Mineralogical Society of Western Australia

FEBRUARY 2001 Volume 2, Issue 1

Presidents Report

Firstly I would like to wish all our members and their families a safe, happy and prosperous New Year.
I would like to take this opportunity to thank three people in particular, for there support over the last 12 months and they are John Reeve, Roger Staley and Jeff Manners.
I am pleased to say over the last 6 months or so we have successfully set up and Incorporated the Society and attracted sufficient funds to keep afloat.
We have had a number of interesting and informative meetings and also had our first very enjoyable field trip to Greenbushes and an outing to the Diamonds to Dinosaurs at the Museum.
We were welcomed into the fraternity of the Australian Mineralogical Societies at the Joint Conference at Broken Hill in 2000 to which I attended on our behalf.
The committee have planned an interesting year for 2001.This includes field trips near and far, lectures by Mineralogist a Geochemist and a Soil Scientist and more.
Therefore I urge members to attend meetings when they can .The key to a successful society is ongoing member participation.
I have some exciting news on the 2005 Joint Societies Seminar, which we will be hosting in Kalgoorlie and some ideas from the committee on a technical publication by our society, which I shall announce at the next meeting.
Lastly I would like to personally thank the members for their continued support at the last election.

Feb 7th.

This meeting is a *buy, swap & sell nite.*
Bring your excess or swapping material along and see your collection grow.

Go online to the Australian Mineralogical Societies at these addresses.
http//www.mineral.org.au
http//www.home.gil.com.au/~mineral/

FORWARD Diary 2001

February 7th
Ordinary Meeting

April 4th
Ordinary Meeting

April 13th -16th
NSW Gemboree

June 9th - 10th
Joint SocietiesSeminar in Hobart

June 6th
Ordinary Meeting

August 1st
Ordinary Meeting

Oct 3rd
Ordinary Meeting

Dec 5th
Ordinary Meeting

Newsletter Contents

Editors Ramble.

My first act as ED will be to ask for any juicy stories you have on anything to do with Minerals in W.A.or any related matters.

The Logo competition that was mentioned in the last minutes, for which Roger Staley has kindly offered to donated the prize,will be announced in more detail at the next meeting.

Private Advertisements.

If anyone has a classified ad to put in our newsletter this can be arranged.However it must be received at least 1 month prior to the next meeting and not be for commercial gain.
Any commercial ads will be considered and are to be paid for.

Inward Correspondence

The best of Italian micromounts from Gianni Porcellini, Rimini, Italy.

An extensive list of Italian microminerals has arrived from Mr Porcellini.
They include both rare and common species from the Alps, central, northern and southern Italy,as well asthe islands of Elba and Sardinia.Prices are in Euros and range from 1 to 7.5.
1 Euro = $A1.6

The Mineralogical Society of NSW. December 2000 Newsletter.
The newsletter included notes on the Christmas social and swap and sell.A field trip report on the Woodland mine and Marvalan Quarry.Society business was covered and a summary of their monthly lecture by, Dr.Mylius on Native Elements.

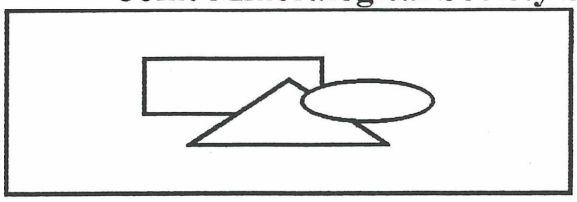
The Mineralogical Society of Queensland October 2000 Newsletter.
The results of the annual elections at AGM were announced – it ought to be noted that the society was undergoing a period of poor member participation. A report on the City Heritage Museum mineral display, notes on Mineral Dangers and the Treasurers Report complete the newsletter.

The Mineralogical Society of South Australia. Mineral Matters July 2000.
A report on the Joint Societies Seminar at Broken Hill was detail including minutes.There was also a report on a field trip to the Burra Peninsular.

The Mineralogical Society of Victoria. December 2000 Newsletter.
This newsletter included a number of interesting articles and general news including the Societies , Broken Hill Micro Collection , an excursion to Ballarat , Mount Cole Quarries and an article by G Faureau on micromounting.

All the aforementioned newsletters can be obtained on loan from Peter Clark.

Joint Mineralogical Society Seminar - June 2001 at



Tasmania will host the 2001 Joint Mineralogical Society Seminar in June 2001.
The theme is:

"2001 - A Mineral Odyssey".

