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 2018

The October Meeting will be held on Friday the 5th of October at 7.30 pm in the clubrooms of the Parramatta and Holroyd Lapidary Club at 73 Fullagar Road, Wentworthville.

The program will include talk a by Professor Peter Williams on :-

'Misleading Mineral Locations'.

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

'The Molong Pallasite Meteorite'

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FORTHCOMING MEETINGS AND PROGRAMS

November 2nd: Lecture to be given by Glen Cathers on : - **'The Sepon Copper Mine, Laos'.**

December 7th: **Christmas Social and 'Swap n' Sell'.** The Christmas Social will comprise as usual the established program for the sale or exchange of mineral specimens and mineralogical material, books, magazines and equipment. There will also be a substantial and comprehensive range of snack food refreshments and drinks provided for which members attending the meeting will be asked to pay an appropriate fee.

Members intending to sell at the Social may advise the Secretary in advance of their requirement for an amount of table space which can be reserved for them.

The Meeting would be officially opened at 7.30 pm possibly with a few 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.

2019: The Society does not hold General Meetings in January and the first Meeting in 2019 will be on February the 1st. 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.

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FIELD TRIPS

To register for any of the following field trips please contact Edward Zbik
by e-mail: - *ecjz@optusnet.com.au* … or call 0401 538 480 until 10:00pm

Date		Locality:	Leader
Check MinView, DIGS and Mindat for minerals and site information			
October field Trip to Duckmaloi has been rescheduled to a future date.			
24th November	CANBERRA Weekend	GeoScience Canberra Visit, limit 10, afternoon Open to all Members. Arrange your own accommodation, camp at Cotter Reserve	Site Leader: Steven Petkovski
25th November		Paddy's River, Corrin locality, Canberra Open to all Members. Camping at Cotter Reserve (Fees apply, book site)	Edward Zbik

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The SEPTEMBER MEETING

The Meeting was opened by the Society Vice-President, John Chapman, in the absence of the President, Dieter Mylius, who was overseas. Initially John Chapman drew members' attention to boxes of donated specimens set out for purchase for $1 - $3 each specimen. The boxes included a tray of **Beryl specimens** from the **Triple Chance mine** in far-western NSW donated by Newcastle member Andy Patterson. The Vice-President asked that members allow any new members to look at and buy from the boxes first until the end of the Meeting when everyone could buy.

Ed Zbik reported on the recent **August Field Trip** to the Native Dog Creek, Hopes Creek, Sapphire Bend and Lowes Mount area which was attended by a small number of members and one visitor. The trip had been quite successful with members recovering about one gram of gold and an amount of fossils. The next trip would be in mid-September to the McAlpine Mine near Tumut and in November to Canberra.

Adam McKinnon displayed a number of specimens of **Manuka smoky quartz crystals** which he had recovered from the mine dumps after only an hour or so spent fossicking just after the Society's field trip to the site in early May. The Manuka quartz crystals are all smoky to a degree and occur in uncommon forms, multiple sceptres, doubly terminated reverse sceptres, castellated etc. Since Adam was able to collect a number of kilos of specimens just after the field trip party had also been working on the dumps it was apparent that there was still a substantial amount of specimens still to be found.

With no more announcements being made John Chapman introduced the first speaker for the evening, Society member Angela Lay, BEnvSc, (Geology honours), who is currently a PhD student at UNSW.

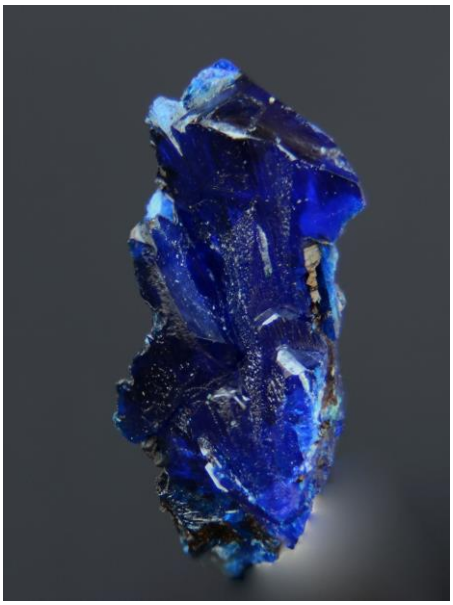
'World Class Linarite from Drake'
Angela Lay

