

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

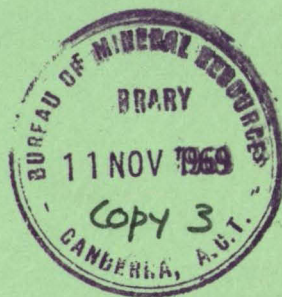
REPORT No. 117

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**Catalogue of Age Determinations
On Australian Rocks, 1962-1965**

COMPILED BY

R. R. HARDING



*Issued under the Authority of the Hon. David Fairbairn,
Minister for National Development*

1969

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DEPARTMENT OF NATIONAL DEVELOPMENT

MINISTER: THE HON. DAVID FAIRBAIRN, D.F.C., M.P.

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Summary

A CATALOGUE of age determinations carried out on 479 samples from Australian territory between June 1962 and December 1965 has been compiled. This Report lists the sample numbers, method of age determination, analytical data, locality, collector, and a brief evaluation of the age. Most of the determinations have been carried out at the Department of Geophysics and Geochemistry, Australian National University, Canberra, and many are the result of co-operation between this Department and the Bureau of Mineral Resources in the programme of dating the Australian continent. Some results have been supplied by companies.

Introduction

AGE DETERMINATIONS carried out on Australian rocks were summarized to June 1962 by R. P. Coats (1961) and D. A. White (1962); the present record lists the analytical data of samples that have been published between June 1962 and December 1965; some unpublished data are also included. Most of the determinations have been carried out at the Department of Geophysics and Geochemistry, Australian National University, Canberra. Some of these represent independent projects of the staff and students of the University; a substantial proportion are the result of co-operation between the University and the Bureau of Mineral Resources in the programme of dating the Australian continent. In this programme, specimens for age determination are collected by Bureau field parties and analysed under the supervision of members of staff of the Department, on machines provided by the University and the Bureau. The samples are listed under State headings and are further subdivided on the basis of publication. Results from the whole of Antarctica up to 1965 are summarized in two compilations by P. N. Webb (1962, 1965) and are not repeated here. One paper on age determinations of Australian Antarctic rocks (McDougall & Grindley, 1965) has appeared since, and the results are given here. Published papers referred to appear under 'General' or under State headings on pp 103-105. An abbreviated reference number, e.g. NSW 1, NSW 2, is given to each publication.

The data listed for each sample are set out as follows:

ROCK TYPE		
Ref. No.	Type of sample analysed	Method: Age
BMR No.	Analytical data	
GA or sample No.	Locality; latitude; longitude; Collector, Evaluation of age.	1 : 250,000 Sheet area

Although, it is hoped, enough analytical data for the reader also to evaluate the age quoted for a particular specimen are presented, the original publication or the analyst should be consulted for discussion of the limitations and for proper assessment of the results.

The GA or sample number of each set of data is tabulated (Table 1) under 'Period' and 'State'. Precambrian has been divided into Proterozoic (Adelaidean 600-1400 m.y., Carpentarian 1400-1800 m.y. and Lower Proterozoic 1800-2500 m.y.) and Archaean. Each subdivision in the Proterozoic has been further subdivided into 200 m.y. periods for ease of presentation. The divisions of Phanerozoic time are taken from 'The Phanerozoic Time-scale' (Geol. Soc. London, 1964), to which readers should refer for a discussion of the evidence for the divisions. Different components (e.g. feldspar and biotite) of some samples indicate different ages; in these cases, the sample number is assigned to the older or to the more reliable age and tabulated accordingly.

The samples are also indexed according to 1 : 250,000 Sheet number (Index I), and in order of GA and sample number (Index II). Text-figure 2 shows the location of Sheet numbers in Australia; the areas from which samples have been dated are shaded. If, for example, the reader wishes to ascertain which rocks have been analysed isotopically from North Queensland, he should consult Text-figure 1 and note the appropriate 1 : 250,000 Sheet numbers, consult the Queensland part of Index I for these numbers, and note the page references indicated. Areas at present being investigated geochronologically, but for which data are not yet available, include the Kimberley Region (W.A.), Kalgoorlie region (W.A.), Pilbara region (W.A.), Bowen Basin (Qld), Broken Hill (N.S.W.), Melbourne (Vic.), New Guinea, and Antarctica. Text-figures 1 and 3 show the location of samples dated from Antarctica and New Guinea.

Unless otherwise stated, the constants used in determining the ages listed are:

K-Ar Methods: $\lambda_{\beta}K^{40} = 4.72 \times 10^{-10}\text{yr}^{-1}$ ($3 \times$ uncertainty)

$\lambda_K K^{40} = 0.584 \times 10^{-10}\text{yr}^{-1}$ ($3 \times$ uncertainty)

$K^{40} = 1.22 \times 10^{-4}\text{g/gK} = 1.19 \times 10^{-4}$ mole/mole K.

Rb-Sr Method: $\lambda_{\beta}Rb^{87} = 1.39 \times 10^{-11}\text{yr}^{-1}$ ($6 \times$ uncertainty)

$Rb^{85}/Rb^{87} = 2.600$

$Sr^{88}/Sr^{86} = 8.34$.

The strontium in most samples was determined by isotope dilution, but where the present-day Sr^{87}/Sr^{86} was determined on an unspiked sample, the Sr^{87}/Sr^{86} value quoted in the text is followed by '(unsp.)'. The initial Sr^{87}/Sr^{86} value of the sample, quoted after the age of the sample, may have been assumed, or deduced from an isochron: this is indicated by (A) or (I) respectively.

Re-Os Method: Half-life of $Re^{187} = (4.3 \pm 0.5) \times 10^{10}\text{yr}$.

C^{14} Method: Results of C^{14} age determinations carried out on Australian samples of archaeological or geological interest appear in the *Australian Journal of Science*, and in *Radiocarbon*, an annual publication of the *American Journal of Science*.

An attempt has been made to collect all the information available concerning age determinations of Australian rocks; however, it would be appreciated if the Bureau of Mineral Resources could be notified of any omissions so that they can be included in the next Catalogue of Age Determinations.

Acknowledgments

I am indebted to members of the Department of Geophysics and Geochemistry, Australian National University, for their assistance and advice in the collection and presentation of the age determination results.

Acknowledgments are due to New South Wales Department of Mines, the Victorian Department of Mines, Planet Exploration Co. Pty Ltd, Esso Mineral Exploration Pty Ltd, Delhi Australian Petroleum Ltd, Australian Associated Oilfields, French Petroleum Ltd, Woodside Oil Co., Burma Oil Corp., and the Water Conservation and Irrigation Commission of Queensland, and to other organizations, for information or for permission to include results in this catalogue.

Antarctica

Ref.: ANT 1
GA 762

BIOTITE-BEARING LAMPROPHYRE

Biotite

K 7.62% *Ar⁴⁰/K⁴⁰ 0.0316.

Lat. 85°08'S.; long. 156°52'E.

Collected by G. W. Grindley.

Intrusive into Nimrod Group; could be genetically related to Hope Granite.

K-A age 476 m.y.

SV48-57/8

1:250,000 SHEET INDEX OF ANTARCTICA
SHOWING AREAS FROM WHICH SAMPLES HAVE BEEN DATED

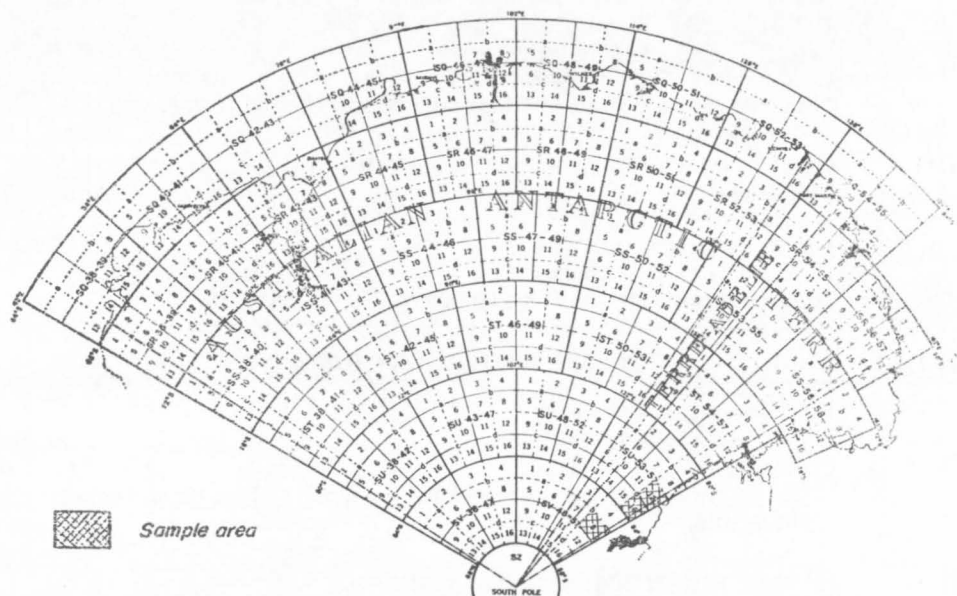


FIGURE 1

Ref.: ANT 1 GA 763	FUCHSITE-QUARTZ SCHIST	
	Muscovite	K-Ar age 487 m.y.
	K 7.81% *Ar ⁴⁰ /K ⁴⁰ 0.0325.	
	Muscovite	K-Ar age 491 m.y.
	K 7.83% *Ar ⁴⁰ /K ⁴⁰ 0.0328. Lat. 83°09'S.; long. 156°22'E. Collected by G. W. Grindley. Marker band in Nimrod Group. Age of metamorphism.	SU53-57/16
Ref.: ANT 1 GA 764	BIOTITE-EPIDOTE SCHIST	
	Biotite	K-Ar age 456 m.y.
	K 6.96% *Ar ⁴⁰ /K ⁴⁰ 0.0301.	
	Lat. 83°08'S.; long. 157°07'E. Collected by G. W. Grindley. Nimrod Group. Age of Metamorphism (minimum).	SU53-57/16
Ref.: ANT 1 GA 765	MUSCOVITE-BIOTITE SCHIST	
	Muscovite	K-Ar age 486 m.y.
	K 7.47% *Ar ⁴⁰ /K ⁴⁰ 0.0324.	
	Lat. 83°08'S.; long. 157°07'E. Collected by G. W. Grindley. Nimrod Group (adjacent to GA 764). Age of metamorphism.	SU53-57/16
Ref.: ANT 1 GA 766	BIOTITE-MICROCLINE GRANITE (OF HOPE GRANITE)	
	Biotite	K-Ar age 463 m.y.
	K 7.57% *Ar ⁴⁰ /K ⁴⁰ 0.0307.	
	Lat. 82°57'S.; long. 157°40'E. Collected by G. W. Grindley. Minimum age of intrusion of Hope Granite into Nimrod Group.	SU53-57/12
Ref.: ANT 1 GA 767	QUARTZ-MUSCOVITE-K-FELDSPAR-TOURMALINE PEGMATITE	
	Muscovite	K-Ar age 478 m.y.
	K 8.46% *Ar ⁴⁰ /K ⁴⁰ 0.0317.	
	Lat. 83°02'S.; long. 157°45'E. Collected by G. W. Grindley. Pegmatite associated with Hope Granite.	SU53-57/16
Ref.: ANT 1 GA 768	QUARTZ-PLAGIOCLASE-BIOTITE ORTHOGNEISS	
	Biotite	K-Ar age 520 m.y.
	K 7.60% *Ar ⁴⁰ /K ⁴⁰ 0.0350.	
	Lat. 83°38'S.; long. 157°09'E. Collected by G. W. Grindley. Upper part of Nimrod Group. Biotite has lost argon and age given is younger than age of formation.	SU53-57/16
Ref.: ANT 1 GA 769	GARNET-BIOTITE-MUSCOVITE GNEISS	
	Biotite	K-Ar age 471 m.y.
	K 6.94% *Ar ⁴⁰ /K ⁴⁰ 0.0312	
	Muscovite	K-Ar age 483 m.y.
	K 8.14% *Ar ⁴⁰ /K ⁴⁰ 0.0322.	
	Lat. 83°36'S.; Long. 157°12'E. Collected by W. W. Grindley. Upper part of Nimrod Group; argon loss from biotite and muscovite.	SU53-57/16

Ref.: ANT 1
GA 770

QUARTZ-PLAGIOCLASE-BIOTITE ORTHOGNEISS

Biotite

K-Ar age 631 m.y.

K 7.64% *Ar⁴⁰/K⁴⁰ 0.0438.

Biotite

K-Ar age 635 m.y.

K 7.64% *Ar⁴⁰/K⁴⁰ 0.0441.

Lat. 83°34'S.; long. 157°12'E.

SU53-57/16

Collected by G. W. Grindley.

Nimrod Group; minimum age for regional metamorphism of Nimrod Group before intrusion of granite.

Australian Capital Territory

Ref.: ACT 1
I55/16

STATE CIRCLE SHALE

				Age 433 m.y.	
				Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$
				Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
SC 12	12	..	..	192	48.3
	13	..	..	164	22.8
	17	..	..	178	32.2
				11.42	0.7862
				20.72	0.8457
				15.87	0.8170

Age 433 m.y.

Initial Sr⁸⁷/Sr⁸⁶ 0.714 (I).

Lat. 35°15'33"S.; long. 149°07'08"E.

Canberra

Collected by A. A. Öpik and R. T. Pidgeon.

Small scatter of points about isochron probably indicates initial Sr⁸⁷/Sr⁸⁶ variance.

Ref.: ACT 2
GA 290

SHANNONS FLAT GRANODIORITE

				Age 417 m.y.	
				Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$
				Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock	..	..	..	168.3	161.0
Microcline	..	..	..	371.9	139.6
Biotite	..	..	..	807.8	24.4
				3.009	0.7221
				7.669	0.7519
				95.23	1.2560

Initial Sr⁸⁷/Sr⁸⁶ 0.707 (I).

Lat. 35°27'15"S.; long. 148°58'59"E.

Canberra

Collected by R. T. Pidgeon.

Age of intrusion.

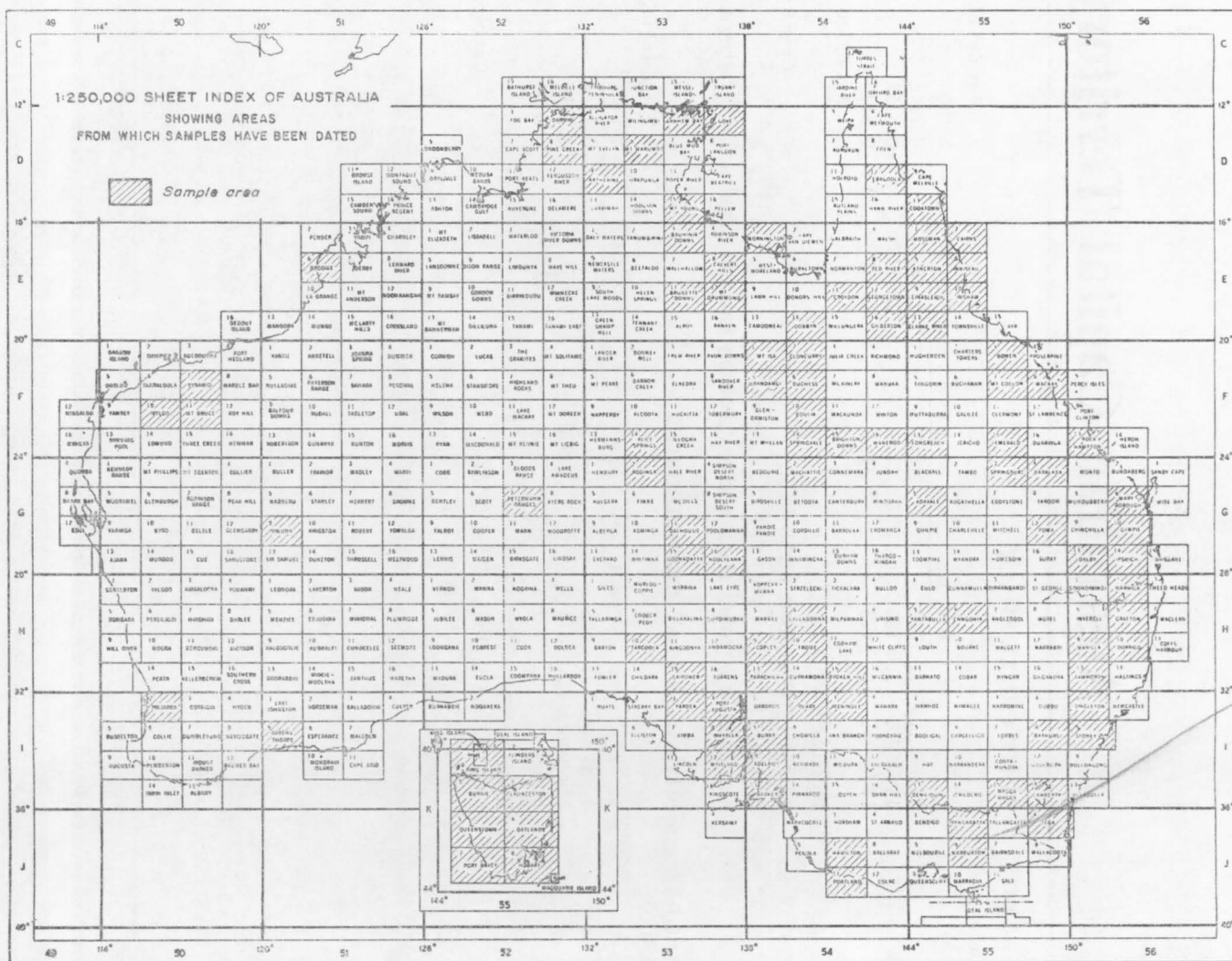


FIGURE 2

New South Wales

Ref.: NSW 1 H 56/13/1 GA 209	ANDESITE LAVA (LOWER KUTTUNG) Hornblende K 0.0797% *Ar ⁴⁰ /K ⁴⁰ 0.01550 Lat. 31°31'S.; long. 150°49'E. Collected by A. H. Voisey. Minimum age.	K-Ar Age 248 m.y. Tamworth
Ref.: NSW 1 GA 338	HILLGROVE ADAMELLITE Biotite K 7.76% *Ar ⁴⁰ /K ⁴⁰ 0.01690. Lat. 30°33'S.; long. 151°55'E. Collected by J. F. G. Wilkinson. Minimum age.	K-Ar age 269 m.y. Dorrigo
Ref.: NSW 1 GA 452	INLET MONZONITE Biotite K 7.52% *Ar ⁴⁰ /K ⁴⁰ 0.01527. Hornblende K 0.7506% *Ar ⁴⁰ /K ⁴⁰ 0.01541 Hornblende K 0.7475 *Ar ⁴⁰ /K ⁴⁰ 0.01582. Lat. 30°55'S.; long. 150°56'E. Collected by B. W. Chappell. Age of intrusion 245–250 m.y.	K-Ar age 245 m.y. K-Ar age 247 m.y. K-Ar age 253 m.y. Manilla
Ref.: NSW 1 GA 453	ATTUNGA CREEK ADAMELLITE Biotite K 6.86% *Ar ⁴⁰ /K ⁴⁰ 0.01517. Lat. 30°53'S.; long. 150°58'E. Collected by B. W. Chappell. Age of intrusion.	K-Ar age 243 m.y. Manilla
Ref.: NSW 1 GA 454	GRANITE Biotite K 7.58% *Ar ⁴⁰ /K ⁴⁰ 0.01476. Puddledock. Lat. 30°21'S.; long. 151°44'E. Collected by J. F. G. Wilkinson. Age of intrusion.	K-Ar age 237 m.y. Dorrigo

Ref.: NSW 1 H56/13 GA 469	GRANITE Biotite K 7.32% *Ar ⁴⁰ /K ⁴⁰ 0.01618. Barrington Tops. Lat. 31°57'S.; long. 151°27'E. Collected by A.O.G. Minimum age.	K-Ar age 258 m.y. Tamworth
Ref.: NSW 1 H56/6 GA 479	ANALCITE BASALT Biotite K 7.06% *Ar ⁴⁰ /K ⁴⁰ 0.002037. Hornblende K 1.395% *Ar ⁴⁰ /K ⁴⁰ 0.002009. Spring Mt. Lat. 29°48'S.; long. 151°31'E. Collected by J. F. G. Wilkinson. Age of extrusion.	K-Ar age 34.5 m.y. K-Ar age 34.1 m.y. Grafton
Ref.: NSW 2 84332B	AMPHIBOLITE Hornblende K 0.45% *Ar ⁴⁰ /K ⁴⁰ 0.0757. Lat. 31°51'45"S.; long. 141°20'24"E. Collected by R. A. Binns. Age of first regional metamorphism (low compared with 84336).	K-Ar age 894 ± 57 m.y. Broken Hill
Ref.: NSW 2 84336B	AMPHIBOLITE Hornblende K 0.70% *Ar ⁴⁰ /K ⁴⁰ 0.0668. Lat. 31°55'21"S.; long. 141°24'00"E. Collected by R. A. Binns. Age of regional metamorphism M1; not reliable; M1 probably older than 1345 m.y.	K-Ar age 987 ± 62 m.y. Broken Hill
Ref.: NSW 2 84368B	MICA SCHIST Muscovite K 3.53% *Ar ⁴⁰ /K ⁴⁰ 0.0990. Lat. 31°38'56"S.; long. 141°15'36"E. Collected by R. A. Binns. Age of metamorphism M2 (minimum age).	K-Ar age 1226 ± 54 m.y. Broken Hill
Ref.: NSW 2 84367B	BIOTITE-MUSCOVITE-QUARTZ SCHIST Biotite K 5.26% *Ar ⁴⁰ /K ⁴⁰ 0.0549. Muscovite K 7.19% *Ar ⁴⁰ /K ⁴⁰ 0.1017. Muscovite K 6.97% *Ar ⁴⁰ /K ⁴⁰ 0.1146. Silver King Mine. Lat. 31°38'35"S.; long. 141°22'45"E. Collected by R. A. Binns. Age of metamorphism M3 (minimum age).	K-Ar age 762 ± 38 m.y. K-Ar age 1233 ± 54 m.y. K-Ar age 1345 ± 30 m.y. Broken Hill
Ref.: NSW 2 84359B	FINE-GRAINED SCHIST WITHIN TILLITE (TORROWANGEE SERIES) Muscovite K 6.47% *Ar ⁴⁰ /K ⁴⁰ 0.0666. Muscovite K 6.47% *Ar ⁴⁰ /K ⁴⁰ 0.0711. Lat. 31°34'50"S.; long. 141°21'30"E. Collected by R. A. Binns Minimum age.	K-Ar age 892 ± 43 m.y. K-Ar age 939 ± 22 m.y. Broken Hill

Ref.: NSW 2 84365B	MUNDI MUNDI GRANITE Muscovite K 9.90% *Ar ⁴⁰ /K ⁴⁰ 0.1101. East of Mt Robe. Lat. 31°36'55"S.; long. 141°23'42"E. Collected by R. A. Binns. Minimum age.	K-Ar age 1307 ± 56 m.y. Broken Hill
Ref.: NSW 2 84393B	MUNDI MUNDI GRANITE Muscovite K 9.61% *Ar ⁴⁰ /K ⁴⁰ 0.0755. Mundi Mundi Creek: Lat. 31°45'22"S.; long. 141°16'30"E. Collected by R. A. Binns. Age too low: indicates granite affected by M4 movements. In addition to the above results, determined by isotope dilution, 9 results were obtained by the total volume method.	K-Ar age 985 ± 38 m.y. Broken Hill
Ref.: NSW 2 84348B	GNEISS Biotite K 8.27% *Ar ⁴⁰ /K ⁴⁰ 0.0736. Lat. 31°57'43"S.; long. 141°27'18"E. Collected by R. A. Binns. Gneiss a product of first regional metamorphism; age too low—probably mineral suffered argon loss.	K-Ar age 965 ± 38 m.y. Broken Hill
Ref.: NSW 2 84349B	GNEISS Biotite K 8.74% *Ar ⁴⁰ /K ⁴⁰ 0.1182. Lat. 31°54'03"S.; long. 141°23'00"E. Collected by R. A. Binns. Minimum age.	K-Ar age 1375 ± 49 m.y. Broken Hill
Ref.: NSW 2 84341B	AMPHIBOLITE Hornblende K 0.89% *Ar ⁴⁰ /K ⁴⁰ 0.1306. Lat. 31°57'43"S.; long. 141°29'00"E. Collected by R. A. Binns. Minimum age.	K-Ar age 1475 ± 81 m.y. Broken Hill
Ref.: NSW 2 84368B	MICA SCHIST Biotite K 8.16% *Ar ⁴⁰ /K ⁴⁰ 0.0827. Biotite K 8.16% *Ar ⁴⁰ /K ⁴⁰ 0.0820. Muscovite K 7.02% *Ar ⁴⁰ /K ⁴⁰ 0.110. West of Mt Robe Mine: Lat. 31°38'56"S.; long. 141°15'36"E. Collected by R. A. Binns. Ages show that some argon has leaked from biotite lattice.	K-Ar age 1056 ± 41 m.y. K-Ar age 1049 ± 40 m.y. K-Ar age 1307 ± 47 m.y. Broken Hill

Ref.: NSW 2
84367B

BIOTITE-MUSCOVITE-QUARTZ SCHIST

Biotite

K-Ar age 924 ± 37 m.y.

K 5.86% *Ar⁴⁰/K⁴⁰ 0.0696.

Biotite

K-Ar age 740 ± 36 m.y.

K 5.86% *Ar⁴⁰/K⁴⁰ 0.0529.

Silver King Mine. Lat. 31°38'35"S.; long. 141°22'45"E.

Broken Hill

Collected by R. A. Binns.

Results compared with those for muscovite indicate argon loss from biotite (see 84367 measured by isotope dilution).

Ref.: NSW 2
84365B

MUNDI MUNDI GRANITE

Muscovite

K-Ar age 1466 ± 51 m.y.

K 10.40% *Ar⁴⁰/K⁴⁰ 0.1295.

East of Mt Robe. Lat. 31°36'55"S.; long. 141° 23'42"E.

Broken Hill

Collected by R. A. Binns.

Minimum age.

Ref.: NSW 3
H54/15/1
GA 106

GRANODIORITE GNEISS

Biotite

K-Ar age 459 m.y.

K 7.43% *Ar⁴⁰/K⁴⁰ 0.03036.

	Rb μg/g	Sr μg/g	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	1124	4.6	706.0	5.5035

Age 488 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Equiv. to formation No. 1, Broken Hill Mine Sequence.

Lat. 31°47'S.; long. 141°36'E.

Broken Hill

Collected by B.M.R.

Records metamorphic event which took place between 550 and 440 m.y. ago.

Ref.: NSW 3
H54/15/2
GA 107

ALMA AUGEN GNEISS

Biotite

K-Ar age 434 m.y.

K 6.84% *Ar⁴⁰/K⁴⁰ 0.02851.

	Rb μg/g	Sr μg/g	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	967	72.1	38.54	1.0060
	973	74.3	37.62	1.0008

Age 546 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 31°59'S.; long. 141°29'E.

Broken Hill

Collected by B.M.R.

See GA 106.

Ref.: NSW 3
H54/15/3
GA 108

GRANITE GNEISS

Biotite

K-Ar age 463 m.y.

K 6.94% *Ar⁴⁰/K⁴⁰ 0.03065.

	Rb μg/g	Sr μg/g	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	1587	12.7	358.6	3.4379

Age 548 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 31°54'30"S.; long. 141°33'E.

Broken Hill

Collected by B.M.R.

See GA 106.

Ref.: NSW 3
H54/15/4
GA 109

ALMA AUGEN GNEISS

Biotite

K-Ar age 1059 m.y.

K 6.51% *Ar⁴⁰/K⁴⁰ 0.08304.

Biotite

K-Ar age 1032 m.y.

K 6.51% *Ar⁴⁰/K⁴⁰ 0.08024.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	857	9.7	254.9	2.6109
	851	9.4	258.9	2.6193

Age 532 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 31°59'30"S.; long. 141°28'E.