To request specific information, or to register interest,
Check out the June 2000 Broken Hill Seminar programme at the ,
and a .
Come to , Hobart, Tasmania for the weekend of 9th and 10th of June 2001 and take a mineral odyssey around the Australasian region. There will be talks on:

Region	Subject	Presented by
New South Wales	Mineral Hill	John Chapman
New Zealand	To Be Advised	To Be Advised
Northern Territory	To Be Advised	
Papua New Guinea	Specimen Gold From PNG	L D Queen
Queensland	The Biggenden Mine	(Prepared by) Eric Stevens
South Australia	To Be Advised	To Be Advised
Tasmania	The Petterd Mineral Collection	Noel Kemp
Tasmania/Victoria	In and Around Bass Strait Islands	Lin Sutherland
Victoria	To Be Advised	Bill Birch
Western Australia	Whim Creek	Ted Madden

In keeping with the 2001 odyssey topic, there will be cosmic topics of:

Subject	Presented by
Lunar Rocks and Minerals	
Darwin Glass	Dave Duncan
Impact Sites	

Other subjects will include:

Subject	Presented by
Minerals Dot Com (Minerals on the Internet)	
Synthetic Crocoite	

Field trips in northwest Tasmania will be held during the week leading up to the Seminar (4th - 8th June) an on the Monday following (11th). Details from .
There will be a special event on the Saturday night. Details will NOT be released prior!
The Seminar dinner will take place on the Sunday night.
The cost for attending has yet to be finalised but will be around $50 for the two days and will include all morning and afternoon teas, and lunches on both days.
Please bookmark this site to keep up to date with news on the Seminar.

Maintaining hydrated minerals in an aesthetic by *Don Halterman*

Article from : Don Halterman

author --> mailto:morningstar@worldnet.att.net

Synopsis: The storage of hydrated minerals has always been problematic. Some, specifically chalcophyllite, dehydrate in a very short period of time, losing their appearance as well as their scientific and commercial value. The answer is to store the specimens in an airtight container such as Tupperware, along with a wet sponge or towel to provide atmospheric humidity. However, this precludes the attractive display of the minerals. Using commercially available materials, though, it is possible to both store and display them while maintaining their hydrated state.

Article: Several minerals such as autinite, torbernite, and especially chalcophyllite will dehydrate over time and lose both their structure and appearance. Chalcophyllite especially is susceptible to irreversible and damaging dehydration in as quickly as three days (1). In July 1999, Scott Kleine offered hydrated chalcophyllites from Majuba Hill, Nevada, on the Internet. At that time several on-line discussions took place as to the best way to preserve the integrity of these specimens and yet display them attractively. Some persons offered scientifically wonderful but expensive active systems, which would provide specific temperature and humidity control but would be out of range for the average collector to build and maintain.

At this time I placed my order with Scott, sent my check, and shopped for a solution while waiting for the shipment to arrive. While in the mall, I visited the Natural Wonders store, and was inspired by a new product: an egg-shaped, clear glass container housing a self-sustaining ecosystem, complete with animal species. At this point I needed a leap of faith; high school chemistry that was nearly twenty years ago, and my remembrances of its application have been faulty before. Still, I was willing to take a guess that a passive system, relying on what I remembered to be Charles' and Boyle's laws, would be all that one required to sustain an adequate relative humidity.

Walking a little further down the mall I entered Lechter's, a domestic specialty store with an emphasis on kitchens and cooking. I found what I needed: a 48-oz., clear acrylic cylindrical container with perfectly vertical sides and a Mason-style clamp lid with a plastic seal (2). It was 117 mm in inside diameter and approximately 130 mm in inside height with the lid closed. I purchased this, then went to the local rock shop and purchased clear acrylic cubes with 25 mm sides (1 inch square). Constructing the vessel was simple: a tiny drop of cyanoacrylate glue was placed on the inside bottom of the container after which an acrylic cube was placed on top of the glue and allowed to dry. This drying should be allowed to occur naturally, since blowing air across drying cyanoacrylate glue seems to create a frosted appearance. The creator may glue as many acrylic cubes in any pattern as desired.

Once complete, the vessel is ready to fill. Obtain distilled water and fill the vessel so that the water level is just over the tops of the cubes. At this point the mounting method depends upon the specimen itself; however, in the case of the Majuba Hill chalcophyllites, I used a non-drying clay called Polyform. Whatever the method, it must withstand a moist environment, and in fact should be constructed on the cubes before they are actually attached to the inside of the container. Mount the specimens carefully on their acrylic pedestals.