The small town of Drake is situated about 70 klm west of Casino on the Bruxner Highway in northern NSW and has long been of interest to mining companies due to the presence of gold and silver in the area. In 1886 gold and silver were found at Drake, Mt Carrington, White Rock and Red Rock. Latterly since 2016 White Rock Minerals has been investigating a number of the sites with a view to further development, including the Red Rock mining area a few klm to the north of the town. As a result of this work a number of the minerals associated with the gold deposits have been identified. Notably workers including Angela Lay and Ian Graham have found small but very fine amounts of the mineral linarite often exposed in previous old workings.

Linarite was named in 1822 after the type occurrence at Linares in the Andalusian Province of Jaén in Spain but occurs in small amounts in many places around the World including a few in Australia. It is a lead copper phosphate, $PbCu(SO_4)(OH)_2$, and is an intense azure blue in colour. Specimens recently recovered from the Red Rock workings have been found with crystals up to 2.5 cm and the Drake or Red Rock linarite is now being considered to be world class. Up to the recent findings Broken Hill had been the only other notable Australian source of good quality linarite.

With the aid of projected images Angela Lay described at some length the examination of the old workings at Red Rock where the researchers have been finding linarite noting that there were several previously worked areas, old adits trending north and south and referred to as the north, central and south adits. The north adit has produced the best specimens. Overall the Red Rock minerals comprise a range of sulphate, sulphide and carbonate minerals and are hosted within a quartz sandstone. Associated minerals included brochantite, anglesite, cerrusite, clinochlore and quartz. Further images displayed a number of the specimens found and the workings where they were located.

Ian Graham and Brett Nagel collecting linarite samples from the Northern adit looking south.



Linarite. Dieter Mylius specimen

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Jeff Davis was to be the lecturer for the evening and was introduced by the Vice-President who advised that the original title for the lecture had been ‘Elements That Make Up Minerals’ but Jeff had decided to revise this to more adequately describe his lecture which was to be very thorough. Jeff has provided the notes and images that he referred to in his talk and which have been quoted extensively in the following summary.

The Periodic Table of Elements

A Look into the World of the Elements that make up Minerals

Jeff Davis

Initially the speaker advised that he had originally joined the Mineralogical Society in 1978 having now been a member for forty years. He then described his interest in collecting comparing this to other member’s likely collecting themes - from specific locations, or specific minerals or groups of minerals, micro-mounts, gem minerals and crystals, ore specimens or meteorites etc. In his case he is a species collector but also with a particular interest in collecting the ‘Elements of the Periodic Table’ and with that interest he had acquired a collection of a large number of examples of elements and had brought some 50-60 to display to the meeting.

As an introduction to his subject Jeff Davis described some of the earliest theories that ancient peoples had about the ‘elements’ that formed the Earth. These were initially the four ‘elements’ of earth, fire, water and air. The Chinese added two more, - metal and wood. In fact ancient people already had available to them a few examples of what we now know as elements since a few occur naturally such as gold, silver, copper, sulphur, carbon and iron. With just a little work by ancient workers smelting ores a few other useful elements could be obtained such as lead, tin and mercury.

Accordingly these elements were given ancient names mostly derived from Latin or Greek and which have come down to us, not to use the full ancient name but to refer to the element by the first and usually one other letter of its old name. Hence Aurum is gold, symbol Au; Argentum is silver, - Ag; Cuprum is copper, - Cu; Stannum is tin – Sn; Ferrum is iron - Fe ; Plumbum is lead – Pb etc. By about the seventeenth and eighteenth centuries early chemists were extracting and naming a few other elements such as wolfram in 1747, later named tungsten but given the chemical symbol W. The word wolfram is derived from German and referred to aspects of its difficult extraction process from wolframite. The element was later named tungsten which is from the Swedish name for the tungsten ore scheelite meaning 'heavy stone'. Later in the eighteenth century the elements sodium and potassium were given names derived from early language useages, - natrium from the Greek 'nitron' for sodium carbonate and kalium from the Arabic *'al qalīy'* meaning 'calcined ashes'. (Which also provided the word 'alkali'). Sodium and potassium are highly reactive and like many other elements would not occur in nature. They were first extracted and identified by Humphry Davy in 1807.