Broken Hill

Collected by B.M.R.

See GA 106. Reason for anomalously high K-Ar ages unknown.

Ref.: NSW 3
H54/15/5
GA 110

MUNDI MUNDI GRANITE

Biotite

K-Ar age 581 m.y.

K 7.60% *Ar⁴⁰/K⁴⁰ 0.03977.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	1148	11.5	287.2	2.6432
	1143	11.8	277.5	2.6374

Age 492 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 31°48'20"S.; long. 141°20'20"E.

Broken Hill

Collected by B.M.R.

See GA 106. Reason for anomalously high K-Ar age unknown.

Ref.: NSW 3
I54/3/1
GA 111

GRANITE OR FELDSPATHIZED SCHIST

Biotite

K-Ar age 562 m.y.

K 6.97% *Ar⁴⁰/K⁴⁰ 0.03822.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	1067	34.2	89.67	1.3173
	1027	34.8	84.71	1.3091

Age 493 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 32°02'S.; long. 141°18'E.

Menindee

Collected by B.M.R.

See GA 106. Reason for higher K-Ar than Rb-Sr age unknown.

Ref.: NSW 3
GA 312

POTOSI GNEISS

Biotite

K-Ar age 810 m.y.

K 7.65% *Ar⁴⁰/K⁴⁰ 0.05908.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	1073	3.2	950.1	7.1837

Age 490 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 31°57'50"S.; long. 141°28'10"E.

Broken Hill

Collected by Zinc Corp. Ltd.

See GA 106. Reasons for higher K-Ar than Rb-Sr age unknown.

Ref.: NSW 3
GA 313

BIOTITIC LODE MATERIAL

Biotite

K-Ar age 519 m.y.

K 6.77% *Ar⁴⁰/K⁴⁰ 0.03494.

Muscovite

K-Ar age 470 m.y.

K 8.67% *Ar⁴⁰/K⁴⁰ 0.03115.

Lat. 31°58'15"S.; long. 141°27'E.

Broken Hill

Collected by Zinc Corp. Ltd.

See GA 106.

Ref.: NSW 3
GA 314

GRANITIC GNEISS

Biotite

K-Ar age 462 m.y.

K 7.82% $^{40}\text{Ar}/^{40}\text{K}$ 0.03057.

Plagioclase

K-Ar age 518 m.y.

K 2.98% $^{40}\text{Ar}/^{40}\text{K}$ 0.03479.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	2034	3.0	1,947.5	15.1806

Age 534 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715(A).

Lat. 31°57'10"S.; Long. 141°29'40"E.

Broken Hill

Collected by Zinc Corp. Ltd.

See GA 106.

Ref.: NSW 3
GA 405

ALMA AUGEN GNEISS (SAME O/C AS GA 107)

Biotite (coarse)

K-Ar age 476 m.y.

K 7.94% $^{40}\text{Ar}/^{40}\text{K}$ 0.03165.

Biotite (fine)

K-Ar age 491 m.y.

K 7.91% $^{40}\text{Ar}/^{40}\text{K}$ 0.03274.

Lat. 31°59'S.; long. 141°29'E.

Broken Hill

Collected by Zinc Corp. Ltd.

See GA 106.

Ref.: NSW 3
GA 406

AUGEN GNEISS

Biotite

K-Ar age 434 m.y.

K 6.74% $^{40}\text{Ar}/^{40}\text{K}$ 0.02853.

Lat. 31°33'35"S.; long. 141°41'10"E.

Broken Hill

Collected by Zinc Corp. Ltd.

See GA 106. Probably radiogenic argon has leaked from the biotite.

Ref.: NSW 3
GA 407

MUNDI MUNDI GRANITE

Biotite

K-Ar age 487 m.y.

K 7.17% $^{40}\text{Ar}/^{40}\text{K}$ 0.03246.

Biotite

K-Ar age 518 m.y.

K 7.70% $^{40}\text{Ar}/^{40}\text{K}$ 0.03485.

Muscovite

K-Ar age 1351 m.y.

K 8.71% $^{40}\text{Ar}/^{40}\text{K}$ 0.11532.

Muscovite

K-Ar age 1349 m.y.

K 8.71% $^{40}\text{Ar}/^{40}\text{K}$ 0.11516.

Muscovite

K-Ar age 1363 m.y.

K 8.77% $^{40}\text{Ar}/^{40}\text{K}$ 0.11675.

Lat. 31°45'40"S.; long. 141°16'15"E.

Broken Hill

Collected by Zinc Corp. Ltd.

Biotite indicates age of metamorphism. Muscovites indicate age between that of intrusion and metamorphism.

Ref.: NSW 3
GA 437

GNEISS BOULDER IN TILLITE

Biotite

K-Ar age 456 m.y.

K 7.09% $^{40}\text{Ar}/^{40}\text{K}$ 0.03012.

Lat. 31°31'S.; long. 141°40'E.

Broken Hill

Collected by Zinc Corp. Ltd.

See GA 106.

Ref.: NSW 3 GA 438	GRANITIC GNEISS Biotite K 7.74% *Ar ⁴⁰ /K ⁴⁰ 0.03109. Lat. 32°02'S.; long. 141°15'35"E. Collected by Zinc Corp. Ltd. See GA 106.	K-Ar age 510 m.y. Menindee
Ref.: NSW 3 GA 439	ALMA AUGEN GNEISS (APPROX. SAME POINT AS GA 109) Biotite K 7.56% *Ar ⁴⁰ /K ⁴⁰ 0.03005. Lat. 31°59'30"S.; long. 141°28'E. Collected by Zinc Corp. Ltd. See GA 106.	K-Ar age 455 m.y. Broken Hill
Ref.: NSW 4 GA 303	BRECCIA PIPE Phlogopite K mg/g 83.4 *Ar ⁴⁰ /K ⁴⁰ 0.01190. Breccia pipe filling.	K-Ar age 194 m.y.
R 112	Clinopyroxene (6M) K mg/g 0.95 *Ar ⁴⁰ /K ⁴⁰ 0.01020. Plagioclase (10M) K mg/g 4.93 *Ar ⁴⁰ /K ⁴⁰ 0.007282. Pyroxene granulite xenolith.	K-Ar age 167 m.y. K-Ar age 121 m.y.
R 130	Clinopyroxene (12M) K mg/g 0.31 *Ar ⁴⁰ /K ⁴⁰ 0.01043. Garnet granulite xenolith.	K-Ar age 171 m.y.
R 117	Hornblende (19M) K mg/g 7.22 *Ar ⁴⁰ /K ⁴⁰ 0.01021. Clinopyroxene (8M) K mg/g 0.116 *Ar ⁴⁰ /K ⁴⁰ 0.05132, 0.04707. Clinopyroxene (GA 218) K mg/g 0.116 *Ar ⁴⁰ /K ⁴⁰ 0.04016, 0.06839. Delegate. Lat. 36°54'S.; long. 148°46'E. Collected by J. F. Lovering.	K-Ar age 167 m.y. K-Ar age 721 m.y. 671 m.y. K-Ar age 586 m.y. 911 m.y. Bega
	Phlogopite age probably indicates time of intrusion of magma which formed the breccia. R 112 could have been contaminated with K as well as lost argon. R 130—minimum age. R 117—high ages for clinopyroxene may result in part from slight inhomogeneities in K content (K determined by isotope dilution).	
Ref.: NSW 5 (WC 38) GA 1359	GARNET-BEARING MARGINAL VARIANT OF GNEISSIC GRANITE Biotite K 7.65% *Ar ⁴⁰ /K ⁴⁰ 0.01574. Lat. 30°15'40"S.; long. 152°07'30"E. Collected by R. A. Binns. Age of metamorphism.	K-Ar age 252 m.y. Dorrigo
Ref.: NSW 5 (WB 71) GA 1360	GRANITIC VEIN IN MIGMATITE ZONE Biotite K 7.82% *Ar ⁴⁰ /K ⁴⁰ 0.01584. Lat. 30°17'S.; long. 152°09'E. Collected by R. A. Binns. Age of metamorphism.	K-Ar age 253 m.y. Dorrigo

Ref.: NSW 5 WC 39 GA 1361	PSAMMITIC SCHIST Biotite K 7.60% *Ar ⁴⁰ /K ⁴⁰ 0.01562. Lat. 30°16'S.; long. 152°07'E. Collected by R. A. Binns. Age of metamorphism.	K-Ar age 250 m.y. Dorrigo
Ref.: NSW 5 WC 33 GA 1362	'TYPICAL' GNEISSIC GRANITE Biotite K 7.63% *Ar ⁴⁰ /K ⁴⁰ 0.01283. Lat. 30°21'30"S.; long. 152°10'E. Collected by R. A. Binns. Radiogenic argon has probably leaked from the biotite; minimum age.	K-Ar age 208 m.y. Dorrigo
Ref.: NSW 5 WB 166 GA 1363	GRANITE OF THE NEW ENGLAND BATHOLITH Biotite K 6.73% *Ar ⁴⁰ /K ⁴⁰ 0.01522. Nr Wards Mistake. Lat. 30°08'30"S.; long. 151°51'10"E. Collected by R. A. Binns. Granite intrudes northern part of Wongwibinda Complex. Minimum age of intrusion.	K-Ar age 244 m.y. Dorrigo
Ref.: NSW 5 WC 3 GA 1364	LEUCOCRATIC GRANITE Biotite K 7.35% *Ar ⁴⁰ /K ⁴⁰ 0.01388. Snowy Range. Lat. 30°30'S.; long. 152°10'30"E. Collected by R. A. Binns. Granite intruding southern part of Wongwibinda Complex. Minimum age of intrusion.	K-Ar age 224 m.y. Dorrigo
Ref.: NSW 5 WB 123 GA 1365	GNEISSIC GRANITE Biotite K 7.85% *Ar ⁴⁰ /K ⁴⁰ 0.01622. Lat. 30°12'20"S.; long. 152°00'40"E. Collected by R. A. Binns. Intrudes Permian greywackes and slates west of Wongwibinda Complex. Age of intrusion or metamorphism.	K-Ar age 259 m.y. Dorrigo
Ref.: NSW 6 GA 678	BRECCIA, UMBIELLA CREEK PIPE Hornblende K 1.46% *Ar ⁴⁰ /K ⁴⁰ 0.00363. Lat. 33°00'S.; long. 150°24'E. Collected by J. F. Lovering. Minimum age.	K-Ar age 61.2 m.y. Sydney
Ref.: NSW 6 GA 783	NEPHELINITE Total rock K 1.38% *Ar ⁴⁰ /K ⁴⁰ 0.01096. Umbiella Creek. Lat. 33°00'S.; long. 150°24'E. Collected by J. F. Lovering. Minimum age.	K-Ar age 179 m.y. Sydney

Unpublished Esso 1	VEINED AND ALTERED QUARTZ DIORITE Muscovite K 0.45 % *Ar ⁴⁰ /K ⁴⁰ 0.0228. From banded magnetite iron formation.	K-Ar age 355±28 m.y.
Esso 2	Detrital biotite K 0.33 % *Ar ⁴⁰ /K ⁴⁰ 0.0310. From green siliceous phyllite.	K-Ar age 468±37 m.y.
Esso A4	Muscovite K 4.33 % *Ar ⁴⁰ /K ⁴⁰ 0.0210. 1 from 1161 ft, 2 from 1252 ft, A4 from 1785 ft depth. Dingo Hole. Lat. 29°06'47"S.; long. 146°48'31"E. Collected by Esso Mineral Company of Australia. Age of rocks between Ordovician and Mississippian.	K-Ar age 330±26 m.y. Enngonia
Unpublished I56/1/2 GA 470	GRANITE Biotite K 7.20 % *Ar ⁴⁰ /K ⁴⁰ 0.02145. Mt View, near Cessnock. Lat. 32°50'S.; long. 151°18'E. Collected by Australian Oil and Gas Corp. Ltd. Minimum age.	K-Ar age 336 m.y. Singleton
Unpublished H55/5/1 GA 594	GRANITE Biotite K 6.77 % *Ar ⁴⁰ /K ⁴⁰ 0.02424. 1157 ft depth in water bore (No. 6644). Lat. 29°47'S.; long. 144°17'E. Collected by Water Conservation and Irrigation Commission. Minimum age.	K-Ar age 375 m.y. Yantabulla
Unpublished H55/5/3 GA 595	GRANITE Biotite K 7.12 % *Ar ⁴⁰ /K ⁴⁰ 0.0247. 1191 ft depth in water bore (No. 6644). Lat. 29°47'S.; long. 144°17'E. Collected by Water Conservation and Irrigation Commission. Minimum age.	K-Ar age 381 m.y. Yantabulla
Unpublished I55/13/1 GA 596	GRANITE Biotite K 7.61 % *Ar ⁴⁰ /K ⁴⁰ 0.02586. Basement of stratigraphic well. Lat. 35°03'00"S.; long. 144°31'18"E. Collected by Woodside Oil Co. Minimum age.	K-Ar age 398 m.y. Deniliquin
Ref.: NSW 7 Mol. 1	MOLYBDENITE Molybdenite Re 71.4 ppm. Os ¹⁸⁷ /O 0.239 ppm. Yetholme. Lat. 33°27'30"S.; long. 149°49'E. Collected by N. H. Fisher.	Re-Os age 330±40 m.y. Bathurst

Ref.: NSW 7
Mol. 2

MOLYBDENITE

Molybdenite

Re-Os age 105 ± 40 m.y.

Re 3.45 ppm. Os¹⁸⁷/ 0.0037 ppm.

Glen Eden. Lat. 29°35'S. (approx.); long. 151°43'E. (approx.)

Grafton

Collected by N. H. Fisher.

Unpublished
H56/6/7
GA 830

BASIC SILL

Plagioclase

K-Ar age 58 m.y.

K 0.25% *Ar⁴⁰/K⁴⁰ 0.00344.

Clifden No. 3 Well, 7500 ft (core 24). Lat. 29°34'08"S.; long.
152°54'57"E.

Grafton

Collected by Burma Oil Corporation.

Reliable minimum age of intrusion of basic magma into pre-Jurassic rocks.

Ref.: NSW 8
C2

ANDALUSITE-BEARING GRANITE

Age 415 ± 12 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	185	116.2	4.581	0.7438
Orthoclase ..	244	444.1	1.582	0.7286
	240.9	439.8	1.577	0.7278
Muscovite ..	117.5	64.22	5.266	0.7495
	120.7	68.40	5.080	0.7479
Biotite ..	596.9	11.11	170.0	1.7135
	618.6	10.70	166.4	1.6760

Initial Sr⁸⁷/Sr⁸⁶ $0.7179 \pm 0.0005(I)$.

Lat. 36°14'27"S.; long. 149°05'16"E.

Bega

Collected by R. T. Pidgeon.

Age of formation of the Cooma Granite. Determinations on C2, C5, and GA 293 lie on a straight line (isochron).

Ref.: NSW 8
C5

ANDALUSITE-BEARING GRANITE

Age 415 ± 12 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	177.5	129.0	3.960	0.7411
	178.0	130.1	3.942	0.7389
Orthoclase ..	211.3	441.8	1.377	0.7260
Biotite ..	654.6	6.61	284.9	2.2780
	657.2	6.56	288.4	2.3047

Initial Sr⁸⁷/Sr⁸⁶ $0.7179 \pm 0.0005(I)$.

Lat. 36°13'50"S.; long. 149°06'23"E.

Bega

Collected by R. T. Pidgeon.

See C2.

Ref.: NSW 8
GA 293

GRANITE DYKE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Age 415 $\pm$ 12 m.y.
				Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	180.3	90.27	5.750	0.7509
	181.4	88.18	5.926	0.7502
Orthoclase ..	448.0	152.7	8.45	0.7674
Biotite	948.1	5.48	498.0	3.624
	949.9	5.51	496.6	3.582
Muscovite ..	331.1	35.75	26.66	0.8725
Plag. & quartz	71.3	76.66	2.672	0.7338
Plag. & q. (fine)	202.1	98.10	5.920	0.7516

Initial Sr⁸⁷/Sr⁸⁶ 0.7179 $\pm$ 0.0005(I).

Lat. 36°14'27"S.; long. 149°06'07"E.

Collected by R. T. Pidgeon.

See C2.

Bega

Ref.: NSW 8

FELDSPAR-RICH BAND (C7), AND BIOTITE-RICH BAND (C8)

C7 & C8

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Age 402 m.y.
				Sr ⁸⁷ /Sr ⁸⁶
C7 Total Rock	131.5	213.2	1.776	0.7285
	132.3	210.5	1.809	0.7293
C8 Total Rock	256.2	92.43	7.980	0.7639
	256.1	90.88	8.095	0.7629

Initial Sr⁸⁷/Sr⁸⁶ 0.719(I).

Lat. 36°11'42"S.; long. 149°04'41"E.

Collected by R. T. Pidgeon.

Age of formation of migmatite.

Bega

Ref.: NSW 8

BIOTITE-RICH BAND (C9), AND FELDSPAR-RICH BAND (C10)

C9 & C10

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Age 411 m.y.
				Sr ⁸⁷ /Sr ⁸⁶
C9 Total Rock	237.0	102.8	6.639	0.7582
	238.7	104.9	6.552	0.7600
C10 Total Rock	210.4	199.3	3.040	0.7390
	207.9	194.3	3.080	0.7385

Initial Sr⁸⁷/Sr⁸⁶ 0.7215(I).

Lat. 36°14'27"S.; long. 149°06'07"E.

Collected by R. T. Pidgeon.

Age of formation of migmatite: initial Sr⁸⁷/Sr⁸⁶ differs from that of C7 and C8.

Bega

Ref.: NSW 8
GA 55

**BIOTITE-ANDALUSITE-ORTHOCLASE GNEISS (CORDIERITE-
ORTHOCLASE ZONE)**

				Age 399 ± 29 m.y.
				$\text{Sr}^{87}/\text{Sr}^{86}$
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	$\text{Rb}^{87}/\text{Sr}^{86}$	
Total Rock ..	265.5	117.1	6.525	0.7560
	275.0	109.1	7.254	0.7565
	266.4	118.6	6.470	0.7539
Orthoclase ..	248.5	416.7	1.716	0.7288
	247.3	413.2	1.723	0.7289
	569.8	9.213	178.1	1.0920
Biotite	672.7	8.490	228.1	2.0275
	708.1	5.600	364.2	2.7790
	211.3	97.89	6.216	0.7547
C4A Total Rock ..	249.6	153.0	4.696	0.7439
C4B Total Rock ..	249.9	153.8	4.677	0.7462

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.719 ± 0.002(I).

Lat. 36°14'52"S.; long. 149°03'E.

Collected by R. T. Pidgeon.

Age of formation of migmatite (same age, to within experimental error, as that of Cooma Granite).

Bega

Ref.: NSW 8
Binjura 3

**CHLORITE-MUSCOVITE SCHIST (3), QUARTZ-BIOTITE SCHIST (9),
QZ-MUSC-CORD-BIO SCHIST (10), AND QUARTZ-EPIDOTE ROCK (7)**

				Age 460 ± 11 m.y.
				$\text{Sr}^{87}/\text{Sr}^{86}$
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	$\text{Rb}^{87}/\text{Sr}^{86}$	
Total Rock B	187.3	42.66	12.64	0.7900
	D 187.7	42.69	12.65	0.7912
	E 187.7	42.69	12.65	0.7897
Binjura 9 Total Rock A	152.1	137.9	3.175	0.7307
	B 155.9	143.4	3.130	0.7314
Binjura-10 Total Rock A	174.7	58.36	8.62	0.7638
	B 177.7	58.77	8.70	0.7643
Binjura 7 Total Rock A	1.87	210.8	0.0255	0.7160

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.710 ± 0.002(I).

3: Lat. 36°14'27"S.; long. 149°01'11"E.

7, 9, 10: Lat. 36°11'42"S.; long. 149°01'32"E.

Collected by R. T. Pidgeon.

Isochron through 3, 9 and 10 indicates schists significantly older than Cooma Granite, also their initial $\text{Sr}^{87}/\text{Sr}^{86}$ is significantly lower. The quartz-epidote $\text{Sr}^{87}/\text{Sr}^{86}$ is similar to that of the Cooma Granite.

Bega

Bega

Ref.: NSW 8
CI

CLINOPYROXENE AMPHIBOLITE, INCLUSION IN COOMA GRANITE

				Age uncertain
				$\text{Sr}^{87}/\text{Sr}^{86}$
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	$\text{Rb}^{87}/\text{Sr}^{86}$	
Total Rock ..	3.280	232.0	0.0407	0.7038
	3.292	236.0	0.0402	0.7068

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.704(I).

Lat. 36°14'27"S.; long. 149°07'44"E.

Collected by R. T. Pidgeon.

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ undistinguishable from that of Tertiary basalts; indicates no appreciable mixing with Sr of Cooma Granite.

Bega

Ref.: NSW 8
GA 272

SOHO ST. PEGMATITE

Age 440 ± 40 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Orthoclase ..	367.7	266.4	3.97	0.7274
	354.2	265.1	3.84	0.7282

Initial Sr⁸⁷/Sr⁸⁶ 0.704(A).

Lat. $36^{\circ}14'27''\text{S}$.; long. $149^{\circ}07'44''\text{E}$.

Bega

Collected by R. T. Pidgeon.

Sample too poorly enriched in radiogenic Sr to determine reliable age.

Ref.: NSW 8
GA 273

SPRING CREEK PEGMATITE

Age 402 ± 7 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Muscovite ..	540.1	8.024	193.8	1.8258
	543.1	8.117	192.6	1.7777
Microcline ..	473.0	91.51	14.88	0.8061
	472.4	89.52	15.19	0.8037
Biotite ..	1,462.7	26.30	160.1	1.2972
	1,449.3	26.10	159.8	1.3011
GA 292 Muscovite ..	510.7	12.04	122.1	1.4206
	507.3	11.42	127.9	1.4520

Initial Sr⁸⁷/Sr⁸⁶ 0.724 ± 0.004 (I).

Lat. $36^{\circ}11'42''\text{S}$.; long. $149^{\circ}04'\text{E}$.

Bega

Collected by R. T. Pidgeon.

Age and initial Sr⁸⁷/Sr⁸⁶ close to that of Cooma Granite; consistent with an origin for the pegmatite by metamorphic segregation from pre-existing sedimentary rocks.

Ref.: NSW 8
C6

LEUCOGRANITE (UNKNOWN STRUCTURAL RELATIONSHIP WITH MIGMATITE)

Age 590 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	130.8	153.1	2.46	0.7272
	129.5	154.1	2.42	0.7250
Orthoclase ..	361.6	260.3	3.97	0.7400
	357.3	250.8	4.10	0.7385

Initial Sr⁸⁷/Sr⁸⁶ 0.707(I).

Lat. $36^{\circ}14'10''\text{S}$.; long. $149^{\circ}06'07''\text{E}$.

Bega

Collected by R. T. Pidgeon.

Age indicated may be misleading, and total rock could have lost radiogenic strontium; orthoclase lies on Cooma Granite isochron.

Ref.: NSW 9
155/15/16 GA 48
155/15/17 GA 49
GA 48, GA 49

HAPPY VALLEY GRANODIORITE

Ages too low.

Pb- α age: (48) 310 m.y., (49) 330 m.y.

Chemical age: (48) 290 m.y., (49) 320 m.y.

	U $\mu\text{g/g}$	Th $\mu\text{g/g}$	Pb $\mu\text{g/g}$	α mg. ⁻¹ hr. ⁻¹
	740	330	35	282
	755	310	39	295

Tumut 1 and Tumut 2. (48)Lat. $35^{\circ}57'15''\text{S}$.; long. $148^{\circ}19'45''\text{E}$.

(49)Lat. $35^{\circ}52'59''\text{S}$.; long. $148^{\circ}19'55''\text{E}$.

Wagga

Wagga

Collected by H. Berry, R. Rudowski, and G. Lafeber.

BOOMERANG CREEK GNEISS

Ref.; NSW 9	U $\mu\text{g/g}$	Th $\mu\text{g/g}$	Pb $\mu\text{g/g}$	α $\text{mg}^{-1} \text{hr}^{-1}$
GA 56 155/15/22	930	375	66	324
GA 57 155/15/23	895	340	106	341
GA 58 155/15/24	930	385	43	291
GA 59 155/15/25	695	285	38	285

Pb- α age: (56) 500 m.y., (57) 750 m.y., (58) 370 m.y.,
(59) 330 m.y.

Chemical age: (56) 440 m.y., (57) 720 m.y., (58) 290 m.y.,
(59) 340 m.y.

(Tumut 1 and Tumut 2 tunnels). Lat. $35^{\circ}55'S$. (approx.);
long. $148^{\circ}19'E$. (approx.).

Wagga

Collected by G. A. Joplin and H. Berry.

GA 56 and GA 57 may be contaminated with lead or they may be preserving a memory
of pre-gneiss existence. GA 58 and GA 59 ages appear too low.

Northern Territory

Ref.: NT 1
D53/15/1
GA 752

ROSIE CREEK SANDSTONE

Glauconite K 7.15% *Ar⁴⁰/K⁴⁰ 0.1369. K-Ar age 1523 m.y.

Glauconite K 7.15% *Ar⁴⁰/K⁴⁰ 0.1366. K-Ar age 1521 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glauconite A	299	4.89	175.6	4.662
B	298	3.84	224.8	5.601

Age A 1605 m.y., B 1,550 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Lat. 15°55'S.; long. 135°40'E.

Mount Young

Collected by H. G. Roberts.

Rosie Creek Sandstone probably equivalent to Aquarium Formation in the Tawallah Group.

Ref.: NT 1
E53/8/13
GA 753

AQUARIUM FORMATION

Glauconite K 5.82% *Ar⁴⁰/K⁴⁰ 0.1304. K-Ar age 1473 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glauconite ..	268	7.02	110.5	3.031

Age 1495 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Lat. 17°18'S.; long. 137°22'E.

Calvert Hills

Collected by H. G. Roberts.

Aquarium Formation 1200 ft below top of Tawallah Group which is oldest group of sediments in the Proterozoic.

Ref.: NT 1
E53/8/14
GA 754

AQUARIUM FORMATION

A Glauconite K 6.52% *A⁴⁰/K⁴⁰ 0.1450. K-Ar age 1584 m.y.

A Glauconite K 6.52% *Ar⁴⁰/K⁴⁰ 0.1411. K-Ar age 1555 m.y.

B Glauconite K 6.43% *Ar⁴⁰/K⁴⁰ 0.1436. K-Ar age 1573 m.y.

B Glauconite K 6.43% *Ar⁴⁰/K⁴⁰ 0.1473. K-Ar age 1601 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glauconite (i)	288	7.87	105.9	3.089
(ii)	282	8.94	91.02	2.737

Age (i) 1,600 m.y., (ii) 1,585 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Lat. 17°28'S.; long. 137°39'E.

Calvert Hills

Collected by H. G. Roberts.

Part of Tawallah Group, oldest Group of Proterozoic sediments (Fraction A washed in warm 0.1N HNO₃).

Ref.: NT 2
E53/8/2
GA 125

NICHOLSON GRANITE

Biotite

K-Ar age 1840 m.y.

K 7.23% *Ar⁴⁰/K⁴⁰ 0.1823.

Lat. 17°47'S.; long. 137°53'E.

Calvert Hills

Collected by C. Bennett, B.H.P. Ltd.

Average of three determinations on Nicholson Granite (GA 125, 559 and 581) is 1815 m.y. This is a minimum age, but probably close to age of intrusion.

Ref.: NT 2
E53/8/3
GA 483

NORRIS GRANITE

Biotite

K-Ar age 1760 m.y.

K 5.51% *Ar⁴⁰/K⁴⁰ 0.1699.

Lat. 17°46'S.; long. 137°47'E.

Calvert Hills

Collected by B.M.R.

Average of four determinations (GA 159, 483 and 484) is 1790 m.y. This is a minimum age but probably close to age of intrusion.

Ref.: NT 2
E53/8/5
GA 484

NORRIS GRANITE

Biotite

K-Ar age 1780 m.y.

