Mineralogical Society of Western Australia (inc.)

December 2002 Volume 3, Issue 6

Forward Diary
2002 -2003

Presidents Report.

May I take this opportunity to thank the members for their support during 2002 and extend Christmas wishes to all members and their families.

The second lecture in our series on mineralogical topics was 'the physical properties of minerals' presented by Ted Fowler.My sincere thanks to Ted for his contribution to this series of talks.

The next in this series of lectures will be by Roger Staley on 'mineral classification'.

I believe Mark has as usual been hunting down a new field locality on our behalf that he will announce shortly. The December meeting promises to be a little different and I am sure informative and entertaining.

***February* 5th**
Club Meeting

***April* 2rd**
Club Meeting

***June* 4th**
Club Meeting

***August* 6th**
Club Meeting

October 1th
Club Meeting

December 4th
Guest Speakers

John Reeve and

Mark Jacobsen.

Newsletter Contents.

Cubbine-Dangin corundum locality, Quairading, WA

Simpson (1948, v 2, p. 112-114) described a series of opaque blue corundum localities northwest of Quairading.

Location

The localities are on the 1:100,000 scale Gunderin (2334) topographic map sheet. The first discovery was made in 1924 on land tract CG 13096 by Fitzgerald. Other finds of corundum were later made on the adjacent land tract CG 9150, as well as on land tracts 7637, 10564, and 12407.

In January 1930, license MC 70/100 was surveyed over the corundum discovery. This license on land tract CG 13096, was active until it was surrendered in January 1982. The center of this license is at 527,613 E and 6,464,819 N, AGD84. This license is about 1 kilometre west of Hayes Road. The turnoff to the locality is about 3 kilometres south of the intersection of Hayes road with Cubbine road.

Freehold Land Tract 13096 is owned by Greg Hayes at Box 3, Quairading, WA 6383; phone 9646-62219. His farm is located on the southeast corner at the T intersection of Hayes road (north-south road) with Cubbine road.

Directions

From York drive east on the York-Quairading road for 63 kilometres, past Dangin to Hayes Road. From the intersection of the York road with Hayes road (0.0 km) drive northward on this bitumen road past Toakin road (3.6 km), past Dorakin road (6.7 km), past the Sandercock farm entrance road on the left (west) at 8.75 km to an unlabelled farm gate on the left side at 10.85 km. After obtaining permission from the landowner, Greg Hayes, enter at this gate and drive westward, keeping to the north side of the paddock. Park your vehicle at 12.75 km, or 1.9 km after entering the farm land. This is at a "dead corner" in the field where the fence forms an acute angle. From the vehicle, walk 20 metres northward to just below the 5 metre "breakaway" scarp. The dumps from the original corundum pit can be seen, as can the remains of a slumped shaft.

History

Simpson (1948, V2, p. 112-113) noted that ..."the most important [corundum find] is on the north boundary of Loc. 13096 at Cubbine, and on Loc. 9150 immediately to the north-west. The first find in the district was made in 1924 on Loc. 13096 by an aborigine (Fitzgerald) who discovered on a quartz strewn slope, below a "breakaway" of laterite, a number of crystals of the mineral. Subsequently he found the mineral in an underlying bed of kaolinised schist, on which he sank a shaft to a depth of 10 feet. The author visited the place in 1926 and found detrital crystals still abundant on the surface, and corroded fragments in the sides of the shaft".

The surface crystals that Simpson (1948) observed in 1926 varied from 0.5 to 4 centimetres in diameter to 7 centimetres in length. The largest crystals he observed from the shaft were 2.54 cm in diameter. The crystals faces were highly corroded. The largest single crystal found in 2002 loose on the surface was 0.8 centimetres wide and 2.9 centimetres long. Broken fragments reached up to 1.3 centimetres wide and 1.5 centimetres wide. All had corroded crystal faces of a blackish to dark blue color. Crystal interiors are white. Rare fragments were seen with a reddish color and a glassy blue color. Small corroded crystal fragments can still be commonly found on the dumps, washing out from the white clay. None are gem quality.

