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 DECEMBER 2021

CHRISTMAS SOCIAL and SWAP n' SELL

The December Meeting will be the Society's Annual Christmas Social and will be held from 11.00 am to 3.00 pm on Sunday the 5th of December in the car park outside the clubrooms of the Parramatta and Holroyd Lapidary Club at 73 Fullagar Road, Wentworthville.

The Social will comprise the sale or exchange of mineral specimens and mineralogical material, books, magazines and equipment. This year again due to the pandemic restrictions the Lapidary Club rooms cannot be used for the Social sales which will be held in the car park area outside the club building. The Lapidary Club will be open to allow access to the kitchen and toilets but in respect to social distancing rules only limited numbers of people can be allowed inside at any one time.

The arrangements will obviously be dependent on the weather being fine but as was provided last year, awnings will be set up over the tables. There should be adequate table space provided for sellers but members intending to sell are asked to notify the Vice-President, John Chapman, on (02) 9808 3481 or the Secretary, George Laking, on (02) 9636 7145 so that sufficient tables can be organized.

Due to the pandemic restrictions still in in place solid refreshments other than biscuits cannot be provided at the Social and members are advised to bring their own food although hot and cold drinks will be available. There will be no entry charge levied; the hot drinks and cold beverages will be free. If anyone needs solid food and chooses not to bring their own the Wentworthville Shopping Plaza with cafeterias and take-away service is about a ten-minute walk away.

Because the Lapidary Club car park is being utilized for the Social, car parking cannot be allowed on the Club premises but nearby street parking is available. The Club car-park will be open from 9.30 am to allow workers to set up the tables and awnings and members with material to sell should arrive early to set out their sales but are asked not to start selling before 11.00 am. Members with sale material to unload should drive into the car park but after unloading must move their cars outside the grounds. Other members arriving before 11 am are asked not to approach the sales areas which may still be getting set up, so please don't arrive too early.

In view of the pandemic regulations the Society must maintain a register of all attendees and in particular the Committee insists that all attendees be fully vaccinated, and should provide proof of this by showing their certificate if asked. Everyone must sign in upon arrival, (names should be printed), and give a contact number. The wearing of masks outside the clubhouse will be a matter of personal choice but should be worn all the time when going inside. Some hand sanitizing dispensers will be available but sellers are recommended to bring their own sanitiser and set it out on their sale table. Members looking at sales material and congregating at tables are advised not to crowd too closely and observe social distancing..

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.

Any members who were unsure of their current financial status could pay their subscriptions for 2022 only and they would then be taken as financial. Cash payments for subscriptions will not be accepted at the Social. Members are recommended to pay their subscriptions only by direct-debiting since this will provide both the member and the Society separately with bank account records of their payments. In direct-debiting, the payer should make certain to add their name to the payment panel to show who the payment is from.

To direct-debit the Society account the details are: - Commonwealth Bank
Account Name: - Mineralogical Society of NSW Inc.
BSB: 062016 Account number: 28023647

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FORTHCOMING MEETINGS AND PROGRAMS

2022: Hopefully by next year pandemic restrictions should have been cancelled and all Meetings can be held 'live' at the Parramatta and Holroyd Lapidary Club although it is hoped to also provide a virtual connection for the benefit of members living outside Sydney who are unable to get to meetings.

The Society does not hold General Meetings in January and the first Meeting in 2022 will be on February the 4th. Subsequently meetings will be held on the first Friday of each month through the year unless that is before a long weekend when the Meeting would be held on the second Friday.

A full program of lectures with some 'mini-talks' is being arranged for the entire year and the Meeting on May the 6th will be the Annual Members Mineral Auction. The programs and speakers on the following list are not entirely confirmed, additions and alterations may be made in due course.

February 4th : There will be a talk by Dieter Mylius on '**The Most Stunning mine in the World'.**

March 4th: Program not confirmed.

