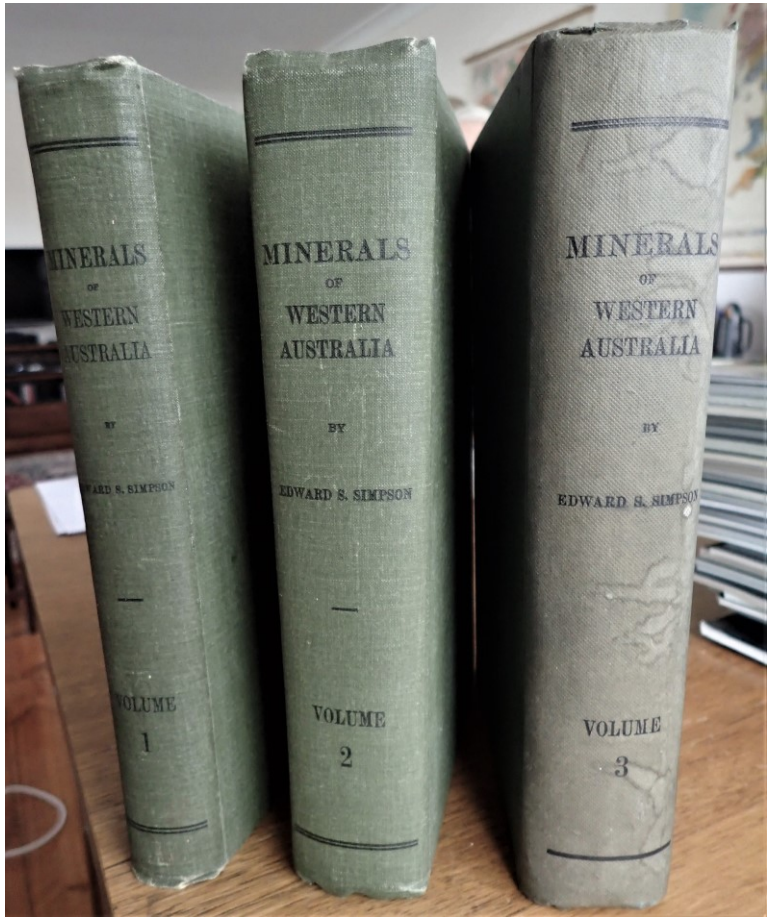
MinSocWA Mission

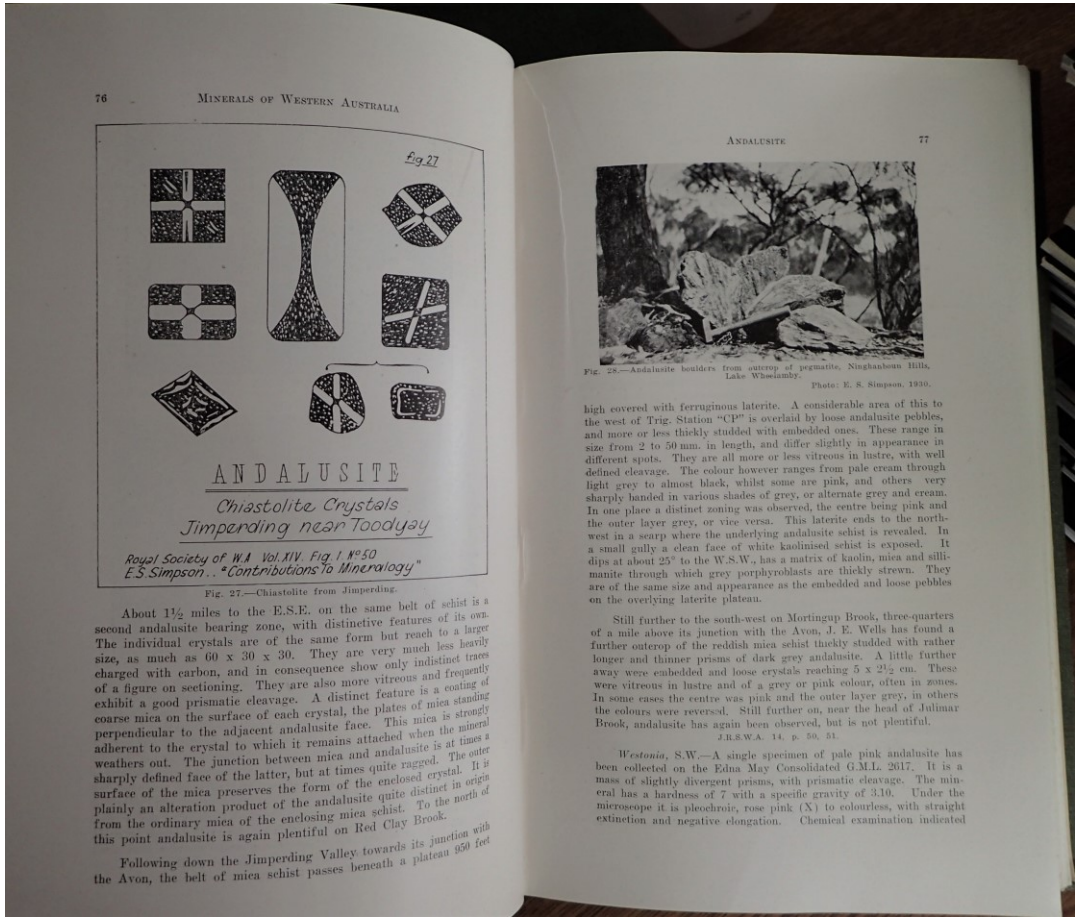
To encourage mineralogical study by amateur and professional alike and, in so doing, discover, document and preserve the Earth's and in particular Western Australia's natural history

