Mineralogical Society of Western Australia (inc.)

JUNE 2002 Volume 3, Issue 3

Presidents Report

I was pleased to see such a good attendance at the recent Toodyay fieldtrip. Abundant small sagenic quartz crystals were to be found.

I have had a number of recent inquiries re-membership such interest augurs well for the future. It has been brought to my attention that a few members are unfinancial would those persons please attend to the matter.

Professor Peter Williams of Sydney is giving a special lecture on June 12th at 7.30 pm at our usual venue. I would encourage members to attend as Peter is not only an extremely knowledgeable geochemist/mineralogist but an entertaining speaker as well.

I look forward to seeing members at our June meeting.

O_2 and $CaWO_4$ – He Who Hesitates Is Lost!

"Every school child knows that oxygen was first discovered by the English chemist Joseph Priestley." Most of us think that statement is true – or is it?

Priestley (1733 – 1804) was a remarkable scientist. Much of his work centred on the Phlogiston Theory, which in essence postulated that anything that would burn or support combustion contained a special substance called Phlogiston. In 1772 he discovered that plants gave off a gas that sustained animal life. As a result of subsequent experiments, including heating red oxide of mercury and lead, he concluded that he had discovered a new kind of air from which phlogiston had been removed which he entitled dephlogisticated air.
He had discovered oxygen.

To the north in Sweden, an apothecary and chemist was conducting his own experiments with mercuric oxide. The result was an odourless, colourless gas that made a glowing splint to burst into flame and caused a mouse to be frisky when kept in a jar of the gas.

This remarkable discovery was the basis of the chemist's book entitled "A Chemical Treatise on Air and Fire". The year – 1771. Idleness on the part the chemist's patron, Torber Bergman, to produce a promised introduction for the book caused a lamentable delay in publication until 1777. Priestley had long since reported his own experiments and claimed the credit for the discovery of oxygen.

So who was the real discoverer of oxygen? His name was Karl Wilhelm Scheele (1746 – 1786). Sceele devoted his life exclusively to the pursuit of science and probably shortened his life by his habit of tasting all the new substances he discovered, including copper arsenite, oxalic acid and tungstic acid. But that is another story.

Today mineral collectors remember Karl Scheele for his discovery of tungsten and the naturally forming compound $CaWO_4$ which carries his name – SCHEELITE.

Ref.
Youngson, R. (1998). Scientific Blunders (The historical oxygen blunder) Publ. Robinson, London.

Hurlbut,C. and Klein, C (1977). Manual of Mineralogy (after James D. Dana). Publ. John Wiley and Sons, New York.

Scheelite with Mica. (1997) Pingwu, Sichuan, China. 9.5 x 9 cm. Photo by Francesc Fabre / Fabre Minerals

Forward Diary 2002

***February* 6th**
Club Meeting

***April* 3rd**
Club Meeting

***June* 5th**
Guest Speaker

Peter Clark

***June* 12th**
Guest speaker

Prof Peter Williams

***August* 7th**

AGM

***October* 2th**
Club Meeting

***December* 4th**
Club Meeting

Newsletter Contents.

The Mount Edon Pegmatite Field, Paynes Find – Goodingnow: Compiled Data and Field Obseravations

Introduction

The Mount Edon area, near Paynes Find, contains numerous developed and undeveloped pegmatites containing a limited, although mineralogically interesting range of minerals.

This report documents collecting and field observations recorded by Mark Jacobson in 2001 and Mark Jacobson and John Reeve, in company with Suzanne Koepke, during the 2002 Labour Day long weekend. Five mineral claims were visited:

MC 59/5800-Goodingnow Feldspar Quarry Pit 1
MC 59/5987-Goodingnow Feldspar Quarry Pit 2
MC 59/7089
MC 59/6969
MC 59/6468

The undermentioned mineral claims were not visited however data on these claims are recorded in this report:

MC 59/5799
MC 59/5801

Much of the information presented in this report is taken from data previously compiled by Mark Calderwood (2000) and revised by Mark Jacobson from available literature, open geological reports, and personal contacts and communications.