April 1st: There may be a lecture to be given by Dioni Cendon on '**Collecting in Spain'**

May 6th: **Annual Members Mineral Auction.**

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The SOCIETY COMMITTEE

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The NOVEMBER MEETING

The November meeting was conducted in virtual mode and opened by the Society President, Dieter Mylius, who expressed the hope that this Meeting would be the last one to be conducted only by Zoom. The December Meeting was to be the **Society Annual Christmas Social** which would be held outside the Parramatta and Holroyd Lapidary Club rooms on Sunday the 5th of December after which meetings in 2022 should be able to be held 'live' inside the Club-room. Given the familiarity obtained by operating virtual meetings it was hoped to provide virtual connection for the meetings in 2022 for members residing outside Sydney and usually not able to get to meetings.

There would be a Micro-mineral group meeting on the 25th of November and the group would be looking at Northern Territory minerals. After the excellent talks by given by Paul Melville it had become apparent that there were important sites and minerals in the Territory and hopefully members would bring a range of examples to the group meeting.

After asking if any members had queries or matters to report the President introduced the speaker for the evening. Allan Pring is the ex-curator of minerals at the South Australia Museum. Since 2014 he has been Adjunct Professor of Mineralogy, Department of Geology at the University of Adelaide.

Mineralogy and Chemistry in the Early 19th Century - a "Golden Age" of Science.

Allan Pring

The speaker initially described being on study leave in 2019 in Cambridge, U.K. when he was able to examine the very extensive archive in the Sedgwick Museum of minerals and fossils going back to the 1720s. The 18th and 19th centuries were a significant period for the development of what became modern chemistry, crystallography, mineralogy and geology. Over the course of his lecture Allan Pring described the advancement of science over the 18th & 19th period with particular reference to the early scientists and people involved. Many of the early scientists described by the speaker have minerals named after them.

The Cambridge archives included an amount of correspondence between H.J.Brooke and W.H. Miller who had collaborated in writing a book, - the Brooke Miller edition of *Philips Mineralogy* in 1852. This was the first modern mineralogy book and dealt with the problem in the 18th and 19th centuries where mineralogists working separately had been discovering minerals and had gradually assigned several different names to the same mineral. The Brooke and Miller book gave detailed physical, chemical, optical and crystallographic data as well as locality information on all of the then known minerals (about 600 species).

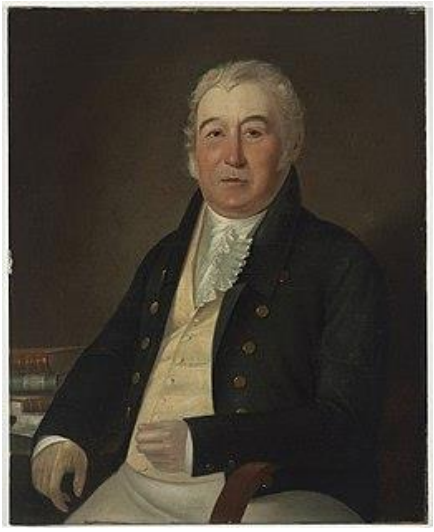
Henry James Brooke (1771–1857), was a lawyer who worked in the wool trade and in insurance. His hobbies were mineralogy, geology, and botany. Brookite was named in his honour. He was also a collector and his large collections of shells and of minerals were presented to the University of Cambridge. William Hallows Miller (1801-1880) introduced and developed the method of Miller Indices.

The end of the 18th century was a significant time for chemistry and mineralogy with about half of the periodic table of elements having been discovered. At that time there were no professional scientists in the modern sense. The people working in chemistry were educated but were medics, pharmacists, clergy or 'gentlemen of means'. At that time also there were only two universities in the U.K., Oxford and Cambridge, the London University not being established until 1820. The universities were effectively training schools for clergy or finishing schools for the gentry and only provided two degrees, Oxford in classics and Cambridge in mathematics. Alumni who wished to become doctors or lawyers had to then go to London to enroll at teaching hospitals to be doctors or the Inns of Court for lawyers. This was a world dominated by patronage and a person could go quite far if he was well-connected or well-born and not so far if he was not.

At that time Britain was not in the forefront of the development of chemical science. The centre of chemical analysis in Europe was in Sweden and Germany and for crystallography was France. Geology was developing and this period was described as 'the Golden Age of Geology' but it did not emerge as a separate science from mineralogy until about the 1830-40s. All of the founders of the Geological Society of London, (in 1807), were chemists and mineralogists.

