# Mineralogical Society of Western Australia

Forward Diary 2001.

APRIL 2001 Volume 2, Issue 2

## Presidents Report

I am pleased to report that following the last general and committee meetings that a number of society activities have been arranged. The fieldtrip to the Riverina emerald deposit has been organized for June also a trip to Cattlin Creek pegmatite is being arranged for Easter. I would like to encourage members to participate in fieldtrips as they are an important social and educational experience not to mention the considerable effort required to arrange them. Public liability insurance for the society has been purchased at very reasonable rates.

The February meeting was a success with the buy swap and sell night well attended. Thanks go to those who donated samples for the raffles and to Peter Bridge for kindly donating some interesting Western Australian specimens as well as generously providing a set of Simpson's Minerals of Western Australia. The funds raised brought a smile to the Treasurers face.

For those members unfamiliar with Peter Bridge's Hesperian Press, publishers of the Simpson volume, I thoroughly recommend a visit. The Simpson set will be auctioned at the next meeting, so bring your money with you!

Rules for the logo competition have been formalized and will be explained at the April meeting.

An informative series of lectures, by, Professor Bob Gilkes of UWA, Dr. Ernie Nickel our own Peter Bridge and lastly myself is planned, for details see diary.

Finally as mentioned at a previous meeting, the Australian Journal of Mineralogy is seeking submissions particularly relating to Western Australian occurrences, so if anyone has some worthwhile information please make the effort to contribute.

## AUCTION OF SIMPSON VOLUMES

The Society is indebted to Peter Bridge for his generous donation of the three volume set of Minerals of Western Australia.

As agreed at the February meeting, the set will be auctioned at the April meeting.

In keeping with the value of this reference set, the Society Executive has determined a reserve price and the Auctioneer has been instructed to commence bidding at $120.00.

If you do not have the Minerals of Western Australia on your book shelf, this is a golden opportunity to gain the set at a competitive price.

***April 4th***
Guest Speaker
**Proffessor Bob Gilkes.**
**Microscopic Minerals in the Regolith.**

***April 13th – 16th***
**Cattlin Creek Trip**

***June 2nd – 4th***
**Menzies Field Trip.**

***June 6th***
Guest Speaker
**Dr Ernie Nickel.**
**Nickel Minerals**

***June 9th – 10th***
**NSW Gemboree**

***August 1st***
**AGM**
Guest Speaker
**Peter Bridge.**

***October 3rd***
Guest Speaker
**Peter Clark.**
**Supergene Minerals.**

***December 5th***
**Quiz Nite**
**Social Evening.**

**Newsletter Contents.**

**Presidents report**
**Catlin Creek pegmatite**
**Notes on Priderite**
**Logo competition**
**Catlin Creek and Menzies field trips.**

# Inward Correspondence

**The Mineralogical Society of N.S.W. February 2001 Newsletter**
The newsletter included a program of meetings and noted that the society had acquired a full set of Mineralogical Records. The financial statement for 1999-2000 was presented.

**The Mineralogical Society of Queensland January 2001 Newsletter**
News of the society Christmas party the Kilkivan fieldtrip and an article on Kyogle as well as notes on the Micromineral Symposium in New Zealand. Also Field Collecting of Minerals – Part One: The Tools.

**The Mineralogical Society of S. A. Mineralogical News December 2000**
Information included program for 2001, President's and Treasurer's reports and articles on South Australian deposits including the Middleback Ranges, Dome Rock, Utica Mine and Princess Royal Mine.

**The Mineralogical Society of Victoria February 2001 Newsletter**
Notes from the Committee, Field Trips and general news was followed by an interesting article on collecting in the UK.

## Cattlin Creek pegmatite,

Directions: The pegmatite is located 1.2 miles (2.0 km north) north of the intersection of the South Coast Highway (Morgan Street) and Scott Street in Ravensthorpe along Scott Street which becomes the old Newdegate road. The pegmatite can be seem to the east from the road at 225,100 E and 6,282,000 N, AGD1966. Ravensthorpe is located 532 km southeast of Perth and 190 km west of Esperance along the Southern Highway. Ravensthorpe in 1990 had a population of 392.