Location

The Mount Edon pegmatite field is located surrounding Mount Edon (Trig Point) which is located between Paynes Find and Goodingnow, and west of the road connecting these two mining camps. The area is 7km south south west of the Paynes Find fuel station-tavern-caravan park.

To reach the pegmatites , travel from Perth on the Great Northern Highway for about 450 kilometres to Paynes Find. From the Paynes Find hamlet return to the Highway and turn south onto a well graded dirt road (Goodingnow Homestead/ Mt Edon Road) less than 200 metres east of the northern turnoff to the Paynes Find petrol station. Pass through the gate onto Pullagaroo Station and travel past the two feldspar quarries seen to the west from the road. Take the Mt Edon sign posted dirt track to the west that leads to the summit of Mt Edon, the centre of the field at 564,462E and 6,755,951N (GPS measured). [Ningham map sheet 1=250,000 scale map sheet and Maranalgo 1=100,000 scale map sheet]

All of the Mount Edon pegmatites are on Pullagaroo Station. This Station is owned by Mr and Mrs Noel and Ginny Broun, P.O. Box 73, Coorow, W.A. 6515. Telephone: 0899 636570

General Pegmatite Field Geology

The Paynes Find greenstone belt (Murchison Terrane, Yilgarn Craton) comprises a north-east trending sequence of ultramafic, mafic greenstones and metasedimentary rocks (now slates, phyllites, mica schists and amphibolites), intruded by largely concordant, but irregularly shaped bodies of felsic pegmatite and aplite. The area was geologically mapped in detail by Calderwood (1976) with a map in the Western Australia Geological Survey (WAMEX open file report 5770). Most of the pegmatites trend to the northeast but several cleavelandite-bearing pegmatites trend to northwest.

The pegmatites are simple quartz-microcline-muscovite pegmatites, but several of them have small core-margin units of albite, variety cleavelandite "clots". Tantalite, tapiolite and lepidolite are directly associated with the occurrence of cleavelandite. Beryl can be found in the pegmatites.

Minerals that have been reported from the field are: quartz (white massive, clear crystals), microcline (perthite, amazonite), albite (var. cleavelandite), muscovite, lepidolite, zinnwaldite, beryl, garnet (spessartite), tantalite, columbite, tapiolite, opal (var.hyalite), uranophane, allanite, apatite(?), microlite(?), and an unnamed thorium phosphate.

Production History

There have been several periods of pegmatites exploration, principally between 1965-1990. No active mining has been undertaken since that time. Watkins and Hickman (1990) reported that the Goodingnow (Mt Edon) pegmatites produced 5.85 tonnes of beryl up to 1987. The beryl production is believed to have come mostly from the Goodingnow feldspar quarries just to the west side of the Goodingnow – Paynes Find track. A small amount of tantalite-columbite was produced from the field in 1990 (Watkins and Hickman (1990)).

Pegmatites Visited During the March, 2002 Field Trip

Paynes Find – Goodingnow Feldspar Quarries

1. Northern Pits 1 and 2 (MC 59/5800) (566,500E, 6,757,650N GPS measured)
2. Southern Pit 3 (MC 59/5987) (566,497E, 6,757,143N GPS measured)