Figure 1. Road map of the Hayes Road area, west of Quairading, WA.

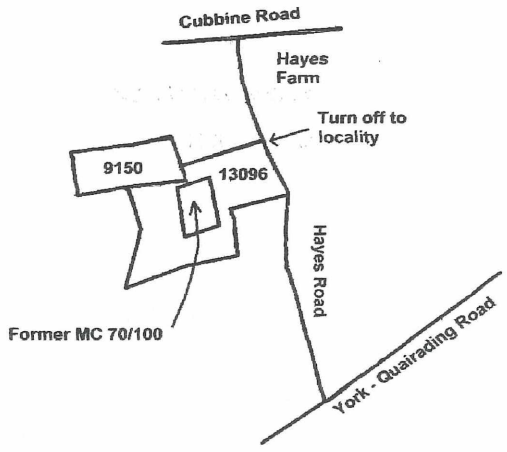
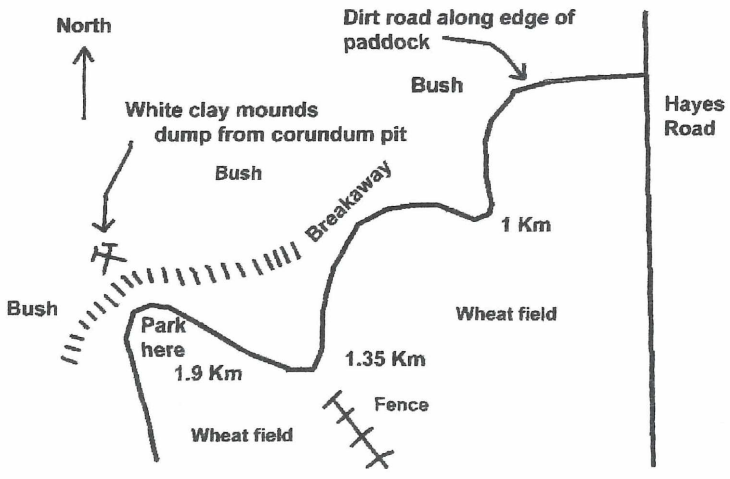


Figure 2. A mud map showing the directions to the abandoned corundum pit at Dangin.



Minerals of the Mount Clement Prospects with comparative notes to the Ashburton Downs Prospects minerals.

Introduction

The Mount Clement Prospects are located 8.5 km south west of Mount Clement and about 20 km south west of Wyloo Station. The area has been the subject of interest by several mineral exploration companies since its discovery by Ronald Prothero, a kangaroo shooter, in 1973. Davy et al (1991) provide a comprehensive discourse on the geology of the Prospects, but minimal descriptive mineralogy. In some respects, the Mount Clement prospects have a secondary mineral assemblage similar to the Ashburton Downs deposits (Nickel and Gartrell (1993)) thus making it an interesting occurrence for general and micromineral collectors.

Regional Geology

The Ashburton Basin, in which the Mount Clement Prospects are located, is an arcuate belt of Proterozoic sedimentary and volcanic rocks which form the northern margin of the capricorn Orogen. The Capricorn Orogen is a major orogenic zone between the Pilbara and Yilgarn Cratons (Blockley (1971), Davy et al (1991), Ferguson (1999)).

Local Geology

The informally named Mount Clement occurrence consists of two distinct prospects – "Main Prospect" and "Eastern Prospect".

The mineralisation at the Main Prospect is contained in a conformable, triangular to lenticular body of chert, ferruginous chert and dolomitic siltstone of the Ashburton Formation with the mineralised zone having a thickness of 450 metres and a strike length of 1.2 kilometres. Ferguson (1999) indicates the deposit is enriched in silver, arsenic, gold, bismuth, cerium, copper, mercury, uranium, lanthanum, lead, antimony, thorium, thallium, tungsten and zinc. Exploration reports indicate that the primary sulphides are arsenopyrite, pyrite and traces of chalcopyrite, however the presence of significant silver, antimony and copper suggests that a sulphosalt of the tetrahedrite-tennantite series could have been present. Traces of these minerals, together with native bismuth, were reported from the discovery gossan. Most of the copper now occurs in chenevixite-conichalcite, whereas silver has been converted to a halide or has been taken up in the secondary copper arsenate. Antimony is associated with goethite or occurs with lead in bindheimite.