K 5.81% *Ar⁴⁰/K⁴⁰ 0.1727.

Lat. 17°45'S.; long. 137°55'E.

Calvert Hills

Collected by B.M.R.

See GA 483.

Ref.: NT 2
E53/8/6
GA 558

NORRIS GRANITE

Age 1725 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	228	188	3.498	0.7992(unsp.)
	227	188	3.476	0.7982(unsp.)
K-feldspar ..	434	167	7.497	0.8932(unsp.)
	431	173	7.223	0.8920(unsp.)

Initial Sr⁸⁷/Sr⁸⁶ 0.713(I).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 17°43'S.; long. 137°57'E.

Calvert Hills

Collected by W. B. Dallwitz and J. M. Rhodes.

Compared with K-Ar data, age is young and there has probably been leakage of radiogenic strontium.

Ref.: NT 2
E53/8/11
GA 559

NICHOLSON GRANITE

Muscovite

A-Kr age 1790 m.y.

K 8.84% *Ar⁴⁰/K⁴⁰ 0.1,743.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	391	24.5	46.09	1.856(unsp.)
	391	24.2	46.73	1.853(unsp.)
Muscovite ..	1,060	3.69	829.3	21.34
	1,060	4.96	618.0	16.67

Age 1770 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.705(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 17°55'S.; long. 137°13'E.

Calvert Hills

Collected by K. Yates.

See GA 125. Rb-Sr data indicate that 1770 m.y. is a maximum age.

Ref.: NT 2
E53/8/12
GA 581

NICHOLSON GRANITE
Hornblende
K 1.035% *Ar⁴⁰/K⁴⁰ 0.1782.
Lat. 17° 55'S.; long. 137° 13'E.
Collected by K. Yates.
See GA 125.

K-Ar age 1815 m.y.

Calvert Hills

Ref.: NT 2
E53/8/1
GA 159

NORRIS GRANITE
Biotite
K 5.92% *Ar⁴⁰/K⁴⁰ 0.1794.
Biotite
K 5.92% *Ar⁴⁰/K⁴⁰ 0.1806.
Lat. 17° 50'S.; long. 137° 55'E.
Collected by E. K. Carter.
See GA 483.

K-Ar age 1820 m.y.

K-Ar age 1830 m.y.

Calvert Hills

Ref.: NT 2
D53/4/6
GA 1044

GIDDY GRANITE
Biotite
K 6.09% *Ar⁴⁰/K⁴⁰ 0.1702.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	330	63.8	14.93	1.104
K-feldspar ..	530	77.0	19.91	1.206
	529	78.8	19.40	1.198
Biotite	1216	3.35	1050	27.69

Age 1825 ± 50 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.720(A).
Sr⁸⁸/Sr⁸⁶ assumed = 8.387.
Lat. 12° 23'S.; long. 136° 37'E.
Collected by D. Dunnet.
Probably some radiogenic argon leaked from the biotite. 1825 m.y. probably close to age of intrusion.

K-Ar age 1760 m.y.

Gove

Ref.: NT 2
D53 4/7
GA 1045

BRADSHAW GRANITE
Biotite
K 7.41% *Ar⁴⁰/K⁴⁰ 0.1722.
Lat. 12° 37'S.; long. 136° 30'E.
Collected by D. Dunnet.

K-Ar age 1775 m.y.

Gove

Probably 1775 m.y. records age of emplacement of Giddy and Caledon Granites, and does not indicate age of crystallization of Bradshaw Granite.

Ref.: NT 2
D53/4/8
GA 1047

CALEDON GRANITE
Muscovite
K 8.73% *Ar⁴⁰/K⁴⁰ 0.1684.
Lat. 12° 53'S.; long. 136° 32'E.
Collected by D. Dunnet.
Muscovite thought to be not of primary origin. Minimum age; probably 1750 m.y. is younger than age of emplacement.
See GA 1044.

A-Kr age 1750 m.y.

Gove

Ref.: NT 2
E53/8/8
GA 746

PACKSADDLE MICROGRANITE

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Age 1520 m.y. Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	214	45.3	13.67	0.991
	215	44.4	14.01	1.009
	215	43.4	14.32	1.011

Initial Sr⁸⁷/Sr⁸⁶ 0.705(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 17°4'S.; long. 137°56'E.

Collected by K. Yates.

Maximum age.

Calvert Hills

Ref.: NT 2
E53/12/2
GA 1158

MULLERA FORMATION

Glaucanite

K-Ar age 1040 m.y.

K 5.19% *Ar⁴⁰/K⁴⁰ 0.0812.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucanite ..	377	23.6	45.96	1.458

Age 1160 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Lat. 18°18'S.; long. 137°42'E.

Collected by J. W. Smith.

Mount Drummond

Deformation present in Mullera Formation and this may be a factor in loss of argon and strontium; ages probably too young.

Ref.: NT 2
D53/3/17
GA 993

ELCHO ISLAND FORMATION, WESSEL GROUP

Glaucanite

K-Ar age 780 m.y.

K 6.65% *Ar⁴⁰/K⁴⁰ 0.0564.

Glaucanite

K-Ar age 765 m.y.

K 6.65% *Ar⁴⁰/K⁴⁰ 0.0592.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucanite ..	181	6.95	75.18	1.539

Age 790 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387

Lat. 12°01'S.; long. 135°41'E.

Collected by P. Rix.

Arnhem Bay

Minimum age; consistent with upper limit of Roper Group.

Ref.: NT 2
E53/3/14
GA 942

CRAWFORD FORMATION, ROPER GROUP

Glaucanite

K-Ar age 1140 m.y.

K 5.77% *Ar⁴⁰/K⁴⁰ 0.0911.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucanite ..	380	22.4	49.14	1.618

Age 1315 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 16°38'S.; long. 135°47'E.

Collected by J. M. Rhodes.

Bauhinia Downs

Top of Crawford Formation.

Ref.: NT 2
E53/3/15
GA 943

CRAWFORD FORMATION, ROPER GROUP

Glaucinite K 5.56% *Ar⁴⁰/K⁴⁰ 0.1071. K-Ar age 1280 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucinite A ..	481	22.6	61.86	1.846
B ..	477	23.3	59.11	1.829

Age A 1310 m.y., B 1350 m.y., Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 16°34'S.; long. 135°26'E.

Bauhinia Downs

Collected by J. M. Rhodes.

Minimum age; radiogenic argon and radiogenic strontium probably leaked from glauconite.

Compare Rb-Sr age on GA 944.

Ref.: NT 2
E53/3/16
GA 944

CRAWFORD FORMATION, ROPER GROUP

Glaucinite K 5.35% *Ar⁴⁰/K⁴⁰ 0.0989. K-Ar age 1210 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucinite A ..	441	28.5	44.68	1.574
B ..	441	28.9	43.99	1.575

Age A 1380 m.y., B 1400 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 16°34'S.; long. 135°26'E.

Bauhinia Downs

Collected by J. M. Rhodes.

Minimum age 1390 ±20 m.y., argon leakage apparent—see GA 943.

Ref.: NT 2
E53/3/18
GA 945

CRAWFORD FORMATION, ROPER GROUP

Glaucinite K 5.40% *Ar⁴⁰/K⁴⁰ 0.0891. K-Ar age 1120 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucinite ..	392	21.3	53.37	1.669

Age 1270 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 16°11'S.; long. 136°04'E.

Bauhinia Downs

Collected by J. M. Rhodes.

Position in Crawford Formation unknown. Argon and strontium leakage apparent—see GA 943 and GA 944.

Ref.: NT 2
E53/3/19
GA 946

CRAWFORD FORMATION, ROPER GROUP

Glaucinite K 5.14% *Ar⁴⁰/K⁴⁰ 0.0875. K-Ar age 1100 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucinite ..	364	28.2	37.47	1.389

Age 1290 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 16°11'S.; long. 136°04'E.

Bauhinia Downs

Collected by J. M. Rhodes.

Argon and strontium leakage apparent—see GA 943 and GA 944.

Ref.; NT 2

D53/9/6
GA 949

DOLERITE IN ROPER GROUP

Plagioclase

K 1.44% *Ar⁴⁰/K⁴⁰ 0.1003.

Lat. 14° 30' S.; long. 133° 24' E.

Collected by J. M. Rhodes.

Minimum age; argon leakage probable—see GA 950.

K-Ar age 1220 m.y.

Katherine

Ref.: NT 2

D53/9/7
GA 950

DOLERITE IN ROPER GROUP

Plagioclase

K 1.15% *Ar⁴⁰/K⁴⁰ 0.1074.

Plagioclase

K 1.15% *Ar⁴⁰/K⁴⁰ 0.1067.

Pyroxene

K 0.113% *Ar⁴⁰/K⁴⁰ 0.0923.

Lat. 14° 26' S.; long. 133° 30' E.

Collected by J. M. Rhodes.

Minimum age of intrusion 1280 m.y.

K-Ar age 1280 m.y.

K-Ar age 1280 m.y.

K-Ar age 1150 m.y.

Katherine

Ref.: NT 2

D53/9/8
GA 947

DOOK CREEK FORMATION

Glaucinite

K 5.63% *Ar⁴⁰/K⁴⁰ 0.0986.

K-Ar age 1210 m.y.

	Rb (ppm)	Sr (ppm)	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Glaucinite ..	354	12.3	83.43	2.180

Age 1255 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Sr⁸⁸/Sr⁸⁶ assumed = 8.387.

Lat. 14° 31' S.; long. 135° 06' E.

Collected by J. M. Rhodes.

Glaucinitic dolomite.

Loss of argon and strontium probable since overlying Roper Group rocks are older than 1300 m.y. See GA 944.

Katherine

Ref.: NT 2

D53/6/4
GA 848

DOLERITE IN DOOK CREEK FORMATION

Plagioclase

K 1.43% *Ar⁴⁰/K⁴⁰ 0.0888.

Plagioclase

K 1.43% *Ar⁴⁰/K⁴⁰ 0.0867.

Pyroxene

K 0.040% *Ar⁴⁰/K⁴⁰ 0.0987.

Lat. 13° 39' S.; long. 134° 21' E.

Collected by D. Dunnet and K. A. Plumb.

Minimum age.

K-Ar age 1115 m.y.

K-Ar age 1095 m.y.

K-Ar age 1205 m.y.

Mount Marumba

Ref.: NT 2

E53/3/7
GA 1157

CRAWFORD FORMATION, ROPER GROUP

Glaucinite

K 5.63% *Ar⁴⁰/K⁴⁰ 0.1030.

Lat. 16° 17' S.; long. 134° 57' E.

Collected by A. W. Webb.

Position within Crawford Formation unknown. Minimum age—see GA 944.

K-Ar age 1245 m.y.

Bauhinia Downs

Ref.: NT 3

GA 5406

GA 5407

GA 5408

GA 5417

GA 5418

GA 5419

SHALES

Age 1510 ± 120 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	302	69.0	12.0507	0.9567
	281	73.7	10.4435	0.9183
	352	117.6	8.1950	0.8747
	339	90.6	10.3217	0.9162
	354	101.2	9.5765	0.9031
	330	84.3	10.7351	0.9301

Initial Sr⁸⁷/Sr⁸⁶ $0.700 \pm 0.020(\text{I})$.

Brunette Downs No. 1 borehole. Lat. $18^{\circ}35'17''\text{S}$;

long. $136^{\circ}05'00''\text{E}$.

Brunette Downs

Collected by the Papuan Apinaipi Petroleum Co. Ltd.

Points lie on straight line within experimental precision. Not certain whether figure represents age of deposition of shale, age of compaction, or age of formation of clay minerals.

Ref.: NT 4

G52/7/1

GA₁1057

GRANITIC GNEISS

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	302.1	104.2	8.339	0.8408
K-feldspar ..	537.5	134.7	11.480	0.8651
Biotite	1,447.2	4.8	862.169	7.9325

Age (T.R.) 1190 m.y. Initial Sr⁸⁷/Sr⁸⁶ —

Age (Bio) 600 m.y. Initial Sr⁸⁷/Sr⁸⁶ —

2 miles west of Tornpakara, Petermann Ranges. Lat. $25^{\circ}24'\text{S}$;

long. $130^{\circ}02'30''\text{E}$.

Petermann Ranges

Collected by W. Oldershaw.

Ref.: NT 4

G52/7/3

GA 1058

BIOTITE GRANITE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	429.9	24.0	51.512	1.5372
K-feldspar ..	984.6	41.1	68.892	1.6940
Biotite	2,397.1	1.9	3,604.028	29.2469

Age (T.R.) 1,150 m.y. Initial Sr⁸⁷/Sr⁸⁶ —

Age (Bio) 600 m.y. Initial Sr⁸⁷/Sr⁸⁶ —

Collected by W. Oldershaw.

Armstrong Ck, Petermann Ranges. Lat. $25^{\circ}21'\text{S}$; long. $129^{\circ}45'\text{E}$. Petermann Ranges

At least two interpretations of the data:

- (i) True age of formation is apparent age of T.R. specimens i.e. 1190 m.y. and 1150 m.y. The biotite apparent age of 600 m.y. would then represent the approximate age of later metamorphism.
- (ii) True age of formation of both specimens is about 670 m.y. with both rocks being formed with a very large amount of inherited radiogenic strontium.

Unpublished
F53/14/
GA 1059

SHALES

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock F	195.0	69.6	8.0540	0.8065
E	161.6	77.9	5.9630	0.7840
A	218.2	64.4	9.7436	0.8230

Age 760 ± 30 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.720(I).

Ooraminna No. 1 Well. 42 miles SE. of Alice Springs.

Lat. 24°00'06"S., long. 134°09'50"E.

Alice Springs

Collected by B.M.R.

Approximate age of deposition or compaction of the sediment, or of the formation of the clay minerals.

Unpublished
G53/2/
GA 5212

DARK SHALE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶	Age 820 m.y.
Total Rock C3	205.6	96.2	6.1466	0.7747	
D1	130.4	109.3	3.4290	0.7437	
D5	180.8	114.5	4.5387	0.7562	

Initial Sr⁸⁷/Sr⁸⁶ 0.704(I).

Mt Charlotte No. 1. Lat. 24°52'03"S.; long. 133°59'11"E.

Rodinga

Collected by Transoil.

Approximate age of deposition or compaction of the sediment.

Ref.: NT 5
D52/4/1
GA 24A

COARSE GRANITE, RUM JUNGLE

Zircon ages from isotope dilution data.

²⁰⁶ Pb/ ²³⁸ U	²⁰⁷ Pb/ ²³⁵ U	²⁰⁷ Pb/ ²⁰⁶ Pb	²⁰⁸ Pb/ ²³² Th.
0.255, (0.243);	5.28, (5.03);	0.151;	0.885, 0.885

Age: 1480 m.y. (1410 m.y.); 1890 m.y. (1850 m.y.); 2390 m.y.; 1740 m.y., (1680 m.y.).

Continuous diffusion: 2670 m.y.; Radiation damage: 2560 m.y.

U $\mu\text{g/g}$	Th $\mu\text{g/g}$	Pb $\mu\text{g/g}$	α mg ⁻¹ hr ⁻¹
805	405	196	263

Pb- α age 1600 m.y. Chemical age 1320 m.y.

Lat. 13°21'S., long. 130°38'E.

Darwin

Collected by B.M.R.

Minimum age (Pb-Pb) of 2400 m.y. Probably records event at about 2550 m.y. (considering GA 24A, GA 656 and GA 675).

Ref.: NT 5
D52/4/25
GA 656

LARGE FELDSPAR GRANITE

Zircon ages from isotope dilution data.

	²⁰⁶ Pb/ ²³⁸ U	²⁰⁷ Pb/ ²³⁵ U	²⁰⁷ Pb/ ²⁰⁶ Pb	²⁰⁸ Pb/ ²³² Th
Age ..	0.322	6.87	0.155	0.132
..	1820 m.y.	2120 m.y.	2440 m.y.	2540 m.y.

Continuous diffusion: 2580 m.y. Radiation damage 2540 m.y.

Lat. 12°50'30"S., long. 130°58'30"E.

Darwin

Collected by J. R. Richards and B. P. Ruxton.

Minimum age (Pb-Pb) of 2400 m.y.—see GA 24A.

Ref.: NT 5
D52/8/10
GA 675

LEUCOCRATIC GRANITE

Zircon ages from isotope dilution data.

	$^{206}\text{Pb}/^{238}\text{U}$	$^{207}\text{Pb}/^{235}\text{U}$	$^{207}\text{Pb}/^{206}\text{Pb}$	$^{208}\text{Pb}/^{232}\text{Th}$
	0.0896	1.37	0.111	0.0445
Age ..	.. 560 m.y.	890 m.y.	1840 m.y.	890 m.y.

Continuous diffusion: 3000 m.y. Radiation damage: 2600 m.y.

Lat. 13°S.; long. 131°01'30"E.

Pine Creek

Collected by J. R. Richards and B. P. Ruxton.

3,000 m.y. age uncertain owing to large lead loss—see GA 24A.

Ref.: NT 5
D52/8/6
GA 10

HERMIT HILL GRANITE

	U $\mu\text{g/g}$	Th $\mu\text{g/g}$	Pb $\mu\text{g/g}$	α $\text{mg}^{-1} \text{hr}^{-1}$
	595	90	170	222

Pb- α age 1,640 m.y. Chemical age 1620 m.y.

Lat. 14°02'S.; long. 30°33'E.

Pine Creek

Collected by O. N. Warm and E. J. Malone.

Minimum age—probably considerably below true age.

Ref.: NT 5
D52/4/50(30)
GA 15

MT BUNDEY SYENITE

	U $\mu\text{g/g}$	Th $\mu\text{g/g}$	Pb $\mu\text{g/g}$	α $\text{mg}^{-1} \text{hr}^{-1}$
	905	1010	174	348

Pb- α age 1120 m.y. Chemical age 950 m.y.

Lat. 12°54'S., long. 131°34'E.

Darwin

Collected by E. Malone.

Minimum age—probably considerably below true age.

Ref.: NT 6
Z 134

TEKTITE, CHARLOTTE WATERS

Total Rock, K-Ar age 0.69 ± 0.06 m.y.

K 1.88% $^{40}\text{Ar}/^{40}\text{K}$ 0.00004.

Lat. 25°55'S., long. 134°55'E.

Charlotte Waters

Collected by Fenner.

Minimum age.

Queensland

Ref.: Q 1
F54/6/4
GA 131

KALKADOON GRANITE (?Wonga Granite)

Biotite

K 6.88% *Ar⁴⁰/K⁴⁰ 0.1238.

Lat. 21°41'S., long. 139°55'E.

Collected by E. K. Carter.

See GA 126.

K-Ar age 1420 m.y.

Duchess

Ref.: Q 1, Q 11,
Q 12
F54/6/11
GA 132

WIMBERU GRANITE

Biotite

K 4.21% *Ar⁴⁰/K⁴⁰ 0.1253.

K-Ar age 1432 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	139.5	200.1	2.007	0.7491 (unsp.).
Age 1530 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.7043(I).				
	²⁰⁶ Pb/ ²³⁸ U	²⁰⁷ Pb/ ²³⁵ U	²⁰⁷ Pb/ ²⁰⁶ Pb	²⁰⁸ Pb/ ²³² Th
Zircon ..	0.103	1.25	0.0885	0.0435
Age ..	635 m.y.	830 m.y.	1420 m.y.	870 m.y.

Continuous diffusion: 1900 m.y. (approx.); Radiation damage
1670 m.y. (approx.)

Lat. 21°13'30"S.; long. 140°25'30"E.

Collected by E. K. Carter.

K-Ar age unreliable (biotite bleached). Rb-Sr age—see GA 129.

Difficult to interpret U-Pb data.

Duchess

Ref.: Q 1, Q 11
F54/6/1
GA 126

KALKADOON GRANODIORITE

Biotite

K 6.60% *Ar⁴⁰/K⁴⁰ 0.1170.

K-Ar age 1364 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	228.9	233.9	2.817	0.7777 (unsp.)
Biotite ..	1119	19.45	165.7	4.131

Age 1760 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.7065 (I).

Lat. 21°07'S.; long. 139°38'E.

Collected by E. K. Carter.

Duchess

K-Ar ages on Kalkadoon, Sybella, Wonga, Naraku, Williams, and Wimberu may be ages of metamorphism or of intrusion: results indicate only that the last recordable event occurred between 1300 and 1400 m.y. ago. Rb-Sr age from total rock isochron (with GA 172, 378, 379); biotite, assuming initial Sr⁸⁷/Sr⁸⁶ of 0.7065 gives age of 1470 m.y.

- Ref.: Q 1
F54/2/6
GA 127
- WONGA GRANITE**
Biotite K 1.26% *Ar⁴⁰/K⁴⁰ 0.1067.
Lat. 20°38'S.; long. 139°59'E.
Collected by E. K. Carter.
Strongly foliated part of heterogeneous granite which intrudes Corella Formation.
Biotite chloritized; age unreliable.
- K-Ar age 1278 m.y.
Cloncurry
- Ref.: Q 1
F54/2/4
GA 128
- NARAKU MICROADAMELLITE, FINE-GRAINED LATE PHASE**
Biotite K 6.63% *Ar⁴⁰/K⁴⁰ 0.1222.
Lat. 20°27'S.; long. 140°19'E.
Collected by E. K. Carter
See GA 126.
- K-Ar age 1408 m.y.
Cloncurry
- Ref.: Q 1
F54/6/7
GA 134
- WILLIAMS GRANODIORITE (GNEISSIC)**
Biotite K 6.55% *Ar⁴⁰/K⁴⁰ 0.1212.
Lat. 21°36'S.; long. 140°55'E.
Collected by E. K. Carter.
See GA 126.
- K-Ar age 1399 m.y.
Duchess
- Ref.: Q 1, Q 12
F54/6/2
GA 135
- WONGA GRANITE**
Biotite K 7.47% *Ar⁴⁰/K⁴⁰ 0.1276.
Zircon, ²⁰⁷Pb/²⁰⁶Pb 0.0951. Age 1560 m.y.
Lat. 21°13'S.; long. 139°52'E.
Collected by E. K. Carter.
Relict bedding structures in metasomatic granite.
See GA 126. Lead isotope age a minimum.
- K-Ar age 1450 m.y.
Duchess
- Ref.: Q 1, Q 12
F54/2/1
GA 162
- KALKADOON GRANODIORITE GNEISS**
Biotite K 6.17% *Ar⁴⁰/K⁴⁰ 0.1240.
- | | U $\mu\text{g/g}$ | Th $\mu\text{g/g}$ | Pb $\mu\text{g/g}$ | α $\text{mg}^{-1} \text{hr}^{-1}$ |
|--------|-------------------|--------------------|--------------------|--|
| Zircon | 775 | 315 | 173 | 235 |
- Pb- α age 1580 m.y. Chemical age 1250 m.y.
Lat. 20°29'S.; long. 139°48'E.
Collected by E. K. Carter.
Part of oldest phase of Kalkadoon Granite—see GA 126.
Pb- α age represents part of a 'discordant set'. True age greater than 1580 m.y.
- K-Ar age 1422 m.y.
Cloncurry
- Ref.: Q 1
F54/2/3
GA 163
- PEGMATITE**
Muscovite K 9.12% *Ar⁴⁰/K⁴⁰ 0.1154.
Lat. 20°04'S.; long. 140°E.
Collected by E. K. Carter.
Associated with the Wonga granite. See GA 126.
- K-Ar age 1351 m.y.
Cloncurry

Ref.: Q 1, Q 11
E54/14/2
GA 378

KALKADOON GRANITE

Biotite		K-Ar age 1312 m.y.		
K 5.83 % *Ar ⁴⁰ /K ⁴⁰ 0.1107.				
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	203.5	203.2	2.883	0.7773 (unsp.)
Age 1760 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.7065(I).				
Lat. 19°46'S.; long. 139°59'E.				
Collected by E. K. Carter.				
K-Ar age unreliable (biotite highly altered).				
Rb-Sr age. See GA 126.				

Dobbyn

Ref.: Q 1, Q 11
F54/2/2
GA 379

KALKADOON GRANODIORITE

Biotite		K-Ar age 1448 m.y.		
K 7.55 % *Ar ⁴⁰ /K ⁴⁰ 0.1273				
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	172.0	92.1	5.374	0.8391 (unsp.)
	170.3	92.9	5.278	0.8386 (unsp.)
Biotite	735.4	4.80	440.8	10.11
Age (T.R.) 1760 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.7065 (I).				
Age (Bio.) 1520 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.7065 (A).				
Lat. 20°17'S.; long. 139°48'E.				
Collected by E. K. Carter.				
See GA 126.				

Cloncurry

Ref.: Q 1, Q 11
198MI (Perth)
GA 422

SYBELLA PEGMATITE

Muscovite		K-Ar age 1398 m.y.		
K 8.62 % *Ar ⁴⁰ /K ⁴⁰ 0.1210.				
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Muscovite ..	2,613	2.42	3,109	68.45
(A) 2,511	1.48	4,900	106.7	
Age 1545 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.712 (A).				
Lat. 20°48'S.; long. 139°25'E.				
Collected by E. K. Carter.				
Age independent of initial Sr ⁸⁷ /Sr ⁸⁶ . Minimum age. See GA 126.				

Mt Isa

Ref.: Q 1, Q 11
F54/1/3
GA 530

SYBELLA GRANITE

Biotite		K-Ar age 1404 m.y.		
K 7.50 % *Ar ⁴⁰ /K ⁴⁰ 0.1218.				
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	183.4	183.2	2.876	0.7777 (unsp.)
	183.5	184.3	2.865	0.7764 (unsp.)
Biotite	940.0	14.06	192.4	4.723
Age (T.R.) 1600 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.712 (I).				
Age (Bio.) 1480 m.y. Initial Sr ⁸⁷ /Sr ⁸⁶ 0.712 (A).				
Lat. 20°47'S.; long. 139°12'E.				
Collected by E. K. Carter.				
Data not sufficient to group the granite as 'older' or 'younger'; with only two samples the age is provisional. See GA 126.				

Mt Isa

Ref.: Q 1
F54/1/4
GA 531

SYBELLA GRANITE
Biotite K-Ar age 1398 m.y.
 K 7.46% *Ar⁴⁰/K⁴⁰ 0.1210.
 Lat. 20°51'S.; long. 139°10'E. Mt Isa
 Collected by E. K. Carter.
 Intrudes Yaringa metamorphics; thought to be second oldest body in Sybella Granite,
 See GA 126.

Ref.: Q 1
F54/1/6
GA 532

SYBELLA GRANITE
Biotite K-Ar age 1410 m.y.
 K 6.77% *Ar⁴⁰/K⁴⁰ 0.1226.
 Lat. 20°39'S.; long. 139°23'E. Mt Isa
 Collected by E. K. Carter.
 Probably belongs to second oldest granite mass. See GA 126.

Ref.: Q 1
F54/2/16
GA 582

SOLDIERS CAP SCHIST
Biotite K-Ar age 1431 m.y.
 K 7.43% *Ar⁴⁰/K⁴⁰ 0.1251.
Muscovite K-Ar age 1456 m.y.
 K 7.48% *Ar⁴⁰/K⁴⁰ 0.1283.
Muscovite K-Ar age 1466 m.y.
 K 7.48% *Ar⁴⁰/K⁴⁰ 0.1296.
 Lat. 20°57'S.; long. 140°41'E. Cloncurry
 Collected by E. K. Carter.
 Probably near the oldest lower Proterozoic rocks in NW Queensland. See GA 126.

Ref.: Q 1
F54/2/17
GA 583

CORELLA SCHIST
Biotite K-Ar age 1452 m.y.
 K 7.67% *Ar⁴⁰/K⁴⁰ 0.1278.
Muscovite K-Ar age 1431 m.y.
 K 7.83% *Ar⁴⁰/K⁴⁰ 0.1251
 Lat. 20°50'S.; long. 139°58'E. Cloncurry
 Collected by E. K. Carter.
 Sillimanite-biotite-muscovite schist in predominantly calc-silicate Corella Formation.
 See GA 126.