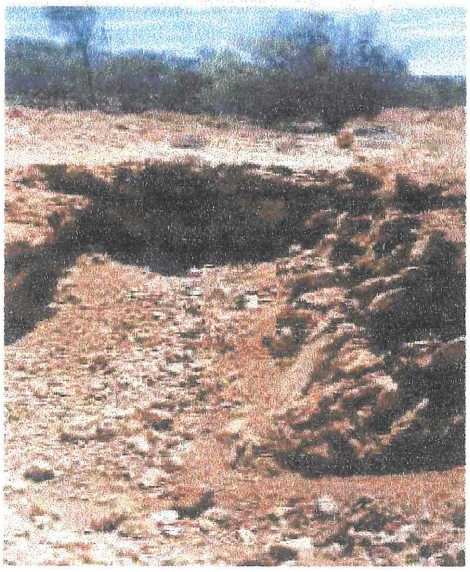
These two pegmatite locations are described as the Goodingnow feldspar pegmatites in Lipple et al (1983), the explanatory geologic notes that accompany the Ningham 1:250,000 geologic map sheet. The dumps of the pits can be clearly seen to the west of the Paynes Find -Goodingnow Road. A good dirt track leads to each of these pits. The Pit 3 area affords a good camp site.

The three open pits are excavated into two very simple pegmatites consisting of microcline-perthite with subordinate quartz and muscovite. Rare minerals in these pegmatites are zinnwaldite, albite, beryl and columbite. Minor columbite was produced from the elluvial material around Pit 1 during the 1960s (Calderwood 2000). Lipple et al (1983) states that lepidolite has been found at the Goodingnow feldspar quarries. The pegmatites appear to have essentially two zones, microcline in large monomineralic masses and smaller areas of coarse grained quartz-microcline pegmatite with accessory muscovite. No quartz core segments were observed. In the mid 1970s, D. Calderwood recognised the high quality microcline-perthite that was later mined. During excavation of Pit 1, a small quartz-albite-muscovite unit was exposed containing beryl, spessartine, columbite and a thorium phosphate mineral. In the early 1980s, Mark Calderwood was involved with the mining of beryl including a crystal cluster of at least 5 tonnes. Aftr mining was abandoned in the 1980s, Calderwood (2000) noted that beryl was still exposed in the wall of the former feldspar quarry. The remaining pits contained only minor rare mineral zoning. The white microcline-perthite from the quarries was of high quality. Later testing of the feldspar indicated that the common grey microcline-perthite has the same ceramic characteristics as the white feldspar.

2002 Field Observations and Collecting

Pits 1 and 2 failed to produce any collectable minerals of significance. Very minor metallic sections (>=1mm) of columbite(?) were found. Decomposed garnets (spessartine) were located on the surface of a few rocks which, on cracking, revealed fresh pinkish-red micro crystals. Very rare vugs usually contained a light lime green amorphous clay (?) mineral, however, one vug contains an unknown lime green mineral exhibiting sprays of prismatic crystals.

Under microscopic examination, several pieces of rock revealed several minerals requiring identification. A rock exhibiting a yellow coating has an appearance similar to clinobisvanite from the Londonderry pegmatite. Another piece has two dark green blebs resembling chlorapatite and several black, very thin, long crystals penetrating quartz which resemble needles of tourmaline.



In Pit 3, the feldspar-quartz contact zone proved to be particularly productive for large microcline and beryl crystals. The microcline crystals are cream white in colour and attached to matrix. It was anticipated that the beryl would be near white in colour and probably massive, or at best, show some crystallisation. There was clear evidence that collecting activity had occurred on a ledge on the east face of the Pit. Exploration of this face on two occasions (mid/late afternoon with full Sun on the face and early morning when the face was in shadow) clearly indicates that morning collecting is the preferred time as the colour contrast between the beryl and feldspar-quartz is most pronounced. Several cream yellow to pale lemon yellow hexagonal beryl sections were located in the feldspar-quartz contact zone. All the euhedral beryl crystals that were extracted with (regretably) varying degrees of damage. Four crystals were particularly notable for their lemon yellow colouration and size (up to 10cm long x 6cm wide).

One of two small quarries at MC59/5800
Goodingnow Feldspar quarry Pit.1. Looking aprox South . Photos by J.Reeve. 2002.