Jeff Davis moved on historically to refer briefly to the 'pseudo-science' of alchemy and the legendary 'philosopher's stone', (Latin: *lapis philosophorum*) which was an alchemical substance supposedly capable of turning base metals into gold. By the end of the eighteenth century however alchemy was beginning to give way to 'modern' chemistry and the speaker commenced naming the significant figures in that development.

A very notable and competent early chemist was the French nobleman Antoine-Laurent de Lavoisier, (1743 – 1794), who is widely considered to be the 'father of modern chemistry'. Lavoisier is most noted for his discovery of the role oxygen plays in combustion recognizing and naming oxygen and hydrogen - in 1778 and 1783. He helped construct the metric system, wrote the first extensive list of elements, helped to reform chemical nomenclature, predicted the existence of silicon, classified the elements as metals or non-metals and was the first to establish that sulphur was an element rather than a compound. He discovered that although matter may change its form or shape, its mass always remains the same. Unfortunately Lavoisier was working at the time of the French Revolution and whilst he was for a time a powerful member of a number of aristocratic councils he became involved in tax collecting, fell out of favour with the regime and was guillotined.

Jon Jacob Berzelius, (1779 – 1848), was a Swedish chemist. Berzelius is considered, along with Robert Boyle, John Dalton, and Antoine Lavoisier to be one of the founders of modern chemistry. Berzelius's work with atomic weights led to his development of a modern system of chemical formula notation and abbreviated the Latin names of the elements assigning them one (H, C, K, P, O) or two letters (Na, Ca, Au, Ag). He applied superscripts to designate the number of atoms of each element present in a mineral, e.g. H^2O for water, although later workers changed the superscript notation to a subscript, - H_2O. Berzelius himself discovered and isolated several new elements, including cerium (Ce – element 58), in 1803 and thorium (Th - element 90) in 1828. The mineral berzelianite, Cu_2Se, was discovered in 1850 and named after him.

John Newlands, (1837 – 1898), was the first person to devise a periodic table of chemical elements arranged in order of their relative atomic masses. In 1865 he published his 'Law of Octaves', which stated that *'any given element will exhibit analogous behaviour to the eighth element following it in the table.'* Newlands arranged all of the known elements, starting with hydrogen and ending with thorium (atomic weight 90), into seven groups of eight, which he likened to octaves of music. After Dmitri Mendeleev and Lothar Meyer received the Davy Medal from the Royal Society for their later 'discovery' of the periodic table, Newlands fought for recognition of his earlier work and eventually received the Davy Medal in 1887.

Dmitri Mendeleev, (1834 – 1907), is credited as being the first scientist to start constructing the Periodic Table of the Elements similar to the format we use today. He started arranging the elements in order of atomic mass and whilst doing so noticed a series of patterns occurring in the structure. These recurring or periodic patterns related the chemical properties of each of the elements. He arranged the elements into a series of rows or periods and vertical columns and labelled groups based on the atomic mass of each element. He left gaps in the table for later discoveries of elements not then named such as gallium, germanium and scandium and made predictions about their properties. He made a formal presentation of his 'Periodic System' to the Russian Chemical Society in 1869.

Antonius Johannes van den Broek (1870 – 1926) was a Dutch amateur physicist notable for being the first who realized that the number of an element in the periodic table (now called atomic number) corresponds to the charge of its atomic nucleus i.e. the number of protons. This hypothesis was published in 1911 and inspired the experimental work of Henry Moseley, who found good experimental evidence for it by 1913.

Henry Moseley was an English physicist who found a relationship between the X-ray wavelength of an element and its atomic number. He was then able to re-sequence the periodic table relating the nuclear charge of the element to the number of protons, rather than sequencing the elements by their atomic weight which had been the previous method. Moseley's discovery showed that the previous arrangement had not been completely reliable because elements such as potassium and argon had been placed in the Table based sequentially on their atomic weights when they should have been placed according to their atomic number, (i.e. number of protons), in the sequence - argon, potassium. The new order was in agreement with the chemical properties of these elements, since argon is a noble gas and potassium is an alkali metal.

