers with the new mineral was some difficulty in making a quantity of powdered sample since mudgeeite has a hardness about equivalent to that of soap and would not powder up easily. Another technical problem is that since the diffraction analysis involving intense x-ray beams would cause water contained in the substance to be lost, the readings would possibly be altered.

As an aid to the description of some of the analytical methods and equipment used to identify and describe a mineral David Colchester projected a number of images, of diagrams of the instrument methodology, of x-ray patterns produced and of the instruments used including a microprobe, the diffractometer and a scanning electron microscope with an attached EDS, (Energy Dispersive Spectrometer). Also noted was a supply of liquid nitrogen, needed to keep the instruments cool during use. According to the speaker, all the hard work these days is done by computer compared to when he was first involved in doing mineral analytical work in the late 1970s. Then he had to use log tables and a slide rule! A little later in 1981 he obtained his first pocket calculator which made things a lot simpler. Computers were gradually applied to mineral analysis, subject to appropriate programs being written, and results are now produced within a few minutes instead of hours.

XRD, (powder X-Ray Diffraction) is the principal method for identifying minerals today, the CNMNC requiring a fully comprehensive and indexed XRD pattern of the mineral to be submitted. After overcoming the problem due to the mudgeeite samples being very difficult to make into a powder other technical problems arose with initially weak readings being obtained. There was also a very limited number of specimens. Gradually these problems were overcome and the XRD was able to provide patterns indicating the crystallography, mudgeeite being trigonal.

John Chapman next showed a series of images of samples of the mudgeeite recovered from the Mt Knowles quarry. The first few images were taken by normal photographic methods of specimens which were fairly small, only 1-2 cm across but the mineral and crystals were readily visible to the naked eye. Later images were taken with the scanning electron microscope which takes extremely high-resolution, very detailed images. The speaker spent a little time describing the photographic methods which he had used, particularly in dealing with very small subjects.

A few images showed the paragenesis or the order in which minerals are deposited, images showing dolomite crystals overlain with some colourless calcite crystals which is further overlain or intergrown with some mudgeeite. Another image showed grains of mudgeeite sitting on a quartz crystal and virtually all images indicated that the mudgeeite formed last, coating either quartz or growing with or on the calcite. Later images taken through the scanning electron microscope were in the order of one to three millimeters across and showed the habit and crystal forms of the mudgeeite clearly as well as some of the other crystal features at the magnification including some variation in the crystal forms of the mudgeeite and of etched dolomite crystals. Finally the series of images moved in to show features only about two thousandths of a millimeter across.

One requirement for establishing a new mineral is that type specimens should be lodged with two recognized institutions. Accordingly the researchers have provided two specimens to the Museum of Natural Science in London and one to the Australian Museum. The latter specimen was one of the largest that has been collected but is still only about 1.5 cm across. It is not precisely a type specimen which has to be the specimen upon which the all the analytical work has been done so the Museum specimen is a ‘co-type’.

At the end of the presentation John Chapman acknowledged the University of Western Sydney for the use of all of their analytical equipment and the Australian Museum for allowing the use of their camera equipment. Both speakers then answered a number of questions about the new mineral. Upon being asked how much mudgeeite had been present at the Mt Knowles quarry David Colchester advised that there had been two Society trips with most of the specimens collected on the first one. He also speculated that specimens of mudgeeite were probably by now scattered to some degree over the entire district of Mudgee !. This had become apparent because Dieter Mylius had reported finding a few small specimens amongst the crushed limestone road fill on a farm property that he had visited in Windeyer, a village about fifty kilometers south-west of Mudgee. The limestone road fill was apparently obtained from the Mt Knowles quarry.

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FORTHCOMING EVENTS

FESTIVAL OF MINERALS & GEMS
by the **ILLAWARRA LAPIDARY CLUB INC**

Over SATURDAY 7th November 9am to 4pm & SUNDAY 8th November 9am to 2.30pm
At the RIBBONWOOD CENTRE, PRINCES HIGHWAY, DAPTO
Our 53rd Exhibition featuring top Mineral Dealers plus Lapidary Supplies, Jewellery, Beads, Opals, Jewellery Valuations, Fossils & Displays. Food & refreshments available. Adults $3, Children free.
http://www.illawarralapidaryclub.com.au/

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THE WINDSOR GEM & MINERAL FAIR

Over Saturday 9.30 a.m. to 5.00 p.m and Sunday 9.30 a.m. to 4.00 p.m the 28th & 29th of November at the Windsor Function Centre on the corner of Dight & George Streets in Windsor.