With the oxidised zone extending below 100 metres and surface mineralisation being dominated by green arsenate minerals, there is considerable potential for superb micro crystals.

The co-located "Eastern Prospect" (2 km south east of the main prospect) is 400 metres higher in the stratigraghic sequence than the Main Prospect with the mineralisation confined to a 3 metre wide siliceous zone containing irregular, cross-cutting quartz veins. The gossan is dominated by scorodite, secondary lead minerals (bindheimite, carminite and philipsbornite) and minerals of the jarosite and alunite group. The area has been enriched in silver, arsenic, gold, cadmium, molybdenum, antimony and tin. Some discrete pods of sulphide minerals have been observed in the shear zone.

The Main Prospect is interpreted as a sediment-hosted, deep-marine, hot spring deposit, whereas the Eastern Prospect is suggested to be a sulphide bearing fill-in fracture that formed as a result of dexral wrenching after the deposition of the Ashburton Formation. Davy et al (1991) conclude that similar trace element assemblages in the Main and Eastern Prospects are derived from both early and late mineralisation tapping a common source.

Unoxidised Ore Minerals
Arsenopyrite, boulangerite, chalcopyrite, galena, gold, pyrite, pyrrhotite

Oxidised Ore Minerals
Arseniosiderite, bindheimite, carminite, chenevixite, chlorargyrite, conichalcite, cornubite, covellite, digenite, jarosite, iodargyrite, plumbogummite, philipsbornite, scorodite, ullmanite

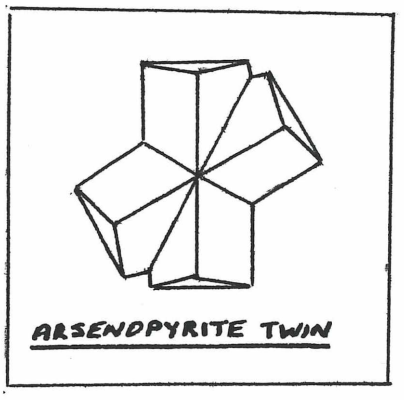
Gangue Minerals
Anhydite, apatite, chlorite, dolomite, epidote, goethite, gypsum, ilmenite, muscovite, quartz, talc, tourmaline (dravite?), rutile

Host Rock Minerals
Albite, biotite, chlorite, dolomite, graphite, hornblende, kaolinite, magnetite, microcline, muscovite, orthoclase, phlogopite, pyrite, quartz, spessartine, talc, tourmaline, tremolite, vermiculite, zircon

Selected Mount Clement Mineral Descriptions and Comparison to the Ashburton Downs Minerals

Arseniosiderite $Ca_2Fe^{3+}{}_3(AsO_4)_3.3H_2O$
Arseniosiderite occurs as pseudomorphs after scorodite, but crystals are not well developed. Not reported at the Ashburton Downs prospects.

Arsenopyrite FeAsS
Occurs in both massive and disseminated form. Where the Mount Clement matrix rock is soft (such as talc), perfect crystals, some with butterfly and interpenetrating twins are present. Noted as a remnant primary mineral at Ashburton Downs, but not in crystal form.

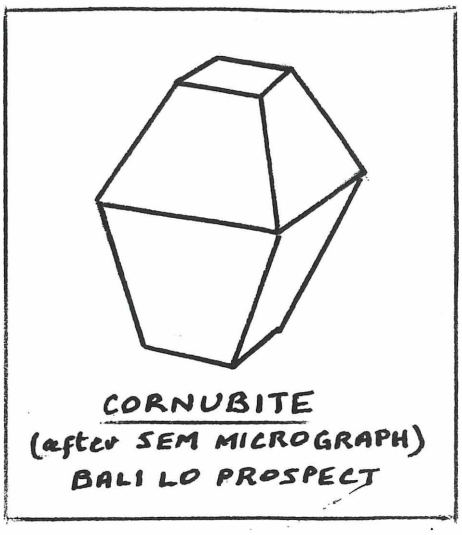


Bindheimite $Pb_2Sb_2O_6(O,OH)$
Vitreous to resinous masses with philipsbornite at the Eastern Prospect. Bindheimite is an extremely rare at Ashburton Downs occurring as a buff powder coating fracture surfaces at the Anticline Prospect.

