

1982/45. Tasmanian Proterozoic rocks.

N.J. Turner

Abstract

A summary of lithostratigraphic and chronostratigraphic information on the Tasmanian Proterozoic rocks is presented. There is concordance between the age of the Cooee Dolerite, the age of an amphibolite at Savage River and the oldest ages of granitoids on King Island.

INTRODUCTION

A working group on Australian Proterozoic Rocks was convened by the Geological Survey of Western Australia in September-October 1982. In order to provide up-to-date lithostratigraphic and chronostratigraphic information on the Tasmanian Proterozoic rocks, a review of the relevant literature and of recent mapping was carried out. The results of this review are summarised in Figures 1, 2, and 3.

CONCLUSIONS

The principal result of the review has been to show that there is concordance, within experimental error, between:

- (1) the age of the Cooee Dolerite
- (2) the age of an amphibolite at Savage River
- (3) oldest ages of granitoids on King Island.

Thus, the early phase of the Penguin Orogeny is a chronostratigraphic event well established by concordance in age in three quite different geological settings.

A total rock isochron for the west King Island granite was excluded because its variance is outside experimental error. An age for the Dove Granite is concordant with the above group but its error limits (± 140 my) are too great for much significance to be attached to it.

Syntectonic (D1-2) metamorphic ages within the Tyennan region are either concordant with the above group or not significantly older. These ages question the occurrence of a Frenchman Orogeny and a programme of further work has been initiated to resolve this problem.

REFERENCES

- ADAMS, C.J. (in prep.), in ADAMS, C.J.; BLACK, L.; CORBETT, K.D.; GREEN, G.R. *Geochronological studies of Lower Palaeozoic and Proterozoic rocks in western and northern Tasmania.*
- BLACK, L. (in prep.), in ADAMS, C.J.; BLACK, L.; CORBETT, K.D.; GREEN, G.R. *Geochronological studies of Lower Palaeozoic and Proterozoic rocks in western and northern Tasmania.*
- BROWN, A.V. 1980. Some aspects of the geology of the Mt Lindsay-Dundas area, western Tasmania. *Unpubl.Rep.Dep.Mines Tasm.* 1980/42.

CALVER, C.R. 1982. Proterozoic sedimentary sequences in the eastern part of the Pedder Quadrangle, south-western Tasmania. *Unpubl.Rep.Dep. Mines Tasm.* 1982/35.

COLEMAN, R.J. 1976. Savage River magnetite deposits. *Monogr.Ser. australas.Inst.Min.Metall.* 5:598-604.

COX, S.F. 1973. *The structure and petrology of the Cape Wickham area.* B.Sc. (Hons) thesis. University of Tasmania : Hobart.

CROOK, K.A.W. 1980. Tectonic implications of some field relations of the Adelaidean Cooee Dolerite, Tasmania. *J.geol.Soc.Aust.* 26:353-361.

GRIFFIN, B.J.; PREISS, W.V. 1976. The significance and provenance of stromatolitic clasts in a probable Late Precambrian diamictite in northwestern Tasmania. *Pap.Proc.R.Soc.Tasm.* 110:111-127.

JAGO, J.B. 1981. Possible late Precambrian (Adelaidean) tillites of Tasmania. in HAMBREY, M.J.; HARLAND, W.B. (ed.). *Earth's pre-Pleistocene glacial record:* 549-554. Cambridge University Press : Cambridge.

McDOUGALL, I.; LEGGO, P.J. 1965. Isotopic age determinations on granitic rocks from Tasmania. *J.geol.Soc.Aust.* 12:295-332. [Ages (King Island) have been adjusted in accordance with modern decay-constant convention].

RAHEIM, A. 1976. Petrology of eclogites and surrounding schists from the Lyell Highway-Collingwood River area. *J.geol.Soc.Aust.* 23:313-327.

RAHEIM, A. 1977. Petrology of the Strathgordon area, western Tasmania: Si⁴⁺ - content of phengite mica as monitor of metamorphic grade. *J.geol.Soc.Aust.* 24:329-338.

RAHEIM, A.; COMPSTON, W. 1977. Correlations between metamorphic events and Rb-Sr ages in metasediments and eclogites from western Tasmania. *Lithos* 10:271-289.

STEIGER, R.H.; JÄGER, E. 1977. Subcommittee on Geochronology: Convention on the use of decay constants in geo- and cosmochronology. *Earth planet. Sci.Lett.* 36:359-362.

