



Mineralogical Society of Western Australia (inc.)

December 2001

Volume 2, Issue 6

Forward Diary
2001.

President's Report

The year is rapidly coming to a close and I would like to take this opportunity to wish all our members a happy and prosperous festive season. The October meeting was an informative and enjoyable evening. Peter Bridge's talk on cave minerals and other organically derived minerals gave an insight into what may happen when one lands in the.....

I recommend that members attend our next meeting in December our Quiz and Social Night. A program of next year's events will be finalized shortly; reports from those who attended the Poona trip were encouraging. Members with suggestions re social events and fieldtrips are most welcome.

I have received a request from Ron Young the President of the Queensland Society, asking for speakers to give

talks at the next Joint Seminar in Brisbane in June 2002. The theme is "My favourite subject – relating to Mineralogy in Australia". I have indicated to Ron that I would be happy to give a talk perhaps on a W.A. topic. If any members are interested in speaking or attending please let me know.

It gives me pleasure to welcome a new member Dr Ben Grguric a mineralogist currently working for WMC at their Mt Keith operations. Ben has recently co-authored the description of a new mineral species Woodallite from Mt Keith.

D.D.McNICOLL

It's a small world

WITH mutterings about boatpeople and endless wars on everyone's lips, a Queensland academic offers the following for quiet contemplation. "If we could shrink the Earth's population to a village of precisely 100 people, with all the existing human ratios remaining the same, it would look something like this: There would be 57 Asians, 35 Europeans, eight Africans; 52 would be female, 48 would be male; 70 would be non-white, 30 would be white; 70 would be non-Christian, 30 would be Christian; 89 would be heterosexual, 11 would be homosexual. Six people would possess 59 per cent of the world's wealth and all six would be from the US. Eighty would live in sub-standard housing, 70 would be unable to read, 50 would suffer from malnutrition. One would be near death and one would be newborn. One would have a university education and one would own a computer."

2001

**December 5th
Quiz Nite Social
Evening.
Hosted by John
Reeve.**

2002

**February 6th
Club Meeting**

**April 3rd
Club Meeting**

**June 5th
Club Meeting**

**August 7th
Club Meeting**

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Inward Correspondence

The Mineralogical Society of N.S.W. October Newsletter

The programmed lectures on Unusual Cave Minerals by Ross Pogson and The Yeranderie Silver and Lead Mines by Professor Lawrence were summarized. Safety on fieldtrips was highlighted.

The Mineralogical Society of N.S.W. November Newsletter

The November program was planned as an inactive night displaying photographs and favorite specimens while the December meeting is the Xmas social and swap and sell. A field trip to the North Parks mine is planned for November and a field trip report on the October Yeranderie trip is included. Two talks were presented in October the first talk by Professor Peter Williams on two new minerals from Broken Hill the second by Derek Dolstra title Ophir and the discovery of gold. The Society has changed its postal address to C/- School Science, Food and Horticulture B. C. R.I. Parramatta Campus University of Western Sydney Locked Bag 1797 Penrith South DC N.S.W. 1797.

The Mineralogical Society of Victoria October Newsletter

The Newsletter includes notes from the committee excursions and coming events, details of a field trip to the Western Districts also notes from the photographic and micromounting group.

Editors Corner.

Well another year is nearly gone and Xmas is upon us again. I would like to take this opportunity to wish all of my fellow members the very best for the coming year and hope that we shall all get together in 2002 for some good collecting trips.

Merry Xmas from Jeff.

March 2002

- **29 MAR - 1 APRIL 2002
NATIONAL GEMBOREE 2002**
Rockhampton, Qld.

June 2002

- **June Queen's Birthday Weekend 2002**
25th Joint Mineralogical Society Seminar : Queensland will host the 2002 Joint Mineralogical Society Seminar. The theme is 'Speakers Choice', to give the authors (and attendees!) a smorgasbord of mineral subjects. Queensland Museum, Southbank, Brisbane for the Queen's Birthday weekend of June 2002
For More information contact • Tony Forsyth via email or watch this space for more information as it comes to hand .

The Riverina Emerald Deposit

By P. Clark

1.0 Introduction

Emerald is one of the most highly prized precious gems, more valuable per carat than diamonds. The discovery of emerald at Riverina 50 km west of Menzies in the Eastern Goldfields in 1974 was a significant mineralogical find however the economic potential of the deposit has never been realized. Emerald is a green variety of beryl and is a rare mineral usually associated with pegmatite. Other notable Western Australian occurrences include Poona in the Murchison, Wodgina in the Pilbara, Warda Warra, Melville in the Yalgoo Goldfield, and at Bullabulling near Coolgardie (Garstone 1981). Western Australia is the nations largest producer however emerald and beryls are recorded from every other state. Production from the deposit has been intermittent currently the mining lease is owned by Mr. Roger Lindsay. High quality gems, cabochon grade and specimen pieces are produced from the lease.