Ref.: Q 1, Q 9
E54/14/3
GA 584

EWEN BIOTITE ADAMELLITE (RED)
Biotite K-Ar age 1776 m.y.
 K 6.79% *Ar⁴⁰/K⁴⁰ 0.1724.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	469	43.7	30.99	1.491 (unsp.)
	—	—	—	1.490
Plagioclase ..	38	43.1	2.52	0.8056
	—	—	—	0.8084 (unsp.)
K-feldspar ..	982	71.3	39.82	1.680

Age 1780 $\pm$ 20 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.715 (I).
 (Sr⁸⁸/Sr⁸⁶ assumed to be 8.387.)
 Lat. 19°24'S.; long. 139°39'E. Dobbryn
 Collected by E. K. Carter.
 Main part of Ewen Granite; intrudes Argylla Formation and underlies Eastern Creek
 Volcanics. Age of intrusion.

Ref.: Q 1
E54/14/6
GA 585

EWEN BIOTITE ADAMELLITE (GREY)

Biotite

K 6.31 % *Ar⁴⁰/K⁴⁰ 0.1717.

Lat. 19°27'S.; long. 139°39'E.

Collected by E. K. Carter.

Intrudes Eastern Creek Volcanics. Age of intrusion.

K-Ar age 1772 m.y.

Dobbyn

Ref.: Q 1, Q 11,
Q 12
F54/1/12
GA 586

SYBELLA GRANITE (RIEBECKITE-BIOTITE GRANITE)

Biotite

K 5.70 % *Ar⁴⁰/K⁴⁰ 0.1223.

K-Ar age 1409 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	256.4	71.18	10.37	0.9469 (unsp.)
	255.6	71.94	10.21	0.9439 (unsp.)
	256.6	71.65	10.30	0.9448 (unsp.)
Biotite	1370	14.11	279.3	6.646

Age (T.R.) 1600 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.712 (I).

Age (Bio.) 1510 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.712 (A).

	²⁰⁶ Pb/ ²³⁸ U	²⁰⁷ Pb/ ²³⁵ U	²⁰⁷ Pb/ ²⁰⁶ Pb	²⁰⁸ Pb/ ²³² Th
Zircon	0.149	2.00	0.0970	0.0294
Age	910 m.y.	1130 m.y.	1590 m.y.	590 m.y.

Continuous diffusion: 1860 m.y. Radiation damage 1760 m.y.

Lat. 20°29'S.; long. 139°11'E.

Collected by E. K. Carter.

See GA 126. Maximum possible age (found by Rb-Sr) is 1690 m.y.; see GA 530.

Zircon data indicate age of granite greater than 1760 m.y.

Mt Isa

Ref.: Q 2
F54/15/1
GA 177

BASEMENT GRANITE

Biotite

K 7.48 % *Ar⁴⁰/K⁴⁰ 0.06367.

Ooroonoo No. 1 Bore. Lat. 23°11'S.; long. 140°33'E.

Collected by Coronado Oil Co.

At 3850 ft, overlain by Jurassic and Cretaceous. Minimum age.

K-Ar age 860 m.y.

Brighton Downs

Ref.: Q 2
F55/13/1
GA 309

BASEMENT GRANITE

Biotite

K 2.71 % *Ar⁴⁰/K⁴⁰ 0.02734.

Longreach Oil Bore No. 1. Lat. 23°30'S.; long. 144°5'E.

Collected by Q.G.S.

Basement granite overlain by Jurassic and Cretaceous sediments at 3067 ft. Biotite chloritized; age unreliable.

K-Ar age 418 m.y.

Longreach

Ref.: Q 2
F55/15/1
GA 399

GRANODIORITE (*Retreat Granite*)

Biotite

K 7.09 % *Ar⁴⁰/K⁴⁰ 0.02265, 0.02284.

Lat. 23°9'S.; long. 147°38'E.

Collected by J. J. Veevers and W. B. Dallwitz.

Part of the Anakie High. Minimum age. Age reported in Q 2 (334 m.y.) is wrong.

K-Ar age 353 m.y., 355 m.y.

Emerald

Ref.: Q 2 F55/15/2 GA 400	DIORITE (<i>Retreat Granite, Anakie High</i>) Biotite K 7.10% *Ar ⁴⁰ /K ⁴⁰ 0.02212. Hornblende K 0.726% *Ar ⁴⁰ /K ⁴⁰ 0.02304. Lat. 23°18'S.; long. 147°40'E. Collected by J. J. Veevers and W. B. Dallwitz. Minimum age.	K-Ar age 345 m.y. K-Ar age 358 m.y. Emerald
Ref.: Q 2 F55/15/3 GA 401	QUARTZ DIORITE (<i>Retreat Granite, Anakie High</i>) Biotite K 7.28% *Ar ⁴⁰ /K ⁴⁰ 0.02357. Hornblende K 0.734% *Ar ⁴⁰ /K ⁴⁰ 0.02366. Lat. 23°33'S.; long. 147°43'E. Collected by J. J. Veevers and W. B. Dallwitz. Minimum age.	K-Ar age 366 m.y. K-Ar age 367 m.y. Emerald
Ref.: Q 2 F55/15/4 GA 402	ADAMELLITE (<i>Retreat Granite, Anakie High</i>) Biotite K 6.72% *Ar ⁴⁰ /K ⁴⁰ 0.02238. Hornblende K 0.576% *Ar ⁴⁰ /K ⁴⁰ 0.02290. Lat. 23°14'S.; long. 147°40'E. Collected by J. J. Veevers and W. B. Dallwitz. Minimum age.	K-Ar age 349 m.y. K-Ar age 356 m.y. Emerald
Ref.: Q 2 F55/3/12 GA 472	GRANODIORITE (<i>Urannah Complex</i>) Biotite K 7.14% *Ar ⁴⁰ /K ⁴⁰ 0.0170. Hornblende K 1.42% *Ar ⁴⁰ /K ⁴⁰ 0.0170. Lat. 20°51'S.; long. 148°17'E. Collected by C. M. Gregory and E. J. Malone. Relation to GA 473 and GA 474 not known. Minimum age.	K-Ar age 271 m.y. K-Ar age 271 m.y. Bowen
Ref.: Q 2 F55/3/14 GA 473	ADAMELLITE (<i>Urannah Complex</i>) Biotite K 7.20% *Ar ⁴⁰ /K ⁴⁰ 0.01699. Lat. 20°24'S.; long. 147°56'E. Collected by C. M. Gregory and E. J. Malone. Minimum age.	K-Ar age 270 m.y. Bowen
Ref.: Q 2 F55/3/15 GA 474	ADAMELLITE (<i>Urannah Complex</i>) Biotite K 7.27% *Ar ⁴⁰ /K ⁴⁰ 0.1706. Biotite K 7.27% *Ar ⁴⁰ /K ⁴⁰ 0.01713. Hornblende K 0.789% *Ar ⁴⁰ /K ⁴⁰ 0.01613. Lat. 20°20'S.; long. 148°E. Collected by C. M. Gregory and E. J. Malone. Minimum age.	K-Ar age 271 m.y. K-Ar age 272 m.y. K-Ar age 258 m.y. Bowen

Ref.: Q 2 G55/12/2 GA 607	BASEMENT ADAMELLITE Biotite K 6.31% $^{40}\text{Ar}/^{40}\text{K}$ 0.02170. Rosewood No. 1 Bore. Lat. 26° 04' S.; long. 148° 42' E. Collected by Associated Australian Oilfields. Basement, 2074 ft; overlain by Mesozoic and U. Permian sediments. Minimum age.	K-Ar age 342 m.y. Roma
Ref.: Q 2 G55/12/3 GA 747	BASEMENT ADAMELLITE Biotite K 7.08% $^{40}\text{Ar}/^{40}\text{K}$ 0.02068. Pleasant Hills No. 1 Well. Lat. 26° 25' S.; long. 149° E. Collected by Australian Associated Oilfields. Basement, 3480 ft; overlain by Mesozoic sediments. Minimum age.	K-Ar age 324 m.y. Roma
Ref.: Q 6 Canberra Pb1	COARSE-GRAINED ORE Galena Mt Isa. Lat. 20° 50' S.; long. 139° 27' E. Collected by Mt Isa Mines Ltd. Single stage model lead age (Holmes Houtermans) 1557 m.y.	Pb age Mt Isa
Ref.: Q 6 Canberra Pb11	FINE-GRAINED GALENA IN SHALE Galena Northern leases, Mt Isa. Lat. 20° 40' S.; long. 139° 27' E. Collected by E. K. Carter. Single stage model lead age (H-H) 1568 m.y.	Pb age Mt Isa
Ref.: Q 6 Canberra Pb17	FINELY CRYSTALLINE ORE Galena Northern leases, Mt Isa. Lat. 20° 40' S.; long. 139° 27' E. Collected by E. M. Bennett. Single stage model lead age (H-H) 1590 m.y.	Pb age Mt Isa
Ref.: Q 6 Canberra Pb28	LEAD ORE Galena Mt Isa mine. Lat. 20° 50' S.; long. 139° 27' E. (approx.) Collected by W. J. Murray. Single stage model lead age (H-H) 1576 m.y.	Pb age Mt Isa
Ref.: Q 6 Canberra Pb29	LEAD ORE Galena Mt Isa mine. Lat. 20° 50' S.; long. 139° 27' E. (approx.) Collected by W. J. Murray. Single stage model lead age (H-H) 1565 m.y.	Pb age Mt Isa
Ref.: Q 13 E55/13/2 GA 417	DUMBANO GRANITE Biotite K 7.43% $^{40}\text{Ar}/^{40}\text{K}$ 0.02450. 5 miles W. of Lyndhurst H.S. Lat. 19° 13' S.; long. 144° 17' E. Collected by C. D. Branch. Minimum age. See GA 418.	K-Ar age 379 m.y. Clarke River

Ref.: Q 13 E55/13/6 GA 419	DUMBANO GRANITE Biotite K 6.63% $^{40}\text{Ar}/^{40}\text{K}$ 0.0252. 4 miles N. of Wando Vale H.S. Lat. 19°37'S.; long. 144°52'E. Collected by C. D. Branch. Minimum age.	K-Ar age 388 m.y. Clarke River
Ref.: Q 3 F55/7/4 GA 781 ✓	MT BARKER GRANODIORITE Biotite K 7.08% $^{40}\text{Ar}/^{40}\text{K}$ 0.007373. Hornblende K 0.307% $^{40}\text{Ar}/^{40}\text{K}$ 0.007399. Lat. 21°09'30"S.; long. 148°23'E. Collected by E. J. Malone and A. R. Jensen. Agreement between biotite and hornblende ages suggests that they indicate age of intrusion.	K-Ar age 122 m.y. K-Ar age 123 m.y. Mt Coolon
Ref.: Q 3 F55/7/5 GA 782	MT BARKER GRANODIORITE Biotite K 6.78% $^{40}\text{Ar}/^{40}\text{K}$ 0.007562. Hornblende K 0.296% $^{40}\text{Ar}/^{40}\text{K}$ 0.007366. Lat. 21°08'30"S.; long. 148°24'E. Collected by E. J. Malone and A. R. Jensen. Age of intrusion.	K-Ar age 125 m.y. K-Ar age 122 m.y. Mt Coolon
Ref.: Q 3 F55/8/2 GA 792 ✓	URANNAH COMPLEX Biotite K 7.10% $^{40}\text{Ar}/^{40}\text{K}$ 0.007730. Biotite K 7.10% $^{40}\text{Ar}/^{40}\text{K}$ 0.007644. Hornblende K 0.467% $^{40}\text{Ar}/^{40}\text{K}$ 0.007544. Lat. 21°8'S.; long. 148°30'30"E. Collected by E. J. Malone and A. R. Jensen. Age of intrusion.	K-Ar age 128 m.y. K-Ar age 127 m.y. K-Ar age 125 m.y. Mackay
Ref.: Q 4 G56/6/3 GA 5295 ✓	MT PERRY GRANITE Biotite K 7.53% $^{40}\text{Ar}/^{40}\text{K}$ 0.01558 Possum Creek. Lat. 25°15'39"S.; long. 151°30'44"E. Collected by W. B. Dallwitz and P. L. Ellis. Member of group of lower U. Permian intrusions, range 235–250 m.y.	K-Ar age 249 m.y. Maryborough
Ref.: Q 4 G56/10/6 GA 5296	TAROMELO TONALITE Biotite K 6.91% $^{40}\text{Ar}/^{40}\text{K}$ 0.01468. Hornblende K 0.530% $^{40}\text{Ar}/^{40}\text{K}$ 0.01526. Lat. 26°42'S.; long. 152°00'30"E. Collected by W. B. Dallwitz and R. M. Tucker. Member of group of lower U. Permian intrusions, range 235–250 m.y.	K-Ar age 236 m.y. K-Ar age 245 m.y. Gympie

Ref.: Q 4 G56/14/8 GA 5298	ESKDALE COMPLEX Hornblende K 0.371 % *Ar ⁴⁰ /K ⁴⁰ 0.01448. Lat. 27°11'S.; long. 152°16'E. Collected by W. B. Dallwitz and R. M. Tucker. Result of 233 m.y. within limits of experimental error for an intrusion belonging to lower U. Permian group.	K-Ar age 233 m.y. Ipswich
Ref.: Q 4 G56/10/7 GA 5312	TAROMELO TONALITE Biotite K 7.05 % *Ar ⁴⁰ /K ⁴⁰ 0.01482. Lat. 26°44'S.; long. 152°1'E. Collected by W. B. Dallwitz and R. M. Tucker. Member of group of lower U. Permian intrusions, range 235–250 m.y.	K-Ar age 238 m.y. Gympie
Ref.: Q 4 G56/10/8 GA 5313 ✓	STUART RIVER Biotite K 6.99 % *Ar ⁴⁰ /K ⁴⁰ 0.01497. Hornblende K 0.623 % *Ar ⁴⁰ /K ⁴⁰ 0.01487. Near Proston. Lat. 26°11'S.; long. 151°33'E. Collected by W. B. Dallwitz and R. M. Tucker. Member of group of lower Upper Permian granites ranging 235–250 m.y. in age.	K-Ar age 240 m.y. K-Ar age 239 m.y. Gympie
Ref.: Q 4 G56/6/11 GA 5322 ✓	GRANITE Biotite K 6.49 % *Ar ⁴⁰ /K ⁴⁰ 0.01561. South of Gayndah. Lat. 25°46'S.; long. 151°31'E. Collected by A. W. Webb, P. L. Ellis, and R. M. Tucker. Member of group of lower U. Permian granites ranging 235–250 m.y.	K-Ar age 250 m.y. Maryborough
Ref.: Q 4 G56/14/0 GA 220	ENOGERA GRANITE Biotite K 2.35 % *Ar ⁴⁰ /K ⁴⁰ 0.0136. Lat. 27°27'S.; long. 152°57'30"E. Collected by J. F. Evernden. Biotite probably originally deficient in potassium, age conforms with surrounding intrusions.	K-Ar age 219 m.y. Ipswich
Ref.: Q 4 G56/10/1 GA 1217	NEURUM TONALITE Biotite K 7.09 % *Ar ⁴⁰ /K ⁴⁰ 0.01380. Lat. 26°44'S.; long. 152°43'E. Collected by W. B. Dallwitz and R. M. Tucker. Member of group of U. Permian—L. Trias. intrusions, range 225–215 m.y.	K-Ar age 223 m.y. Gympie
Ref.: Q 4 G56/14/4 GA 5297	MT SAMSON GRANITE Biotite K 6.85 % *A ⁴⁰ /K ⁴⁰ 0.01346. Lat. 27°18'S.; long. 152°51'E. Collected by W. B. Dallwitz and R. M. Tucker. Member of group of U. Permian—L. Trias. intrusions, range 225–215 m.y.	K-Ar age 217 m.y. Ipswich

- Ref.: Q 4
G56/10/3
GA 5311
- WOONDUM GRANODIORITE**
- Biotite** K-Ar age 221 m.y.
K 6.99% $^{40}\text{Ar}/^{39}\text{K}$ 0.01369.
- Hornblende** K-Ar age 218 m.y.
K 0.581% $^{40}\text{Ar}/^{39}\text{K}$ 0.01353.
Lat. 26°12'S.; long. 152°49'E.
Gympie
Collected by W. B. Dallwitz and R. M. Tucker.
Member of group of U. Permian—L. Trias intrusions, range 225–215 m.y. Weak field evidence indicated Jurassic age.
- Ref.: Q 4
G56/6/5
GA 5314
- MT BIGGENDEN**
- Biotite** K-Ar age 215 m.y.
K 6.85% $^{40}\text{Ar}/^{39}\text{K}$ 0.01331.
Lat. 25°32'S.; long. 151°59'E.
Maryborough
Collected by W. B. Dallwitz and P. L. Ellis.
Member of group of U. Permian—L. Trias intrusions, range 225–215 m.y.
- Ref.: Q 4
G56/10/4
GA 5317
- WONGA**
- Biotite** K-Ar age 226 m.y.
K 6.14% $^{40}\text{Ar}/^{39}\text{K}$ 0.01400.
Lat. 26°05'S.; long. 152°29'E.
Gympie
Collected by W. B. Dallwitz and R. M. Tucker.
Weak field evidence indicated Jurassic age; probably U. Permian.
- Ref.: Q 4
G56/6/7
GA 5318
- MUSKET FLAT GRANITE**
- Biotite** K-Ar age 217 m.y.
K 5.81% $^{40}\text{Ar}/^{39}\text{K}$ 0.01346.
Lat. 25°34'S.; long. 152°25'E.
Maryborough
Collected by W. B. Dallwitz and P. L. Ellis.
Member of group of U. Permian—L. Trias intrusions, range 225–215 m.y. Field evidence indicated that granite was younger than U. Trias.
- Ref.: Q 4
G56/6/14
GA 5320
- BOOYAL GRANITE**
- Biotite** K-Ar age 215 m.y.
K 5.86% $^{40}\text{Ar}/^{39}\text{K}$ 0.01328.
Lat. 25°17'S.; long. 152°02'E.
Maryborough
Collected by A. W. Webb and P. L. Ellis.
Member of group of U. Permian—L. Trias intrusions, range 225–215 m.y.
- Ref.: Q 4
G56/6/9
GA 5321
- SANDY CREEK**
- Biotite** K-Ar age 207 m.y.
K 7.42% $^{40}\text{Ar}/^{39}\text{K}$ 0.01280.
South of Biggenden. Lat. 25°45'S.; long. 152°01'E.
Maryborough
Collected by A. W. Webb and P. L. Ellis.
Age lower than that of nearby granites; possibly dyke rock intrusive into granite.

- Ref.: Q 4
G56/6/12
GA 5325
- MT PERRY GRANITE**
Biotite K 6.75% $^{40}\text{Ar}/^{40}\text{K}$ 0.0136. K-Ar age 220 m.y.
Hornblende K 0.291% $^{40}\text{Ar}/^{40}\text{K}$ 0.0132. K-Ar age 214 m.y.
10 miles NE. of Mt Perry. Lat. 25°04'S.; long. 151°40'E. Maryborough
Collected by A. W. Webb and P. L. Ellis.
Member of group of U. Permian—L. Trias intrusions, range 225–215 m.y.
- Ref.: Q 4
G56/14/12
GA 5315
- SOMERSET DAM GABBRO (HORNBLENDE GABBRO)**
Hornblende K 0.502% $^{40}\text{Ar}/^{40}\text{K}$ 0.01320. K-Ar age 213 m.y.
Lat. 27°07'S.; long. 152°32'E. Ipswich
Collected by R. M. Tucker.
Gabbro intrudes Neara Volcanics which are probably lower Triassic.
- Ref.: Q 4
G56/14/7
GA 5323
- SOMERSET DAM GABBRO (*olivine gabbro*)**
Plagioclase K 0.109% $^{40}\text{Ar}/^{40}\text{K}$ 0.01276. K-Ar age 207 m.y.
Lat. 27°07'30"S.; long. 152°32'30"E. Ipswich
Collected by W. B. Dallwitz and R. M. Tucker.
See comment for GA 5315.
- Ref.: Q 5
F55/15/7
GA 777
- OLIVINE BASALT**
Total Rock K 1.299% $^{40}\text{Ar}/^{40}\text{K}$ 0.001934, 0.001923. K-Ar age 32.8 m.y., 32.6 m.y.
Lat. 23°50'S.; long. 148°02'E. Emerald
Collected by R. G. Mollan.
Age of extrusion.
- Ref.: Q 5
F55/15/20
GA 1143
- OLIVINE BASALT**
Total Rock K 1.396% $^{40}\text{Ar}/^{40}\text{K}$ 0.001636, 0.001649. K-Ar age 27.8 m.y., 28.0 m.y.
Lat. 23°42'S.; long. 148°05'E. Emerald
Collected by R. G. Mollan.
May either be age of extrusion or an age younger than extrusion because of leakage of radiogenic argon.
- Ref.: Q 5
F55/15/23
GA 5152
- OLIVINE BASALT**
Total Rock K 1.290% $^{40}\text{Ar}/^{40}\text{K}$ 0.001569. K-Ar age 26.7 m.y.
Lat. 23°51'30"S.; long. 148°08'E. Emerald
Collected by A. W. Webb.
Rock may have lost radiogenic argon, or age may indicate time of extrusion.
- Ref.: Q 5
G55/3/1
GA 1031
- BASALT**
Total Rock K 1.422% $^{40}\text{Ar}/^{40}\text{K}$ 0.001579. K-Ar age 26.8 m.y.
Lat. 24°08'S.; long. 147°56'E. Springsure
Collected by R. G. Mollan.
Age of extrusion.

Ref.: Q 5 G55/3/2 GA 1032	BASALT Total Rock K 0.69% *Ar ⁴⁰ /K ⁴⁰ 0.001410, 0.001367. Lat. 24°08'30"S.; long. 147°55'E. Collected by R. G. Mollan. Rock suspected of having lost radiogenic argon.	K-Ar age 24.0 m.y., 23.2 m.y. Springsure
Ref.: Q 5 G55/3/3 GA 1033	BASALT Total Rock K 1.192% *Ar ⁴⁰ /K ⁴⁰ 0.001629. Near St Peter. Lat. 24°01'S.; long. 148°03'E. Collected by R. G. Mollan. Age of extrusion.	K-Ar age 27.7 m.y. Springsure
Ref.: Q 5 G55/3/4 GA 1034	BASALT Total Rock K 1.016% *Ar ⁴⁰ /K ⁴⁰ 0.001569. Near St Peter. Lat. 24°01'S.; long. 148°03'E. Collected by R. G. Mollan. Age of extrusion. Overlies GA 1033.	K-Ar age 26.7 m.y. Springsure
Ref.: Q 5 G55/3/5 GA 1035	BASALT Total Rock K 3.76% *Ar ⁴⁰ /K ⁴⁰ 0.001592. Mt Boorambool. Lat. 24°06'S.; long. 148°04'30"E. Collected by R. G. Mollan. Age of extrusion.	K-Ar age 27.0 m.y. Springsure
Ref.: Q 5 G55/3/6 GA 1036	BASALT Total Rock K 1.989% *Ar ⁴⁰ /K ⁴⁰ 0.001618. Mt Boorambool. Lat. 24°06'S.; long. 148°04'30"E. Collected by R. G. Mollan. Age of extrusion. Overlies GA 1035.	K-Ar age 27.5 m.y. Springsure
Ref.: Q 5 F55/15/6 GA 686	SANIDINE TRACHYTE A Sanidine K 5.42% *Ar ⁴⁰ /K ⁴⁰ 0.001585, 0.001412. B Sanidine K 5.40% *Ar ⁴⁰ /K ⁴⁰ 0.001651, 0.001632. C Sanidine K 5.75% *Ar ⁴⁰ /K ⁴⁰ 0.001635, 0.001538, 0.001567, 0.001555. Crystal Hill. Lat. 23°58'S.; long. 148°08'E. Collected by R. G. Mollan. Fractions B and C crushed finer than A (see GA 1150); reason for older age of these fractions not known.	K-Ar age 26.9 m.y., 24 m.y. K-Ar age 28.1 m.y., 27.7 m.y. K-Ar age 27.8 m.y., 26.1 m.y., 26.6 m.y., 26.4 m.y. Emerald
Ref.: Q 5 F55/15/17 GA 1043	SPRINGSURE VOLCANICS Sanidine K 6.23% *Ar ⁴⁰ /K ⁴⁰ 0.001560, 0.001515. Lat. 23°59'S.; long. 148°05'E. Collected by R. G. Mollan. Probably age too low, incomplete extraction of Ar during fusion.	K-Ar age 26.5 m.y., 25.7 m.y. Emerald

Ref.: Q 5 G55/3/10 GA 1149	RHYOLITE Sanidine K 6.22% *Ar ⁴⁰ /K ⁴⁰ 0.001523. Lat. 24°02'S.; long. 148°06'E. Collected by R. G. Mollan. Age of extrusion.	K-Ar age 25.9 m.y. Springsure
Ref.: Q 5 G55/3/11 GA 1150	RHYOLITE A Sanidine K-Ar age 23.2 m.y., 25.3 m.y., 24.7 m.y. K 5.96% *Ar ⁴⁰ /K ⁴⁰ 0.001363, 0.001488, 0.001452. B Sanidine K-Ar age 26.4 m.y., 25.9 m.y., 26.7 m.y., 25.2 m.y. K 5.97% *Ar ⁴⁰ /K ⁴⁰ 0.001552, 0.001523, 0.001572, 0.001481. Lat. 24°02'S.; long. 148°06'E. Collected by R.G. Mollan. Fraction B (finer crushed sample) give ages higher than coarse fraction. See GA 686.	Springsure
Ref.: Q 5 G55/4/3 GA 983	BASALT Total Rock K 0.967% *Ar ⁴⁰ /K ⁴⁰ 0.001424. Lat. 24°55'S.; long. 149°32'E. Collected by A. W. Webb. Age of extrusion.	K-Ar age 24.2 m.y. Baralaba
Ref.: Q 5 G55/4/4 GA 984	BASALT Total Rock K 0.929% *Ar ⁴⁰ /K ⁴⁰ 0.001395. Lat. 24°51'S.; long. 149°33'E. Collected by A. W. Webb. Age of extrusion.	K-Ar age 23.7 m.y. Baralaba
Ref.: Q 5 G55/4/5 GA 985	BASALT Total Rock K 1.091% *Ar ⁴⁰ /K ⁴⁰ 0.001238, 0.001226. Lat. 24°51'S.; long. 149°32'E. Collected by A. W. Webb. Age of extrusion.	K-Ar age 21.1 m.y., 20.9 m.y. Baralaba
Ref.: Q 5 G55/4/6 GA986	BASALT Total Rock K 1.185% *Ar ⁴⁰ /K ⁴⁰ 0.001201, 0.001222. Lat. 24°49'S.; long. 149°31'E. Collected by A. W. Webb. Age of extrusion.	K-Ar age 20.5 m.y., 20.8 m.y. Baralaba
Ref.: Q 5 G55/4/2 GA 982	OLIVINE BASALT Total Rock K 0.725 *Ar ⁴⁰ /K ⁴⁰ 0.001321. Lat. 24°35'S.; long. 149°16'E. Collected by A. W. Webb. Age of extrusion.	K-Ar age 22.5 m.y. Baralaba

Ref.: Q 5
G55/3/7
GA 1037

TRACHYTE

Total Rock
K 3.96% *Ar⁴⁰/K⁴⁰ 0.004171, 0.004150.
Lat. 24°15'30"S.; long. 149°53'E.
Collected by A. W. Webb.
Age of intrusion.

K-Ar age 70.1 m.y., 69.7 m.y.

Springsure

Ref.: Q 5
F56/13/9
GA 5334

TRACHYTE

Total Rock
K 3.48% *Ar⁴⁰/K⁴⁰ 0.004108.
Lat. 23°12'S.; long. 150°40'E.
Collected by A. W. Webb.
Age of intrusion.

K-Ar age 69.0 m.y.