In 1900, Maitland (1900, p. 10) wrote that T. Blatchford during his investigation of the Philips River Goldfield observed a pegmatite "...about half-a-mile south of Ravensthorpe ("Central camp") [and that] this rock carries very large crystals of spodumene." E. S. Simpson confirmed the spodumene discovery as the first occurrence in Western Australia (Maitland 1900, p. 32). Later mineralogic and geologic work was done by Simpson (1948, p. 584), Ellis (1944) and Sofoulis (1958). Currently, the property is controlled by Haddington International Resources Ltd. In April 2000, they announced their signing an agreement with Sons of Gwalia (SOG) to develop and operate a mine at Cattlin Creek with SOG purchasing all the tantalite (and possibly spodumene) concentrates. The mine is expected to become operational by January 2002. After completion of mining within two years, the Cattlin Creek

pegmatite will be completely removed.

The Cattlin Creek pegmatite occurs on the western side of the Ravensthorpe greenstone belt, close to the contact between the mafic volcanics and the Ravensthorpe quartz diorite. The pegmatite forms a large, flat lying tabular body that is zoned. These zones can be recognized based on mineralogy and texture. The zones are quartz-albite-microcline-muscovite pegmatite (wall zone), albite-quartz-lepidolite±elbaite pegmatite and albite-quartz-spodumene pegmatite. "Tantalite" and microlite are associated with the albite-quartz-spodumene and albite-quartz-lepidolite pegmatite.

This pegmatite is a well-known Australian pegmatite locality for its large opaque green, pink and watermelon elbaites in quartz and cleavelandite, as well as for its abundant greenish spodumene. Sofoulis (1958) reported: quartz, microcline (perthite, orthoclase), albite variety cleavelandite, lepidolite (3.26% $Li_2O$), muscovite, spodumene, beryl, elbaite (green, red, blue, cucumber, watermelon), schorl, amblygonite-montebrasite, manganocolumbite, cassiterite, stibiotantalite (635 pounds from MC 23 lease), microlite (a bismuth-bearing, stibio-microlite), and sericite. Sphalerite was collected in 1993 from the quartz-albite-spodumene pegmatite.

References

Ellis, H. A. 1944a. A spodumene deposit, Ravensthorpe, WA. Annual report of the Department of Mines for 1943. Geological Survey of Western Australia.

Maitland, A. G. 1900. Annual progress report of the Geological Survey for the Year 1900. p. 5-40.

Simpson. E. S. 1948. Minerals of Western Australia. 3 volumes. Hesperian Press, Victoria Park, Western Australia. 1984 reprint.

Sofoulis, J. 1958. Report on Cattlin Creek spodumene pegmatite, Ravensthorpe, Phillips River Goldfields, W. A. pp. 193-302. in: The geology of the Phillips River Goldfields, W. A. Geological Survey of Western Australia Bulletin 110.

# Some Notes on Priderite, Jeppeite and other Minerals from the Walgidee Hills Lamproite.

The term lamproite was introduced by petrologist Paul Niggli in 1923 to identify the magma type that exhibited unusually high amounts of $K_2O$ coupled with high MgO. The name is derived from a Greek word meaning "glistering" and refers to the characteristic presence in such rocks of shiny phenocrysts of phlogopite. The term lamproite was subsequently extended in potassic rock terminology by Wade and Prider (1940) in their description of leucite bearing rocks from Western Australia. The first recognition of leucite bearing rocks in Western Australia was made by Fitzgerald with further work being done by others, including Edward Simpson.

A systematic study of the occurrence of leucite bearing rocks in the Fitzroy River Basin (Kimberley Region) formed the basis of Rex Prider's Doctor of Philosophy at Cambridge University. Prider's work demonstrated the existence of a third lamproite province (Lennard River and Fitzroy River Basin having been previously determined) and introduced four new type locality names. The new terms were:

cedricite from Mount Cedric (named after Wade's son),
fitzroyite after the Fitzroy River (Lord Fitzroy held the post of Governor General of Australia for a period in the nineteenth century),
walgidite from the Walgidee (formerly Wolgidee) Hills, and
mamilite from Mamilu Hill (named after Wade's wife).

It is interesting to note that the names were criticized by Cecil Tilley (Prider's thesis supervisor) and others for the lack of euphony, but were not objected to on petrological grounds.

The discovery of the Western Australian lamproites did not herald an upsurge of interest in the study of lamproites, despite the fact that Wade and Prider suggested a genetic link between these rocks and diamondiferous kimberlites. For the next two decades, lamproites were largely ignored.