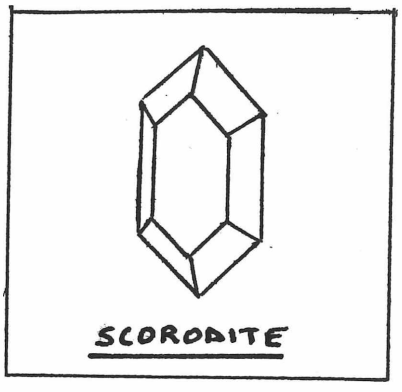
Boulangerite $Pb_5Sb_4S_{11}$
Found as disseminated fibrous crystals and massive granular aggregates in the Eastern Prospect. Not recorded at Ashburton Downs.

Chenevixite $Cu_2Fe_2(AsO_4)_2(OH)_4.H_2O$
Occurs as earthy masses at the Main Prospect in many shades of green.
At Ashburton Downs, the grass-green chenevikite is a major component of the boxwork produced from the oxidation of tennantite. In places, the chenevikite occurs as nodular precipitate and less commonly as yellowish-green powder or grass-green crystallites.

Cornubite $Cu_5(AsO_4)_2(OH)_4$
At Mount clement, cornubite occurs as rare greenish-blue botryoidal grains associated with chenevixite, whereas cornubite at Ashburton Downs is crystallised as rare bluish-green equant crystals tending to pseudo-octahedra.



Philipsbornite $PbAl_3(AsO_4)(AsO_3OH)(OH)_6$
Compact greyish-yellow masses are found at the Eastern Prospect. Consistent with the morphology of the species, the philipsbornite from the Anticline and Bali Lo Prospects generally forms massive aggregates which are frequently soft and earthy. The colour range at Ashburton Downs is more diverse than the Mount Clement occurrence with creamy yellow and greenish yellow to pale green, brown and pink hues depending on compositional variation and grain size. Nickel and Gartrell (1993) caution that the yellow and greenish varieties of philipsbornite may be confused with gartrellite, duftite and chenevikite in hand specimens. Equally, the possibility may exist that gartrellite will found at Mount Clement.



Scorodite $FeAsO_4.2H_2O$
Ubiquitous as euhedral grains in the boxwork at Mount Clement, scorodite is a very rare mineral at Ashburton Downs where it occurs as tan coloured flakes to 0.5mm.

A list of Ashburton Downs minerals by Prospect follows as Appendix 1 to this paper.

Notwithstanding the diversity of secondary minerals recorded at the Ashburton Downs prospects compared to the Mount Clement prospects, the respective deposits have two significant similarities, namely, a substantial gossan zone reflecting a long weathering history, and the range of elements in the deposits. With respect to the mineral size, it is suggested that the relatively fine grained size of the Ashburton Downs secondary minerals may have been the result of rapidly changing equilibrium conditions and a rapidly falling water table which did not allow sufficient time for large crystals to grow from solution. (Nickel and Gartrell (1993)).

It can only be hoped that Nickel and Gartrell are correct when they promulgate the thought that larger crystals of some of the secondary minerals will be found at depth where stable conditions could be expected to prevail for longer periods. Perhaps Mount Clement and Ashburton Downs have secrets yet to be found.

References

Blockley, J.G. (1971) The lead, zinc and silver deposits of Western Australia. Geological Survey of Western Australia Mineral Resources Bulletin, 9, 185-187.

Bridge, P.J. and Pryce, M.W. (1978) Copper minerals from Bali Lo Copper mine, Ashburton Downs, Western Australia. *Australian Mineralogist,* 14, 69-70.