The actions in the preceding three paragraphs were accomplished in mid-summer 1999. Nearly a year later, the specimens appear to be in pristine condition, and surprisingly the water level has not visibly diminished. I do not know the nature of the seal material, but it is a transluscent milky white and very smooth material, with an almost greasy feel. In any case the vessel has held up quite well and it allows a fairly clear view of the specimens, with the only drawback being occasional condensation on the sides of the jar. Quite frankly this condensation is welcome, since it indicates a relatively airtight seal.

Conclusion: although it has been less than one year, it seems this style of storage and display for hydrated chalcophyllites fulfills both the need to keep them in a humid environment and the desire to display them in a fairly accessible manner.

Feedback and observations are welcome.

(1) Per conversation with Scott Kleine.

(2) Cooks Club brand.

(3) This was an obvious overcompensation on my part, back in the days when I wasn't even sure this would work. Most likely much less water will suffice. Volume calculations are left to the motivated reader.

GREENBUSHES
A 19th Century Mine Producing 21st Century Minerals

Introduction

The Greenbushes rare-metal pegmatite in Western Australia is unquestionably deserving of inclusion in any list of Australia's greatest mineral deposits. Its size, complexity mineralogical diversity, production and mining history make Greenbushes a world class mineral deposit.

The Greenbushes deposit and town are situated some 300km south of Perth and 80 km SE of the Port of Bunbury. The deposit lies in the Western Gneiss Terrane in the SW of the Yilgarn Block within the Collie (SI 50-6) 1:250000 map sheet.

The deposit is one of the world's largest lithium and tantalum resources. Hatcher and Clynick (1990). Currently the mine produces about 20% of the world's tantalum and is the world's largest lithium producer. (Sons of Gwalia Annual Report 1999). The mine has been in production for over 100 years and reserves of tantalum are sufficient at the current mining rate to last a further 17 years.

The pegmatite is notable for the occurrence of tantalite and spodumene as well as the rare tantalum minerals stibiotantalite, holtite, microlite, tapiolite, and wodginite. . Hatcher and Clynick (1990) Also the rare amphibole, holmquistite (lithium glaucophane) which is found in the exocontact Witt (1990).

The deposit was originally worked for tin, then tantalun and finally lithium and kaolin. Tin metal is used in the electronics industry and for manufacturing pewter. Tantalum is a high-tech metal used in the production of capacitors, alloys and tantalum carbides. Lithium oxide is used in glass and ceramic manufacture and in the production of TV tubes and computer monitors. Though the Greenbushes mine has its origins in the 19th century its future lies in the high-technology 21st century.

History

Cassiterite was discovered by a kangaroo hunter D W Stinton in 1888 though the Government geologist E T Harding had a role in the discovery. Hatcher and Clynick (1990). Mining commenced in 1888 with tin being mined continuously since that time. In recent times tantalum and lithium have become the major revenue earners.

The early operations were small scale and in 1893 as a result of tin smelting problems stibiotantalite was identified and tantalite in 1900. It was not until 1944 during WW11 that markets for tantalum were established. In 1949 spodumene was identified by the Geological Survey of Western Australia from a specimen collected in 1928 previously identified as feldspar. Hatcher and Clynick (1990).

Until 1970 most of the production came from alluvial deposits and small underground and open pit operations. Prior to this time the demand for tantalum was modest and prices were low, however with the advent of the 'spaceage' and development of computers demand surged.

Greenbushes Ltd amalgamated all of the small mining tenements on the Greenbushes mineral field and began production from the weathered pegmatite and significantly, negotiated the re-routing of the Southwest Highway which ran along the strike of the ore body.

Price increases in the late 1970's saw increased production and exploration in the weathered zone. The result was, that the world significance of the deposit became apparent. Between 1977 – 1980, deep exploration drilling confirmed the extensive size of the deposit below the weathered zone. (Sons of Gwalia Ltd information brochure 1999). The complex nature of the pegmatite was revealed and the enriched Sn/Ta and Li zones were delineated.

In 1990 Gwalia Consolidated Ltd took control of the operations of Greenbushes Tin and Lithium Australia and developed the mining and processing operation to its present day sophistication. In 1998 Gwalia Consolidated merged with its sister company, gold miner, Sons of Gwalia Ltd who are the current operator.

