



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 OCTOBER 2019

The October Meeting will be held on the 11th of October at 7.30 pm in the clubrooms of the Parramatta and Holroyd Lapidary Club at 73 Fullagar Road, Wentworthville.

The program at the October Meeting will present two lectures on

Mineral Museums in Australia and Overseas

or 'A Night at the Museum'

Dieter Mylius will speak on **'Three Lesser-Known Museums in Europe'**.

Graham Ogle will speak on **'Eight Amazing Museums. Six Countries. Four Continents'**.

Display of Manuka and Cobar specimens

Members who participated in the Field Trip to central NSW in June visiting a number of mining properties and particularly the Manuka mine are invited to bring in a selection of their more notable specimens collected on the trip to display to other members. The Manuka site has been particularly productive of a large quantity of impressive, quartz crystals in a variety of more uncommon forms, some very rare, mostly smoky to a degree and some with small liquid inclusions containing gas bubbles. Interesting specimens may have been collected from some of the other sites in the Cobar area and members are invited to include these in any display.

In setting out a display of a number of specimens from the same site with similar appearances there may be the potential for mixing one member's specimens with another. Members are recommended to bring identifying labels to place alongside their specimens.

FORTHCOMING MEETINGS AND PROGRAMS

November 1st: Lecture by David French on **Minerals in Coal** and a talk by Brian Holden on **'Collecting at Torrington'** the titles of both talks are to be confirmed.

December 6th: **Christmas Swap and Sell**

2020: The Society does not hold General Meetings in January and the first Meeting in 2020 will be on February the 7th. Meetings will be held on the first Friday of each subsequent month through the year unless the first Friday is before a long weekend when the Meeting would be put back one week. This will be necessary in June and October next year.

The SOCIETY COMMITTEE

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WELCOME

Welcome to new member Margaret BEAL of Leura

The SEPTEMBER MEETING

The meeting was opened by the Vice-President, John Chapman, in the absence of the President, Dieter Mylius who with other Society members was in Perth attending the Mineralogical Seminar.

The Vice-President presented a suggestion from Ed Zbik that for the October meeting members who had attended the **Field Trip to the Cobar area** over the last week of June should be invited to bring in specimens collected on the trip to display to the Meeting to provide a **Manuka display** table.

John Chapman also reported that Professor Peter Williams had offered to donate to the Society all of his field note-books accumulated during his entire career. There would be an enormous amount of important information in the collection and the Society Committee would be considering how it all could be digitalised with the view to ensuring that the archive would be available to students, researchers and geologists.

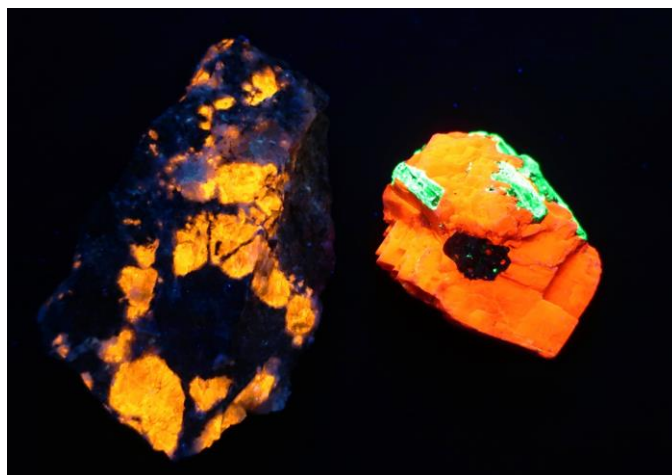
Graham Ogle reported that the next meeting of the **Micro-Mineral Group** would be on Saturday the 14th at 1.00pm. The meeting had been originally scheduled to be held in the Lapidary Club rooms but these had been alternatively booked by another group and the meeting would be held at Graham Ogle's house in Epping. The Group would be studying Italian and Vesuvian minerals.