Davy, R., Clarke, R.M., Thorne, A.M. and Seymour, D.B. (1991) Geology, mineralisation and origin of the Mount Clement gold and lead prospects, Ashburton Basin. Geological Survey of Western Australia Professional Papers Report 30, 41-63

Ferguson, K.M. (1999) Lead, zinc and silver deposits of Western Australia. Geological Survey of Western Australia. Mineral Resources Bulletin 15, 253.

Nickel, E.H. and Gartrell, B.J. (1993) Secondary minerals from Ashburton Downs, Western Australia. *The Mineralogical Record*, 24, 3, 203-218

Appendix 1

Minerals of the Anticline Prospect, Ashburton Downs
Chalcocite, pyromorphite, cinnabar, adamite, siderite, atacamite, arsentsumebite, chlorargyrite, bayldonite, jarosite, cumengite, beudantite, diaboleite, carminite, ashburtonite, laurionite, chenevixite, paralaurionite, duftite, linarite, paratacamite, gartrellite, bindheimite, hidalgoite, chryscolla, chalcophanite, lavendulan, coronadite, mimetite, osarizawaite, cryptomelane, olivenite, goethite, pharmacosiderite, hemimorphite, groutite, philipsbornite, hematite, tsumcorite, plumbojarosite, plattnerite, alunite, tenorite, anglesite, kaolinite, tripuhyite, antlerite, aurichalcite, beaverite, libethenite, cerussite, brochantite, hydrozincite, caledonite, mottramite, malachite, connellite, rosasite, gypsum, pseudomalachite.

Minerals of the Bali Lo Prospect, Ashburton Downs
Chalcocite, atacamite, paratacamite, coronadite, goethite, groutite, hematite, pyrolusite, tripuhyite, azurite, hydrozincite, malachite, chrysocolla, kaolinite, aheylite, corkite, libethenite, metatorbornite, pseudomalachite, adamite, bayldonite, beudantite, ceruleite, chenevixite, clinoclase, cornubite, cornwallite, duftite, gartrellite, hidalgoite, lavendulan, luetheite, metazeunerite, mimetite, olivenite, philipsbornite, scorodite, alunite, barite, beaverite, brochantite, caledonite, osarizarwaite, perroudite.