Production and Reserves

Currently mining occurs only in fresh pegmatite which is sourced from two open pits. The Cornwall or Tantalum Pit immediately south of the Greenbushes townsite and the Spodumene Pit 300 metres to the south. Total production to 1990 has comprised 23606t cassiterite, 46320t of spodumene and 2556t of tantalite-columbite, Witt (1990). Production for 1999 reached a peak of 741050 lb Ta_2O_5, 637t of tin and 75,824t of Lithium minerals (Sons of Gwalia Annual Report 1999) from 1.6 mt of tantalum ore. Reserves and resources are extensive.

Mining operations involve drill and blast on 7.5m benches, as at September 1999 the Cornwall Pit was 175 m deep and the Spodumene Pit was 100 m deep. Current mine plans are for the two pits to reach 270 m and 180 m respectively. (Sons of Gwalia information brochure 1999)

Geological Complexity

The Greenbushes pegmatite is part of a dyke swarm intruded along a NNW shear zone within the Balingup Gneiss Complex. Witt (1990). The pegmatites have intruded a sequence of metasediments and metabasic igneous rocks. The pegmatite swarm has a strike length of 7km and width of 1km. The longest body is about 3.3km long and up to 250m wide and has been drill tested to a 500m depth.

The pegmatites dip at 40° to 50° W. The contacts are sharp but comprise mylonite zones, xenoliths occur within the pegmatites. The pegmatite has been recrystalized with a grain size of generally less than 1mm. Gneissic textures with mineral banding are common . Hatcher and Clynick (1990).

It is evident that the genesis of the deposit is complex this is clearly shown by the multiple intrusion of pegmatite and dolerite dykes along a reactivated shear zone. The pegmatite is zoned and contains three internal but not symmetric zones along with a discrete contact zone. See table 1. (Modified from Witt 1990)

TABLE 1 ZONING OF THE GREENBUSHES PEGMATITE

Unit	Major minerals	Accessory minerals	Geochemistry
Exocontact	Biotite, holmquistite	Tourmaline, garnet, arsenopyrite	Li (As)
Contact	Albite, quartz, tourmaline	Garnet, apatite, muscovite; Sn, Ta, and Nb oxide minerals	Na (Sn, Ta, Nb)
K-feldspar	Quartz, microcline	Tourmaline, spodumene	K. Rb (Cs) (B, Li)
Albite	Albite, quartz, tourmaline, muscovite	Apatite, spodumene; Sn, Ta, and Nb oxide minerals	Sn (B, Sn, Ta, Nb, Be)
Spodumene	Spodumene, quartz	Albite, apatite	Li, Na (P)

Native Elements:	Gold, copper, tin?
Sulphides:	Arsenopyrite, chalcopyrite
Oxides:	Cassoterite, corundum, gahnite, gibbsite, goethite, ilmenite, magnetite, pseudorutile, psilomelane, rutile, spinel
Tantalates-Niobates:	Columbite, microlite, mossite, pyrochlore, stibiotantalite, tantalite, tantalo polycrase, tapiolite, wodginite
Carbonates:	Siderite
Phosphates:	Apatite, monazite, montebrasite, triphylite, turquoise, xenotime
Titanates:	Sphene
Tungstates:	Scheelite, wolframite
Silicates:	Albite, augite, beryl, biotite, diopside, enstatite, epidote, fuchsite, garnet, hornblende, holtite, holmquistite, kaolinite, kyanite, labradorite, microcline, muscovite, staurolite, sillimanite, spodumene, topaz, tourmaline, zircon

Conclusion

If the greatness of a mineral deposit is measured in terms of longevity, wealth, mineral diversity and rarity, and future potential then surely the Greenbushes pegmatite ought to be included in the list of Australia's greatest mineral deposits. Greenbushes is in the enviable position with respect to many mining operations, in that it possesses extensive reserves and a diversified product base and well developed infrastructure which will see it producing well into the 21st century.

Acknowledgements

It is with much gratitude that I wish to acknowledge the assistance of Sons of Gwalia Ltd their staff and in particular Mr Pat Scallan mine manager at Greenbushes. Professor Laurie Lawrence for his advice regarding the rare minerals of the deposit. Dr Alex Bevan curator of minerals and meteorites of the Western Australian Museum for access to the Simpson collection. Also thanks to Ms Cheryl Bird for typing the manuscript.