Dr John Woodward (1665-1728) was a London doctor and a founder of the Natural History School of Geology. He built up a large and significant collection, buying several collections from people on the continent, and the total of 6000 minerals, rocks and fossils was donated to Cambridge University in 1729. He published a catalogue of his collection which was one of the first mineralogy books to give locality information on the specimens. Dr Woodward's will provided a large sum of money to establish a chair in geology, the Woodwardian Professorship of Geology. Probably the most well-known occupant of that chair was Adam Sedgwick (1785–1873) said to be one of the founders of modern geology. This was in spite of the fact that he was actually originally an Anglican deacon and knew no geology at all. This apparently was not regarded by the university as an impediment to his appointment.

Dr John Woodward



Robert Townson

Carl Scheele (1742–1786) was a German and Swedish pharmaceutical chemist for whom scheelite is named. He discovered oxygen and identified molybdenum, tungsten and barium but couldn't purify them into their metallic form. Scheele died moderately young at the age of forty-four possibly because he was a chemist who liked to taste his compounds, -- including ones containing cyanide and he may have poisoned himself!

Torbern Bergman (1735-1784,) was a Swedish chemist and mineralogist for whom torbernite is named He developed the concept of chemical affinity and the idea of chemical formulae to describe minerals and chemicals. This greatly contributed to the advancement of quantitative analysis, and he developed a mineral classification scheme based on chemical characteristics and appearance.

Richard Kirwan (1733–1812) was an Irish geologist, mineralogist and chemist who published an early 'modern' mineralogy book written in English in 1784. His experiments on the specific gravities of minerals and inorganic compounds formed a substantial contribution to the methods of analytical chemistry.

Providing an Australian connection was Robert Townson MD, (1762–1827) who was an English natural historian, traveller, and mineralogist. He trained as a doctor in the University of Göttingen in 1795, having earlier studied chemistry and mineralogy in Edinburg. He published the *Philosophy of Mineralogy* in 1798, an early book which focused on the chemistry of minerals. He also wrote a book *'Travels in Hungary'* after having made a journey through parts of the Kingdom of Hungary in 1793. In 1806 Townson emigrated to New South Wales, where his brother John was in the Royal Marines and became involved in the Rum Rebellion. Townson doesn't appear to have been active in mineralogy once he was in Australia, but succeeded with his farming and wine growing. He had been given a land grant in the Varroville area near Campbelltown.

John Dalton (1766 –1844) was an English chemist, physicist and meteorologist. He is best known for introducing the atomic theory into chemistry putting chemical formulae on a firmer footing. Dalton was the first scientist to use the term atom for the smallest particle of matter although his terminology was not generally accepted until around 1900. He also was the first to introduce the use of atomic symbols for the elements. He came from a humble background and was based for most of his life in Manchester.

René Just Haüy (1743–1822) was a French priest and mineralogist and due to his innovative work on crystal structure and his book, *'Traité de Minéralogie'* (1801), he is often referred to as the 'Father of Modern Crystallography'. Haüy observed a crystal's habit and cleavage planes, measured interfacial angles and found the constant for a particular mineral to formulate the first modern ideas of the regular internal structure of crystals which in modern times has led to the concept of the unit cell. During the French revolution, (1789-1799), Haüy helped to establish the metric system. In 1817 he was elected an honorary member of the New York Academy of Sciences and in 1821 elected a foreign member of the Royal Swedish Academy of Sciences. His name is the thirteenth inscribed on the south-east side of the Eiffel Tower and the mineral haüyne, (hauynite), was named for him in 1807.

Moving on and referring to mineral collectors Allan Pring described Philip Rashleigh (1729 –1811) of Menabilly, Cornwall, who was a noted mineral collector and his collection of Cornish minerals was remarkable for its various specimens of tin and secondary copper minerals. It is held by the Royal Cornwall Museum in Truro and its most valuable portions are described in two volumes of '*Specimens of British Minerals*' from his cabinet (1797 and 1802). The speaker advised that at the moment there is some question as to the fate of the Rashleigh collection which is no longer on display and it may be offered for sale. It would be quite valuable and the Museum would be able to undertake some re-modelling.