Background to the project

- Simpson was mineralogist of the Geological Survey of Western Australia until his retirement in 1937
- During this time he kept copious notes on mineral occurrences which were subsequently used to compile “Minerals of Western Australia”
- The 3 volumes of his works, completed after his death between 1948 and 1952, contain information on all the WA minerals known at the time

Background to the project





76 MINERALS OF WESTERN AUSTRALIA

Fig 27

ANDALUSITE

Chiastolite Crystals
Jimperding near Toodyay

Royal Society of W.A. Vol. XIV. Fig. 1 N°50
E.S. Simpson. "Contributions to Mineralogy"

Fig. 27.—Chiastolite from Jimperding.

About 1½ miles to the E.S.E. on the same belt of schist is a second andalusite bearing zone, with distinctive features of its own. The individual crystals are of the same form but reach to a larger size, as much as 60 x 30 x 30. They are very much less heavily charged with carbon, and in consequence show only indistinct traces of a figure on sectioning. They are also more vitreous and frequently exhibit a good prismatic cleavage. A distinct feature is a coating of coarse mica on the surface of each crystal, the plates of mica standing perpendicular to the adjacent andalusite face. This mica is strongly adherent to the crystal to which it remains attached when the mineral weathers out. The junction between mica and andalusite is at times a sharply defined face of the latter, but at times quite ragged. The outer surface of the mica preserves the form of the enclosed crystal. It is plainly an alteration product of the andalusite quite distinct in origin from the ordinary mica of the enclosing mica schist. To the north of this point andalusite is again plentiful on Red Clay Brook.

Following down the Jimperding Valley towards its junction with the Avon, the belt of mica schist passes beneath a plateau 950 feet

ANDALUSITE 77

Fig. 28.—Andalusite boulders from outcrop of pegmatite, Ninghanboon Hills, Lake Wheelamby.
Photo: E. S. Simpson, 1930.

high covered with ferruginous laterite. A considerable area of this to the west of Trig. Station "CP" is overlaid by loose andalusite pebbles, and more or less thickly studded with embedded ones. These range in size from 2 to 50 mm. in length, and differ slightly in appearance in different spots. They are all more or less vitreous in lustre, with well defined cleavage. The colour however ranges from pale cream through light grey to almost black, whilst some are pink, and others very sharply banded in various shades of grey, or alternate grey and cream. In one place a distinct zoning was observed, the centre being pink and the outer layer grey, or vice versa. This laterite ends to the north-west in a scarp where the underlying andalusite schist is revealed. In a small gully a clean face of white kaolinised schist is exposed. It dips at about 25° to the W.S.W., has a matrix of kaolin, mica and silli-manite through which grey porphyroblasts are thickly strewn. They are of the same size and appearance as the embedded and loose pebbles on the overlying laterite plateau.