Bibliography

East, J.J., 1894. On Stibio-tantalite, a new mineral from the Staniferous gravel at Greenbushes, Bunbury,

AFLACA* *(Australian Federation of Lapidary and Allied Crafts Association Inc.)*

Gemboree 2001 is to be held in the Bolton Sports Complex, Morgan Street, Wagga Wagga New South Wales, over the Easter period 2001.
Please contact the following persons if you wish to receive more information on this event:

Bob Wright
Lot 28
Riveroak Drive
Mardi NSW 2259
Ph (02) 4353 4435
Arthur Roffey
PO Box 114
Londonderry NSW 2753
Ph (02) 4572 5812
Joan Ball
21 Edinburgh Drive
Revesby NSW 2212
Ph (02) 9773 5092
Gwen Johnston
46 Bryson Street
Toongabbie NSW 2416
Ph (02) 9636 1303

During the Gemboree, day trips will be arranged to two locations. The locations are: Tumbarumba (for sapphires and gold) and Muttama (for crystals). Please note the Muttama day is 4WD only.

We are planning to make this the most exciting and interesting exhibition possible. Therefore, we would like to obtain applications from those persons who may be interested in providing a display case of their treasured or unusual items. Whilst the competition sections provide valuable insight into the skills of the hobbyist/cutters, display cases afford great pleasure to both hobbyists and the general public alike. They form an essential part of our Gemboree exhibition. Please contact Joan Ball, 21 Edinburgh Drive, Revesby Heights NSW 2212, or telephone (02) 9773 5092 for an application form. We look forward to you helping us make this, our 37th Gemboree, an outstanding success and one to be enjoyed by all.

A selection of lectures is being assembled during the Gemboree. These will be advertised in the official program giving times, topics, venues and speaker. We hope to offer speakers who are expert on different aspects of our craft. Please note individual lectures will not be repeated.

Boral Quarry Bridgewater

- Adapted from an Article published in Mineralogical Society of Tasmania Newsletter #5, 1993, by John Richmond & Ralph Bottrill.

Geological Notes

- The major rock type present here is a basalt, a fine grained plagioclase-pyroxene-olivine bearing volcanic rock common in Tasmania, here of late Tertiary age (~ 10-20 million years). There is also an old stream channel exposed, filled with clayey sand and gravel. The basalt contains abundant columnar jointing in diverse orientations suggesting that the original surface was very irregular and the volvanic vents were probably close by. The lava probably flowed down the old Jordan River into the Derwent Valley, to about Claremont. The basalt is vesicular in part (particularly near the top), and these vesicles (frozen gas bubbles) commonly contain interesting minerals. Zeolites are notably lacking, perhaps due to insufficient depth of burial and/or low groundwater temperatures and/or unsuitable fluid compositions; they are commonly found at deeper levels than exposed here.

Minerals

- Aragonite

This occurs as small to large, attractive, lustrous prismatic crystals, colourless or white to pale violet coloured; also fibrous-massive, colourless to pale brown veinlets.

Barite

Occurs as attractive groups of colourless, bladed crystals to about 5 mm, with calcite.

Calcite

Attractive spheroids and botryoidal aggregates to about 15 mm diameter, white or banded to pale green and brown.

Ilmenite

Small black crystals lining vesicles.

Montmorillonite-nontronite

Massive, blue, green and black.

Opal

Black, massive.

Plagioclase Feldspar

Fine white crystals lining vesicles.

Quartz

Small drusy surfaces and chalcedony.

International Union of Crystallography

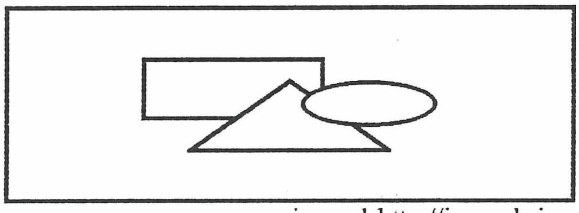
Welcome to the International Union of Crystallography

The IUCr is a member of the International Council for Science (ICSU) and exists to serve the world community of crystallographers. This home page supplies information on the Union, its Commissions and Regional Associates, and its journals and other publications. It is a major component of a web of crystallography services being developed under the auspices of the IUCr.