Rockhampton

Ref.: Q 7
GA 5409
GA 5410
GA 5411
GA 5412
GA 5413
GA 5414

SHALES

Age 720 ± 130 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	160	77.1	5.6807	0.7755
	61	75.5	2.2124	0.7391
	302	56.3	14.7157	0.8652
	233	61.1	10.4705	0.8288
	165	62.9	7.2060	0.8034
	157	71.0	6.0800	0.7917

Initial Sr⁸⁷/Sr⁸⁶ 0.723(I).

Marduroo No. 1 Bore. Lat. 24°02'20"S.; long. 139°54'15"E.

Machattie

Collected by French Petroleum Co. (Aust.) Pty Ltd.

Approximate age; the six points almost certainly do not represent one isochron.

Ref.: Q 8
GA 5400
GA 5401
GA 5402
GA 5403

SHALES

Age 710 ± 250 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	61	214	0.9754	0.7113
	143	78	5.5936	0.7814
	169	101	5.0682	0.7773
	165	77	5.5879	0.7884

Initial Sr⁸⁷/Sr⁸⁶ 0.728(I).

Canary No. 1 borehole, SE. of Boulia. Lat. 23°15'30"S.;
long. 140°22'43"E.

Springvale

Collected by Phillips Petroleum Co.—Sunray D.X. Co.

Approximate age; points do not lie on single isochron within experimental error and geological variation is present.

Ref.: Q 8
GA 5404
GA 5405

SHALES

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Age 710 $\pm$ 250 m.y. Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	160	69	8.7017	0.8095
	162	55	9.5984	0.8266

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.728(I).

Elizabeth Springs No. 1 borehole. Lat. 23°20'44"S.;

long. 140°34'12"E.

Springvale

Collected by Phillips Petroleum Co.—Sunray D.X. Co.

These results combined with Canary No. 1 results to get approximate age. See Canary results.

Unpublished
F54/10/1
GA 849

AMPHIBOLITE

Hornblende

K-Ar age 1495 m.y.

K 0.874% *Ar⁴⁰/K⁴⁰ 0.1333.

2060 ft depth in Beantree No. 1 Bore. Lat. 22°42'48"S.;

long. 140°06'30"E.

Boulia

Collected by Phillips Sunray Co. Ltd.

Probably age of metamorphism.

Unpublished
F54/10/2
GA 850

FOLIATED ADAMELLITE

Biotite

K-Ar age 1444 m.y.

K 7.01% *Ar⁴⁰/K⁴⁰ 0.1268.

1800 ft depth in Beantree No. 1 Bore. Lat. 22°42'48"S.;

long. 140°06'30"E.

Boulia

Collected by Phillips Sunray Co. Ltd.

Probably close to age of metamorphism; possibly biotite has lost radiogenic argon.

Unpublished
E54/1/1

GRANITE BASEMENT

Biotite

K-Ar age 273 m.y.

K 7.50% *Ar⁴⁰/K⁴⁰ 0.01718.

2750–2756 ft depth, Mornington Is. No. 1 Bore.

Lat. 16°45'S.; long. 139°20'E.

Mornington Is.

Collected by Delhi Australian Petroleum Ltd.

Minimum age.

Ref.: Q 10
Mol. 3

MOLYBDENITE

Molybdenite

Re-Os age 225 $\pm$ 40 m.y.

Re 94.4 ppm. Os¹⁸⁷ 0.217 ppm.

Carpenters Gully. Lat. 28°52'S.; long. 151°43'E.

Warwick

Collected by L. C. Noakes.

Ref.: Q 10
Mol. 4

MOLYBDENITE

Molybdenite

Re-Os age 210 $\pm$ 40 m.y.

Re 73.0 ppm. Os¹⁸⁷ 0.156 ppm.

Wonbah Mine, Mt Perry. Lat. 25°05'S. (approx.);

long. 151°39'E. (approx.).

Maryborough

Collected by L. C. Noakes.

Unpublished
G55/12/5
GA 1041

BASEMENT GRANODIORITE

Biotite

K-Ar age 298 m.y.

K 6.98 % *Ar⁴⁰/K⁴⁰ 0.0189.

Brucedale No. 1 well, 5248-55 ft (core 5)

Lat. 26°54'51"S.; long. 148°56'39"E.

Roma

Collected by Aust. Assoc. Oilfields.

Age consistent with known geology of well; could be age of emplacement or metamorphism of granodiorite.

Ref.: Q 11

WIMBERU GRANITE (*fine grained phase which intrudes coarse grained phase [GA 132] at same locality*)

GA 129

Age 1530 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.7043 (I).

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	172.3	143.5	3.407	0.773 (unsp.)
	169.5	143.7	3.394	0.7778 (unsp.)

Lat. 21°13'30"S.; long. 140°25'30"E.

Duchess

Collected by E. K. Carter.

Age from total rock isochron with GA 130 and GA 132. Younger than Kalkadoon, Ewen and Sybella granites to the west.

Ref.: Q 11
F54/6/12
GA 130

WIMBERU GRANITE

Age 1530 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.7043 (I).

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	43.14	322.4	0.3851	0.7129 (unsp.)

Lat. 21°13'S.; long. 140°02'E.

Duchess

Collected by E. K. Carter.

See GA 129.

Ref.: Q₁₃
E55/5
GA 301

IGNIMBRITE, FEATHERBED VOLCANICS

Age 320 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.703 (A).

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock A	266	51.3	14.93	0.770
B	268	51.7	14.90	0.763

10 miles ENE. of Chillagoe. Lat. 17°02'S.; long. 144°37'E.

Atherton

Collected by C. D. Branch.

Maximum age—assumed mantle initial Sr⁸⁷/Sr⁸⁶ of 0.703.

Ref.: Q 13
E55/5
GA 302

ELIZABETH CREEK GRANITE

Age 315 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.718 (I).

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	299	30.8	27.91	0.841
	300	30.5	28.35	0.832
	294	31.2	27.14	0.835 (unsp.)
Microcline ..	358	48.8	21.10	0.815
	358	49.4	20.89	0.812
Biotite ..	1,664	9.43	507.7	2.95
	1,672	9.26	519.5	2.98

10 miles SSE. of Barwidgi H.S.

Lat. 17°51'S.; long. 144°35'

Atherton

Collected by C. D. Branch.

Age of intrusion.

Ref.: Q 13
E55/9
GA 653
E54/8/1
GA 652

AUGITE ANDESITE (652), RHYODACITE (653)

Age 377 m.y. Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.707 (I.)

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock (652)	39.7	320	0.3569	0.709
(653)	156	39.2	11.47	0.767
K-feldspar (653)	338	49.5	19.67	0.805

Newcastle Range 652: Lat. 17°55'S.; long. 143°46'E.

Red River

653: Lat. 18°26'S.; long. 144°02'E.

Einasseigh

Collected by C. D. Branch.

Isochron through two Total Rock points indicates above age and initial $\text{Sr}^{87}/\text{Sr}^{86}$.

If isochron drawn through two GA 653 points—indicated age 333 m.y. and initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.714. Insufficient data to determine the truer age.

Ref.: Q 13
E54/12/17
GA 1380
E54/11/2
GA 1379

CROYDON VOLCANICS

Age 1460 m.y. Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.724 (I.)

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock				
(1379)	204	98.1	6.003	0.847
(1380)	301	67.3	12.88	0.988

2 miles N. of Croydon 1379: Lat. 18°12'S.; long. 142°15'E.

Croydon

1380: Lat. 18°28'S.; long. 142°30'E.

Georgetown

Collected by C. D. Branch.

Age may be as low as 1380 m.y., but the volcanics are definitely Precambrian.

Ref.: Q 13
E54/12/8
GA 410

ROBIN HOOD GRANITE

Muscovite

K-Ar age 1116 m.y.

K 9.04% $^{40}\text{Ar}/^{40}\text{K}$ 0.08891.

3 miles NW. of Robin Hood H.S. Lat. 18°49'S.; long. 143°39'E.

Georgetown

Collected by C. D. Branch.

Minimum age of intrusion.

Ref.: Q 13
E54/12/9
GA 411

ROBIN HOOD GRANITE

Biotite

K-Ar age 381 m.y.

K 7.53% $^{40}\text{Ar}/^{40}\text{K}$ 0.02464.

1 mile NW. of Robin Hood H.S. lat. 18°50'S.; long. 143°42'E.

Georgetown

Collected by C. D. Branch.

Argon has probably leaked from the biotite; age too low.

Ref.: Q 13
E54/12/10
GA 412

FORSAYTH GRANITE

Biotite

K-Ar age 368 m.y.

K 7.84% $^{40}\text{Ar}/^{40}\text{K}$ 0.02374.

Muscovite

K-Ar age 482 m.y.

K 7.34% $^{40}\text{Ar}/^{40}\text{K}$ 0.03217.

10 miles W. of Eveleigh H.S. Lat. 18°13'S.; long. 143°51'E.

Georgetown

Collected by C. D. Branch.

Biotite and muscovite both have leaked argon; ages too low.

Ref.: Q 13 E54/12/13 GA 413	FORSAYTH GRANITE Biotite K 7.93% *Ar ⁴⁰ /K ⁴⁰ 0.02510. 5 miles E. of Forsayth. Lat. 18°35'S.; long. 143°39'E. Collected by C. D. Branch. Biotite has leaked argon; age too low.	K-Ar age 387 m.y. Georgetown
Ref.: Q 13 E54/12/14 GA 414	FORSAYTH GRANITE Biotite K 7.24% *Ar ⁴⁰ /K ⁴⁰ 0.03159. Muscovite K 9.11% *Ar ⁴⁰ /K ⁴⁰ 0.05853. 6.5 miles on road from Georgetown–Croydon road to Mt Turner H.S. Lat. 18°13'S.; long. 143°20'E. Collected by C. D. Branch. Biotite has leaked argon; muscovite age closer to true one but is probably still too low due to argon loss.	K-Ar age 475 m.y. K-Ar age 804 m.y. Georgetown
Ref.: Q 13 E54/12/15 GA 415	FORSAYTH GRANITE Biotite K 7.50% *Ar ⁴⁰ /K ⁴⁰ 0.02578. 5 miles E. of Georgetown. Lat. 18°17'S.; long. 143°37'E. Collected by C. D. Branch. Age too low due to argon loss, caused by event in Palaeozoic.	K-Ar age 397 m.y. Georgetown
Ref.: Q 13 E55/9/4 GA 416	FORSAYTH GRANITE Biotite K 7.53% *Ar ⁴⁰ /K ⁴⁰ 0.02407. 10 miles N. of Carpentaria Downs H.S. Lat. 18°35'S.; long. 144°22'E. Collected by C. D. Branch. See GA 415.	K-Ar age 373 m.y. Einassleigh
Ref.: Q 3 E55/13/5 GA 418	DUMBANO GRANITE Biotite K 7.49% *Ar ⁴⁰ /K ⁴⁰ 0.02435. 0.02535. Muscovite K 8.84% *Ar ⁴⁰ /K ⁴⁰ 0.02458, 0.02393. 3 miles E. of Reedy Springs H.S. Lat. 19°57'S.; long. 144°44'E. Collected by C. D. Branch. Concordant ages indicate a Middle Palaeozoic intrusion slightly younger than Dido Granodiorite. See GA 430.	K-Ar age 377 m.y., 391 m.y. K-Ar age 380 m.y., 371 m.y. Clarke River
Ref.: Q 3 E54/16/8 GA 427	DUMBANO GRANITE Biotite K 6.05% *Ar ⁴⁰ /K ⁴⁰ 0.02393. 7 miles SW. of Glenmore H.S. towards Gorge Ck H.S. Lat. 19°18'S.; long. 143°54'E. Collected by C. D. Branch. Minimum age.	K-Ar age 371 m.y. Gilberton

Ref.: Q 13 E55/5/9 GA 428	FORSAYTH GRANITE (<i>Dargalong</i>) Biotite K 5.98% *Ar ⁴⁰ /K ⁴⁰ 0.08143. 7 miles SW. of Chillagoe. Lat. 17°13'S.; long. 144°27'E. Collected by C. D. Branch. Minimum age.	K-Ar age 1044 m.y. Atherton
Ref.: Q 13 E55/9/1 GA 429	FORSAYTH GRANITE Biotite K 7.16% *Ar ⁴⁰ /K ⁴⁰ 0.02699. Copperfield River crossing, 3 miles N. of Kidston. Lat. 18°50'S.; long. 144°10'E. Collected by C. D. Branch. Age too young. See GA 415.	K-Ar age 413 m.y. Einasseigh
Ref.: Q 13 E54/12/3 GA 441	FORSAYTH GRANITE Biotite K 6.83% *Ar ⁴⁰ /K ⁴⁰ 0.09798. Forest Home. Lat. 18°16'S.; long. 143°06'E. Collected by C. D. Branch. Minimum age.	K-Ar age 1200 m.y. Georgetown
Ref.: Q 13 E54/12/1 GA 658	ESMERALDA GRANITE Biotite K 6.69% *Ar ⁴⁰⁰ /K ⁴⁰ 0.03459. Muscovite K 8.46% *Ar ⁴⁰ /K ⁴⁰ 0.04964. 4 miles N. of Esmeralda H.S. Lat. 18°48'S.; long. 142°35'E. Collected by C. D. Branch. Granite older than 700 m.y.	K-Ar age 515 m.y. K-Ar age 701 m.y. Georgetown
Ref. Q 13 E54/12/2 GA 659	ESMERALDA GRANITE Biotite K 7.33% *Ar ⁴⁰ /K ⁴⁰ 0.0414. Lat. 18°48'S.; long. 142°35'E. Collected by C. D. Branch. Argon loss from biotite; age too low. See GA 658.	K-Ar age 602 m.y. Georgetown
Ref.: Q 13 E54/12/12 GA 442	PEGMATITE IN EINASLEIGH METAMORPHICS Biotite K 6.88% *Ar ⁴⁰ /K ⁴⁰ 0.02704. Muscovite K 8.91% *Ar ⁴⁰ /K ⁴⁰ 0.02704. 8 miles WSW. of Einasseigh. Lat. 18°33'S.; long. 143°58'E. Collected by C. D. Branch. Either minerals lost all argon during a Palaeozoic event, or the pegmatite is not Pre-cambrian.	K-Ar age 414 m.y. K-Ar age 432 m.y. Georgetown

Ref.: Q 13 E55/9/6 GA 430	DIDO GRANODIORITE	
	Biotite K 7.56% $^{40}\text{Ar}/^{39}\text{K}$ 0.02684.	K-Ar age 411 m.y.
	Hornblende K 0.511% $^{40}\text{Ar}/^{39}\text{K}$ 0.02722.	K-Ar age 416 m.y.
	7 miles ESE. of Lynd. H.S. Lat. 18°59'S.; long. 144°35'E.	Einasleigh
	Collected by C. D. Branch.	
	Minimum age. Middle Palaeozoic intrusion probably slightly older than the Dumbano Granite. See GA 418.	
Ref.: Q 13 E55/9/8 GA 431	DIDO GRANODIORITE	
	Biotite K 7.52% $^{40}\text{Ar}/^{39}\text{K}$ 0.02502.	K-Ar age 386 m.y.
	Hornblende K 0.487% $^{40}\text{Ar}/^{39}\text{K}$ 0.02673	K-Ar age 408 m.y.
	5 miles S. of Wyandotte H.S. Lat. 18°50'S.; long. 144°50'E.	Einasleigh
	Collected by C. D. Branch.	
	Minimum age. See GA 430.	
Ref.: Q 13 E54/16/7 GA 660	MT ROUS RING DYKE	
	Hornblende K 0.627% $^{40}\text{Ar}/^{39}\text{K}$ 0.02072.	K-Ar age 325 m.y.
	10 miles SW. of Glenmore H.S. Lat. 19°19'S.; long. 143°53'E.	Gilberton
	Collected by C. D. Branch.	
	Minimum age.	
Ref.: Q 13 E55/5/6 GA 443	ALMADEN GRANITE	
	Biotite K 6.81% $^{40}\text{Ar}/^{39}\text{K}$ 0.01843.	K-Ar age 292 m.y.
	Hornblende K 0.579% $^{40}\text{Ar}/^{39}\text{K}$ 0.01913.	K-Ar age 302 m.y.
	1 mile W. of Almaden. Lat. 17°21'S.; long. 144°40'E.	Atherton
	Collected by C. D. Branch.	
	Probably close to age of intrusion. Grouped with Herbert River and Ixe intrusions. See GA 445.	
Ref.: Q 13 E55/5/7 GA 444	HYBRID GRANITE	
	Biotite K 6.33% $^{40}\text{Ar}/^{39}\text{K}$ 0.01788.	K-Ar age 284 m.y.
	4 miles SE. of Almaden. Lat. 17°22'S.; long. 144°42'E.	Atherton
	Collected by C. D. Branch.	
	Minimum age.	
Ref.: Q 13 E55/5/8 GA 445	HERBERT RIVER GRANITE	
	Biotite K 5.15% $^{40}\text{Ar}/^{39}\text{K}$ 0.01799.	K-Ar age 285 m.y.
	Hornblende K 0.560% $^{40}\text{Ar}/^{39}\text{K}$ 0.01703.	K-Ar age 271 m.y.
	12 miles SW. of Chillagoe. Lat. 17°16'S.; long. 144°22'E.	Atherton
	Collected by C. D. Branch.	
	Minimum age of intrusion. Grouped with Almaden and Ixe intrusions (see GA 443)—scatter of ages in this group could mean prolonged activity rather than a single intrusion. See GA 448.	

Ref.: Q 13 E55/5/12 GA 446	HERBERT RIVER GRANITE Biotite K 5.88% $^{40}\text{Ar}/^{40}\text{K}$ 0.01678. 1 mile W. of Watsonville. Lat. 17°23'S.; long. 145°17'E. Collected by C. D. Branch. Minimum age. See GA 445.	K-Ar age 267 m.y. Atherton
Ref.: Q 13 E55/5/13 GA 447	HERBERT RIVER GRANITE (Herberton) Biotite K 7.03% $^{40}\text{Ar}/^{40}\text{K}$ 0.01751. 2 miles S. of Herberton. Lat. 17°25'S.; long. 145°23'E. Collected by C. D. Branch. Minimum age. See GA 445.	K-Ar age 278 m.y. Atherton
Ref.: Q 13 E55/5/22 GA 505	HERBERT RIVER GRANITE (Mt Cardwell) Biotite K 6.25% $^{40}\text{Ar}/^{40}\text{K}$ 0.01749. 1.5 miles N. of Mt Cardwell H.S. Lat. 17°37'S.; long. 144°57'E. Collected by C. D. Branch. Minimum age. See GA 445.	K-Ar age 278 m.y. Atherton
Ref.: Q 13 E55/5/39 GA 506	HERBERT RIVER GRANITE Biotite K 6.22% $^{40}\text{Ar}/^{40}\text{K}$ 0.01838. 5 miles along track Dimbulah to Wolfram Camp. Lat. 17°09'S.; long. 145°02'E. Collected by C. D. Branch. Minimum age. See GA 445, GA 443.	K-Ar age 291 m.y. Atherton
Ref.: Q 13 E55/5/31 GA 539	HERBERT RIVER GRANITE Biotite K 6.04% $^{40}\text{Ar}/^{40}\text{K}$ 0.01869. True Blue Mine, 20 miles NW. of Bullock Creek siding. Lat. 17°36'S.; long. 144°18'E. Collected by C. D. Branch. Oldest age determined on Herbert River Granite. See GA 443, GA 445.	K-Ar age 296 m.y. Atherton
Ref.: Q 13 D54/12/1 GA 529	GRANITE NEAR MUSGRAVE, CAPE YORK Biotite K 6.65% $^{40}\text{Ar}/^{40}\text{K}$ 0.02256, 0.02317. Muscovite K 8.84% $^{40}\text{Ar}/^{40}\text{K}$ 0.02401. Lat. 14°40'S. (approx.); long. 143°25'E. (approx.) Collected by K. G. Lucas. Minimum age: tentative correlation with Devonian events of central Georgetown Inlier.	K-Ar age 351 m.y., 360 m.y. K-Ar age 372 m.y. Ebagoola

Ref.: Q 13 E55/9/9 GA 449	GRANITE, ROCKY DAM Biotite K 6.91% *Ar ⁴⁰ /K ⁴⁰ 0.02248. 12 miles W. of Camel Creek Station. Lat. 18°50'S.; long. 145°17'E. Collected by C. D. Branch. Minimum age.	K-Ar age 350 m.y. Einassleigh
Ref.: Q 13 E55/9/10 GA 450	GRANITE Biotite K 7.37% *Ar ⁴⁰ /K ⁴⁰ 0.02005. Perry Creek Tinfield. Lat. 18°44'S.; long. 145°20'E. Collected by C. D. Branch. Minimum age.	K-Ar age 315 m.y. Einassleigh
Ref.: Q 13 E55/13/13 GA 544	GRANITE Biotite K 7.20% *Ar ⁴⁰ /K ⁴⁰ 0.01931. 10 miles W. of Black Braes H.S. Lat. 19°32'S.; long. 144°03'E. Collected by C. D. Branch. Minimum age.	K-Ar age 305 m.y. Clarke River
Ref.: Q 13 E55/5/34 GA 540	IXE MONZONITE Biotite K 5.81% *Ar ⁴⁰ /K ⁴⁰ 0.01883. 5 miles SW. of Bullock Creek Siding. Lat. 17°46'S.; long. 144°27'E. Collected by C. D. Branch. Minimum age.	K-Ar age 298 m.y. Atherton
Ref.: Q 13 E55/9/3 GA 448	ELIZABETH CREEK GRANITE Biotite K 7.51% *Ar ⁴⁰ /K ⁴⁰ 0.01902. 0.5 miles E. of Cumbana H.S. Lat. 18°02'S.; long. 144°02'E. Collected by C. D. Branch. Minimum age; comparable with Rb-Sr age. See GA 302. No significant difference in ages or in scatter of ages between Elizabeth Creek, Herbert River, Almaden and Ixe intrusions. See GA 445.	K-Ar age 300 m.y. Einassleigh
Ref.: Q 13 E55/5/24 GA 536	ELIZABETH CREEK GRANITE Biotite K 6.96% *Ar ⁴⁰ /K ⁴⁰ 0.01620. Hann Highway, 15 miles S. of Sundown turnoff. Lat. 17°58'S.; long. 144°52'E. Collected by C. D. Branch. Minimum age; biotite has probably leaked argon.	K-Ar age 259 m.y. Atherton

Ref.: Q 13 E55/5/25 GA 537	HYBRID GRANITE (SUNDOWN) Biotite K 6.62% *Ar ⁴⁰ /K ⁴⁰ 0.01901. 12 miles E. of Sundown H.S. Lat. 17°47'S.; long. 144°56'E. Collected by C. D. Branch. Minimum age. See GA 448.	K-Ar age 300 m.y. Atherton
Ref.: Q 13. E55/5/28 GA 538	ELIZABETH CREEK GRANITE (TATE RIVER) Biotite K 7.05% *Ar ⁴⁰ /K ⁴⁰ 0.01878. 3 miles SW. of Crystal Brook H.S. Lat. 17°25'S.; long. 144°25'E. Collected by C. D. Branch. See GA 448.	K-Ar age 297 m.y. Atherton
Ref.: Q 13 E55/9/17 GA 541	ELIZABETH CREEK GRANITE Biotite K 4.96% *Ar ⁴⁰ /K ⁴⁰ 0.01682. 5 miles NE. of Whitechalk H.S. Lat. 18°00'S.; long. 144°32'E. Collected by C. D. Branch. Age probably too low. See GA 448 and GA 542.	K-Ar age 268 m.y. Einasleigh
Ref.: Q 13 E55/9/18 GA 542	GREISEN LODGE IN ELIZABETH CREEK GRANITE Muscovite K 8.97% *Ar ⁴⁰ /K ⁴⁰ 0.01691. (near GA 541) Lat. 18°00'S.; long. 144°32'E. Collected by C. D. Branch. Intrusive into GA 541; possible age of intrusion.	K-Ar age 269 m.y. Einasleigh
Ref.: Q 13 E55/9/19 GA 543	ELIZABETH CREEK GRANITE (GREY VARIETY) Biotite K 7.63% *Ar ⁴⁰ /K ⁴⁰ 0.01696. (near GA 541) Lat. 18°00'S.; long. 144°32'E. Collected by C. D. Branch. See GA 448.	K-Ar age 270 m.y. Einasleigh
Ref.: Q 13 E55/5/37 GA 666	ELIZABETH CREEK GRANITE Biotite K 5.45% *Ar ⁴⁰ /K ⁴⁰ 0.01851. 8 miles S. of Burlington H.S. Lat. 17°56'S.; long. 144°24'E. Collected by C. D. Branch. See GA 448.	K-Ar age 293 m.y. Atherton
Ref.: Q 13 E55/5 GA 1354	GREISEN-ORE VEIN IN ELIZABETH CREEK GRANITE Muscovite K 8.69% *Ar ⁴⁰ /K ⁴⁰ 0.01761. 12 miles NW. of Dimbulah. Lat. 17°05'S.; long. 144°57'E. Collected by C. D. Branch. See GA 541 and GA 542. Possibly age of vein injection.	K-Ar age 280 m.y. Atherton

Ref.: Q 13 E55/10/1 GA 5159	BIOTITE ADAMELLITE Biotite K 7.47% *Ar ⁴⁰ /K ⁴⁰ 0.01708. 1.5 miles S. of Mt Fox sawmill. Lat. 18°49'30"S.; long. 145°54'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 445 and 448.	K-Ar age 272 m.y. Ingham
Ref.: Q 13 E55/10/3 GA 5160	BIOTITE ADAMELLITE Biotite K 7.22% *Ar ⁴⁰ /K ⁴⁰ 0.01746. Ingham-Kangaroo Hills road, 3 miles W. of Mt Fox. Lat. 18°50'S.; long. 145°46'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 445 and 448.	K-Ar age 277 m.y. Ingham
Ref.: Q 13 E55/10/4 GA 5161	PINK BIOTITE GRANITE Biotite K 5.35% *Ar ⁴⁰ /K ⁴⁰ 0.01974. Road Ingham to Oak Hills. Lat. 18°40'30"S.; long. 145°45'E. Collected by A. W. Webb and F. de Keyser. See GA 448.	K-Ar age 311 m.y. Ingham
Ref.: Q 13 E55/10/7 GA 5164	GRANODIORITE Biotite K 7.36% *Ar ⁴⁰ /K ⁴⁰ 0.01804. Road from Kennedy to Kirrama. Lat. 18°12'S.; long. 145°51'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 286 m.y. Ingham
Ref.: Q 13 E55/10/8 GA 5165	ADAMELLITE Biotite K 7.37% *Ar ⁴⁰ /K ⁴⁰ 0.01791. 10 miles E. of Kirrama H.S. Lat. 18°10'S.; long. 145°41'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 284 m.y. Ingham
Ref.: Q 13 E55/10/9 GA 5166	GRANODIORITE Biotite K 7.19% *Ar ⁴⁰ /K ⁴⁰ 0.01810. Kirrama H.S. to Koombooloomba track. Lat. 18°06'S.; long. 145°35'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 287 m.y. Ingham
Ref.: Q 13 E55/10/11 GA 5176	GRANODIORITE Biotite K 5.52% *Ar ⁴⁰ /K ⁴⁰ 0.01724. Flagstone Creek. Lat. 18°51'30"S.; long. 146°05'30"E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 274 m.y. Ingham

Ref.: Q 13 E55/6/10 GA 5181	GRANODIORITE	
	Biotite K 6.91% $^{40}\text{Ar}/^{39}\text{K}$ 0.01739. Hornblende K 1.064% $^{40}\text{Ar}/^{39}\text{K}$ 0.01832. CREB track, 4.5 miles from Tully River Bridge. Lat. 17°45'S.; long. 145°39'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 276 m.y. K-Ar age 290 m.y. Innisfail
Ref.: Q 13 E55/6/11 GA 5182	FOLIATED PORPHYRITIC BIOTITE GRANITE	
	Biotite , K 6.94% $^{40}\text{Ar}/^{39}\text{K}$ 0.01697. CREB track, 6.3 miles from Tully River Bridge. Lat. 17°44'S.; long. 145°39'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 270 m.y. Innisfail
Ref.: Q 13 E55/6/12 GA 5183	FOLIATED BIOTITE GRANITE	
	Biotite K 7.5% $^{40}\text{Ar}/^{39}\text{K}$ 0.0164. CREB road, 8.5 miles from Tully River Bridge. Lat. 17°43'S.; long. 145°38'30"E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 262 m.y. Innisfail
Ref.: Q 13 E55/6/13 GA 5184	GRANODIORITE	
	Biotite K 7.44% $^{40}\text{Ar}/^{39}\text{K}$ 0.01822. CREB road, 13.3 miles from Tully River Bridge. Lat. 17°40'30"S.; long. 145°39'E. Collected by A. W. Webb and F. de Keyser. Minimum age. See GA 448.	K-Ar age 289 m.y. Innisfail
Ref.: Q 13 E55/6/15 GA 5186	DIORITE	
	Biotite K 7.58% $^{40}\text{Ar}/^{39}\text{K}$ 0.01684. Hornblende 2 miles N. of Tarzali on Millaa Millaa-Malanda road. Lat. 17°25'S.; long. 145°36'E. Collected by A. W. Webb and F. de Keyser. Concordance of ages indicates that they are close to age of intrusion.	K-Ar age 268 m.y. K-Ar age 276 m.y. Innisfail
Ref.: Q 13 E55/1/5 GA 498	MAREEBA GRANITE	
	Biotite K 6.96% $^{40}\text{Ar}/^{39}\text{K}$ 0.01640. Muscovite K 8.56% $^{40}\text{Ar}/^{39}\text{K}$ 0.01665. 0.5 miles S. of Southedge H.S. Lat. 16°50'S.; long. 145°13'E. Collected by W. R. Morgan. Mareeba Granite was probably intruded into the Hodgkinson Basin in one major episode about 265-270 m.y. ago.	K-Ar age 262 m.y. K-Ar age 265 m.y. Mossman

Ref.: Q 13
E55/1/6
GA 499

MAREEBA GRANITE
Biotite
K 7.48% *Ar⁴⁰/K⁴⁰ 0.01661.
3 miles W. of Rumula. Lat. 16°35'S.; long. 145°18'E.
Collected by W. R. Morgan.
See GA 498.