Rashleigh also collected and published the Trewhiddle Hoard of Anglo-Saxon treasure found in south Cornwall in 1774. That collection is in the British Museum.

James Sowerby, (1757–1822), was an English naturalist, illustrator and mineralogist who produced a large number of published works many very finely illustrated such as *English Botany* (over 2700 colour plates), *British Mineralogy* (550 hand coloured plates), and *Exotic mineralogy*, (167 plates). The books were published in monthly parts – in the case of the British minerals between 1804 -1817. They are landmark publications in British natural history.

Over the period 1790 to 1821 English scientists discovered a number of chemical elements, : -

Titanium 1791- William Gregor;
Niobium 1801 – Charles Hatch;
Palladium 1803 – William Wollaston;
Iridium 1803 -Smithson Tennant;
Osmium 1803 -Smithson Tennant;
Rhodium 1803 – William Wollaston;
Lithium 1821- William Brande.

William Gregor (1761 1817) was a clergyman with a parish in Cornwall. He had originally studied mathematics at Cambridge where he was a don for a while before becoming a clergyman and taking up an interest in chemistry and began a remarkably accurate chemical analysis of Cornish minerals.

William Hyde Wollaston (1766–1828), was an interesting and significant English chemist and physicist who was originally a medic. Since he did not like treating patients he became involved in industrial chemistry and with his friend Smithson Tennant formed a secret partnership and worked on a method of making platinum malleable. They purchased 60,000 ounces of platinum ore from Jamaica, paying sixpence an ounce for the platinum ore which amounted to a considerable outlay at that time. (Platinum had originally been discovered as a by-product of gold mining in Colombia in the 1790s. The name platinum comes from the Spanish 'platino' which means 'bad silver'. Spanish authorities at the time would not pay the gold miners for the platinum and took the view that it all belonged to them. This led to a very large smuggling operation during which quantities of ore were smuggled to the West Indies).

Wollaston had a shed and a furnace in his back garden in London and set about refining the ore into malleable ingots. He sold the metal for laboratory ware which was needed to make and handle sulphuric acid. The platinum ware was sold for one guinea an ounce which provided a very handsome return on the original sixpence per ounce for the ore. In the process of refining the platinum ore Wollaston and Tennant discovered a number of other elements in the residues including palladium, iridium, osmium, and rhodium. (Another element, ruthenium, is also a usual minor component of platinum residues but this was discovered by a Russian chemist in 1844). In addition to Wollaston's chemical discoveries he also invented the reflecting goniometer which allowed the angles between faces on a crystal to be measured with great accuracy. This was really a revolution in crystallography.

When Wollaston discovered palladium he could not find a use for it in 1803 and gradually accumulated a large amount. So he endowed the Wollaston Medal, to be made of palladium, to the Geological Society of London as the highest award granted by the Society for the most notable researcher in geology each year. The medal was made from Wollaston's palladium up to about 1930 when the metal ran out. Subsequently the Johnson Matthey company has underwritten a supply of it and the medal is still being made of palladium. In the present day an amount of palladium is used in cars to catalyse hydrocarbon combustion emissions and is quite expensive. The price may fall if electric cars become the dominant means of transport.

Humphry Davy, (1778–1829) was a Cornish chemist and inventor who is best remembered today for isolating, by using electricity, a series of elements for the first time. He is also particularly noted for developing the Davy Safety Lamp in 1815 for use by miners in coal mines.

Sodium 1807	Strontium 1808
Potassium 1807	Barium 1808
Calcium 1808	Boron 1808
Magnesium 1808	Chlorine 1810

Some of these elements were actually already known but had not been purified before. However Davy who was very much involved in electro-chemistry was able to make pure amounts of the elements. It was a very productive three years between 1807 to 1810 and Davy was knighted in 1812.

Possibly the greatest chemist of them all from the speaker's point of view is Jacob Berzelius, (1779 – 1848). Berzelius was a Swedish chemist and is considered, along with Robert Boyle, John Dalton and Antoine Lavoisier to be one of the founders of modern chemistry. Although Berzelius began his career as a medic he became Professor of Chemistry at Uppsala University in Sweden and a member of the Royal Swedish Academy of Sciences in 1808 serving from 1818 as its principal functionary. His enduring contributions were in the fields of electrochemistry, chemical bonding and chemical formulae. In particular he is noted for his determination of atomic weights and his experiments that forged links between elements in chemical compounds and chemical reactions. He also invented the system of chemical notation still used today. Berzelius used superscripts (H^2O or Fe^2O^3) rather than today's subscripts (e.g., H_2O or Fe_2O_3).

