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1986/38. A radiometric age for the Moriarty Basalt, north-western Tasmania

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Abstract

A whole-rock K/Ar radiometric age for the Moriarty Basalt at Sassafras is 25.9 ± 0.2 Ma.

INTRODUCTION

The Moriarty Basalt (Burns, 1965) is the youngest mapped unit of the Tertiary succession in the Devonport-Port Sorell area. Based on a microfloral determination of the *Proteacidites tuberculatus* Zone for the underlying Wesley Vale Sand (Forsyth in Cromer, 1980), Cromer concluded that the Moriarty Basalt was Miocene in age.

As part of a regional study of Miocene volcanism in the Bass Basin and its environs, a sample of the Moriarty Basalt was obtained for K/Ar dating. The sample is from the road cutting 50 metres north of the Bass Highway on road C713 [DQ585287]. This is the only known location where fresh Moriarty Basalt can be obtained; the formation is everywhere else generally decomposed to red/brown clay.

The dating was carried out by AMDEL, Frewville, South Australia.

RESULTS

The rock is a porphyritic olivine basalt containing olivine phenocrysts in a groundmass of plagioclase laths, pyroxene and iron oxides.

Standard techniques were used to determine the potassium content in duplicate and for the extraction and isotopic analysis of the argon.

The analyses and calculated age are given below:

%K	Ar* ($\times 10^{-11}$ moles/g)	$^{40}\text{Ar}^*/^{40}\text{Ar}_{total}$	Age ($\times 10^6$ years)
1.318	5.9574	0.914	25.9 ± 0.2
1.320			

* Denotes radiogenic Ar
Constants used:

$$\begin{aligned}
^{40}\text{K} &= 0.01167 \text{ atom \%} \\
\lambda\beta &= 4.962 \times 10^{-10} \text{ y}^{-1} \\
\lambda\varepsilon &= 0.581 \times 10^{-10} \text{ y}^{-1}
\end{aligned}$$

DISCUSSION

Using the time scale of Harland et al. (1982) the Moriarty Basalt is Late Oligocene in age. This is slightly older than anticipated, but given the relatively long (approximately 16 - 38 Ma) age of the *P.tuberculatus* Zone, the result is satisfactory.

The revised stratigraphic subdivision of the Tertiary succession east of Devonport is:

Moriarty Basalt
Wesley Vale Sand
Thirlstane Basalt
Harford Beds

Late Oligocene
Early-Late Oligocene
?Middle Eocene-Early Oligocene
Palaeocene-Early Eocene

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