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1986/39. Radiometric ages for Circular Head and the Green Hills basalt, north-western Tasmania

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Abstract

Whole-rock K/Ar ages have been obtained for samples obtained from Circular Head (12.5 ± 0.2 Ma) and the basalt at the northern end of Godfreys Beach (8.5 ± 0.1 Ma), in the Stanley area of north-western Tasmania. The Green Hills basalt is the youngest known volcanic rock in Tasmania.

INTRODUCTION

Although the igneous origin of The Nut (or Circular Head) is clear, its precise age and mode of formation has not been clearly understood. Baillie and Leaman (1978) conducted a detailed gravity survey on and around The Nut, and after defining a positive anomaly some 250 m in diameter near the northern edge, concluded that The Nut was the remnant of a volcanic feeder, as first suggested by Gill and Banks (1956). Based on similarities with other Tasmanian Tertiary basalts, Lennox *et al.* (1982) assigned a Tertiary age to both The Nut and also to the basalts of the Green Hills and North Point areas.

As part of a regional study of Miocene volcanism in the Bass Basin and its environs, samples were obtained from Circular Head and also from the Green Hills area for radiometric analysis.

The sample from Circular Head was obtained from a very large block immediately behind the timber yards on the southern side of the monolith [CQ569856]; the Green Hills sample came from the curved collonades near the base of the pile at the northern end of Godfreys Beach [CQ561875].

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

RESULTS

The Circular Head sample was a medium-grained glomeroporphyritic rock consisting of olivine and titaniferous augite in a matrix of calcic plagioclase, iron oxides and zeolite.

The Green Hills sample was a fine-grained porphyritic basalt, consisting of olivine, titaniferous augite, feldspar, zeolites, and ?nepheline.

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 ages are:

	%K	$^{40}Ar^{*}$ ($\times 10^{-11}$ moles/g)	$^{40}Ar^{*}/^{40}Ar$ total	Age ($\times 10^{6}$ years)
1.	1.441 1.435	3.1302	0.800	12.5 ± 0.2
2.	2.103 2.101	3.0926	0.765	8.5 ± 0.1

1 = Circular Head
2 = Green Hills
* = Denotes radiogenic argon
Constants: ^{40}K = 0.01167 atom %
$\lambda\beta$ = 4.962×10^{-10} y^{-1}
$\lambda\varepsilon$ = 0.581×10^{-10} y^{-1}

DISCUSSION

The ages are in agreement with observed stratigraphic relationships in the area, and are Late Miocene using the time scale of Harland *et al.* (1982).

The dates are the youngest known from the Tasmanian Tertiary and provide a new upper limit for Miocene volcanism in the region.

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