K-Ar age 265 m.y.
Mossman

Ref.: Q 13
E55/1/7
GA 500

MAREEBA GRANITE
Biotite
K 6.48% *Ar⁴⁰/K⁴⁰ 0.01671.
Lighthouse Mt, 7 miles W. of Molloy.
Lat. 16°40'S.; long. 145°14'E.
Collected by W. R. Morgan.
See GA 498.

K-Ar age 266 m.y.
Mossman

Ref.: Q 13
E55/1/9
GA 501

MAREEBA GRANITE
Biotite
K 6.85% *Ar⁴⁰/K⁴⁰ 0.01611.
16.1 miles along track to Mt Spurgeon from Mulligan Highway
Lat. 16°26'S.; long. 145°08'E.
Collected by W. R. Morgan.
See GA 498.

K-Ar age 257 m.y.
Mossman

Ref.: Q 13
E55/1/11
GA 502

MAREEBA GRANITE
Biotite
K 7.26% *Ar⁴⁰/K⁴⁰ 0.01687.
9 miles WSW. of Curraghmore H.S.
Lat. 16°32'S.; long. 133°51'E.
Collected by W. R. Morgan.
See GA 498.

K-Ar age 269 m.y.
Mossman

Ref.: Q 13
E55/1/12
GA 503

MAREEBA GRANITE
Biotite
K 5.84% *Ar⁴⁰/K⁴⁰ 0.01599.
Muscovite
K 8.59% *Ar⁴⁰/K⁴⁰ 0.01702.
1 mile E. of Spring Hill H.S. Lat. 16°24'S.; long. 144°47'E.
Collected by W. R. Morgan.
See GA 498.

K-Ar age 256 m.y.
K-Ar age 271 m.y.
Mossman

Ref.: Q 13
E55/6/2
GA 507

MAREEBA GRANITE
Biotite
K 6.93% *Ar⁴⁰/K⁴⁰ 0.01644.
Muscovite
K 8.31% *Ar⁴⁰/K⁴⁰ 0.01684.
7.1 miles W. of Little Mulgrave River on Gilles Highway.
Lat. 17°13'S.; long. 145°42'E.
Collected by F. de Keyser.
See GA 498.

K-Ar age 262 m.y.
K-Ar age 268 m.y.
Innisfail

Ref.: Q 13 D55/13/7 GA 534	PUCKLEY GRANITE Biotite K 7.31% *Ar ⁴⁰ /K ⁴⁰ 0.01657. 1 mile SE. of Battle Camp Siding. Lat. 15°24'S.; long. 144°51'E. Collected by W. R. Morgan. Minimum age.	K-Ar age 264 m.y. Cooktown
Ref.: Q 13 E55/1/10 GA 535	MAREEBA GRANITE Biotite K 7.47% *Ar ⁴⁰ /K ⁴⁰ 0.01646. Muscovite K 7.94% *Ar ⁴⁰ /K ⁴⁰ 0.01660. Mt Elephant. Lat. 16°29'S.; long. 144°55'E. Collected by W. R. Morgan. See GA 498.	K-Ar age 263 m.y. K-Ar age 265 m.y. Mossman
Ref.: Q 13 E55/6/4 GA 5169	ADAMELLITE (MAREEBA) Biotite K 6.72% *Ar ⁴⁰ /K ⁴⁰ 0.01706. Muscovite K 8.88% *Ar ⁴⁰ /K ⁴⁰ 0.01677. Tinaroo Falls Reservoir, 1.4 miles from dam. Lat. 17°09'S.; long. 145°33'30"E. Collected by A. W. Webb and F. de Keyser. See GA 498.	K-Ar age 271 m.y. K-Ar age 267 m.y. Innisfail
Ref.: Q 13 E55/6/5 GA 5170	MAREEBA GRANITE Biotite K 7.20% *Ar ⁴⁰ /K ⁴⁰ 0.01644. Muscovite K 8.42% *Ar ⁴⁰ /K ⁴⁰ 0.01691. Quarry at Tinaroo Falls Dam. Lat. 17°11'S.; long. 145°32'E. Collected by A. W. Webb and F. de Keyser. See GA 498.	K-Ar age 262 m.y. K-Ar age 269 m.y. Innisfail
Ref.: Q 13 E55/6/6 GA 5171	PEGMATITE IN MAREEBA GRANITE Muscovite K 8.69% *Ar ⁴⁰ /K ⁴⁰ 0.01609. Tourmaline K 0.02–0.04% *Ar ⁴⁰ /K ⁴⁰ 0.0414–0.0207. Quarry, Tinaroo Falls Dam. Lat. 17°11'S.; long. 145°32'E. Collected by A. W. Webb and F. de Keyser. Could be excess Ar in tourmaline. See GA 498.	K-Ar age 257 m.y. K-Ar age 600–320 m.y. Innisfail
Ref.: Q 13 E55/10/12 GA 5177	RIEBECKITE GRANITE Biotite K 6.3% *Ar ⁴⁰ /K ⁴⁰ 0.01566, 0.01604. Riebeckite K 0.897% *Ar ⁴⁰ /K ⁴⁰ 0.01666. Hinchinbrook Is. (southernmost inlet, W. coast) Lat. 18°24'S.; long. 146°14'30"E. Collected by A. W. Webb and F. de Keyser. Minimum age.	K-Ar age 251 m.y., 256 m.y. K-Ar age 266 m.y. Ingham

Ref.: Q 13 D55/13/1 GA 494	TREVETHAN GRANITE Biotite K-Ar age 253 m.y. K 7.62% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01580. Actinolite K-Ar age 257 m.y. K 0.449% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01607. 0.25 mile N. of Helenvale Junc., Mulligan Hwy. Lat. 15°40'S.; long. 145°13'E. Cooktown Collected by W. R. Morgan. Age of intrusion; a distinct, later episode than the Mareeba intrusion.
Ref.: Q 13 D55/13/3 GA 495	TREVETHAN GRANITE Biotite K-Ar age 246 m.y. K 7.56% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01536. 1 mile N. of Black Gap, Mulligan Hwy. Lat. 15°38'S.; long. 145°14'E. Cooktown Collected by W. R. Morgan. Minimum age of intrusion.
Ref.: Q 13 D55/13/4 GA 496	FINLAYSON GRANITE Biotite K-Ar age 246 m.y. K 7.02% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01533. S. outskirts of Cooktown. Lat. 15°29'S.; long. 145°15'E. Cooktown Collected by W. R. Morgan. Minimum age; intruded at about same time as Trevethan Granite.
Ref.: Q 13 D55/13/5 GA 497	FINLAYSON GRANITE Biotite K-Ar age 246 m.y. K 6.43% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01534. Wallaby Creek, 3 miles W. of Rossville. Lat. 15°44'S.; long. 145°15'E. Cooktown Collected by W. R. Morgan. See GA 496.
Ref.: Q 13 E55/1/15 GA 504	(?)MAREEBA GRANITE Biotite K-Ar age 251 m.y., 249 m.y. K 7.31% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01542, 0.01528. Muscovite K-Ar age 234 m.y., 241 m.y. K 8.33% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01453, 0.01502. 1 mile NE. of China Camp. Lat. 16°02'S.; long. 145°18'E. Mossman Collected by W. R. Morgan. Minimum age; granite may have been intruded at same time as Finlayson Granite and may not be a part of the Mareeba Granite.
Ref.: Q 13 D55/13/2 GA 533	ACID DYKE IN TREVETHAN GRANITE Biotite K-Ar age 238 m.y. K 5.02% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.01482. Black Gap, Mulligan Hwy. Lat. 15°39'S.; long. 145°13'E. Cooktown Collected by W. R. Morgan. Minimum age of intrusion.

Ref.: Q 13 E55/2/1 GA 5172	ADAMELLITE Muscovite K 8.67% *Ar ⁴⁰ /K ⁴⁰ 0.01551. Rex lookout, White Cliffs, Cook Hwy. Lat. 16°38'30"S.; long. 145°33'30"E. Collected by F. de Keyser and A. W. Webb. Minimum age.	K-Ar age 248 m.y.	Cairns
Ref.: Q 13 E55/2/4 GA 5175	BIOTITE GRANITE Biotite K 7.03% *Ar ⁴⁰ /K ⁴⁰ 0.01419. 13 miles from Gordonvale towards Murray Prior Range. Lat. 16°57'S.; long. 145°48'30"E. Collected by F. de Keyser and A. W. Webb. Minimum age.	K-Ar age 228 m.y.	Cairns
Ref.: Q 13 E55/6/16 GA 5187	FOLIATED BIOTITE GRANITE Biotite K 7.34% *Ar ⁴⁰ /K ⁴⁰ 0.01419. Track to Clamshell Falls, W. of Gordonvale. Lat. 17°11'S.; long. 145°49'E. Collected by F. de Keyser and A. W. Webb. Mapped as Mareeba Granite; belt of shearing close by—meaning of age uncertain.	K-Ar age 228 m.y.	Innisfail
Ref.: Q 13 E55/6/18 GA 5189	BIOTITE GRANITE Biotite K 7.60% *Ar ⁴⁰ /K ⁴⁰ 0.01502. The Boulders, 4 miles W. of Babinda. Lat. 17°20'30"S.; long. 145°52'E. Collected by F. de Keyser and A. W. Webb. Minimum age.	K-Ar age 241 m.y.	Innisfail
Ref.: Q 13 E55/6/9 GA 5180	BARNARD METAMORPHICS (A) Muscovite K 8.12% *Ar ⁴⁰ /K ⁴⁰ 0.01894, 0.01966. (B) Muscovite K 8.36% *Ar ⁴⁰ /K ⁴⁰ 0.02258, 0.02318. South Mission Beach, 16 miles E. of Tully. Lat. 17°57'30"S.; long. 146°05'E. Collected by F. de Keyser and A. W. Webb. (A) is from a banded gneiss, (B) is from a pegmatite vein in the gneiss. Minimum age of metamorphism is 355 m.y.	K-Ar age 299 m.y., 310 m.y. K-Ar age 352 m.y., 360 m.y.	Innisfail
Ref.: Q 13 E55/6/19 GA 5190	AMPHIBOLITE Hornblende K 0.023% *Ar ⁴⁰ /K ⁴⁰ 0.04290. 5 miles NE. of Babinda. Lat. 17°19'S.; long. 145°57'E. Collected by F. de Keyser and A. W. Webb. Excess Ar suspected in the hornblende; age unreliable.	K-Ar age 620 m.y.	Innisfail

Unpublished
G55/12/8
GA 1219

MUSCOVITE-BIOTITE ADAMELLITE

Biotite

K-Ar age 348 m.y.

K 7.605% *Ar⁴⁰/K⁴⁰ 0.02230.

Mt Hope, A.A.O. No. 1, Core 1, depth 2550 ft.

Lat. 26°24'06"S.; long. 149°05'24"E.

Roma

Collected by Australian Associated Oilfields.

Minimum age.

Unpublished
G55/12/9
GA 1220

BIOTITE ADAMELLITE

Biotite

K-Ar age 336 m.y.

K 6.027% *Ar⁴⁰/K⁴⁰ 0.02148.

Sawpit Ck No. 1 (A.A.O.), Core 2, depth 3743 ft.

Lat. 26°29'55"S.; long. 149°09'25"E.

Roma

Collected by Australian Associated Oilfields.

Minimum age.

Ref.: Q 14
F1

BASEMENT SCHIST

Clay minerals

Age 518 ± 22 m.y.

K-Ar age 541 ± 14 m.y.

K 3.67% *Ar⁴⁰/K⁴⁰ 0.0366.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Clay minerals	238	42.5	16.0979	0.8278

Initial Sr⁸⁷/Sr⁸⁶ 0.707(A).

Constants = $\lambda = 5.312 \times 10^{-10} \text{ yr}^{-1}$

$\lambda_K = 1.47 \times 10^{-10} \text{ yr}^{-1}$

$\lambda_{Rb} = 1.47 \times 10^{-10} \text{ yr}^{-1}$

Fermoy No. 1 Bore, 5260 ft. Lat. 23°08'32"S.;

long. 143°04'26"E.

Maneroo

Collected by Australian Aquitaine Petroleum Pty Ltd.

Age of basement about 530 m.y. Determinations were also carried out on shales above

the basement in this core; the Rb-Sr results were close to the basement age, and the

K-Ar results were younger but showed appreciable scatter.

Ref.: Q 15
(Geochron)
F 0223

WELDED TUFF

Plagioclase

K-Ar age 380 ± 40 m.y.

K 0.99% *Ar⁴⁰/K⁴⁰ 0.0248.

Gumbardo No. 1 Well, 10,756-10,776 ft. Lat. 25°58'52"S.;

long. 144°41'41"E.

Adavale

Collected by Phillips Petroleum Co.

Minimum age.

B.M.R. File 62/111
(Geochron)
R 0256

CHLORITIZED AMPHIBOLE

Mafic concentrate

K-Ar age 334 ± 30 m.y.

K 0.165% *Ar⁴⁰/K⁴⁰ 0.0214.

Kogan No. 1 Well, 3404 ft. Lat. 27°05'16"S.;

long. 150°47'50"E.

Dalby

Collected by Phillips—Sunray Co.

Minimum age.

South Australia

Unpublished
G53/11/1
GA 1084

SHALE

		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Age 580 $\pm$ 20 m.y. Sr ⁸⁷ /Sr ⁸⁶
Total Rock	..	A 223.0	35.5	18.0508	0.8833
		B 222.2	47.6	13.4220	0.8441
		C 230.2	31.6	20.9653	0.9038
		D 116.2	46.7	7.1590	0.7939

Initial Sr⁸⁷/Sr⁸⁶ 0.735(I).

6019–6023 ft depth, Purnie Well, Core 8. Lat. 26°16'27"S.;
long. 136°05'36"E.

Dalhousie

Collected by French Petroleum.

High initial Sr⁸⁷/Sr⁸⁶ ratio may indicate a metamorphic age.

Ref.: SA 1
Z 130

TEKTITE

Total Rock

K-Ar age 0.73 $\pm$ 0.05 m.y.

K 1.76% *Ar⁴⁰/K⁴⁰ 0.000043.

Oodnadatta. Lat. 27°33'S.; long. 135°28'E.

Oodnadatta

Collected by Cook.

Minimum age.

Ref.: SA 1
Z 131

TEKTITE

Total Rock

K-Ar age 0.73 $\pm$ 0.05 m.y.

K 1.94% *Ar⁴⁰/K⁴⁰ 0.000043.

Florierton. Lat. 33°52'S.; long. 139°25'E.

Burra

Collected by Penn.

Minimum age.

Ref.: SA 1
Z 133

TEKTITE

Total Rock

K-Ar age 0.76 $\pm$ 0.06 m.y.

K 1.90% *Ar⁴⁰/K⁴⁰ 0.000044.

Pine Creek (not known which of the 9 Pine Creeks in S.A.).

Lat. 32°–35°S.; long. 138°–141°E.

Collected by: not known.

Minimum age.

Ref.: SA 2
H54/10/1
GA 350

PEPEGOONA PORPHYRY, MT PAINTER COMPLEX

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock (1)	386	37.1	29.93	1.390
(2)	392	38.2	29.51	1.386
Microcline ..	408	49.6	23.64	1.331

Initial Sr⁸⁷/Sr⁸⁶ 0.700(A).

App. age (1) 1645 m.y.

App. age (2) 1655 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.700(A).

App. age (microcl.) 1900 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.700(A).

Lat. 30°05'S.; long. 139°36'E.

Frome

Collected by A. R. Crawford and R. P. Coats.

Microcline probably has absorbed Sr⁸⁷ from other minerals.

Ref.: SA 2
H54/6/3
GA 341

RAPAKIVI GRANITE, MT PAINTER COMPLEX

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	App. age 1410 m.y. Sr ⁸⁷ /Sr ⁸⁶
Microcline ..	441	79.1	16.03	1.015

Initial Sr⁸⁷/Sr⁸⁶ 0.700(A).

Lat. 29°56'20"S.; long. 139°37'E.

Callabonna

Collected by A. R. Crawford and R. P. Coats.

Age may be too low, need further determinations.

Ref.: SA 2
I53/12/1
GA 354

PARARA PEGMATITE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	App. age 1510 m.y. Sr ⁸⁷ /Sr ⁸⁶
Muscovite ..	861	2.95	839.0	18.49

Initial Sr⁸⁷/Sr⁸⁶ 0.700(A).

Yorke Peninsula. Lat. 34°24'S.; long. 137°54'E.

Maitland

Collected by A. R. Crawford.

Age of intrusion.

Ref.: SA 2
GA 388

ADAMELLITE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	App. age 1580 m.y. Sr ⁸⁷ /Sr ⁸⁶
Muscovite ..	1.315	1.74	2,176	48.80

Initial Sr⁸⁷/Sr⁸⁶ 0.700(A).

Binberri Hill, Olary District. Lat. 32°04'30"S.; long. 140°19'E.

Olary

Collected by R. P. Coats.

Age of intrusion.

Ref.: SA 2
GA 1517

MOONTA PORPHYRY

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	App. age 1472 m.y. Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	106	31.10	9.85	0.909
Initial Sr ⁸⁷ /Sr ⁸⁶ 0.700(A).				
Yorke Peninsula. Lat. 34°04'S.; long. 137°37'E.				
Collected by A. R. Crawford.				
Minimum age of intrusion.				

Maitland

Ref.: SA 2
H54/9/5
GA 346

TRACHYTE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Age 490 m.y. Sr ⁸⁷ /Sr ⁸⁶
Microcline ..	213.0	18.2	33.7	0.919
Total Rock ..	196.1	67.6	8.35	0.765
	193.4	67.5	8.37	0.767
Calcite ..	..	..	..	0.730 (unsp.)
Total Rock ..	201.7	36.1	16.11	0.819
	198.7	35.4	16.17	0.821

Initial Sr⁸⁷/Sr⁸⁶ 0.730(I).

GA 346 from trachyte, 'Triangle' area. Lat. 30° 17' S.; long. 139° 25' 30" E.

Copley

GA 349 from amygdaloidal trachyte, Wooltana H.S. Lat. 30°24'S.; long. 139°25'30"E.

Copley

Collected by A. R. Crawford and R. P. Coats.

Metamorphic age; or minimum age if microcline leaked Sr⁸⁷; or could be two ages of formation of microcline.

Ref.: SA 2
GA 711

LAVA PEBBLES IN STURTIAN TILLITE

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	App. age 500 m.y. Sr ⁸⁷ /Sr ⁸⁶
Calcite ..	..	..	0.05	0.7322
Chlorite ..	296.5	56.9	14.99	0.839
Initial Sr ⁸⁷ /Sr ⁸⁶ 0.732.				
N. of Wooltana H.S. Lat. 30°23'30"S.; long. 139°25'E.				
Collected by A. R. Crawford, and R. P. Coats.				
Two minerals open to diffusive Sr during Palaeozoic, though calcite demonstrably pre-tillite in age.				

Copley

Ref.: SA 2
H54/9/6
GA 347

ARKAROOLA CREEK PEGMATITE

				Age 460 m.y.
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Albite ..	34.3	5.63	17.53	0.869
	33.7	5.71	17.00	0.870
Muscovite ..	1782	1.49	34.38	23.03
	1778	1.40	3660	24.94
Total Rock ..	430.6	12.78	97.1	1.429
	452.0	12.76	101.8	1.422

Initial Sr⁸⁷/Sr⁸⁶ 0.75.

Lat. 30°17'30"S.; long. 139°20'E.

Copley

Collected by A. R. Crawford and R. P. Coats.

Age of metamorphism of Wooltana Volcanics. Initial Sr⁸⁷/Sr⁸⁶ value testifies to extreme rearrangement of Rb and Sr during Palaeozoic metamorphism.

Ref.: SA 2
H54/9/4
GA 345

BASALTIC LAVA

				Age 850±50 m.y.
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Initial Sr ⁸⁷ /Sr ⁸⁶
Total Rock (1)	159.9	573.9	0.802	0.721
(1)	163.1	572.4	0.820	0.7228
(2)	159.9	480.0	0.959	0.7220 (unsp.)
(2)	158.2	494.7	0.920	0.724
(3)	142.5	596.9	0.687	0.7234 (unsp.)
(3)	143.2	601.2	0.685	0.7237
(4)	—	—	0.07	—
(5)	—	—	0.08	—

Initial Sr⁸⁷/Sr⁸⁶ 0.711 (I).

Arkarooola Creek. Lat. 30°20'S.; long. 139°28'E.

Copley

Collected by A. R. Crawford.

GA samples 345, 706, 707, 708, 342, 343 and 344 are aligned; the alignment may correspond to an isochron dating extrusion or a later metamorphism at 850±50 m.y.

This is a reliable minimum age.

Initial Sr⁸⁷/Sr⁸⁶ of 0.711 indicates age is metamorphic event.

Ref.: SA 2
GA 706

BASALT LAVA

				App. age 1090 m.y.
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	117.4	192.9	1.752	0.732

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Arkarooola Creek. Lat. 30°20'S.; long. 139°28'E.

Copley

Collected by A. R. Crawford.

See GA 345.

Ref.: SA 2
GA 707
GA 708

BASALT LAVA

Age (GA 707) 970 m.y.
Age (GA 708) 3000 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	98.8	112.8	2.521	0.739
	138.4	740.1	0.538	0.728

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Arkaroola Creek. Lat. 30°20'S.; long. 139°28'E.

Collected by A. R. Crawford.

See GA 345.

Copley

Ref.: SA 2
H54/9/1
GA 342

OLIVINE DOLERITE

App. age (1) 1260 m.y.
App. age (2) 1080 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock (1)	58.0	147.5	1.132	0.725
(2)	60.6	147.0	1.188	0.724

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Merinjina Upper. Lat. 30°26'S.; long. 139°24'E.

Collected by A. R. Crawford.

See GA 345.

Copley

Ref. SA 2
H54/9/2
GA 343

AMYGDALOIDAL BASALT

Age 3000 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	9.29	69.1	0.387	0.723
	9.21	69.0	0.384	0.725

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Merinjina Lower. Lat. 30°26'S.; long. 139°24'E.

Collected by A. R. Crawford.

See GA 345.

Copley

Ref.: SA 2
H54/9/3
GA 344

BASALT

App. age 1090 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	56.0	129.0	1.250	0.723

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Woodnamoka Well. Lat. 30°23'S.; long. 139°27'E.

Collected by A. R. Crawford.

See GA 345.

Copley

Ref.: SA 2
H54/13/1
GA 351

OORAPARINNA TRACHYTE

App. age (TR) 870 m.y.
App. age (Alb) 790 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	47.6	85.7	1.599	0.7246 (unsp.)
Albite ..	65.6	109.4	1.725	0.7241 (unsp.)

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Central Flinders Ranges. Lat. 31°22'S.; long. 138°47'E.

Parachilna

Collected by A. R. Crawford and R. P. Coats.

Age between age of extrusion and age of metamorphism. Albite age low—probably due to leak of radiogenic strontium.

Ref.: SA 2
I53/4/1
GA 353

AMYGDALOIDAL TRACHYTE

App. Age (1)735 m.y.; (1A)730 m.y.; (2) 790 m.y.; (3) 645 m.y.;
(4) 665 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock (1)	57.8	34.0	4.897	0.7553 (unsp.)
(1A)	57.8	33.9	4.914	0.7550 (unsp.)
(2)	51.7	4.719	4.719	0.7575 (unsp.)
Albite (3)	103.0	39.9	7.421	0.7721 (unsp.)
(4)	103.9	39.6	7.549	0.7750 (unsp.)

Initial Sr⁸⁷/Sr⁸⁶ 0.705(A).

Depot Creek, Wilkatana. Lat. 32°14'S.; long. 137°56'30"E.

Port Augusta

Collected by A. R. Crawford.

Ages probably younger than age of extrusion because of Palaeozoic metamorphism. Albites probably lost radiogenic strontium by diffusion.

Ref.: SA 2

TRACHYTE

(1) Age 1345 $\pm$ 30 m.y.
(2) App. age 935 m.y.

I53/4/2
GA 369

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	206.6	64.0	9.29	0.8811 (unsp.)
	235.0	23.9	28.3	1.240 (unsp.)
Anorthoclase..	—	—	27.7	1.229

I53/4/3
GA 370

Total rock ..	266.5	31.0	24.7	1.168
(1) Initial Sr ⁸⁷ /Sr ⁸⁶ 0.705(I).				
Microcline ..	242.7	23.4	29.8	1.094

(2) Initial Sr⁸⁷/Sr⁸⁶ 0.705(A).

Old Roopena, Eyre Peninsula. Lat. 32°43'S.; long. 137°24'E.

Port Augusta

Collected by A. R. Crawford and B. P. Webb.

Microcline fills amygdales in the trachyte. 1345 m.y. is probably true age of extrusion of lavas. Low age of microcline probably indicates radiogenic strontium leakage.

Ref.: SA 2
GA 714

AMYGDALOIDAL LAVA

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	App. age (1) 570 m.y.; (2) 570 m.y.; (3) 580 m.y. Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock (1)	—	—	50.41	1.1049
(2)	—	—	50.43	1.1066
Microcline (3)	472.9	24.4	54.68	1.1461

Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Airstrip Hill, Cultana. Lat. 32°45'S.; long. 137°48'20"E.

Port Augusta

Collected by A. R. Crawford.

Ages indicate almost complete leakage of radiogenic Sr during Palaeozoic metamorphism.

Ref.: SA 2
GA 717

LAVA

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	App. age 585 m.y. Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	688.1	68.3	29.00	0.9416

Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Backy Point, Cultana. Lat. 32°55'S.; long. 137°47'E.

Port Augusta

Collected by A. R. Crawford.

See comment for 714.