Similarly, Moseley placed cobalt (27) before nickel (28) and was able to explain that tellurium (52) occurs before iodine (53), without revising the experimental atomic weight of tellurium, as had been proposed by Mendeleev. Moseley's research showed that there were gaps in the periodic table at atomic numbers 43 and 61, which are now known to be occupied by technetium (43) and promethium (61) respectively which had not been discovered at that time. Henry Moseley was killed in action at Gallipoli in August 1915.

In 1945 Glenn T Seaborg (1912 – 1999), proposed a significant change to Mendeleev's table by adding the actinide series. He predicted that the actinides form a transition series analogous to the rare earth series of lanthanide elements. The actinide series comprise the elements from actinium to lawrencium. Seaborg's subsequent elaborations of the actinide concept theorized a series of superheavy elements in a transactinide series comprising elements from 104 to 121 and a superactinide series of elements from 122 to 153.

Seaborg was the principal discoverer of ten elements including plutonium, americium, curium, and berkelium, and co-discoverer of californium, einsteinium, fermium, mendelevium, nobelium and seaborgium. He shared the Nobel Prize in Chemistry in 1951 with Edwin McMillan for "their discoveries in the chemistry of the first transuranium elements."

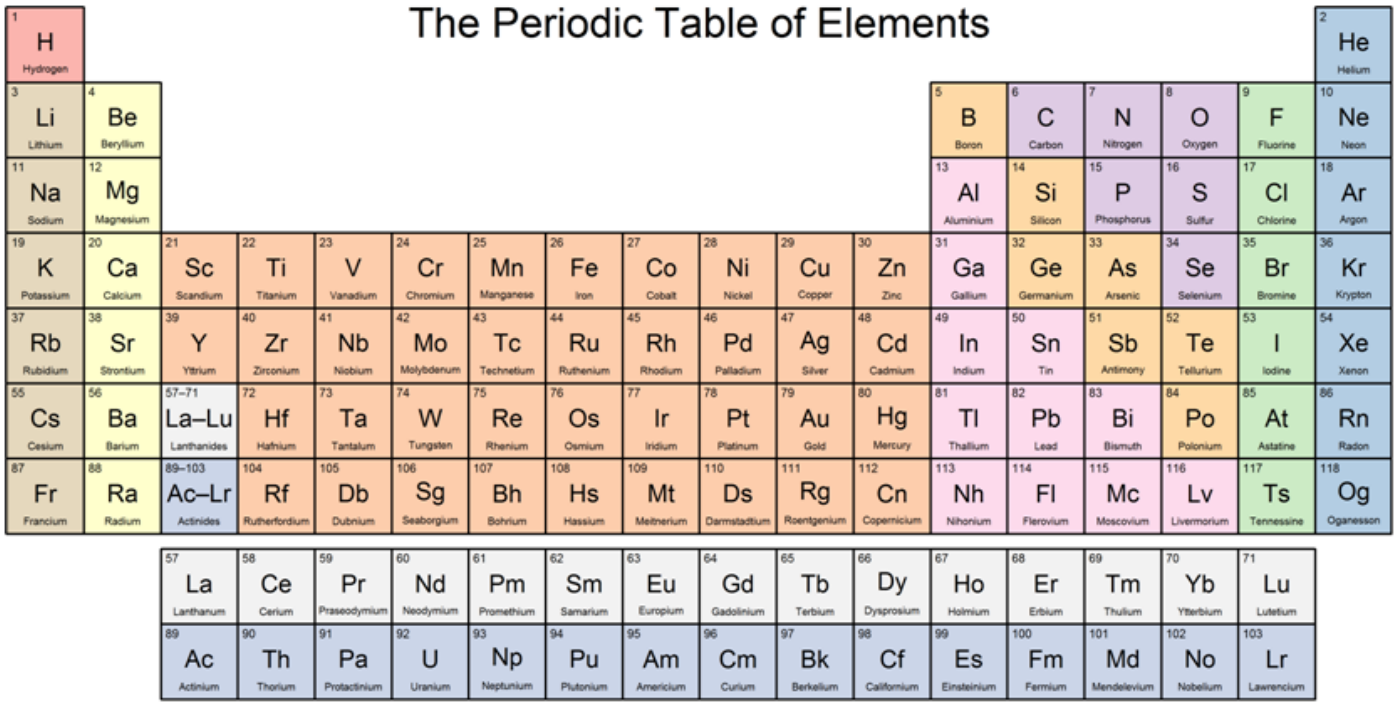
Adding to the names of people significant in the discovery of elements Jeff Davis mentioned the contribution of three women scientists, Marie Curie, (1867 – 1934), discoverer of radium and polonium; Ida Tacke, (1896 – 1978), discoverer of rhenium and Marguerite Perey, (1909 – 1975), discover of francium.