## Minerals of the Walgidee Hills Lamproites

The mottled appearance of the lamproite and lack of distinct crystals of priderite, jeppeite and wadeite in the rock has tended to reduce the interest of collectors in this material. Additionally, it is almost impossible to distinguish priderite from jeppeite without the aid of a microscope. Petrological slides are the ultimate method of identifying the minerals in the assemblage, however this is a collecting mode rarely used by collectors.

### Priderite $(K,Ba)(Ti, Fe^{3+})_8O_{16}$

The mineral was initially identified by Cross (1897) as rutile, an identification not disputed by Wade and Prider (1940). Work published by Norrish in 1951 determined the "rutile" to be a new mineral and was subsequently named priderite in honour of Professor Rex T. Prider.

Priderite is a member of the Cryptomelane Group which contains complex oxides of either the tetragonal or monoclinic system with a general formula $AB_8O_{16}$ where:

A = Ba, K, $Mn^{4+}$, Na, Pb, Sr;
B = $Cr^{3+}$, $Fe^{3+}$, Mg, $Mn^{2+}$, Ti, $V^{3+}$, Zn, Zr.

Typically priderite occurs as acicular crystals from 0.2 to 0.5 mm in length, however the Walgidee Hills lamproite is distinctive in that priderite crystals can reach up to 4mm in length.

### Jeppeite $(K, Ba)_2(Ti, Fe^{3+})_6O_{13}$

Bagshaw et al (1977) reported that a potassium barium titanite, isostructural with synthetic $K_2Ti_6O_{13}$, occurs in

the lamproite pegmatites at Walgidee Hills. This phase was later shown to be a new mineral by Pryce et al (1984) which was named jeppeite in honour of J. Jeppe, an Exploration Geologist.

Jeppeite is found as prismatic to acicular crystals mantling priderite. In specimens examined by Birch(1985), he described jeppeite as forming black, stumpy to prismatic "pseudocrystals" made up of radiating aggregates of small prisms closely resembling schorl.

**Wadeite $K_2ZrSi_3O_9$**

Prider (1939) described wadeite from the West Kimberley lamproite. The mineral is found as rarely occurring colourless masses, often having a fractured appearance resembling shattered quartz. Typically the masses do not exceed 2mm across. Identification of wadeite can be complicated by the ever present fluorapatite which occurs as small colourless prisms. Careful observation for the visual characteristics of wadeite ( and considerable patience) will result in the ability to distingush wadeite from fluorapatite.

Interestingly, in contrast to the relative "common" occurrence of wadeite in lamproites, the mineral has only been reported from two other paragenesis – the Khibina alkaline complex and the Kovdor carbonatite (both in the Commonwealth of Independent States). At these localities, wadeite is a very rare mineral associated with labuntsovite, phlogopite, orthoclase and thorite.

**Potassic Fluororichterite $(K,Na)(Ca,Na)Mg_5Si_8O_{22}F_2$**

Potassic flurorichterite is the most abundant mineral in the assemblage. This amphibole forms prismatic to tabular, transparent, honey to reddish brown coloured crystals with a prominent cleavage. The mineral was first described from the Walgidee Hills occurrence and named magnophorite by Prider (1939), the name was discredited.

**Fluorapatite $Ca_5(PO_4)_3F$**

Fluorapatite occurs as phenocrysts and microphenocrysts with crystals up to 2mm in length. As mentioned under wadeite, the distinction between fluorapatite and wadeite may be difficult.

**Diopside $CaMgSi_2O_6$**

The yellowish green to olive green colour of dioside provides much of the colouration in the lamproite. The generally fractured crystals do not encourage examination beyond casual interest.

**Shcherbakovite $(K, Na, Ba)_3(Ti, Nb)_2Si_4O_{14}$**

This potassium barium titanosilicate from Walgidee Hills was originally named noonkanbahite by Prider (1965). The name was subsequently discredited by the I.M.A. on the basis that the mineral is merely a variety of the shcherbakovite(K) – batisite(Ba) series.

Mitchell and Bergman (1991) report shcherbakovite as prisms to 1mm exhibiting a strong colourless to golden yellow pleochroism in association with priderite and jeppeite, and is commonly partially replaced by barite.