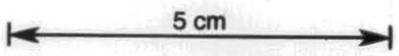
STUBBS, D. 1975. K-Ar geochronology. *Rep.Isotope Geol.Lab.Dep.Geol.Minor. Univ.Qd.* 2.

TURNER, N.J. 1979. The boundary relationship of the Concert Schist and the Oonah Quartzite and Slate correlate at Dundas. *Pap.Proc.R.Soc. Tasm.* 113:15-20.

WILLIAMS, E. 1976. Structural map of pre-Carboniferous rocks of Tasmania. 1:500 000. *Department of Mines, Tasmania.*

WILLIAMS, P.R. 1981. Stratigraphic terminology of low-grade metamorphosed rocks at Bathurst Harbour, S.W. Tasmania. *Pap.Proc.R.Soc.Tasm.* 115:21-28.

WILLIAMS, S.J. 1976. Structure and metamorphism of the McPartlan Pass-Sentinels area. *Pap.Proc.R.Soc.Tasm.* 110:25-34.



Intrusion Pre-D2 to D3. Muscovite in adamellite 727 my. Rb-Sr.

Muscovite in pegmatite K-Ar 724 my; Rb-Sr 735 my.

TASMANIAN PROTEROZOIC ROCKS

Compiled by N.J. Turner, Geological Survey of Tasmania. 1982. Source references given on separate sheet. Unpublished references are numbered and the number is shown in brackets beside the data derived from them. All radiometric ages are calculated to the convention of Steiger and Jäger (1977).