SALES of jewellery, gemstones, beads, opals, mineral specimens from all over the world, tools and equipment for lapidary and beading work, metaphysical and healing crystals.
Displays and demonstrations of lapidary work by the Hawkesbury Valley Lapidary Club
Admission fee, Light refreshments available.
Inquiries to Peter Beckwith on 0412 333 150 or email at *peterrare@optusnet.com.au*

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THE AUSTRALIAN FINE MINERAL SHOW

Saturday 5th December, 2015 10am to 5pm
ONE DAY ONLY – AN EVENT NOT TO BE MISSED
At the AUSROX/CRYSTAL UNIVERSE SHOWROOMS
202 Turner Street, Port Melbourne, Victoria
Featuring newly prepared Broken Hill specimens from the MILTON LAVERS COLLECTION and other superb Australian & overseas mineral specimens. International and Australian Dealers including Crystal Classics (England), Ausrox (Australia), Trinity Minerals (USA), Allan Arnold (ACT), Dehne & Maureen's Minerals (TAS) and Terry Hogarth & Lynne Webb (NSW).
Enquiries (03) 96461744 or *rob@crystaluniverse.com.au*

The 1st Annual SYDNEY CRYSTAL SHOW

Over Saturday 5th & Sunday 6th December from 9.00am to 5.00pm each day
To be held in the Fraser Park Pavilion, 100 Marrickville Road, Marrickville
(Close to the Sydenham Train Station), Less than 10 klm from the CBD!

'Two full days of incredible natural wonders from Australia's leading mineral, fossil & jewellery merchants. Join us for the best crystal show in town! Amazing natural wonders; Minerals, Crystals, Fossils, Jewellery, Gems, Lapidary Supplies & more, all in one place and just before Christmas. Lock in the dates & tell your mates! An oresome event for all ages !'

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SALE OF MINERAL COLLECTION BY SILENT AUCTION.

Ken Mitchell is selling his mineral collection which will be on display in his garage at 81 Fern Street, Gerringong, NSW. 2534, on the South Coast 120 klms from Sydney.

The sale will be conducted by silent auction and offers will close on 4th April 2016. The collection is for sale to the highest bidder and the person whose offer is the highest monetary value, [if its meets or is above the reserve], will win the ENTIRE collection. It may be viewed at any time from the present to April 3rd 2016 by appointment. Ken should be contacted to make arrangements to view the collection.
Ken's contact details are : - Home: 0242341448, mobile:0448724211.
Please leave a message or e-mail : - *kandmitchell@aapt.net.au*

All persons who wish to make a bid should ensure that their bid is sent in before the closing date and must place their offer into a sealed envelope. The envelopes will be placed in a sealed container and on April 4th 2016 Ken will be opening the envelopes and checking the bids.
The highest offer may not be not be the winner, as it may not meet the reserve price.

The Collection consists of:-

Mt Isa Fluorite, Epimorphs, Quartz crystals with inclusions: from Ken's location.
Quartz crystals, Rosettes and more from Tom's Mountain, Mt Isa Inlier.
Mt Lidster, Hematitic Quartz, Mt Isa Inlier.
Quartz crystals from new localities in Mt Isa Inlier.
Fluorite in Quartz Crystals: Soldiers Cap, Cloncurry.
Skeletal Quartz: Beyond the Graves, Wee McGregor, Mt Isa.
Amethyst: Kuridala, Cloncurry.
Rare Drusy Quartz on Calcite, Purlewaugh, NSW.
Stellerite Plus, Tambar Springs area.
Prehnite, Mullaley, NSW.
Broken Hill Minerals.
Brazilian Minerals.
Namibian Minerals.
Shatter Cones and Melt rock from Australian Meteorite Impact Sites.
Many other specimens are available.
90% of my Collection is self-collected.

Look forward to hearing from you all soon.
Cheers Ken

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