Still further to the south-west on Mortingup Brook, three-quarters of a mile above its junction with the Avon, J. E. Wells has found a further outcrop of the reddish mica schist thickly studded with rather longer and thinner prisms of dark grey andalusite. A little further away were embedded and loose crystals reaching 5 x 2½ cm. These were vitreous in lustre and of a grey or pink colour, often in zones. In some cases the centre was pink and the outer layer grey, in others the colours were reversed. Still further on, near the head of Julimar Brook, andalusite has again been observed, but is not plentiful.
J.R.S.W.A. 14, p. 50, 51.

Westonia, S.W.—A single specimen of pale pink andalusite has been collected on the Edna May Consolidated G.M.L. 2617. It is a mass of slightly divergent prisms, with prismatic cleavage. The mineral has a hardness of 7 with a specific gravity of 3.10. Under the microscope it is pleochroic, rose pink (X) to colourless, with straight extinction and negative elongation. Chemical examination indicated

Background to the project

- Simpson's volumes cover descriptions of ~449 minerals and materials
- In the 8 decades since Simpson's notes were left there have been considerable changes in mineralogical classification

The proposal
Simpson WA - update
Volume 4

A MinSocWA project

2020 - ?2025

Background to the project

- > 250 minerals new to WA described since Simpson's volumes
- Minerals covered in vol. 1–3 are not to be described or updated
- Proposal for *Simpson WA update* collaborative project submitted to MinSocWA committee – and approved in May 2020

Proposed final product

- Similar format to Simpson's volumes 1–3

  BUT including photographs and maps

- Modular sections

  i.e. each additional mineral described in the same 'structured' way

- Released as PDF or – if sufficient funding can be secured – as a hardcopy product

We need you!

The book will be authored by MinSocWA and Volunteers needed to:

- Contribute information on occurrences and localities
- Supply or provide access to suitable photographs
- Access required to restricted references
- Take on the write-up of one or more mineral species
- Contributions will be acknowledged

Materials provided

- List of minerals to be covered in *Simpson's WA update*
- + current IMA Master list
- Mineral description template
- Two examples – acanthite and euclase
- List of useful publications

Minerals for write-up

Simpson minerals – Volume 4

Acanthite. Ag_2S
Moxom Well, Braeside lead field, Pilbara, Western Australia, AJM 13(2):57
Shangri La mine, Kimberley, Western Australia, AJM 16(1):18,19SEM

Agardite, Ce-dominant. $CeCu^{2+}_6(AsO4)_3(OH)_6{\cdot}3H2O$
Telfer gold mine, Western Australia, AJM 12(1):29-30f

Agardite, Nd-dominant. $NdCu^{2+}_6(AsO4)_3(OH)_6{\cdot}3H2O$
Telfer gold mine, Western Australia, AJM 12(1):29f, 37f

Agardite-(Y). $YCu^{2+}_6(AsO4)_3(OH)_6{\cdot}3H2O$
Telfer gold mine, Western Australia, AJM 12(1):29

Allanite-(Ce). $CaCe(Al_2Fe^{2+})[Si2O_7][SiO_4]O(OH)$
Mukinbudin pegmatite field, Jacobson et al., 2007, p166

Allanite-(Y). $CaY(Al_2Fe^{2+})[Si_2O_7][SiO_4]O(OH)$
Mukinbudin pegmatite field, Jacobson et al., 2007, p166

Allophane. $Al_2O_3(SiO_2)_{1.3\text{-}2.0}{\cdot}2.5\text{-}3.0H_2O$
MKD5 nickel deposit, Mt Keith, Western Australia, AJM
Penny West gold mine, Youanmi, Western Australia, AJ