Ref.: SA 2
GA 525

DUTTON

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	137.3	69.5	5.68	0.7630
	137.2	69.5	5.68	0.7630
GA 587-1	385	77.1	14.36	0.8160
GA 587-2	390	76.0	14.77	0.8188
GA 587-3	344	74.8	13.23	0.8098
GA 592-2	120.1	200.7	1.721	0.7253
GA 593-2	121.2	229.0	1.522	0.7214
GA 588-1	135.2	52.9	7.35	0.7782
GA 588-2	135.2	54.4	7.14	0.7737
GA 588-3	127.5	65.9	5.56	0.7610
	125.4	64.9	5.56	0.7619

Age and Initial Sr⁸⁷/Sr⁸⁶ See discussion.

Near Truro.

	Lat.	Long.	
GA 525	34°24'S.	139°12'30"E.	Adelaide
GA 587	34°24'S.	139°12'E.	Adelaide
GA 592	35°22'S.	138°28'E.	Barker
GA 593	35°22'S.	138°28'E.	Barker
GA 588	34°24'S.	139°12'E.	Adelaide

Collected by B. P. Thomson.

Model 1: Group 587 with 592 and 593 = age 530 m.y., and initial Sr⁸⁷/Sr⁸⁶ 0.711(I).

Implies other samples had high Sr⁸⁷/Sr⁸⁶ initially or were open chemical systems.

Model 2: Group 587 with 524 and since these samples are mica schists, they should give a metamorphic isochron = age 465 m.y. Agrees with Palaeozoic metamorphism in N. Flinders Ranges. Max. age for deposition found if group remaining samples: 690 m.y., initial Sr⁸⁷/Sr⁸⁶ 0.707(1).

Ref.: SA 2
GA 589-1
GA 589-2
GA 589-3

SADDLEWORTH FORMATION

Age 465 m.y.

Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
114.2	44.8	7.32	0.7934
113.8	35.7	9.17	0.8004
121.1	31.3	11.13	0.8148

Initial Sr⁸⁷/Sr⁸⁶ 0.710 (A).

Riverton. Lat. 34°10'S.; long. 138°49'E.

Adelaide

Collected by B. P. Thomson.

Age of Palaeozoic metamorphism.

Ref.: SA 2
GA 591
GA 591-1
GA 591-2
GA 591-3

SADDLEWORTH FORMATION

Age 850 m.y.

Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
112.5	40.1	8.08	0.7828
111.5	37.1	8.63	0.7864
108.7	36.5	8.56	0.7859

Initial Sr⁸⁷/Sr⁸⁶ 0.707 (A).

Riverton. Lat. 34°23'S.; long. 138°53'E.

Adelaide

Collected by B. P. Thomson.

Maximum and minimum ages of deposition of 850 and 600 m.y. obtained by assuming initial Sr⁸⁷/Sr⁸⁶ 0.707 and 0.715 respectively.

Combine 591 (1) and 589 (3) with initial ratio 0.707 to get reasonable age of about 700 m.y.

Ref.: SA 2
GA 704

WILLOURAN SHALE (OVERLYING GA 342)

Age 1200 m.y.

GA 704-1
GA 704-4
GA 704 I (fines)
GA 704 I (fines)
GA 704 II (fines)
GA 705-1
GA 705-4
GA 705-4 (fines)

Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
125.7	81.9	4.41	0.7655
119.5	108.3	3.17	0.7498
118.8	120.3	2.67	0.7520
115.5	121.1	2.65	0.7516
112.1	119.3	2.70	0.7520
100.0	99.3	2.90	0.7556
99.5	163.7	1.75	0.7424
129.1	84.3	4.40	0.7636

Initial Sr⁸⁷/Sr⁸⁶ 0.707 (A).

Lat. 30°26'S.; long. 139°24'E.

Copley

Collected by B. P. Thomson.

Isochron fitted to all data points indicates metamorphic age of 465 m.y. Age of formation of shales assuming initial Sr⁸⁷/Sr⁸⁶ of 0.707 is 1200 m.y.

Ref.: SA 2
GA 813B

GNEISS

App. age 1,800 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock	240.2	9.46	7.31	0.8835

Initial Sr⁸⁷/Sr⁸⁶ 0.70(A).

Wertigo Rockhole. Lat. 33°04'30"S.; long. 137°20'30"E.

Whyalla

Collected by B. P. Thomson.

Age strongly dependent on assumed initial Sr⁸⁷/Sr⁸⁶; if initial ratio 0.720, age would be 1600 m.y.

Ref.: SA 2
I53/4/5
GA 480

BURKITT GRANITE

App. age 1500 ± 70 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	280.8	409.4	1.974	0.7510
Apatite ..	6.25	285.2	0.063	0.7095

Initial Sr⁸⁷/Sr⁸⁶ 0.707 (I).

Corunna, Eyre Peninsula. Lat. 32°41'S.; long. 137°01'E.

Port Augusta

Collected by A. R. Crawford.

Age of intrusion.

Ref.: SA 2
I53/8/1
GA 481

CHARLESTON GRANITE

App. age 1590 ± 30 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	357.6	121.6	8.46	0.8890
	359.1	118.6	8.71	0.8930
Biotite ..	1,457	11.12	377.4	9.141
	1,454	11.71	357.3	8.714
Apatite ..	8.44	78.8	0.308	0.7067

Initial Sr⁸⁷/Sr⁸⁶ 0.700 (I).

Pine Hill. Lat. 33°21'20"S.; long. 137°05'E.

Whyalla

Collected by A. R. Crawford.

Age of intrusion.

Ref.: SA 2
I53/8/2
GA 387

MOONABIE PORPHYRY

App. age = (1) TR: 1800 m.y. (1) K-f: 1680 m.y., 1630 m.y.

(2) TR: 1900 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
(1) Total Rock	183.8	211.8	2.51	0.7640
(1) K-feldspar	374.8	250.5	4.31	0.8018
	380.8	246.4	4.45	0.8019
(2) Total Rock	—	—	1.971	0.7528

Initial Sr⁸⁷/Sr⁸⁶ 0.705 (A).

Eyre Peninsula. Lat. 33°18'S.; long. 137°12'E.

Whyalla

Collected by A. R. Crawford.

Age depends on assumed initial Sr⁸⁷/Sr⁸⁶; evident that K-feldspar has lost radiogenic Sr.

Ref.: SA 2
GA 716

CULTANA GRANITE

App. age = TR. 1300 m.y., 1310 m.y.
M. 1335 m.y.
P. 1840 m.y., 1830 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	557.6	19.85	80.8	2.176
	553.6	19.86	80.2	2.180
Microcline ..	1,082	33.8	92.0	2.429
Plagioclase ..	71.7	8.77	23.6	1.315
	73.4	8.64	24.4	1.330

Initial Sr⁸⁷/Sr⁸⁶ 0.706(A).

15 miles NE. of Whyalla. Lat. 32°52'S.; long. 137°45'E.

Port Augusta

Collected by A. R. Crawford.

Minimum age; high radiogenic Sr in plagioclase may indicate that the total rock has lost part of its Sr⁸⁷.

Ref.: SA 2

Apparent age 1535 $\pm$ 25 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
GA 599				
	K-feldspar ..	240.9	118.5	3.49
	Plagioclase ..	268.2	220.9	5.85
I53/3/1	Total Rock ..	225.9	100.6	6.47
GA 366		226.5	103.9	6.28
	Plagioclase ..	263.7	73.3	10.35
I53/3/2	Total Rock ..	209.8	135.1	4.47
GA 367	Plagioclase ..	100.1	364.6	0.93
I53/3/3	Total Rock ..	189.6	133.7	4.08
GA 368	Sanidine ..	223.2	255.6	2.51
H53/15/1	Total Rock ..	197.5	193.2	2.94
GA 374	Plagioclase ..	113.6	403.8	0.81

Initial Sr⁸⁷/Sr⁸⁶ 0.706(I).

GA 599 from porphyritic trachyte, Wartaka, Corunna Hills.

Lat. 32°33'S.; long. 137°09'25"E.

Port Augusta

GA 366 from porphyritic rhyolite, Coralbignie, Gawler Ranges.

Lat. 32°37'S.; long. 136°20'E.

Yardea

GA367 from porphyritic rhyolite, Kolendo, Gawler Ranges.

Lat. 32°19'S.; long. 136°13'E.

Yardea

GA 368 from porphyritic rhyolite, Kundery, Gawler Ranges.

Lat. 32°20'S.; long. 135°50'E.

Yardea

GA 374 from sodic rhyolite, Camel Hump Tanks, Gawler Ranges.

Lat. 31°28'S.; long. 135°23'E.

Gairdner

Collected by A. R. Crawford.

Points lie on single straight line to within experimental precision.

Ref.: SA 2
I53/4/4
GA 371

GRANOPHYRE

App. age = TR. 1480 m.y., 1510 m.y.
P. 1440 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	256.2	76.3	9.67	0.9060
	254.9	77.3	9.49	0.9064
Plagioclase ..	265.5	76.0	10.06	0.9080

Initial Sr⁸⁷/Sr⁸⁶ 0.706(A).

Corunna, Eyre Peninsula. Lat. 32°40'S.; long. 137°4'E.

Port Augusta

Collected by A. R. Crawford.

Age may be too young (radiogenic Sr leakage), but possible that it is a later intrusion than much of Gawler Range material.

Ref.: SA 2
GA 1159

CORUNNA CONGLOMERATE

Age and initial ratio. See discussion.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	340.1	41.3	23.7	1.219
Illite ..	507.0	64.9	22.5	1.185
Illite (magnetic)	429.0	49.0	25.2	1.234

Lat. 32°37'47"S.; long. 137°08'38"E.

Port Augusta

Collected by B. P. Thomson.

Maximum age 1535 $\pm$ 20 m.y. using initial ratio of 0.70. If initial Sr⁸⁷/Sr⁸⁶ is 0.71, age is 1500 $\pm$ 20 m.y.

Ref.: SA 2
GA 598

HILTABA GRANITE

App. age 1730 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	277.5	28.1	28.44	1.393
	310.2	30.6	29.20	4.416
Plagioclase ..	51.3	16.2	9.14	0.927

Initial Sr⁸⁷/Sr⁸⁶ 0.710(I).

Lat. 32°09'S.; long. 135°05'E.

Yardea

Collected by A. R. Crawford and J. Johnson.

Hiltaba granite intrudes acid volcanics which therefore cannot be Gawler Range (1535 m.y.) equivalents in age.

Ref.: SA 2
H53/11/2
GA 668

GLENLOTH GRANITE

App. age 1930 $\pm$ 200 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	115.0	386.0	0.858	0.7297
Orthoclase ..	258.6	433.0	1.719	0.7530

Initial Sr⁸⁷/Sr⁸⁶ 0.707(I).

Lat. 31°05'S.; long. 135°09'E.

Gairdner

Collected by A. R. Crawford.

Uncertainty in age due to small enrichment in radiogenic strontium.

Ref.: SA 2
H53/10/1
GA 386

WILGENA GRANITE

Biotite

App. age 1600 m.y.

Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
1,664	18.1	264.0	6.625
1,653	17.7	268.1	6.770

Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

Tarcoola. Lat. 30°50'S.; long. 134°53'E.

Collected by A. R. Crawford.

Minimum age.

Tarcoola

Ref.: SA 2
I54/2/4
GA 357

ANABAMA GRANITE

App. age 473 $\pm$ 3 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	139.8	140.0	2.874	0.7251
Plagioclase ..	15.5	125.3	0.357	0.7079
	16.2	128.1	0.364	0.7071
Microcline ..	437.5	121.9	10.33	0.7715
Biotite	889.8	10.2	250.6	2.358

Initial Sr⁸⁷/Sr⁸⁶ 0.705(I).

Lat. 32°47'S.; long. 140°03'E.

Collected by R. P. Coats.

Probably true age of intrusion.

Olary

Ref.: SA 2
GA 518

GRANODIORITE, MT PAINTER COMPLEX

App. age 375 $\pm$ 10 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	41.4	659.4	0.181	0.7116
Biotite	733.3	22.48	—	1.204
	732.4	21.78	96.8	1.209

Initial Sr⁸⁷/Sr⁸⁶ 0.710(I).

Lat. 30°10'20"S.; long. 139°26'40"E.

Collected by A. R. Crawford and R. P. Coats.

Probably a minimum age.

Copley

Ref.: SA 2
I54/2/2
GA 355

MICROTONALITE

App. age 435 $\pm$ 55 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	266.2	479.5	1.598	0.7246
Biotite	515.9	67.3	22.08	0.8495
Plagioclase ..	125.4	920.0	0.392	0.7178

Initial Sr⁸⁷/Sr⁸⁶ 0.715(I).

Lat. 32°47'S.; long. 140°03'E.

Collected by R. P. Coats.

Minimum age of metamorphism if not emplacement.

Olary

Ref.: SA 2
H54/6/1
GA 339

MUNDAWATANA GRANODIORITE

				App. age 431 ± 7 m.y.
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	45.7	376.9	0.349	0.7067 (unsp.)
Biotite ..	692.8	7.90	252.3	2.220
Microcline ..	274.1	413.0	1.910	0.7172
Initial Sr ⁸⁷ /Sr ⁸⁶ 0.706(I).				
Lat. 29°53'S.; long. 138°34'E.				Callabonna
Collected by A. R. Crawford.				
Age of metamorphism or emplacement.				

Ref.: SA 2
H54/9/7
GA 348

SODA LEUCOGRANITE

				App. age 700 m.y., 730 m.y.
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	42.9	21.74	5.68	0.7553
	44.9	23.65	5.46	0.7555
Initial Sr ⁸⁷ /Sr ⁸⁶ 0.700(A).				
Lat. 30°15'30"S.; long. 139°13'E.				Copley
Collected by A. R. Crawford.				
Maximum age.				

Ref.: SA 2
I54/9/3
GA 471

DUTTON LAVAS

				App. age 455 m.y.
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	4.45	82.3	0.156	0.7040 (unsp.)
Microcline ..	189.4	207.1	2.633	0.7205 (unsp.)
	192.5	208.1	2.663	0.7210 (unsp.)
Albite ..	28.8	95.7	0.866	0.7101 (unsp.)
	28.7	—	—	0.7101 (unsp.)
Initial Sr ⁸⁷ /Sr ⁸⁶ 0.704(I).				
Lat. 34°18'S.; long. 139°10'E.				Adelaide
Collected by A. R. Crawford and R. P. Coats.				
Probably minimum age because lavas contain microcline which is likely to have leaked radiogenic strontium.				

Ref.: SA 3
(Geochron)
R 0456

SILTSTONE

		K-Ar age 435 ± 25 m.y.
Total Rock		
K 2.49% *Ar ⁴⁰ /K ⁴⁰ 0.0286.		
Poonarunna No. 1 Well, Core 7, 5556 ft. Lat. 27°54'20"S.;		
long. 137°54'50"E.		Noolyeanna
Collected by French Petroleum Co. (Australia).		
Unknown amount of detrital minerals; age may not be that of sedimentation.		

Tasmania

Ref.: TAS 1
GA 613

GRANODIORITE, SCOTTSDALE BATHOLITH

Biotite

K-Ar age 373 m.y.

K 7.49% *Ar⁴⁰/K⁴⁰ 0.02412.

Hornblende

K-Ar age 364 m.y., 361 m.y.

K 0.592% *Ar⁴⁰/K⁴⁰ 0.02343, 0.02325.

Bridport. Lat. 40°59'07"S.; long. 147°23'08"E.

Launceston

Collected by I. McDougall.

Probably age of emplacement, results within experimental error.

Ref.: TAS 1
GA 485

GRANODIORITE, SCOTTSDALE BATHOLITH

Age 387 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	107.6	302.8	1.021	0.7118
	—	—	—	0.7111 (unsp.)
K-feldspar ..	251.1	275.0	2.625	0.7213
	—	—	—	0.7191 (unsp.)
Biotite ..	535.8	9.3	166.6	1.6067
	543.0	9.3	167.5	1.1656

Initial Sr⁸⁷/Sr⁸⁶ 0.706±0.001(I).

Biotite

K-Ar age 376 m.y.

K 6.94% *Ar⁴⁰/K⁴⁰ 0.02428.

Hornblende

K-Ar age 371 m.y.

K 0.463% *Ar⁴⁰/K⁴⁰ 0.02393.

Bridport. Lat. 40°59'07"S.; long. 147°23'08"E.

Launceston

Collected by I. McDougall.

Probably age of emplacement, results with experimental error. Initial Sr⁸⁷/Sr⁸⁶ ratio suggests that granites not formed from remelted sialic material.

Ref.: TAS 1
GA 486

XENOLITH IN GRANODIORITE

Biotite

K-Ar age 375 m.y.

K 7.64% *Ar⁴⁰/K⁴⁰ 0.02422.

Hornblende

K-Ar age 370 m.y.

K 0.513% *Ar⁴⁰/K⁴⁰ 0.02390.

Bridport. Lat. 40°59'07"S.; long. 147°23'08"E.

Launceston

Collected by I. McDougall.

Probably age of emplacement of the granodiorite.

Ref.: TAS 1
GA 621

ADAMELLITE

Biotite

K 5.20% *Ar⁴⁰/K⁴⁰ 0.02346.

Mt Stronach, SE. of Scottsdale. Lat. 41°09'27"S.; long. 147°34'28"E.

Collected by K. G. Lucas.

Probably age of emplacement.

K-Ar age 364 m.y.

Launceston

Ref.: TAS 1
GA 487

ADAMELLITE, SCOTTSDALE BATHOLITH

Biotite

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	K-Ar 374 m.y. Sr ⁸⁷ /Sr ⁸⁶
Total Rock	172.4	164.0	3.025	0.7229
K-feldspar	431.4	97.7	12.71	0.7221 (unsp.)
Biotite	819.0	6.3	372.9	0.7776
				2.6461

Age 373 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.708 ± .001 (I).

K 6.81% *Ar⁴⁰/K⁴⁰ 0.02418.

Lat. 41°09'27"S.; long. 147°42'20"E.

Collected by I. McDougall.

Probably age of emplacement.

Launceston

Ref.: TAS 1
GA 620

GRANODIORITE, SCOTTSDALE BATHOLITH

Biotite

K 7.60% *Ar⁴⁰/K⁴⁰ 0.02423.

Hornblende

K 0.614% *Ar⁴⁰/K⁴⁰ 0.02406.

Mt Barrow. Lat. 41°22'58"S.; long. 147°26'34"E.

Collected by K. G. Lucas.

Probably age of emplacement.

K-Ar age 377 m.y.

K-Ar age 373 m.y.

Launceston

Ref.: TAS 1
GA 627

GRANODIORITE, SCOTTSDALE BATHOLITH

Biotite

K 7.28% *Ar⁴⁰/K⁴⁰ 0.02349, 0.02327.

Hornblende

K 0.56% *Ar⁴⁰/K⁴⁰ 0.02350.

Ben Lomond. Lat. 41°26'12"S.; long. 147°40'27"E.

Collected by K. G. Lucas.

Probably age of emplacement.

K-Ar age 364 m.y., 361 m.y.

K-Ar age 365 m.y.

Launceston

Ref.: TAS 1
GA 614

ADAMELLITE, BLUE TIER BATHOLITH

Biotite

K 6.84% *Ar⁴⁰/K⁴⁰ 0.02379.

Mt Cameron. Lat. 40°59'52"S.; long. 148°00'54"E.

Collected by K. G. Lucas.

Probable age of intrusion, though possibly some argon loss.

K-Ar age 369 m.y.

Launceston

Ref.: TAS 1
GA 623

ADAMELLITE, BLUE TIER BATHOLITH

Biotite

K 6.34% *Ar⁴⁰/K⁴⁰ 0.02341.

Lat. 41°15'23"S.; long. 148°06'26"E.

Collected by K. G. Lucas.

Probable age of intrusion, though possibly some argon loss.

K-Ar age 363 m.y.

Launceston

Ref.: TAS 1
GA 624

ADAMELLITE, BLUE TIER BATHOLITH

Biotite

Lat. 41° 16' 33" S.; long. 148° 08' 45" E.

Collected by K. G. Lucas.

Probable age of intrusion, though possibly some argon loss.

K-Ar age 367 m.y.
Launceston

Ref.: TAS 1
GA 488

ADAMELLITE, BLUE TIER BATHOLITH

Biotite

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock	211.6	135.7	4.489	0.7325
K-feldspar	459.3	174.9	7.558	0.7493
Biotite	962.2	20.2	136.9	1.4556
	966.4	19.6	141.8	1.5040

Age 389 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.708 ± 0.001 (I).

K 7.15 % *Ar⁴⁰/K⁴⁰ 0.02425.

Lat. 41° 17' 14" S.; long. 148° 17' 20" E.

Collected by I. McDougall.

Rb-Sr age older than K-Ar age—significance of this is doubtful because of uncertainties in decay constants; may mean that some argon loss has occurred. Age and initial Sr⁸⁷/Sr⁸⁶ very similar to that of Scottsdale Batholith.

Launceston

Ref.: TAS 1
GA 489

ADAMELLITE, BLUE TIER BATHOLITH

Biotite

K 6.88 % *Ar⁴⁰/K⁴⁰ 0.02376.

Lat. 41° 22' 42" S.; long. 148° 17' 20" E.

Collected by I. McDougall.

Probable age of intrusion, though there may have been some argon loss.

K-Ar age 368 m.y.

Launceston

Ref.: TAS 1
GA 490

ST MARYS PORPHYRITE

Biotite

K 6.96 % *Ar⁴⁰/K⁴⁰ 0.02440.

Lat. 41° 32' 16" S.; long. 148° 14' 28" E.

Collected by I. McDougall.

Probably age of emplacement.

K-Ar age 337 m.y.

Launceston

Ref.: TAS 1
GA 491

ST MARYS PORPHYRITE

Biotite

K 6.59 % *Ar⁴⁰/K⁴⁰ 0.02413.

Lat. 41° 33' 10" S.; long. 148° 13' 35" E.

Collected by I. McDougall.

Probable age of emplacement.

K-Ar age 374 m.y.

Launceston

Ref.: TAS 1
GA 626

ADAMELLITE

Biotite

K 7.02 % *Ar⁴⁰/K⁴⁰ 0.02393.

Piccaninny Creek (SSE. of St Marys Porphyrite). Lat. 41° 39' 48" S.;
long. 148° 17' 20" E.

Collected by K. G. Lucas.

Probable age of emplacement.

K-Ar age 371 m.y.

Launceston

Ref.: TAS 1
GA 493

GRANITE

Biotite

K 6.99% $^{40}\text{Ar}/^{40}\text{K}$ 0.02306.

K-Ar age 358 m.y.

Muscovite

K 7.22% $^{40}\text{Ar}/^{40}\text{K}$ 0.02334.

K-Ar age 362 m.y.

S. of Bicheno. Lat. $41^{\circ}53'20''\text{S}$.; long. $148^{\circ}17'18''\text{E}$.

Oatlands

Collected by I. McDougall.

Probable age of emplacement.

Ref.: TAS 1
GA 628

GRANITE

Muscovite

K 8.37% $^{40}\text{Ar}/^{40}\text{K}$ 0.02319.

K-Ar age 360 m.y.

1 mile S. of Bicheno. Lat. $41^{\circ}53'53''\text{S}$.; long. $148^{\circ}17'18''\text{E}$.

Oatlands

Collected by K. G. Lucas.

Probable age of emplacement.

Ref.: TAS 1
GA 629

COLES BAY GRANITE

Biotite

K-Ar age 347 m.y., 355 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	765.1	4.8	457.5	2.8814
	758.0	5.1	423.6	2.8753
	844.8	5.9	412.2	2.8235
K-feldspar ..	1698.8	4.6	1028.2	5.795
	1688.2	4.7	1038.5	5.877
Plagioclase ..	107.6	7.1	43.48	0.9742
	107.5	7.1	43.66	0.9784
Biotite ..	5446	0.9	17,250	90.4912
	5242	0.8	19,520	103.708

Age (T.R., K-f, P.) 353 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.754(I).

Age (Biotite) 375 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.754(A).

K 6.95% $^{40}\text{Ar}/^{40}\text{K}$ 0.02257, 0.02280.

Lat. $42^{\circ}08'54''\text{S}$.; long. $148^{\circ}16'34''\text{E}$.

Oatlands

Collected by K. G. Lucas.

Minimum age of crystallization is 375 m.y. Diffusion of Rb and Sr, both between K-feldspar and plagioclase, and out of the total rock, probably took place 353 m.y. ago.

Ref.: TAS 1
GA 335

APLITE

Muscovite

K 8.81% $^{40}\text{Ar}/^{40}\text{K}$ 0.02189.

K-Ar age 342 m.y.

Aberfoyle Tin Mine, Rossarden (Ben Lomond Granite).

Lat. $41^{\circ}30'\text{S}$.; long. $147^{\circ}30'\text{E}$.

Launceston

Collected by Aberfoyle Tin Co.

Minimum age, possibly argon loss has occurred.

Ref.: TAS 1
GA 625

ADAMELLITE (*Ben Lomond Granite*)

Muscovite

K-Ar age 352 m.y.

		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock	..	664.2	16.6	115.0	1.3093
		661.2	16.5	115.0	1.3098
K-feldspar	..	1498.3	37.7	114.3	1.3239
		1512.2	37.3	116.4	1.3430
		1510.7	—	—	1.3413 (unsp.)
Plagioclase	..	177.2	20.5	24.79	0.8686

Age 370 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.730(I).

K 8.63% *Ar⁴⁰/K⁴⁰ 0.02263.

Stoneys Ck. Lat. 41°39'43"S.; long. 147°41'44"E.

Launceston

Collected by K. G. Lucas.

Minimum age 350 m.y., probably true age is close to 370 m.y. Internal rearrangement of Rb and Sr has probably taken place and argon may have been lost.

Ref.: TAS 1
GA 828

ADAMELLITE (*Murchison River Granite*)

Hornblende

K-Ar age 528 m.y., 504 m.y., 512 m.y.

K 0.539% *Ar⁴⁰/K⁴⁰ 0.03574, 0.03376, 0.03435.

Murchison River. Lat. 41°46'07"S.; long. 145°16'57"E.

Queenstown

Collected by C. Brooks.

Minimum age.

Ref.: TAS 1
GA 616

GRANODIORITE (*Dove Granite*)

Hornblende

K-Ar age 454 m.y.

K 0.732% *Ar⁴⁰/K⁴⁰ 0.02996.

Mersey River Lat. 41°35'30"S.; long. 146°13'39"E.

Burnie

Collected by K. G. Lucas.

Minimum age.

Ref.: TAS 1
GA 617

GRANODIORITE

Biotite

K-Ar age 465 m.y.

K 6.93% *Ar⁴⁰/K⁴⁰ 0.03078.

Hornblende

K-Ar age 474 m.y.

K 0.584% *Ar⁴⁰/K⁴⁰ 0.03146.

		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock	..	179.0	245.2	2.101	0.7381
K-feldspar	..	387.2	340.8	3.270	0.7443
Biotite	..	553.6	8.5	187.7	1.9760

Age 487 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.706(A).

Mersey River. Lat. 41°34'57"S.; long. 146°13'39"E.

Burnie

Collected by K. G. Lucas.

Argon loss from biotite probably took place; minimum age of intrusion is 485 m.y.