The first lecture for the evening was given by Mark Walters who joined the Society only last year but had brought a considerable knowledge of fluorescent minerals to describe to the Meeting. He had prepared a short but very thorough lecture, describing the phenomenon of UV light, its various wavelengths and the visual effect, (in visible wavelengths), on certain minerals. The lecture was illustrated by a Power Point screen display and then by the speaker demonstrating the fluorescence of a representative variety and number of mineral specimens

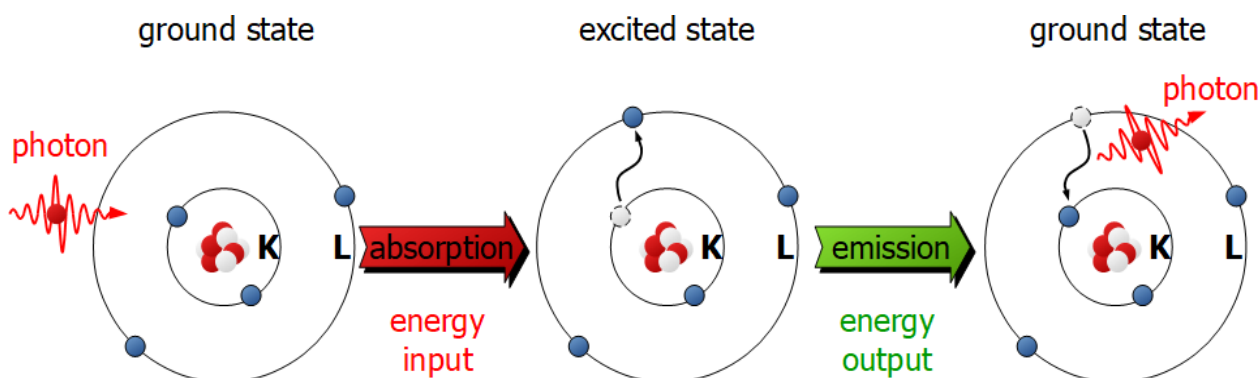
of his own collection which he had brought in to display which were fluorescent to varying degrees, in varying colours and under varying UV wavelengths.

Demonstration of UV Fluorescence in Minerals

Mark Walters



The speaker who was obviously quite knowledgeable about his subject described the background to the fluorescence phenomenon which depends on the energising of electrons in certain substances by UV light of wavelengths from 200 to 400 nanometers and the electrons reverting back to a stable state by emitting the energy but with increased wavelengths as visible light from 380 to 740 nm. (Nm = nanometers which are 10^{-9} m or one billionth of a metre). UV light is absorbed by an atom's electrons and the increase in energy means the electron hops into a higher orbit. It cannot sustain the higher energy level and quickly reverts to a lower orbit releasing visible light.



In describing UV lamps Mark Walters stressed that they do not all produce the same range of wavelengths of UV light which may not generate the same degree or colour of fluorescence in various minerals. Three wavelength ranges of UV light are relevant to produce fluorescence. These are UV_C of wavelengths 200 to 280nm, UV_B from 280 to 315nm and UV_A from 315 to 400nm. The significance in the different ranges is that most minerals fluoresce in the SW- UV_C range whilst most lamps produce LW- UV_A . Also whilst a mineral may fluoresce at all the UV wavelengths it may not do so to the same degree or produce the same colour. Accordingly the collector should ideally make a point of purchasing a lamp which can produce both long and short-wave UV.

In addition to fluorescence there are other phenomena which can generate visible light in certain substances. These are phosphorescence or “afterglow” when the mineral still glows for some time after the UV light is turned off. Triboluminescence – light is emitted from chemical bonds separating from friction, splitting, pulling apart of the substance. Thermoluminescence – light is emitted by mild heating and sometimes in very rare minerals by the warmth of a hand. Some specimens of the mineral chlorophane which is a variety of fluorite can exhibit all these phenomena in the same specimen.