He also described quite a number of elements and a huge number of chemical compounds and was a prolific publisher, writing a number of books over the years. His first book on chemistry was in eight volumes and he would produce a new edition every three to four years. The mineral berzelianite, a copper selenide, was discovered in 1850 and named after him by James Dwight Dana.

Thomas Thomson, (1773 –1852), was a Scottish chemist and mineralogist who also performed a huge amount of writing, some of which contributed to the early spread of Dalton's atomic theory. He compiled and published the first really major collection of early chemical analyses of minerals in the 1830s.

A larger compilation of chemical analyses was produced by Karl Rammelsberg, (1813 –1899), who was a German chemist from Berlin, Germany. He distinguished himself with research in the fields of mineralogy, crystallography and analytical chemistry and published the important textbook *'Handwörterbuch des chemischen Teils der Mineralogie*', (2 volumes, 1841; supplement 1843–53).

A problem about early chemical analyses is that people had not agreed on a uniform set of atomic weights and there were a number of systems in use which were not standardised until 1870. Chemists tended to use their own figures which makes information about early analyses difficult to follow unless the reader knows the atomic weights being referred to.

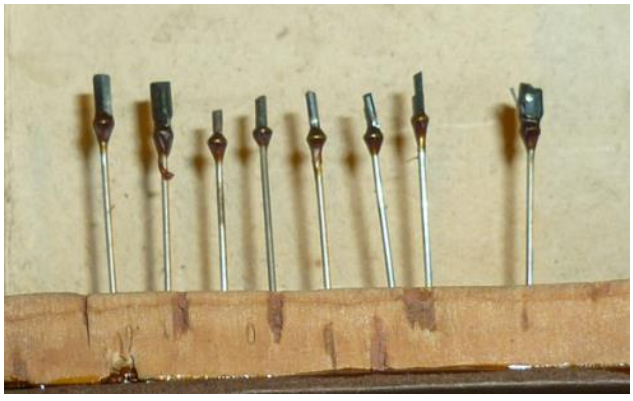
There were some people who started to measure crystals by goniometers to attempt to identify them rather than applying chemical analyses. One of these was William Phillips, (1775–1828), who was an English mineralogist and crystallographer. His *Elementary Introduction to the Knowledge of Mineralogy*, (1816), became a standard textbook with an amount of tabulations of the interfacial angles of crystals and no chemistry. The book ran to three editions in Phillips' lifetime and three others were published later. He was self-taught and by religion and profession a Quaker, printer and bookseller in London. As a printer he was able to publish the first book in English on crystallography, (1823), written by his friend H.J.Brooke who had also become interested in measuring mineral crystals using a Wollaston Goniometer.

H.J.Brooke and W.H.Miller also later published the 6th edition of Philips' *Elementary introduction to Mineralogy* in 1852 which was widely considered the best mineralogy textbook published in the 19th Century. They completely rewrote the original book and added a great deal of crystallographic and chemical data using their own extensive crystallographic measurements and Rammelsberg's analyses.

William Hallows Miller was a gifted child and the son of welsh parents. His family had been in America and became involved in the War of Independence after which they lost their estates because they had supported the British side and moved to Wales. Miller became a graduate of Cambridge mathematics coming fifth in his year. Later he applied for and was elected Professor of Mineralogy at the University of Cambridge from 1832 to 1880. He developed miller indices which related the faces on a crystal to the ratio of the crystallographic axes. He measured thousands of crystals filling twelve notebooks with the readings.

Miller was paid £100 a year for the professorship position and another £200 as a fellow of St John's College for a total of £300 which was not a bad salary in those days. Unfortunately he wanted to get married but as a fellow of a Cambridge college at that time he had to be single. Also after being a fellow for seven years he was expected to take holy orders. There were exceptions to that requirement such as studying medicine which Miller commenced doing in his spare time. However he eventually had to relinquish his fellowship to get married. However very conveniently at that time the Prime Minister of Britain asked him to develop a new standard for the English pound because the old standard had been destroyed when a large fire destroyed much of the Houses of Parliament in 1834. Miller was then paid £500 a year for ten years to sit on a committee to develop new standards for weights, lengths and the pound.