2.0 History

The original discovery, at Riverina was made by road workers grading the Riverina - Mt Ida road. It was subsequently pegged by Mr. Norm McKay who began mining operations. Rojer Lindsay purchased the tenement M 30/8 in 1993 . The deposit has had a chequered history due to uncoordinated mining operations, ore dilution and beneficiation problems. Also maintaining grade has led to marketing difficulties (Lindsay 2000). However a number of high quality gems have been found along with good matrix specimens.

2.1 Previous Production

Past- recorded emerald production is incomplete however Lindsay (2000) has documented the following;

1975-1978

200 tonnes of mica schist, pegmatite and ultramafic were processed recovering 1000 grams of facet grade gems as well as quantities of cabochon grade material, crystal and matrix specimens.

1984-1986

70 tonnes of ore produced 1200 grams of facet grade emerald with unknown quantities of other grades.

1994-1996

46 tonnes of handpicked ore produced 3000 grams of facet grade and 30000 grams of cabochon, bead, carving and specimen material.

1998-1999

Fossicking over dumps resulted in collection of slightly over 1000 grams of cabochon, bead, carving, specimens and facet grade stones.

Parcels of stones have been sold locally, in Perth, interstate and in the U.S.A. as well as Thailand. Specimens can be seen in the Gem Room of the Australian Museum in Sydney and the Museum of the Goldfields.

2000

570 tonnes of ore were mined from shoot no. 7, 169.5 tonnes were processed yielding 5138 grams of emerald.

3.0 Mining and Processing

Mining and processing of the ore, which is predominantly pegmatite and mica schist is relatively straightforward. However beneficiation of the material to liberate the emeralds effectively has proven to be problematic. Mining is conducted by openpit methods using an excavator and dump truck. Processing of ore is accomplished by treatment in a wet trommel followed by screening and hand sorting. The key to efficient processing is efficient attritioning of the ore to separate the fragile emeralds from the gangue minerals.

3.1 Grading and Valuation

As with other gemstones recovered grade in grams is only the first parameter to be determined in the overall grading and valuation procedure. Evaluation of rough stones was conducted on a 1000gram parcel in 1999. The parcel was sent to a Sydney gemstone dealer who divided the sample into two grades and forwarded them to the U.S.A. and Thailand. The American wholesale value of the rough was between US\$0.40-US\$1.00 per carat (1 carat = 1/5th of 1 gram). The anticipated yield of cut stones would wholesale for between US\$20.00-US\$40.00 per carat. However the report stated that a significant amount of material would be lost during cutting. The Thai marketing agent had the parcel assessed in India the result was a wholesale price of US\$1.00 per carat. A parcel of 14 faceted emeralds, ranging from 0.30 carat to 1.86 carat were valued by a qualified gemstone dealer in. The specimens possessed the following characteristics, clarity - "inclusions", colour - "light green to good green". The valuation ranged from AUD\$307 to AUD\$2600 per carat (Lindsay 2000)

3.2 Ore Reserves.

The podi-form nature of the ore zones makes estimation of ore reserves difficult. Based on the known area of ore shoots calculated to a depth of 40m a volume of 388500 cubic metres results. Using an SG of 2.5 an orebody of 971250 tonnes can be calculated. Average recovery grade based on previous production from 1975 to 1996 is 29 grams per tonne. Therefore total recoverable gemstone of facet grade could equal 28 million grams.

3.3 Planned Production

Production is planned to commence from shoot no. 7, one of the richest and largest ore zones. While shoot no. 7 is being mined and attritioned development mining will begin on the other shoots. Processing will initially use the wet trommel plant while a larger throughput plant is established (Lindsay 2000). Lindsay states "The limited capacity of the pilot plant will make selective mining of high grade ore a priority to enable early generation of cash flow and to initiate recognition in the market". Target capacity is 25 tonnes per hour to produce an average recovery of 500000 grams of emerald concentrate. This equates to an average annual production of 7.5 million carats of facet grade and 30 tonnes of lower grade emerald (Lindsay 2000).

4.0 Geology

The regional geology of the area comprises an Archaean sequence of mafic to ultramafic metavolcanic and felsic intrusive rocks. They form part of the Mt Ida greenstone belt in the eastern Yilgarn Craton. The sequence, part of the Kalgoorlie Terrane has undergone four deformational events D₁-D₄. Major N-S trending strikeslip faults such as the Mt Ida and Ballard Faults are dominant features as are late stage granitoid intrusions. Metamorphism has attained upper reenschist to amphibolite facies (Wyche 1999).