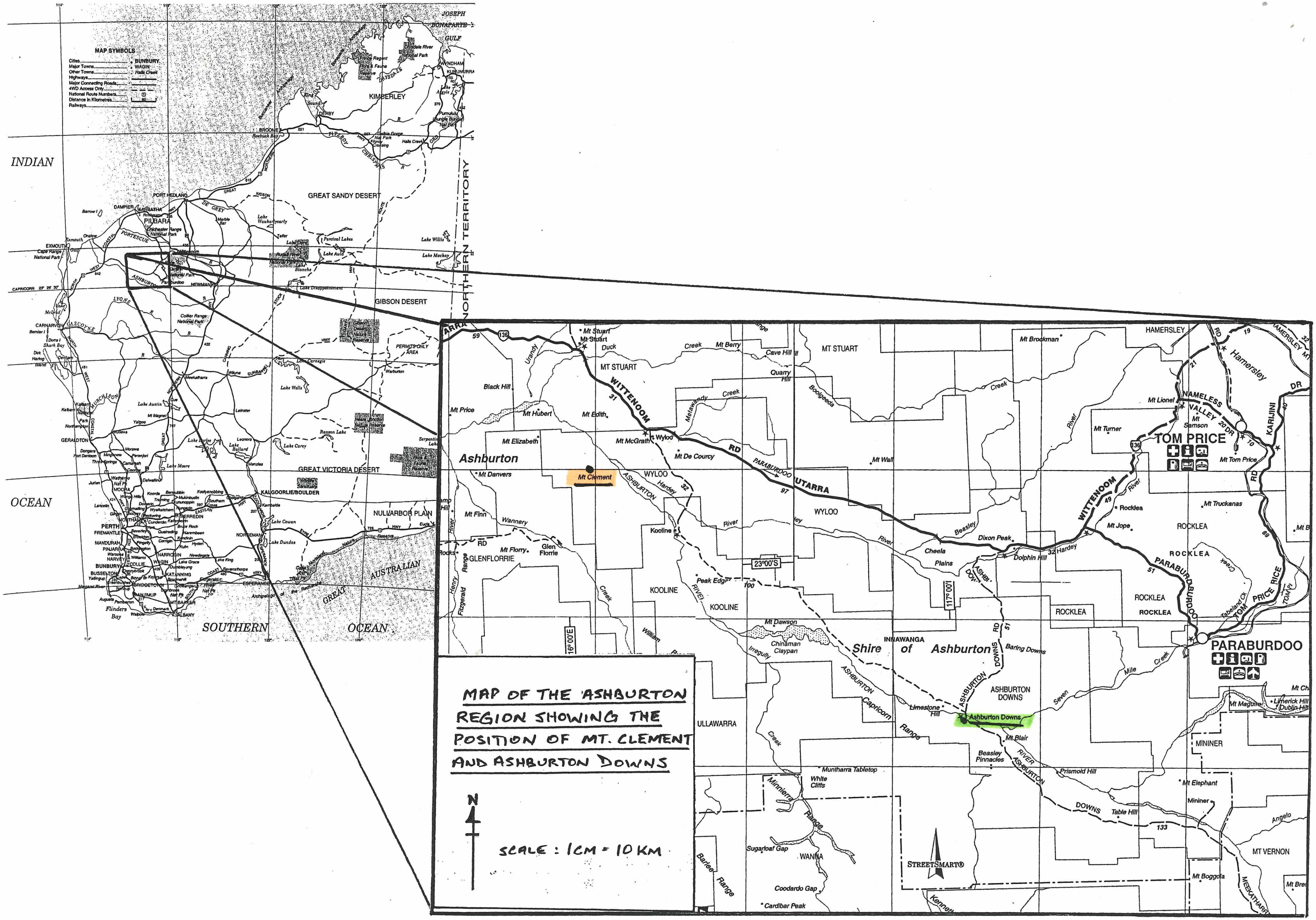
Minerals of the Bali East Prospect, Ashburton Station
Amalgam, cinnabar, atacamite, paratacamite, goethite, hematite, tripuhyite, malachite, chrysocolla, kaolinite, chenevixite, cornubite, conichalcite, cornwallite, olivenite, Pseudomalachite, barite, brochantite, connellite.

Minerals of the Bali South Prospect, Ashburton Downs
Chalcoite, chlorargyrite, goethite, hematite, partzite, tripuhyite, azurite, malachite, chrysocolla, kaolinite, chenevixite, cornwallite, olivenite, alunite, barite, brochantite.

Minerals of the Ledge Prospect, Ashburton Downs
Goethite, hematite, malachite, chrysocolla, kaolinite, plumbogummite, pyromorphite, duftite, mimetite, osarizawaite, wulfenite.

Minerals of the Stockyard Creek Prospect, Ashburton Downs
Atacamite, paratacamite, goethite, hematite, tripuhyite, azurite, malachite, chrysocolla, kaolinite, chenevixite, clinoclase, cornwallite, olivenite, brochantite, connellite.

R.John Reeve
November, 2002


MAP OF THE ASHBURTON REGION SHOWING THE POSITION OF MT. CLEMENT AND ASHBURTON DOWNS
N
SCALE : 1CM = 10 KM
Mt Clement
Ashburton Downs
TOM PRICE
PARABURDOO
Shire of Ashburton
ASHBURTON DOWNS
WITTENOOM
PARABURDOO
UTARRA
RD
WYLOO
KOOLINE
ROCKLEA
MT STUART
HAMERSLEY
MINNER
MT VERNON
ULLAWARRA
STREETSMART®
INDIAN
OCEAN
SOUTHERN
NORTHERN TERRITORY
GREAT SANDY DESERT
GIBSON DESERT
GREAT VICTORIA DESERT
NULLARBOR PLAIN
KIMBERLEY
PILBARA
MAP SYMBOLS

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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.