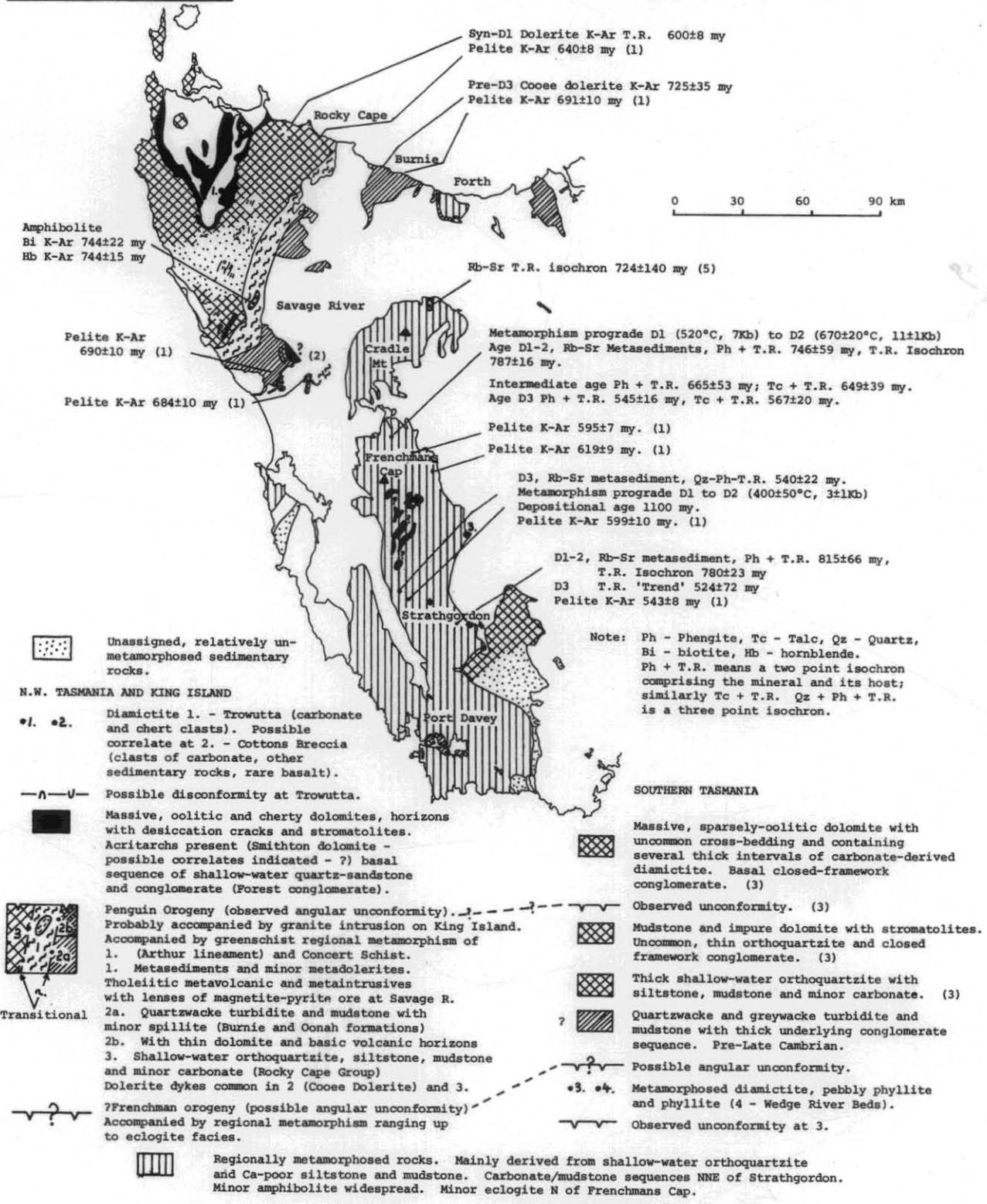


Figure 1. Tasmanian Proterozoic rocks. Unpublished sources are: (1) Adams, in prep.; (2) Brown, 1980; (3) Calver, 1982; (4) Cox, 1973; (5) Black, in prep.