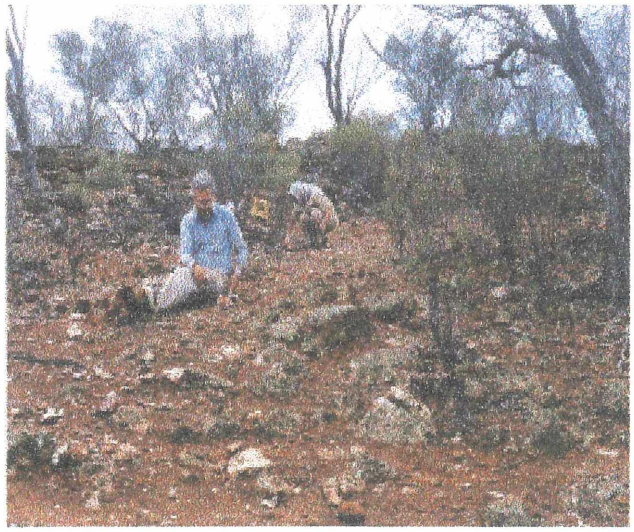
Vugs were rarely encountered, however one piece of vuggy material under microscope examination contains transparent, gemmy euhedral albite crystals exhibiting classic twinning. The vug also contained opal var.hyalite (clear balls and worm-like stringers) confirming the previous recording of the mineral.

Mount Edon Mineral Claim 59/7089
Location: 563,312E, 6,756,860N (GPS measured)

A well defined dirt track which comes off the Mt Edon Lookout track leads to this group of thin pegmatites. Trending in a westerly direction, the track parallels a dry creek bed on its north side and only becomes difficult to follow about 300 metres before reaching the pegmatites where the track crosses to the south side of the creek. The only significant trench on the pegmatites is about 50 metres south of the creek.

Quarries and Dumps at MC59/5987 Goodingnow Feldspar Quarry.Looking North, Showing the East Quarry Beryl bearing face. Photos by J.Reeve. 2002.

Several narrow (>10m) parallel, north-west striking albite-quartz pegmatites (<100m long) are present on this claim. The pegmatite worked for tantalite resulted in a trench pit originally 20 metres by 4 metres by 2metres deep. The pegmatite exposed in the pit consists of albite-quartz-muscovite and is often aplitic. The albite var. cleavelandite forms radiating balls of platy blades surrounding mliky quartz masses. The quartz often occurs as cores that locally dominate the outcrop since the cleavelandite weathers to the ground level. Apart from the relatively common tantalite crystals in the albite, other rare minerals that were noted by Calderwood (2000) are beryl, epidote and an unknown white mineral with a hexagonal shape. The tantalite occurs as clusters of thin tabular and elongated crystals within cleavelandite and is found in the eluvial material adjacent to the pegmatites (Calderwood 2000). The columbite- tantalite from this pegmatite varies between 38-60% Ta_2O_5.



Left : Shallow Pit on Pegmatite MC 59/7089
Looking aprox South. Photos by J .Reeve.March 2002.

Right : Mark Jaobsen and Susan Koepke collecting fine grained Lepidolite on MC 59/6969. Photo by J.Reeve. 2002.

2002 Field Observations and Collecting
Small fragments of tantalite were recovered from the eluvial material and in cleavelandite in the pegmatite, however euhedral crystals were not collected. A small amount of rock contained fresh micro spessartine. Some felsic rock cleavage fracture faces exhibited a micro dendritic form of an unknown mineral (possibly pyrolusite).

Mt Edon Mineral Claim 59/6969
Location: 564,420E and 6,756,110N GPS measured

This pegmatite is located almost due north of the summit of Mount Edon on the north side of a creekbed. The Mount Edon track runs along its southern border before turning uphill to the summit of Mount Edon. (The summit of Mount Edon affords a spectacular view of Lake Moore to the south-east).

High grade perthite occurs over an area of 1300 square metres. This pegmatite forms part of a hill which is cut by a creek. The outcropping perthite extends to a height of at least six metres above the creek. Albite and lepidolite are found along the edge of the perthite zone. Samples of the perthite were glaze tested and produced a high quality white glaze with a good shaped button (Calderwood 2000).