Fluorescence in minerals is caused by the presence of activators or co-activators which are trace amounts of certain elements. The amounts of the activators may be critical and a specific amount may be needed to cause fluorescence. If the amount of a trace element is too high there might be 'concentration quenching' and no light would be emitted whereas other element activators can produce fluorescence with several percent to 0.1 concentrations or even as low as 0.1 ppm with uranium. The colour produced may vary not only due to the particular trace elements but also with whatever mineral contains them. Manganese causes a green colour in willemite and red in calcite. Apart from manganese a few other elements may act as activators. These include uranium and certain of the rare earth elements, (REE), such as europium, yttrium and dysprosium. A co-activator is an element which would pass energy to another trace element that actually gives the fluorescence.

At the end of his talk the speaker asked for the club-room lights to be turned down and that members should move to a display table where he had set out his specimens. Then with his UV lamps providing long and short-wave light he demonstrated the different colours and intensities of fluorescence of the various minerals under different wavelengths of the UV. A few questions and comments were posed to the speaker by members with information exchanged about the quality of commercially-available UV lamps and other uses of UV light.

The next speaker for the evening was invited to give his lecture. Society member Lee Spencer studied at UNSW to obtain a (B.Sc) and Master of Applied Science (M.App.Sc) in Geology and Mineral Exploration. He is now a mining consultant specialising in Asia and the Pacific area with many years' experience in exploration and development of mineral deposits including diamonds, gold, tin, mineral sands and base metals. He has previously given lectures to the Society on 'Diamond Prospecting in Indonesia' and on examining the gemfields of the Mogok area in Burma, ('Up the Irrawaddy').

Arsenates: Examples from the Ojuela Mine, Mexico

Lee Spencer

Some years ago Lee Spencer became involved in researching the distribution of CRD, carbonaceous replacement deposits in the World which led him to look at the Ojuela Mine near Mapimi, Durango State, in north-central Mexico. The mine was worked for and produced a number of metals, notably gold, silver, lead, copper and arsenic. Notably for mineral collectors after 1927 when the variety, number and quality of mineral specimens was recognized, the mine has been a major source of very fine specimens, particularly of zinc arsenate minerals such as adamite and legrandite, which have set the standard for these species but also many others. A total of 119 mineral species have been identified from the site which is the type locality for seven of them. 30% of the total species at Ojuela are arsenates, - of zinc but also of lead, e.g. mimetite, iron – scorodite and calcium/copper – conicalcite etc. Mining at the Ojuela mine discontinued early in the 20th century and the nearby town of Mapimi is effectively a ghost town although the mine workings, tunnels etc and its buildings and notably the old spoil dumps attract a certain amount of general tourism and determined mineral collectors.

The mine was discovered in 1598 by Spanish prospectors after earlier mining by native Americans and actively mined for 350 years up to the early 20th Century with major workings by the Penoles Company. There were four main shafts, a hundred minor shafts and adits, 450 kilometres of underground workings, vertical depths exceeding one kilometer and cross-cuts at 50 metre intervals below the 450 metre level. Since its' discovery six million tonnes of ore has been mined grading 3.5g/t gold, 465g/t silver and 15% lead. Up to 3% copper has been mined in places. Zinc ranged in grades from 12% to 15% but was never mined. Mining effectively ceased in 1914 due to the outbreak of the Mexican Revolution.

The deposit is a carbonate replacement type mineralization with a complex geological history of folding, thrusting and volcanic intrusive activity. Seven major ore chimneys and four inter-related mantos and numerous associated minor mineralized narrow sections. (Manto refers to a flat-lying, bedded ore deposit). Whilst not as economically important as the gold and silver the arsenic content of the mine is considerable and Lee Spencer's lecture focused on the element and its minerals in the Ojuela deposit.

Arsenic is a metalloid, atomic number 33 and is the 20th most abundant element in the earth's crust. The name is derived from the Persian *Zarnikh* and Greek *Arsenikon* – “*potent*” It has been known at least via compounds since the 4th century and was first prepared by Schroeder in 1649. It is very toxic. There are 512 valid mineral species containing arsenic known with 309 or 60% as arsenates. It occasionally occurs as the native element. Arsenic minerals occur in a wide range of colours and readily form solid solution series with phosphates and vanadates.