Having described the history of the development of the Periodic Table the speaker moved on to describe the table in detail, dealing first with the element groups as listed by Mendeleev and then to describe many of the elements individually mostly with reference to examples of the elements which he had brought in to display.

Elements are divided into three main classes:- Metals such as copper, silver, gold and iron. Non-metals such as sulfur, phosphorus, selenium and Metalloids such as silicon, arsenic and tellurium. The layout of the Periodic Table means that the non-metals can be indicated together as one block, (in the top-right segment of the Table diagram below). Elements exist in four states of matter, solid, liquid, gas and plasma.

Most metals have a silvery appearance with a few, copper, gold, etc which are coloured. They have variable densities from low, (Li, Be, Al), to very high, (Os, Ir), variable melting points from low, (W, Ta), to high. Two are liquids at or near room temperature (Hg, Ga), some are brittle (e.g. Cr, Bi), some not easily machined (e.g. Ta, Re, Nb), or are noble – Pt, Rh, Au (hard to oxidise). Metals comprise the large majority of the elements, and can be subdivided into several different categories. From left to right in the Periodic Table are the highly reactive alkali metals; then the less reactive alkaline earth metals; the lanthanides and radioactive actinides; the transition metals; other metals like the refractory metals and the noble metals.

The Non-metals by contrast, - carbon, silicon, phosphorus, sulfur, selenium and the halogens are soft, most with low densities and are coloured. Another separate group are the noble inert gases, helium, neon, argon, krypton, xenon and radon.



Referring to the first group of elements in the left-hand column of the Table the speaker noted that the Alkali Metals, lithium, sodium, potassium, rubidium, caesium and francium are all are silvery, soft, with low densities and are chemically very reactive reacting rapidly and violently with water. The group in the second column are the Alkali Earth Metals, beryllium, magnesium, calcium, strontium, barium and radium and are also substantially reactive although less so than those in the first group. Gradually the speaker worked through the groups in the Table describing aspects and features of the elements in each group.

Jeff Davis was also able to show a large number of examples of refined elements. He had brought in about sixty specimens of his collection to display, many of which being chemically reactive were sealed inside capsules the more seriously reactive being further embedded in clear plastic. Almost all of his specimens were held in clear plastic containers, some sealed and containing inert argon gas to prevent oxidation of the specimen. The samples having been manufactured were mostly in the shapes of tablets, cubes, plates, and slugs whereas a sample of silicon was in the form of a large cone. A number had been produced in crystalline or dendritic crystalline form and there was a specimen of gold leaf. Most of the specimens were a silvery colour but a few that would have been silvery were slightly coloured due to a coating of tarnish. Jeff referred to but had not brought in specimens which were either too fragile or hazardous including a few radio-active elements.

Sodium

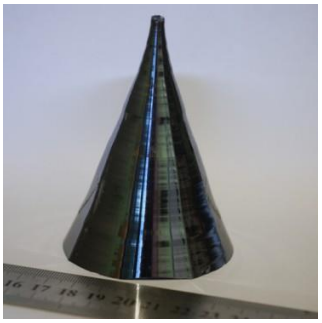

Calcium


Strontium


Osmium

Jeff Davis had been building up his collection for many years mostly by purchasing from companies which specialize in refining elements and providing them to collectors in the sealed containers. These were companies such as Smart Elements in Austria, Metallium in the US, Nova-elements in Italy and various Chinese merchants. Specimens of precious metals could also be obtained from bullion merchants such as Johnson Matthey or Baird & Co in London.