Whitlockite. $Ca_9Mg(PO_3OH)(PO_4)_6$
Mineralogical Magazine **41** (1977), 33

Widgiemoolthalite. $Ni_5(CO_3)_4(OH)_2{\cdot}4\text{-}5H_2O$
132 North Mine, Widgiemooltha, Kambalda, Western Australia, AJM 6(2):126f, 127

Wodginite. $Mn^{2+}Sn^{4+}Ta_2O_8$
Wodgina, Pilbara, Western Australia, AJM 6(2):127

Woodallite, see also Stichtite-woodallite series. $Mg_6Cr_2(OH)_{16}Cl_2{\cdot}4H_2O$
MKD5 nickel deposit, Mt Keith, Western Australia, AJM 9(2):67,68f
Mt Keith mine, Western Australia, AJM 7(2):83fW

Zinc-melanterite. $Fe(SO_4){\cdot}7H_2O$. No Zn variety on IMA list
Teutonic Bore, Western Australia, AJM 2(1):26a

List no doubt destined to grow…

And has already added at least 20 minerals

Template for write-up of each mineral

– two sections:

- General description of the mineral
- Description of localities

Name of occurrence, geographical co-ordinates, 1:100 000 sheet name

Localities – to be grouped by Tectonic unit, Geographical area, Detailed Locality

Deposit geology, Details of mineralization

Image(s) + caption(s)

Submissions of images implies permission to reproduce.

Specimen location

Prime reference(s)

Mineral Name

Formula

IMA Status

Crystal system

Nickel-Strunz classification

Pre-populated

Type locality and derivation of name

Morphology and physical properties

Optical properties (incl. colour)

Geological context and association

Remarks

No. of known occurrences in WA

Example - euclase

Euclase. $BeAlSiO_4(OH)$

Grandfathered valid species. Monoclinic Point Group 2/m

Nickel – Strunz 09.AE.10

The type locality of the first specimen introduced to Europe by the naturalist Joseph Dombey in 1785 was the State of Minas Gerais, Brazil. It was described and named by the French mineralogist René Just Haüy. The name derives from Greek and refers to its ease of fracturing.

Euclase crystals commonly comprise single and multiple groups of prismatic or tabular habit, often with complex faces and not uncommonly doubly-terminated by wedge-like faces. It has one perfect cleavage parallel to (010) and imperfect cleavages parallel to (001) and (110); a Mohs hardness of 7.5 and a brittle tenacity. Specific gravity is typically in the range 2.99 to 3.10.

RI values n_α = 1.651-1.653; n_β = 1.655-1.657; n_γ = 1.669 -1.675 with a maximum birefringence δ = 0.02.; 2Vγ ~ 50°. Crystals from sources worldwide occur in a range of colours that include blue, blue–green and yellow, as well as colourless. Some crystals display sectored colour zoning including hour-glass type. Pleochroism is apparent in shades of blue.

Euclase occurs as a secondary mineral, commonly after beryl, in granitic pegmatites, greisens and miarolitic cavities. It also occurs in Alpine-type hydrothermal veins. It is a rare mineral and may be found together with other beryllium minerals including bertrandite and phenakite.

There are two recorded occurrences of euclase in Western Australia.

Yilgarn Craton

Dalgaranga pegmatite (521,400E and 6,934,938N, UTM 50, AGD66). Dalgaranga (2342)

The first occurrence of euclase identified in Western Australia in 1962 was from a heavy mineral concentrate obtained from the Dalgaranga beryl-tantalite pegmatite, part of the Dalgaranga-Mount Farmer pegmatite field located some 70 km northwest of Mount Magnet in the Murchison Terrane of the Yilgarn Craton.

The Government Chemical Laboratories noted euclase in the heavy mineral fraction containing a small percentage of tantalum minerals, chiefly microlite, which was isolated from Dalgaranga ore. The x-ray pattern, taken to confirm the optical and chemical diagnosis, was identified by comparison with Brazilian euclase.

Reference: Government Chemical Laboratories, 1962.

Giles columbite-beryl pegmatite (354850E 6541500N, UTM 51, AGD66). Yilmia (3135)

In 2012, a single euclase crystal was discovered in a thin layer of loose material excavated from the south-eastern part of the main open pit at the Giles columbite– beryl pegmatite, part of a group of small pegmatites located in the Eastern Goldfields Superterrane of the Yilgarn Craton. The pegmatites, extending for approximately 5km north-south and containing six named groups are located in the Spargoville area some 45 km southeast of Coolgardie.