Lee Spencer compared the arsenic minerals at Ojuela with those at Tsumeb and Broken Hill where the total arsenic content in the orebody was >5 % at Ojuela, >1% at Tsumeb and 0.7% at Broken Hill. He also referred to the different depths of oxidation zones at the sites which led to the development of the variety and differing amounts of secondary minerals. At Tsumeb there were three oxidation zones going down to 1,450 meters compared to Broken Hill at 180 meters and Ojuela to 700 meters which provided complete oxidation of the sulphide ores, notably arsenopyrite. Accordingly the arsenic-containing minerals at the three sites are 30 or 25% of a total of 119 at Ojuela, 63 of 242 or 26% at Tsumeb and 26 of 279 or 9.3% at Broken Hill.

For much of the second half of his lecture Lee Spencer projected a series of images of superlative specimens from Ojuela in his own collection. The images showed the considerable variety of colours and forms of adamite with examples of the other major Ojuela minerals.



Wulfenite with mimetite. $Pb_5(AsO_4)Cl$
Level 5 Campana Chimney. 14 cms. Mined 2001.



Translucent cupro adamite on gossan.
 $Zn,Cu)_2AsO_4OH$. Crystals 0.75cm,



Display of Adamite from the Ojuela Mine

FORTHCOMING EVENTS

The CENTRAL COAST LAPIDARY CLUB INC. ANNUAL GEM FESTIVAL

will be held in the Mingara Recreational Club, Mingara Drive, off Wyong Road, Tumbi Umbi, Central Coast over Saturday & Sunday the 13th and 14th of October, on Sat from 9am-5pm and Sunday from 9am to 4pm.

'Dealers from across the state will be attending selling everything from jewellery, gemstones, fossils, specimen stones and stones polished and rough. There will be displays of the club members' work and our own club tables selling Minerals and also a large table of beading.'

The Illawarra Lapidary Club Inc presents the 2019 Jewellery Gems and Minerals Festival

To be held in the Heininger Hall, Ribbonwood Centre, 109 Princes Hwy, Dapto. From 9.00am to 4pm on Saturday 2nd November and from 9.00am to 2.30pm on Sunday the 3rd of November.

Entry: Adults \$3, children under 12 years free.

Featuring: Gemstone Faceting, Cabochon Cutting, Silvercrafts, Jewellery Making and Valuations, Mineral Group displays, Club and Fossicking Information, Refreshments, Raffle, Lucky Door Prizes and Kids' Games.

Dealers Selling: Lapidary Supplies, Minerals, Jewellery, Crystals, Findings, Fossils, Beads and Opals

Enquiries: John (02) 42675618 www.illawarralapidaryclub.com.

CORRECTION

Correction to the notice in the September Newsletter about the Parramatta & Holroyd Lapidary Club's exhibition & sale. The notice referred to the 2018 event. This year the sale is in November.

Annual Exhibition, Gem, Jewellery, Mineral Show & Sale

By the Parramatta and Holroyd Lapidary Club.

Being held over Friday to Sunday, the 15th, 16th and 17th of November.

In the Clubrooms at 73 Fullagar road, Wentworthville.

The Windsor Gem and Mineral Expo

To be held from 9:30 till 5:00 on Saturday 23rd November and 9:30 till 4:00 on Sunday 24th November in the Windsor Function Centre on the corner of George Street and Dight Street in Windsor.

Hosted by Australian Gem & Mineral Expo's and the Hawkesbury Valley Lapidary Club.

Displays and demonstrations by the Hawksbury Valley Lapidary Club as well as traders and dealers from around Australia. Items for sale by the many traders will include jewellery, gemstones, beads, opals, carvings, gem rough, lapidary cutting rough, fossils, meteorites, crystals as well as mineral specimens from Australia and all over the world. Entry \$7, kids (*under 18 with parent/s*) free. Lucky door prize.

More information on the website www.agamexpos.com.au
or contact Peter on 0412 333 150 or email at raregems@optusnet.com.au