Members were advised that some of the element samples may be quite expensive such as radium which today would cost about $4,000 an ounce. Some years ago it hit a peak of $10,000 an ounce. Transportation of even very small specimens of certain elements may also add substantially to the cost of obtaining a sample because it may be classed as a hazardous substance and require expensive transport safety arrangements.


Silicon


Tellurium


Gold

The speaker advised that realistically a collector can build up a collection of only a little over eighty elements since some are either extremely rare and probably only available as a few milligrams, - for perhaps a price of $2,000 mind, or are prohibitively hazardous or are radio-active with short half-lives.

At the end of his lecture Jeff Davis answered a number of questions and recommended that members consider building up an element collection which he had found to be very interesting and rewarding.

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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.'

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The NORTHERN DISTRICTS LAPIDARY CLUB presents the

2018 GEMS, JEWELLERY AND MINERALS EXHIBITION

'Our Gem show and exhibition, lapidary competition and display, will be held from Friday 26th to Sunday 28th October at the Beecroft Community Centre, on the corner of Beecroft and Copeland Roads, Beecroft, Sydney.
The opening times are as follows:-
Friday 26th – 9am to 7pm; Saturday 27th – 9am to 5pm and Sunday 28th – 10am to 4pm
The Northern Districts Lapidary Club holds its Exhibition and sale of Gemstones and Rings, Faceted Gems, Pendants and Earrings which are handcrafted by club members. There will be something for the whole family with a fossicking fun area for children and demonstrations of craft working.
There will also be refreshments available as well as books and a range of plants.'

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THE ILLAWARRA LAPIDARY CLUB INC presents

The 2018 Jewellery Gems and Minerals Festival

When: Sat 3 Nov 9am – 4pm and Sun 4 Nov, 9am to 3.00pm
Where: Heininger Hall, Ribbonwood Centre, 109 Princes Hwy, Dapto
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 Kid's Games.
Dealers Selling: Lapidary Supplies, Minerals, Jewellery, Crystals, Findings, Fossils, Beads and Opals.
Enquiries: John (02) 42675618
http://www.illawarralapidaryclub.com.au/ Or Like Us on Facebook

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WINDSOR GEM & MINERAL FAIR

Over Saturday and Sunday the 24th and 25th of November at the Windsor Function Centre, on the corner of George and Dight Streets, Windsor. Saturday 9.30 am to 5 pm, Sunday 9.30 am to 4 pm.

'A bi-annual fair held at The Windsor Function Centre on the corner of George Street and Dight Street Windsor. Hosted by The Hawkesbury Valley Lapidary Club and Crystal Habit, the show will have a number of traders from around Australia displaying their wares as well as displays and demonstrations by the Hawkesbury Valley Lapidary Club.

Items for sale by the many traders there will include Jewellery, gemstones, beads, opals, carvings, gem rough, lapidary cutting rough, fossils, meteorites, metaphysical and healing crystals, mineral specimens from all over the world. A great day out for the whole family. There is also a great lucky door prize for one lucky person who comes!'

For more information please contact Peter at raregems@optusnet.com.au or 0412 333 150

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GEMBOREE 2019

The 55th National Gem & Mineral Show will be held at the Rockhampton Showgrounds, Rockhampton, QLD from the 19th to the 22nd of April 2019.

'Australia's biggest Lapidary, Rock, Fossil, Mineral, Gem and Jewellery Competition and Trade Show. For the first time, the GEMBOREE in 2019 will include an international symposium sponsored by the Gemmological Association of Australia (GAA) and will include guest presenters and lectures.

The aim of the symposium is to attract more national and international visitors as well as provide an additional opportunity to learn more about minerals and gemmology, particularly those in the Central Queensland Region.

The GEMBOREE will give visitors the opportunity to visit the Sapphire Gemfields in the Central Highlands. They will be able to see operating sapphire mines, learn about fossicking and lapidary activities in the area. The site visit will also enable local gemstone retailers and supply businesses to showcase their products. Visitors can learn about end-to-end sapphire and other gemstone production for the area.

The GEMBOREE will attract competitors from all over Australia and Internationally and traders from all over Australia. Traders may sell only items related to lapidary. As well as the competition and trading there will be demonstrations and workshops of lapidary related skills.'

For full details and competition schedule, visit the Gemboree 2019 website at : - *http://aflaca.org.au/gemboree*

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