2002 Field observations and Collecting
Lepidolite is the only collectable mineral in the pegmatite ranging from extremely fine grained (lapidary quality) to coarse crystal books. The fine to medium grained lepidolite occurs on the south flank of the hill opposite Mount Edon. The coarse lepidolite was found in a shallow pit on the hill summit.

Mt Edon Mineral Claims 59/6984 and 59/6468
Location: 564,220E and 6,755,350N GPS measured

The mineral claims are located on flat ground to the south of Mount Edon. Access is via a moderately defined track skirting the eastern side of Mount Edon. Access is also available via a well maintained Station road off the Paynes Find - Goodingnow road to a well and stockyard. From the stockyard a well defined track runs north approximately 500 metres to a flat area that has obviously been worked for eluvial minerals (bulldozed depressions and mounds, trails of crushed rock etc).

Mineral claim 59/6984 surrounds mineral claim 59/6468. Apparently the purpose of the MC 59/6984 licence was to have access to the elluvial tantalite-bearing material that had eroded from the pegmatite exposed in MC59/6468.

Two small pits were sunk on a narrow albite-quartz-muscovite pegmatite containing accessory garnet (noted by Alredo Pieri). The pegmatite is about 150 metres long and ranges from 4 to 10 metres in width. Fine to medium crystalline tapiolite is reasonably abundant in patches associated with a quartz core at a bend in the strike of the pegmatite and in the shallow eluvial material to the southeast of the pegmatite. Apart from a welldeveloped core, the pegmatite has a quartz-muscovite (with minor lepidolite) border zone.

2002 Field Observations and Collecting
Tapiolite was found as small discrete metallic bleds requiring a field lens to aid identification. The mineral was found in partially weathered feldspar in a small worked pit to the west of the bulldozed depressions.

Small fragments of tantalite were found in the eluvial soil, however no complete crystals were recovered. A single light green, crudely formed crystal of beryl was found on the ground at the pit. A piece of rock exhibiting an epidote/country rock contact was found. The source of the rock is unknown.

Pegmatites Not Visited During the March, 2002 Field Trip

Mt Edon MC 59/5799
Location: Northeastern pegmatite: 563,550E and 6,775,978N GPS measured
Location: Southwestern pegmatite: 563,705E and 6,755,878N GPS measured (Calderwood 2000)

Access to these pegmatites is via a prominent dirt track that approaches from the south starting at the main Paynes Find- Goodingnow Road and ends at a water well at 564,382E and 6,754,602N. From the water well a poorly defined dirt track goes northward, curves strongly to the west in front of a pronounced hill with schist tombstone outcrops before continuing straight north to the original claim. MC 59/5799 is located on the western half of the later P59/272 propecting licence.

There are at least three rare metal pegmatites on the former MC 59/5799. The southwestern-most pegmatite, located just south of a small creek bed, is 2 to 10 metres wide and about 60m long striking northwest. This pegmatite consists almost entirely of albite variety cleavelandite (white thin blades), microcline and bright purple lepidolite as small clusters of crystals on cleavelandite with a quartz core and scattered, broken, euhedral quartz crystals that had weathered from a vug. Some of the lepidolite is in flakes to 0.5 cm and the ball type (also referred to as onion skin texture). A 20 metre long albitised portion of the pegmatite shed a significant quantity of manganotantalite into a small eluvial patch at the foot of the pegmatite to the north

D. Calderwood worked the rich eluvials in 1978 by transporting the material off site to a small processing plant. Two small pits located partially in weathered albite-quartz and calcrete just south of the dry creek bed are evidence of Calderwood's mining (Calderwood 1979 in WAMEX Report 5770). Apparently these old workings within the weathering albite and calcrete were later completely mined out by McQuillan and Sipos. Forty kilograms of the weathered pegmatite treated by Calderwood yielded manganotantalite at the rate of 7.2 kilograms/tonne with an average composition 74% Ta_2O_5. A five tonne bulk sample of calcrete treated by Calderwood yielded 10,400 kilograms of manganotantalite.