(Sinkankas 1981).

Physical characteristics include:

Colour – Yellow, white, blue(aquamarine), colourless(goshenite), golden(heliodor), red(bixbite), pink(morganite) and green(emerald).

Cleavage – Basal

Fracture – Conchoidal

Lustre – Glassy, brilliant

Hardness – 7.5-8

Specific Gravity – 2.6-2.8

5.2 Riverina

The mineralogy of the deposit is relatively simple. The major mineral species are beryl, quartz, albite and phlogopite. Beryllium rich solutions emanating from the pegmatite have penetrated the schist to a depth of 30cm and removed chromium. Three stages of beryl crystallisation have been recognized (Garstone 1981).

1. Colourless – pale green 0.06% Cr_2O_3 .
2. Dark green high alkali 0.15% Cr_2O_3 .
3. Cr deficient.

6.0 Conclusion

The formation of the deposit involved a complex interaction of pegmatitic, hydrothermal and pneumatolytic processes. Emplacement of irregular pegmatite bodies produced metasomatic alteration of the host-rocks resulting in the crystallization of chromium bearing beryl - emerald.

7.0 References

- Garstone. J.D., 1981, The Geological Setting and Origin of Emerald Deposits at Menzies, Western Australia. Journal of the Royal Society of Western Australia, Vol. 64 Part 2, pp.53-64.
- Lindsay. R., 2000, Menzies Emeralds Timeless Treasures from the Australian Outback. Unpublished. 14p.
- Simpson. E.S., 1952, Minerals of Western Australia Vol. 3, reprinted 1984, Hesperian Press. Perth. pp195-207.
- Sinkankas. J., 1981, Emerald and other Beryls. Chilton Book Company Pennsylvania. 665p.
- Wyche, S., 1999, Geology of the Mulline and Riverina 1:100000 sheets: Western Australia Geological Survey, 1:100000 Geological Series Explanatory Notes, 28p.

Spatial mapping merger

THE merger between the Commonwealth agencies AGSO-Geoscience Australia and the mapping agency AUSLIG was announced this week.

The merger between the two federal government providers of spatial mapping data will create a \$100 million agency with more than 530 staff. It will be implemented over the next six months.

The merger will not involve any job losses. AUSLIG will be swallowed up by AGSO Geoscience Australia, becoming one of its divisions. Existing products such as Acres and Natmap will continue.

Satellite mapping provides vital information for mineral exploration, petroleum exploration, dryland salinity and land management.

Another initiative will see digital data stored online by the agencies made available free of charge.

Free online access will be granted to topographical covering the whole of Australia. Access will also be given to data about land use, salinity, geology, gravity, seismic activity, climate, World heritage areas and the Register of the National Estate.

The merger should enable the organisation to provide information more readily and more efficiently'

Big picture: Free online access will be granted to data.

A MINERAL BY ANY OTHER NAME WOULD SMELL THE SAME - OR WOULD IT?

The potential discovery of a new species is the dream of most collectors. Some time ago my very good friend and fellow Society member, Ted Fowler, a knowledgeable and fine practitioner of the art of micromounting, was delighted to find a possible new species in this backyard. More precisely, the locality was the underside of the concrete lid of the household septic tank.

Not one to ignore the potential scientific value of this interesting cluster of white acicular crystals, Ted duly collected and mounted the specimen. Once mounted, the important labeling requirements became a priority. Notwithstanding the international conventions on naming minerals, my friend was inclined to be a little self-indulgent and proposed "fowlerite" as an appropriate name. This hope for immortality was immediately shattered when it was realized that fowlerite had already been applied to a zincian rhodonite. Undaunted by this setback and mindful of the origin of the specimen, a name was selected that maintained the family connection and provided a subtle clue to the type locality.

Over the years, many collectors have admired Ted's collection and not infrequently visitors have been invited to make a visual identification of a particularly fine cluster of white acicular crystals. To date no one has successfully identified the species, although many learned suggestions have been offered. Each time this play has been performed, Ted proudly turns the mount to reveal its name -

FOULERITE

John Reeve

MINERALOGICAL SOCIETY OF WESTERN AUSTRALIA (INC)

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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
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13 Buchan Place, Hillarys, W.A. 6025

Ordinary meetings of the Society are held on the 1st Wednesday in February, April, June, August, October and December in the **W.A. Lapidary and Rock Hunting Club rooms 31 Gladstone Street Rivervale**, commencing at 7.30pm. The January meeting will involve social activities at a time and place to be notified.

Visitors are most welcome

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THE NEW CLUB LOGO

The crystals featured in the map of WA and the borders are Simpsonites and range in colour from colourless to cream.