**References**

Cross, C.M. 1897: The igneous rocks of the Leucite Hills and Pilot Butte, Wyoming. Am. J. Sci., 4, 115 –141

Birch, W.A. 1985 : A note on large crystals of priderite, jeppeite, wadeite and other minerals from Walgidee Hills, Western Australia. Aust. Min. 50, 298 - 302

Mitchell, R.H. and Bergman, J.C. 1991 Petrology of Lamproite Plenum Press, New York

Norrish, K. 1951: Priderite, a new mineral from the leucite-lamproite of the West Kimberley area, Western Australia. Min. Mag. 29, 496 –501

Prider, R.T. 1939 : Some minerals from the leucite rich rocks of the West Kimberley area of Western Australia. Min. Mag. 25, 373 – 387

Prider, R.T. 1965: Noonkanbahite, a potassic batisite from the lamproites of Western Australia. Min. Mag. 34, 403 -405

Pryce, M.W., Hodge, L.C. and Criddle, A.J. 1984: Jeppeite, a new K-Ba-Fe titanite from Walgidee Hills, Western Australia. Min. Mag. 347, 263 –266

Wade, A. and Prider, R.T. 1940: The leucite-bearing rocks of the West Kimberley area, Western Australia. Quart. J. Geol. Soc. London, 96, 39 –98

Notes prepared by John Reeve, March, 2001

# JUNE FIELD TRIP
# 2 –4 JUNE, 2001

**The Foundation Day long weekend field trip will be to the emerald deposit at Riverina Station, west of Menzies. The President has arranged access to this deposit for Society members and the opportunity exists to visit other mineralogically interesting occurrences in the immediate area.**

**Full details will be given at the April meeting. For those members who can not be at the April meeting, the plan is to meet at the Menzies Hotel on Sunday, 3 June and at 9.00 am leave in convey to the emerald deposit. Please note that the 9.00 am departure time form the Hotel is fixed and will adhered to by the Field Trip Leader. Should you require more details, please call Peter Clarke.**

# SOCIETY LOGO COMPETITION

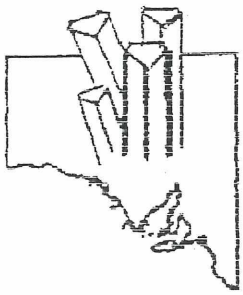
**Members are invited to submit a logo design for the Society to be judged by the membership at the August Annual General Meeting.**

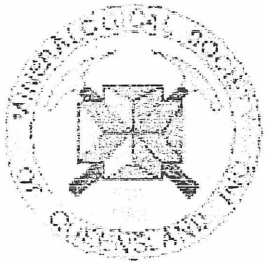
General Conditions of the Competition and Logo Requirements

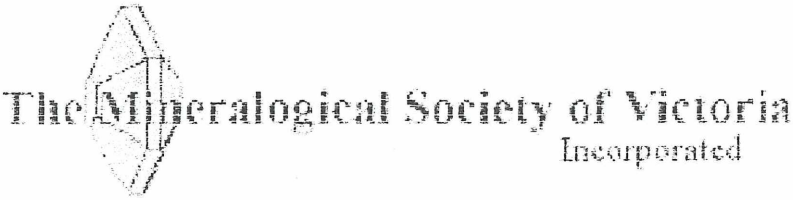
1. The logo design can be any size, however the design must be able to be reduced to 5 x 5cm and retain design clarity.
2. Ideally the design should be presented in a black and white format. Coloured logos are acceptable, but please bear in mind that the usual reproduction format will be black and white.
3. The design must bear the Society's full name (that is, Mineralogical Society of Western Australia (Inc)). The incorporation of other pictorial element(s) is at the discretion of the designer. Where a mineral is placed in the design, the designer is requested to provide a separate note of explanation in regard to the relevance of the mineral in the logo.
4. The winning designer shall assign all intellectual and other rights of the logo to the Society and shall agree to accept any modifications to the design made by the Society.
5. Entries close on 1 July, 2001 and should be delivered to either the Society President or Secretary.
6. All logo designs will be illustrated in the August Newsletter to enable Members to review the entries before the August ballot. The ballot will be conducted using the preferential voting method.
7. The Society reserves the right to make modifications to the winning logo design.

## GOOD LUCK

# Australian Society logos for comparison



# MINERALOGICAL SOCIETY
# OF
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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
Mineralogical Society of Western Australia (Inc)
13 Buchan Place, Hillarys, W.A. 6025

Ordinary meetings of the Society are held on the Ist Wednesday in February, April, June, August, October and December 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**

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