Allan Pring finally referred to the H.J.Brooke collection in Cambridge displaying an image of a set of goniometer standards of crystals mounted on pins and stored in matchboxes. He noted that the collection comprised drawers and drawers of specimens of minerals and fossils all waiting to be looked at.



These are mounted crystals used for Brooke's goniometric measurements

At the end of his very thorough lecture Allan Pring answered a number of questions particularly referring to the mineral collections in Cambridge which other members had visited. In referring to the Sedgwick Museum and its remarkable displays the question was put about the specimens not on show. The University has a separate building about a mile out of town with 700,000 fossils, 350,000 rocks and an archive of correspondence referring to the collections. The facility also stores the Charles Darwin collection.

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FORTHCOMING EVENTS

Canberra Lapidary Club Inc. Gem Shows 2022.

Rock Swap over Saturday the 12th, Sunday the 13th and Monday the 14th of March.
Parrot Park in the Exhibition Park (EPIC) in Canberra.
Free Entry: Fossickers & dealers selling :
Minerals, crystals, jewellery, rough & cut gemstones, opals, fossils.
Refreshments available: Sieve for Sapphires: Pan for Gold

Winter Gem Show in the Mallee Pavilion, EPIC: Sat – Sun 21st – 22nd May
Spring Gem Show in the Mallee Pavilion, EPIC: Sat – Sun 29th & 30th October
Winter & Spring Gem Shows are indoor only, Entry charges apply.

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58TH GEMBOREE 2022

The 58th Gemboree will be held over Easter 2022, from Friday to Monday, the 15th to 18th of April at the Australian Rural Education Centre, 267 Ulan Road, Bombira, north Mudgee, central NSW.

The Gemboree 2022 Booklet and other information is available and can be downloaded from the AFLACA, (Australian Federation of Lapidary and Allied Crafts Associations Inc), website : -

https://aflaca.org.au/gemboree/

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The 30th Lismore GEMFEST:

Will be held over Saturday and Sunday the 14th & 15th of May 2022
In the Lismore Showground.

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THE MINERALOGICAL SOCIETY OF N.S.W. INC.

MEMBERSHIP RENEWAL for 2022

Membership fees are due from January 1st

Please provide your full name, postal address, telephone number/s and e-mail address (if available). Members with e-mail capability will receive the Newsletter and other information only by e-mail.

NAME: ……

POSTAL ADDRESS: ……

……

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Telephone (ah)……. (bh)…….……

(mobile)…….….

E-mail address ……..…….

FEES: Adult membership, Sydney metropolitan area	$30
Adult membership, country or interstate	$25
Child/youth (under 18 years), or student member	$20

Additional family members (spouse/partner and children only) can be admitted for membership at the cost of $5 each (after the first member's costs as per the list above). If applying for additional family members, please list the name(s) here:

……..…. ……..……..……. ……..…….

New members joining from May 1st in any year are deemed to be financial for both the current and the whole of the following year.

Options for payment

1). Direct Credit / bank transfer to the Society's account

The account details are: -

Commonwealth Bank:
Account Name: Mineralogical Society of NSW Inc.
BSB: 062016 Account number: 28023647

Please put your name in the Memo line when making a direct debit/bank transfer so that the Society will know who the payment is from. If any of your address or telephone details have changed you should provide those details on this form and return it to the Treasurer - either : -

1) at the next General Meeting,
2) by e-mail to *quartzandsirius@hotmail.com*
3) by post to the address below

2). Cheque or Australia Post Money Order sent with a completed renewal form to : -

The Mineralogical Society of New South Wales Inc.
58 Amazon Rd,
Seven Hills,
NSW 2147

3). ***By cash or cheque delivered to the Treasurer, or in his absence the Secretary, at any General meeting.*** Members however are strongly urged to pay subscriptions by direct debit only as this will provide bank records of the payment for both the member and the Society.