The white, translucent to transparent euclase crystal is doubly-terminated, measures 14 × 9.5 × 7.2 mm and weighs 2.063 g (Fig.1). It has a thick tabular habit, elongated parallel to the clino axis direction and has a rhombic form transverse section in this direction. The dominant faces are prisms (011) that have smooth surfaces and well-defined clinopinacoid faces (010).

Initial identification was made by optical mineralogical techniques and observations and results compared to a sample of euclase from Zimbabwe. The optic figure is biaxial positive with a small 2V, and the specific gravity was determined as 3.075.

A semi-quantitative SEM-EDS partial microanalysis of the euclase crystal is shown in Table 1, below, with the composition of euclase from Brazil.

The euclase surfaces are encrusted with microscopic, colourless crystals of bertrandite that measured from 0.2 to 0.4 mm long.

Figure 1. Euclase from the Giles columbite–beryl pegmatite. .Crystal is 14mm in length.

Specimen S. Koepke. Photograph by Geoff Deacon.

Table 1.

wt. %	Santo do Encoberto, Brazil	Giles columbite-beryl pegmatite, Spargoville	Calculated composition of ideal, or 'pure' euclase
SiO_2	41.6	43.04	41.41
Al_2O_3	34.76	34.06	35.14
FeO	0.28	-	-
BeO	16.95	-	17.24
Na_2O	0.13	-	-
K_2O	0.04	-	-
H_2O	5.95	-	6.21
Total	99.71	77.1	100.00

Comparison of the compositions of euclase from Brazil (Graziani and Guido, 1980 quoted in Stocklmayer,2017) and the Giles columbite-beryl pegmatite, Spargoville, Western Australia, with calculated ideal euclase

Although the ages of the Neoarchean Giles and Dalgaranga pegmatites are poorly constrained, the occurrences of euclase in these localities are probably the oldest discovered so far in the geological record worldwide.

Reference: Stocklmayer S, 2017.

References

Government Chemical Laboratories, 1962. *In Annual Report of the Department of Mines for 1962*: Government Printer, Perth, Western Australia, p. 173. Annual report

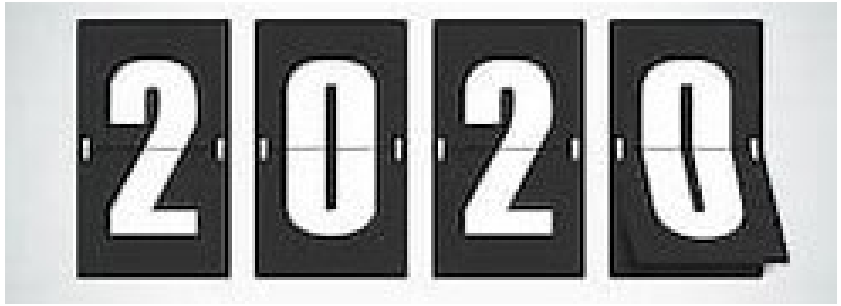
Stocklmayer S, 2017. A new occurrence of euclase in Western Australia, *Australian Journal of Mineralogy*, v.18 (2) p39-44.

Progress to date

- Since introducing the project in July to MinSocWA members we have had moderate interest in contributing
- Some 25 members have expressed interest in contributing
- So far 40 minerals have been “sponsored” of which 8 are ready for the first draft to be edited.

Life of the project?

…not a quick project!



Two possibilities to aim for:

2025	25th MinSocWA seminar
2027	49th Joint Seminar, WA-hosted

What now?

Tell us if:

- You want to receive the documents
- You have relevant information on some minerals - including photographs!
- You want to write up specific minerals
- You want to try your hand at writing some ‘random’ species

  -we can provide assistance with some references
- You can contribute in any other way or have constructive comments on any aspects of the project

Contact

Mineralogical Society WA

Email - simpsonwa@minsocwa.org.au

Without YOUR help this project will not go ahead