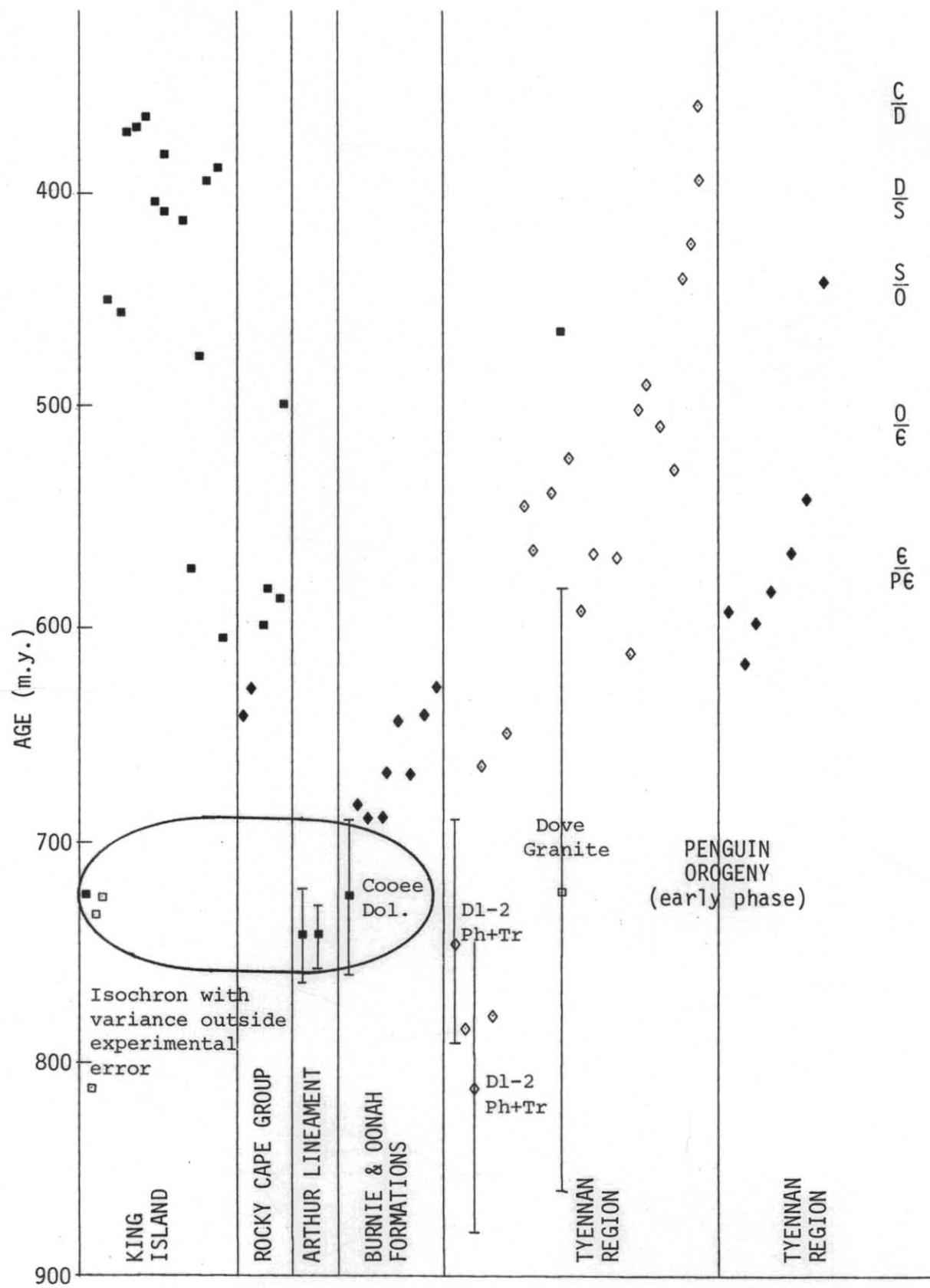
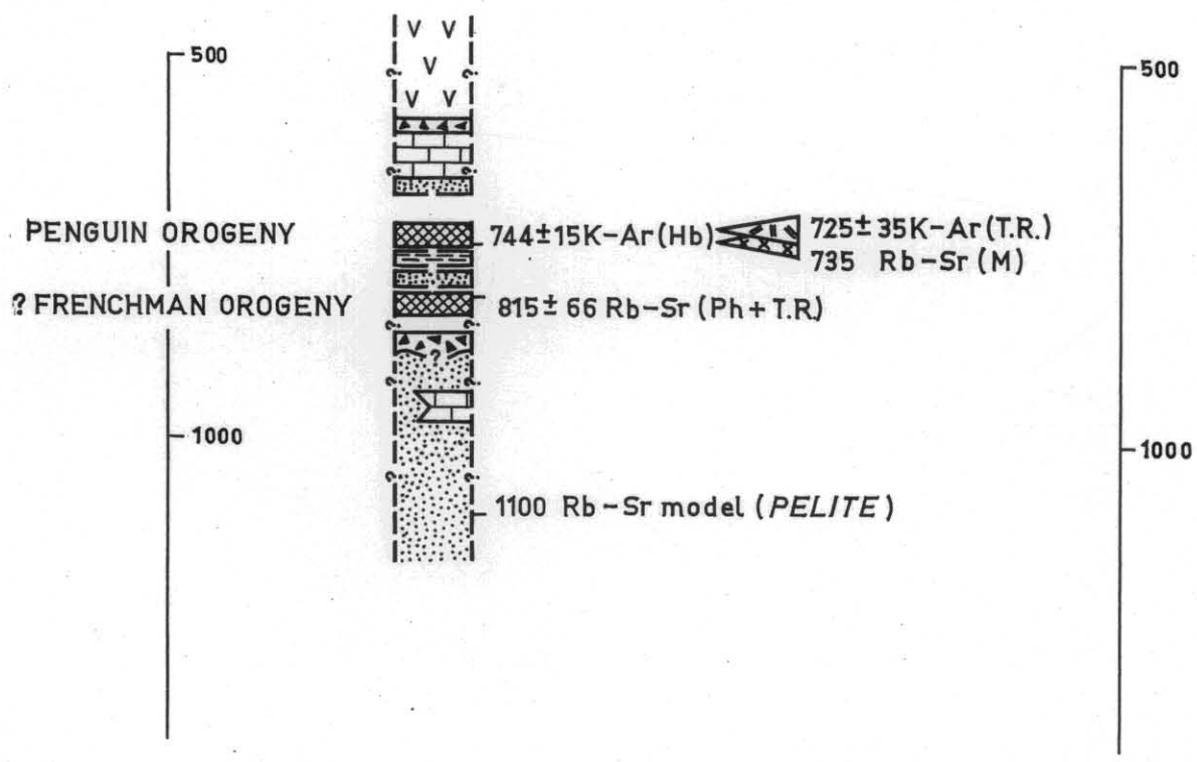


Figure 2. Tasmanian Proterozoic rocks. Igneous: ■ □ Metasediment: ◆ ◇
 K-Ar: ■ ◆ Rb-Sr: □ ◇

5 cm



NOTE: Hb-hornblende, M-muscovite, Ph-phengite, T.R.-total rock

Figure 3. *Tasmanian Proterozoic rocks.* (N.J.Turner, 8 October 1982).