Striking at right angles to, and striking east of, the small southwestern pegmatite, a 10 metre wide, 80 metre long albite-perthite-microcline-quartz pegmatite contains clumps of lepidolite. The microcline-quartz sometimes occurs in graphic granite, however no tantalum minerals have been located in or near this pegmatite,

The northern pegmatite is located about 150 metres north of the southern pegmatites and on the north side of the creek bed. This pegmatite trends discontinuously to the northeast for at least 100 metres and is about 25 metres wide. The pegmatite seems to have zones composed of
microcline-quartz-muscovite, albite variety cleavelandite and several quartz core segments. About 10 metres southeast of the pit, the pegmatite contains albite variety cleavelandite, zinnwaldite and abundant, large masses of very fine-grained lepidolite. Beryl, manganotantalite, allanite and uranophane straining on feldspar have been found. Euhedral quartz crystal fragments were found adjacent to a prominent quartz vein about 7 metres west of the pit.

Mt Edon MC 59/5801
Location: 564,635E and 6,757,076N GPS measured

Access to this pegmatite is by a well defined track that approaches the pegmatite from the southwest. The track starts from the east-west track that goes to MC 59/7089 and curves to the northeast until it trends almost due east upon reaching the pegmatite. All the outcropping pegmatite consists of white quartz masses, coarse grained quartz-microcline-muscovite and blocky masses of microcline-quartz. No albitic areas were observed. Calderwood (2000) noted that the pegmatite contains minor columbite and beryl. The columbite-tantalite crystals, although small and not common in the eluvial material, are sometimes spectacularly crystallised (Calderwood 2000). Two columbite-tantalite crystals were found in November, 2000.

Minerals Collected in March, 2002

Albite	$NaAlSi_3O_8$
Albite var. cleavelandite	
Beryl	$Be_3Al_2Si_6O_{18}$
Columbite	$(Fe,Mn)Nb_2O_6$
Lepidolite	$K(Li,Al)_3(Si,Al)_4O_{10}(F,OH)_2$
Microcline	$KAlSi_3O_8$
Muscovite	$KAl_2(Al,Si_3)O_{10}(OH,F)_2$
Opal var. hyalite	$SiO_2.nH_2O$
Spessartite	$Mn_3^{2+}Al_2(SiO_4)_3$
Tantalite	$(Fe,Mn)Ta_2O_6$

REFERENCES:

Calderwood, D.N. 1985a. Mt. Edon Feldspar Prospect, P59/271. First Annual Report 1984- 85. Unpublished WAMEX Report 5770

Calderwood, D.N. 1985b. Mt.Edon Tantalite Prospect, P59/272. First Annual Report 1984-85. Unpublished WAMEX Report 5770

Calderwood, D.N. 1979. Mount Edon Tantalite-Columbite Propect Preliminary Report. Chandilla Exploration and Investments Pty Ltd and Mount Edon Mines Pty Ltd. Unpublished WAMEX Report 5770. (Contains a geologic map of the pegmatite field)

Calderwood, M.A. 2000.Pegmatites of western Australia. Unpublished notes.

Nickel,E.H. and Nichols, M.C. 1991. Mineral Reference Manual. Publ. Van Nostrand Reinhold, New York

Watkins, K.P. and Hickman, A.H. 1990 Geological Evolution and Mineralisation of the Murchison Province. Geol. Survey of Western Australia, Bulletin 137

R. John Reeve and Mark I. Jacobson
March, 2002

Field Trips 2002

A field trip to the Mt Edon pegmatites has been planned for the weekend of July 13th and 14th anyone interested in going should contact Jeff Manners for more details.

The proposed trip to the Mukinbudin pegmatites is on hold until permissions have been obtained.

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
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 **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

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

OUR SOCIETY's MISSION

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.