The Union and its Components

iucr**International Union of Crystallography**
comm**Activities of the Commissions**
Regional Associates of the Union
Nominations for the Ewald Prize

Journals and Other Publications

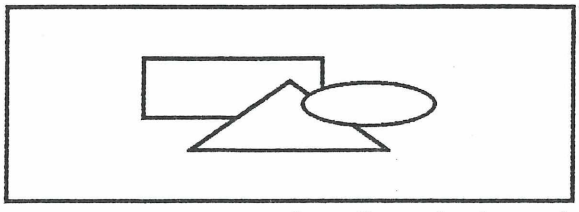


journalshttp://journals.iucr.org/http://journals.iucr.org/

International Tables for Crystallography
IUCr Newsletter
Teaching Pamphlets
Other Publications

Services

wdc**World Database of Crystallographers**
cif**CIF:** Crystallographic Information File
CWW: Crystallography World Wide
SINCRIS Information Exchange
Book reviews
Notes on individual crystallographers
E-mail Discussion Lists
Inorganic Structural Database at Reduced Cost



Crystallography Across the Sciences
A Celebration of 50 Years of *Acta Crystallographica*

Mineralogical Society of Western Australia.

Minutes of the November 1st 2000 meeting.

Apologies: John Reeve, Mark Jacobsen, David Vaughan, Noelene Ayres.

Attendance: Ted Fowler, Nimal Perera, Roger Staley, John Rawlings, Peter Clark, Alan Hart, Jeff Manners.

General Business: We received a donation from the South Australian and NSW Societies ,Peter is to send a letter of thanks.This brings our balance at the Bank to $519.40.

The first field trip to Greenbushes was a success .The weather was good and the mine manager Pat Scallen was very helpful. There were some well-put questions, which were answered duly by Pat. Afternoon tea was provided by the company and was enjoyed by all.
Some feedback on the trip was that it was not long enough. Also there were echoes of one another praising the hospitality that was shown to them by Ted Scallen.

It was suggested that we present Framed Certificates of Appreciation to Guest speakers.

A Club logo is needed and a competition to design one suitable for our Newsletter and Stationery has been suggested. Roger Staley has offered a prize for the winner. Details for this will be published in the Newsletter.

The Christmas Outing will be held on the 3rd of December. It will consist of a social tour of the Diamonds to Dinosaurs exhibit at the WA Museum starting at Lunchtime.

The entire meeting dates for the year shall be in each newsletter.

A summary of MinSoc newsletters will be in each of our newsletters.

Close of business at 8.28 p.m.

Guest Speaker: Ted Fowler.

MISSION STATEMENT of the Mineralogical Society of Western Australia.

To encourage mineralogical study by amateur and professional alike and, in so doing, discover, document and preserve the earth's and in particular Western Australia's natural history.

OBJECTIVES
Whilst focusing on the minerals of Western Australia, the overall objectives of the Society shall be:

(a) To advance the science of mineralogy.
(b) To disseminate knowledge of minerals, their occurrence and associations.
(c) To establish and maintain a register of mineral species and their occurrences in Western Australia.
(d) To increase knowledge of related fields of earth science.
(e) To keep members abreast of developments in mineralogy.
(f) To encourage an appreciation of the aesthetic value of minerals.
(g) To promote the proper care and preservation of mineral specimens.
(h) To promote the conservation of the geologically unique and of the environment in general.
(i) To provide a means of contact between professionals and amateurs in the various fields of the earth sciences.
(j) To foster a sense of cooperation and understanding between individuals, institutions and resource companies in the field of mineralogy.
(k) To provide a forum for debate and discussion on matters relating to mineralogy.

MINERALOGICAL SOCIETY OF WESTERN AUSTRALIA (Inc)

Office Bearers:

President:	Peter Clark 34 McDonald Street, Como, W.A. 6152	Tele. (08) 9368 1778 (h)
Vice President:	Jeffrey Manners 58 Berkley Road, Marangaroo, W.A. 6064	Tele. (08) 9342 8648 (h)
Secretary/Treasurer:	John Reeve 13 Buchan Place, Hillarys, W.A., 6025	Tele. (08) 9401 1963 (h)

Membership Details:

Joining Fee	$5.00
Adult Member	$20.00
Newsletter only	$15.00

An application form for membership can be obtained by writing to :-
The Secretary, J. Reeve
Mineralogical Society of Western Australia (Inc)
13 Buchan Place, Hillarys, W.A. 6025

Ordinary meetings of the Society are held on the 1st Wednesday in March, May, July, September, and November in the Rotary Hall, Sandgate Street, South Perth commencing at 7.30pm. The January meeting will involve social activities at a time and place to be notified.
Visitors are most welcome.

Newsletter of the Mineralogical Society of Western Australia
13 Buchan Place, Hillarys, 6025
Western Australia, Australia