Ref.: TAS 1 GA 1123	ADAMELLITE Biotite K 6.59% *Ar ⁴⁰ /K ⁴⁰ 0.03191. Hornblende K 0.601% *Ar ⁴⁰ /K ⁴⁰ 0.03153. Mersey River. Lat. 41°34'57"S.; long. 146°13'39"E. Collected by I McDougall. Minimum age.	K-Ar age 480 m.y. K-Ar age 474 m.y. Burnie
Ref.: TAS 1 GA 1120	ADAMELLITE (Dove River Granite) Biotite K 6.40% *Ar ⁴⁰ /K ⁴⁰ 0.03079. Hornblende K 0.569% *Ar ⁴⁰ /K ⁴⁰ 0.03094. Lat. 41°34'10"S.; long. 146°04'28"E. Collected by I. McDougall. Minimum age; argon loss has probably taken place.	K-Ar age 465 m.y. K-Ar age 467 m.y. Burnie
Ref.: TAS 1 GA 1121	ADAMELLITE (Dove River Granite) Biotite K 7.27% *Ar ⁴⁰ /K ⁴⁰ 0.03001, 0.03078. Hornblende K 0.585% *Ar ⁴⁰ /K ⁴⁰ 0.03213, 0.03192. Lat. 41°34'10"S.; long. 146°04'16"E. Collected by I. McDougall. Typical argon loss pattern; minimum age.	K-Ar age 454 m.y., 465 m.y. K-Ar age 483 m.y., 480 m.y. Burnie
Ref.: TAS 1 GA 1537	GRANODIORITE Biotite K 7.35% *Ar ⁴⁰ /K ⁴⁰ 0.03330. Forth River. Lat. 41°32'19"S.; long. 146°07'41"E. Collected by C. Gee. Minimum age of intrusion.	K-Ar age 498 m.y. Burnie
Ref.: TAS 1 GA 1538	ADAMELLITE Biotite K 5.79% *Ar ⁴⁰ /K ⁴⁰ 0.03108. Forth River. Lat. 41°32'28"S.; long. 146°07'40"E. Collected by C. Gee. Rock strained; probably argon loss from biotite, minimum age.	K-Ar age 469 m.y. Burnie
Ref.: TAS 1 GA 1423	ADAMELLITE Biotite K 7.03% *Ar ⁴⁰ /K ⁴⁰ 0.02652. Elliott Bay. Lat. 42°58'12"S.; long. 145°30'46"E. Collected by B. Scott. Minimum age.	K-Ar age 407 m.y. Port Davey

Ref.: TAS 1
GA 744

ADAMELLITE (*Housetop Granite*)

Biotite

		K-Ar age 364 m.y., 360 m.y.		
	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	273.3	33.4	23.55	0.8350
	278.1	32.2	24.79	0.8368
	—	—	—	0.8319 (unsp.)
K-feldspar ..	586.8	40.4	41.79	0.9206
Biotite ..	965.4	1.7	1627	9.5042
	988.1	1.7	1626	9.0331
	990.3	1.8	1540	8.8330

Age 375 ± 10 m.y. Initial Sr⁸⁷/Sr⁸⁶ $0.710 \pm 0.002(\text{I})$.

K 7.53% *Ar⁴⁰/K⁴⁰ 0.02344, 0.02316.

Lat. $41^{\circ}10'17''\text{S}$.; long. $145^{\circ}55'\text{E}$.

Burnie

Collected by J. C. Briden.

Rb-Sr data are concordant; initial Sr⁸⁷/Sr⁸⁶ ratio within range normally found for granitic rocks and age is probably that of intrusion.

Ref.: TAS 1
GA 748

ADAMELLITE (*Heemskirk Granite*)

Biotite

K-Ar age 345 m.y.

K 6.76% *Ar⁴⁰/K⁴⁰ 0.02209.

Trial Harbour. Lat. $41^{\circ}54'43''\text{S}$.; long. $145^{\circ}08'28''\text{E}$.

Queenstown

Collected by T. Green.

Minimum age of intrusion 340 ± 5 m.y. (from average of GA 748, 814, 818, and 819).

Ref.: TAS 1
GA 814

TOURMALINE ADAMELLITE (*Heemskirk Granite*)

Biotite

K-Ar age 341 m.y.

K 5.81% *Ar⁴⁰/K⁴⁰ 0.02187.

Lat. $41^{\circ}54'45''\text{S}$.; long. $145^{\circ}08'30''\text{E}$.

Queenstown

Collected by C. Brooks.

See GA 748.

Ref.: TAS 1
GA 818

ADAMELLITE (*Heemskirk Granite*)

Biotite

K-Ar age 338 m.y.

K 6.85% *Ar⁴⁰/K⁴⁰ 0.02165.

Muscovite

K-Ar age 336 m.y.

K 8.30% *Ar⁴⁰/K⁴⁰ 0.02145.

North Mt Heemskirk. Lat. $41^{\circ}50'\text{S}$.; long. $145^{\circ}03'51''\text{E}$.

Queenstown

Collected by C. Brooks.

See GA 748.

Ref.: TAS 1
GA 819

ADAMELLITE (*Heemskirk Granite*)

Biotite

K-Ar age 326 m.y.

K 6.90% *Ar⁴⁰/K⁴⁰ 0.02078.

North Tasman Creek. Lat. $41^{\circ}49'27''\text{S}$.; long. $145^{\circ}03'55''\text{E}$.

Queenstown

Collected by C. Brooks.

See GA 748.

Ref.: TAS 1 GA 615	PORPHYRITIC MICROADAMELLITE (<i>Meredith Granite</i>) Biotite K 6.31% *Ar ⁴⁰ /K ⁴⁰ 0.02240. Lat. 41°28'37"S.; long. 145°29'39"E. Collected by K. G. Lucas. Minimum age.	K-Ar age 349 m.y. Burnie
Ref.: TAS 1 GA 619	ADAMELLITE (<i>Housetop Granite</i>) Biotite K 7.42% *Ar ⁴⁰ /K ⁴⁰ 0.0224. Lat. 41°10'17"S.; long. 145°55'E. Collected by K. G. Lucas. Minimum age; probably argon loss took place (cf. GA 744).	K-Ar age 347 m.y. Burnie
Ref.: TAS 1 GA 1139	GRANITE (<i>Granite Tor</i>) Biotite K 5.97% *Ar ⁴⁰ /K ⁴⁰ 0.02281, 0.02302. Muscovite K 8.36% *Ar ⁴⁰ /K ⁴⁰ 0.02242, 0.2230. Lat. 41°43'37"S.; long. 145°45'11"E. Collected by J. Noldart and R. Jack. Minimum age of intrusion.	K-Ar age 355 m.y., 358 m.y. K-Ar age 349 m.y., 348 m.y. Burnie
Ref.: TAS 1 GA 1140	GRANITE (<i>Granite Tor</i>) Muscovite K 8.35% *Ar ⁴⁰ /K ⁴⁰ 0.02308. Lat. 41°43'20"S.; long. 145°45'21"E. Collected by J. Noldart and R. Jack. Minimum age of intrusion.	K-Ar age 359 m.y. Burnie
Ref.: TAS 1 GA 1122	LEUCOGRANITE (<i>Dolcoath Granite</i>) Biotite K 7.41% *Ar ⁴⁰ /K ⁴⁰ 0.02209. Lat. 41°28'45"S.; long. 146°07'19"E. Collected by I. McDougall. Minimum age of intrusion.	K-Ar age 345 m.y. Burnie
Ref.: TAS 1 GA 1422	ADAMELLITE Biotite K 7.73% *Ar ⁴⁰ /K ⁴⁰ 0.02150. Muscovite K 8.62% *Ar ⁴⁰ /K ⁴⁰ 0.02138. Three Hummock Island. Lat. 40°25'42"S.; long. 144°58'13"E. Collected by I. McDougall. Probably true age of emplacement.	K-Ar age 336 m.y. K-Ar age 335 m.y. King Island

- Ref.: TAS 1
GA 1358
- ADAMELLITE**
Biotite K-Ar age 342 m.y.
K 7.23% $^{40}\text{Ar}/^{40}\text{K}$ 0.02187.
SE. coast of King Island. Lat. $40^{\circ}05'S$.; long. $144^{\circ}03'56"E$. King Island
Collected by I. McDougall.
Probably true age of emplacement of granite 345 ± 5 m.y. (average of GA 1358, 1118, and 1119).
- Ref.: TAS 1
GA 1118
- ADAMELLITE**
Biotite K-Ar age 345 m.y.
K 7.48% $^{40}\text{Ar}/^{40}\text{K}$ 0.02211.
SE. coast of King Island. Lat. $40^{\circ}04'27"S$.; long. $144^{\circ}03'56"E$. King Island
Collected by I. McDougall.
See GA 1358.
- Ref.: TAS 1
GA 1119
- MICROADAMELLITE DYKE**
Biotite K-Ar age 348 m.y.
K 7.37% $^{40}\text{Ar}/^{40}\text{K}$ 0.02232.
Hornblende K-Ar age 349 m.y.
K 0.465% $^{40}\text{Ar}/^{40}\text{K}$ 0.02243.
King Island Scheelite Mine. Level 10, Section 12. Lat. $40^{\circ}04'S$.; long. $144^{\circ}03'56"E$. King Island
Collected by I. MacDougall.
See GA 1358.
- Ref.: TAS 1
GA 1432
- GRANODIORITE (Sea Elephant Granite)**
Biotite K-Ar age 338 m.y.
K 7.44% $^{40}\text{Ar}/^{40}\text{K}$ 0.02163.
King Island. Lat. $39^{\circ}48'37"S$.; long. $144^{\circ}05'32"E$. King Island
Collected by I. McDougall.
Minimum age of intrusion.
- Ref.: TAS 1
GA 1439
- LAMPROPHYRE DYKE**
Biotite K-Ar age 137 m.y.
K 7.07% $^{40}\text{Ar}/^{40}\text{K}$ 0.00828.
King Island. Lat. $39^{\circ}58'53"S$.; long. $144^{\circ}08'13"E$. King Island
Collected by H. Bartlett.
Minimum age; probably close to age of intrusion.
- Ref.: TAS 1
GA 1433
- GRANODIORITE**
Biotite K-Ar age 442 m.y.
- | | Rb $\mu\text{g/g}$ | Sr $\mu\text{g/g}$ | Rb ⁸⁷ /Sr ⁸⁶ | Sr ⁸⁷ /Sr ⁸⁶ |
|------------|--------------------|--------------------|------------------------------------|------------------------------------|
| Total Rock | 263.1 | 104.0 | 7.275 | 0.8053 |
- Age 835 ± 60 m.y. Initial Sr⁸⁷/Sr⁸⁶ $0.720 \pm 0.005(I)$.
K 7.70% $^{40}\text{Ar}/^{40}\text{K}$ 0.02910.
Cataraque Pt, King Island. Lat. $40^{\circ}04'10"S$.; long. $143^{\circ}52'19"E$. King Island
Collected by I. McDougall.
Massive granodiorite, not much evidence of deformation (similar to GA 1238); biotite age greater than from most granites of the west coast. See GA 1434.

Ref.: TAS 1
GA 1419

PEGMATITE

Muscovite

K-Ar age 717 m.y., 712 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Muscovite (1)	1,484	1.17	3,706	39.661
(2)	1,491	1.19	3,667	39.178

Age (1) 753 m.y. (2) 751 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.720(A).

K 7.75% *Ar⁴⁰/K⁴⁰ 0.05095, 0.05050.

Ettrick River, W. coast of King Island. Lat. 39°59'02"S.;
long. 143°53'13"E.

King Island

Collected by I. McDougall.

Believed that all granitic rocks of west coast are consanguinous and that 715 m.y. is minimum age of emplacement. West coast rocks are all deformed and have probably lost variable amounts of argon. See also GA 1434.

Ref.: TAS 1
GA 1238

ADAMELLITE

Biotite

K-Ar age 450 m.y., 449 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	265.4	98.9	7.714	0.8116

With GA 1433, 1434, 1457 and 1355, isochron age is 835 $\pm$ 60 m.y.

Initial Sr⁸⁷/Sr⁸⁶ 0.720 $\pm$ 0.005 (I).

K 7.64% *Ar⁴⁰/K⁴⁰ 0.02976, 0.02960.

Currie, W. coast of King Island. Lat. 39°56'00"S.; long.
143°50'54"E.

King Island

Collected by I. McDougall.

See GA 1433 and 1434.

Ref.: TAS 1
GA 1357

LEUCOCRATIC ADAMELLITE

Biotite

K-Ar age 348 m.y.

K 7.35% *Ar⁴⁰/K⁴⁰ 0.02297.

Porky Creek, W. coast of King Island. Lat. 39°52'05"S.;
long. 143°51'47"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref.: TAS 1
GA 1436

ADAMELLITE

Biotite

K-Ar age 346 m.y.

K 7.63% *Ar⁴⁰/K⁴⁰ 0.02219.

Porky Creek, W. coast of King Island. Lat. 39°52'05"S.;
long. 143°51'47"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref.: TAS 1
GA 1355

PORPHYRITIC ADAMELLITE

Biotite

K-Ar age 340 m.y.

K 7.39% *Ar⁴⁰/K⁴⁰ 0.02180.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	274.2	85.1	9.268	0.8336

With GA 1238, 1433, 1434 and 1457, isochron, age is 835 ± 60 m.y.

Initial Sr⁸⁷/Sr⁸⁶ 0.720 ± 0.005 (I).

Porky Creek, W. coast of King Island. Lat. 39°51'57"S.;
long. 143°51'47"E.

King Island

Collected by I. McDougall.

See GA 1434.

Ref.: TAS 1
GA 1117

ADAMELLITE

Biotite

K-Ar age 391 m.y., 399 m.y.

K 7.66% *Ar⁴⁰/K⁴⁰ 0.02535, 0.02598.

Porky Creek, W. coast King Island. Lat. 39°51'57"S.;
long. 143°51'48"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref.: TAS 1
GA 1356

XENOLITH IN ADAMELLITE

Biotite

K-Ar age 403 m.y.

K 7.84% *Ar⁴⁰/K⁴⁰ 0.02625.

Porky Creek, W. coast King Island. Lat. 39°51'57"S.;
long. 143°51'48"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref.: TAS 1
GA 1437

GRANODIORITE

Biotite

K-Ar age 377 m.y.

K 7.72% *Ar⁴⁰/K⁴⁰ 0.02440.

Whistler Point, W. coast King Island. Lat. 39°43'37"S.;
long. 143°51'26"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref.: TAS 1
GA 1434

ADAMELLITE

Biotite

K-Ar age 413 m.y., 405 m.y.

K 7.51% $^{40}\text{Ar}/^{40}\text{K}$ 0.02698, 0.02638.

Muscovite

K-Ar age 571 m.y., 561 m.y.

K 8.79% $^{40}\text{Ar}/^{40}\text{K}$ 0.03899, 0.03825.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	314.3	48.5	18.65	0.9441
Muscovite ..	886	4.22	612.7	7.106
	895	4.64	626.3	7.205

With GA 1238, 1355, 1433 and 1457, isochron, age is: (TR)

835 $\pm$ 60 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.720 $\pm$ 0.005 (I). (Musc.)

746 m.y., 742 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.720 (A).

Cape Wickham Lighthouse Quarry, King Island. Lat. 39°35'33"S.;
long. 143°57'30"E.

King Island

Collected by I. McDougall.

Rb-Sr muscovite age very close to that of GA 1419—thought to approximate closely the true age of emplacement. Data from Total Rock samples GA 1238, 1355, 1433 and 1457, when plotted as an isochron indicate age of 835 $\pm$ 60 m.y. Statistical analysis indicates that scatter from isochron is greater than could be expected from experimental error. It is probable that geological factors, such as different initial Sr⁸⁷/Sr⁸⁶ ratios or shearing which may make the rocks open chemical systems, have caused the scatter.

Ref.: TAS 1
GA 1438

BIOTITE-QUARTZ-PLAGIOCLASE HORNFELS

Biotite

K-Ar age 392 m.y.

K 7.99% $^{40}\text{Ar}/^{40}\text{K}$ 0.02544.

Cape Wickham, King Island. Lat. 39°35'16"S.;
long. 143°57'09"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref. TAS: 1
GA 1457

ADAMELLITE

Muscovite

K-Ar age 490 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	352.5	47.7	21.25	0.9676
Apatite ..	—	—	—	0.7684 (unsp.)

With GA 1238, 1355, 1433, and 1434, isochron age is

835 $\pm$ 60 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.720 $\pm$ 0.005 (I).

K 8.76 $^{40}\text{Ar}/^{40}\text{K}$ 0.03276.

Cape Wickham, King Island. Lat. 39°35'24"S.;
long. 143°57'51"E.

King Island

Collected by I. McDougall.

See GA 1434. Sr⁸⁷/Sr⁸⁶ ratio of apatite is anomalously high and indicates that redistribution of Sr isotopes took place, probably during the deformation.

Ref.: TAS 1
GA 1435

ADAMELLITE

Biotite

K-Ar age 390 m.y.

K 7.63% $^{40}\text{Ar}/^{40}\text{K}$ 0.02520.

E. of Cape Wickham, King Island. Lat. 39°35'33"S.;
long. 143°58'13"E.

King Island

Collected by I. McDougall.

See GA 1419.

Ref.: TAS 1 GA 1421	PEGMATITE Biotite K 7.37% *Ar ⁴⁰ /K ⁴⁰ 0.02346. E. of Cape Wickham, King Island. Lat. 39°35'33"S.; long. 143°58'13"E. Collected by I. McDougall. See GA 1419.	K-Ar age 365 m.y. King Island
Ref.: TAS 1 GA 1420	MUSCOVITE PEGMATITE Muscovite K 8.73% *Ar ⁴⁰ /K ⁴⁰ 0.04126. King Island. Lat. 39°35'33"S.; long. 143°58'13"E. Collected by I. McDougall. See GA 1419.	K-Ar age 600 m.y. King Island
Ref.: TAS 1 GA 304	DOLERITE Biotite K 6.75% *Ar ⁴⁰ /K ⁴⁰ 0.04966. Burnie. Lat. 41°02'30"S.; long. 145°53'34"E. Collected by A. Spry. Minimum age.	K-Ar age 702 m.y. Burnie
Ref.: TAS 1 GA 305	QUARTZ-MICA SCHIST Muscovite K 7.13% *Ar ⁴⁰ /K ⁴⁰ 0.02954. Howell Group, Mersey River. Lat. 41°43'28"S.; long. 146°12'E. Collected by A. Spry. Precambrian rock showing argon loss pattern, possibly due to reheating in the Jukesian and Tabberabberan Orogenies.	K-Ar age 448 m.y. Burnie
Ref.: TAS 1 GA 440	ECLOGITE, FRANKLIN GP Mica K 5.98% *Ar ⁴⁰ /K ⁴⁰ 0.03258, 0.03399. 17 miles E. of Queenstown. Collected by A. Spry. See GA 305.	K-Ar age 489 m.y., 507 m.y. Queenstown
Ref.: TAS 1 GA 618	GARNETIFEROUS AMPHIBOLITE, ROCKY CAPE GP Hornblende K 0.596% *Ar ⁴⁰ /K ⁴⁰ 0.03223. Muscovite K 8.19% *Ar ⁴⁰ /K ⁴⁰ 0.03235. Lat. 41°14'27"S.; long. 146°14'39"E. Collected by K. G. Lucas. Precambrian Rock. See GA 305.	K-Ar age 484 m.y. K-Ar age 486 m.y. Burnie

Ref.: TAS 1	BIOTITE SCHIST, SETTLERS METAMORPHOSED GREYWACKE	
GA 870	Biotite	K-Ar age 468 m.y.
GA 871	K 7.17% *Ar ⁴⁰ /K ⁴⁰ 0.03105.	
	Biotite	K-Ar age 491 m.y.
	K 6.25% *Ar ⁴⁰ /K ⁴⁰ 0.03279.	
	Beaconsfield. Lat. 41°11'23"S.; long. 146°46'04"E.	Launceston
	Collected by D. H. Green.	
	Metamorphic age; Cambrian sediments altered during Jukesian Movements.	
Ref.: TAS 1	ALKALI SYENITE	
GA 235	Hornblende	K-Ar age 95 m.y.
	K 1.367% *Ar ⁴⁰ /K ⁴⁰ 0.00568.	
	Port Cygnet. Lat. 43°11'36"S.; long. 147°06'30"E.	Hobart
	Collected by W. A. Robertson.	
	Age of emplacement 98 ± 3 m.y. (taking account of earlier results and GA 630).	
Ref.: TAS 1	ALKALI SYENITE	
GA 630	Hornblende	K-Ar age 98 m.y.
	K 1.35% *Ar ⁴⁰ /K ⁴⁰ 0.00588.	
	1 mile N. of Petcheys Bay. Lat. 43°10'17"S.;	Hobart
	long. 147°01'26"E.	
	Collected by K. G. Lucas.	
	Age of emplacement. See GA 235).	

Victoria

Ref.: VIC 1 KA 332 GA 119	BIOTITE RHYOLITE Biotite K 6.20% *Ar ⁴⁰ /K ⁴⁰ 0.0220. Lat. 37°19'48"S.; long. 145°53'53"E. Collected by E. Irving. Minimum age.	K-Ar age 344 m.y. Warburton
Ref.: VIC 2 GA 1512	OLIVINE BASALT Total rock K 1.29% *Kr ⁴⁰ /A ⁴⁰ 0.00730. Core 20 (depth 7858 ft), Casterton No. 1 Well. Lat. 37°36'54"S.; long. 141°20'06"E. Collected by Planet Exploration Co. Pty Ltd. Basalt quite strongly altered; about 10% intersertal glass present; reliable minimum age.	K-Ar age 120 ± 10 m.y. Hamilton
Ref.: VIC 2 Geochron R0508	BASALT Total rock K 1.25% *Ar ⁴⁰ /K ⁴⁰ 0.00935. Core 20 (depth 7858–62 ft), Casterton No. 1 Well. Lat. 37°36'54"S.; long. 141°20'06"E. Collected by Planet Exploration Co. Pty Ltd. Probably minimum age.	K-Ar age 153 ± 5 m.y. Hamilton

Ref.: VIC 3

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Age 365 ± 90 m.y.

		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
J55/6/C3 GA 213	Total rock ..	133	203	1.90	0.7155
		134	202	1.92	0.7178
		—	—	—	0.7220 (unsp.)
Ref.: VIC 3 J55/6/3 GA 214	Total rock ..	137	200	1.970	0.7214
		—	—	—	0.7193 (unsp.)
		138	203	1.966	0.7207
	K-feldspar ..	—	—	—	0.7205 (unsp.)
		163	233	2.022	0.7210
		—	—	—	0.7209 (unsp.)
Ref.: VIC 3 J55/6/6 GA 216	Plagioclase ..	11.8	435	0.079	0.7086
		—	—	—	0.7108 (unsp.)
		—	—	—	0.7210
	Total rock ..	178	17.4	2.98	0.7272
		180	17.2	3.02	0.7263 (unsp.)

Initial Sr⁸⁷/Sr⁸⁶ $0.710 \pm 0.002(\text{I})$. $\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11} \text{yr}^{-1}$.213: lat. $37^\circ 18' 23''\text{S}$.; long. $145^\circ 53' 23''\text{E}$.214: lat. $37^\circ 18' 41''\text{S}$.; long. $145^\circ 53' 37''\text{E}$.216: lat. $37^\circ 17' 52''\text{S}$.; long. $145^\circ 53' 01''\text{E}$.

Collected by J. F. Evernden and E. Irving.

Warburton

Warburton

Warburton

T.R. samples 213 and 214 have nearly the same Rb⁸⁷/Sr⁸⁶ but different Sr⁸⁷/Sr⁸⁶; this indicates geological variance, probably a difference in initial Sr⁸⁷/Sr⁸⁶, is present.

Validity of equating regression line through the data with an isochron is doubtful.

Ref.: VIC 3

J55/6/C3

GA 213

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶	Age m.y.
Biotite	636	15.7	116.9	1.3165	352
	655	15.5	122.5	1.3472	353
	659	16.3	116.8	1.3180	354
	658	16.1	117.1	1.3187	351

Initial Sr⁸⁷/Sr⁸⁶ $0.710(\text{A})$. $\beta\text{Rb}^{87} = 1.47 \cdot 10^{-10} \text{yr}^{-1}$.

See data above for total rock and feldspar samples, and justification for use of initial Sr⁸⁷/Sr⁸⁶ ratio of 0.710.

Biotite ages probably close to age of extrusion of rhyodacite.

Ref.: VIC 3
J55/6/7
GA 217

NEVADITE, CERBEREAN VOLCANICS

(1) Age (T.R., K-f, P) 359 ± 15 m.y.
(2) Age (Biotite) 355 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	213	57.7	10.66	0.7680
	210	57.0	10.67	0.7676
K-feldspar ..	313	—	—	0.7752
	308	75.8	11.74	0.7749
	314	77.2	11.74	0.7762
Plagioclase ..	184	65.5	8.11	0.7453
	182	66.1	7.98	0.7507
	178	65.5	7.87	0.7540
	—	—	—	0.7497 (unsp.)
Biotite ..	642	4.63	400.1	2.806

(1) Initial Sr⁸⁷/Sr⁸⁶ 0.710 ± 0.005 (I).

(2) Initial Sr⁸⁷/Sr⁸⁶ 0.710(A).

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11} \text{yr}^{-1}$.

Lat. $37^{\circ}17'24''\text{S}$.; long. $145^{\circ}52'46''\text{E}$.

Warburton

Collected by J. F. Evernden and E. Irving.

GA 217 combined with GA samples 840 and 841 lie on 359 m.y. isochron. Biotite age is not significantly less than isochron age and conclude that there has been no leak of radiogenic strontium from this mineral.

Ref.: VIC 3
GA 877

BASAL RHYOLITE, SNOBS CREEK VOLCANICS

Age 367 ± 22 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	535	30.4	50.86	0.9806
K-feldspar ..	730	34.4	61.39	1.0347
Plagioclase ..	8.1	23.5	35.10	0.8942
Total Rock ..	288	17.2	48.37	0.9643
K-feldspar ..	361	17.9	58.18	1.0207

Initial Sr⁸⁷/Sr⁸⁶ 0.704 ± 0.015 .

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11} \text{yr}^{-1}$

838: lat. $37^{\circ}20'\text{S}$.; long. $145^{\circ}48'12''\text{E}$.

Warburton

877: lat. $37^{\circ}16'24''\text{S}$.; long. $145^{\circ}52'18''\text{E}$.

Warburton

Collected by I. McDougall.

Data fit straight line to within experimental error; probably age of extrusion of rhyolite.

Ref.: VIC 3
GA 840

CORDIERITE NEVADITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 362 m.y., 356 m.y.

K 7.34% *Ar⁴⁰/K⁴⁰ 0.0233, 0.0229.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	274	17.3	45.7	0.9501
	278	17.2	46.6	0.9497
Biotite ..	1,070	1.42	2,178	12.207

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11} \text{yr}^{-1}$.

Lat. $37^{\circ}20'35''\text{S}$.; long. $145^{\circ}48'04''\text{E}$.

Warburton

Collected by I. McDougall.

K-Ar and Rb-Sr ages agree well.

Ref.: VIC 3
GA 839

CORDIERITE NEVADITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 346 m.y.

K 7.07% *Ar⁴⁰/K⁴⁰ 0.0222.

Lat. 37°20'26"S.; long. 145°48'15"E.

Warburton

Collected by I. McDougall.

Compared with GA 840, low age indicates leakage of Ar from biotite.

Ref.: VIC 3
GA 837

CORDIERITE NEVADITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 345 m.y.

K 7.25% *Ar⁴⁰/K⁴⁰ 0.0221.

Lat. 37°17'23"S.; long. 145°52'48"E.

Warburton

Collected by I. McDougall.

GA 837 (same quarry as GA 217) and GA 835 agree well with age of biotite GA 217 determined previously.

Ref.: VIC 3
GA 835

CORDIERITE NEVADITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 348 m.y.

K 6.90% *Ar⁴⁰/K⁴⁰ 0.0223.

Lat. 37°17'23"S.; long. 145°52'48"E.

Warburton

Collected by I. McDougall.

See GA 837. Same quarry as GA 217.

Ref.: VIC 3
GA 843

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 364 m.y., 358 m.y.

K 7.23% *Ar⁴⁰/K⁴⁰ 0.0234, 0.0230.

Lat. 37°21'50"S.; long. 145°48'E.

Warburton

Collected by I. McDougall.

See GA 876.

Ref.: VIC 3
GA 842

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 365 m.y., 362 m.y.

K 7.32% *Ar⁴⁰/K⁴⁰ 0.0235, 0.0233.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Biotite	694	4.37	459	3.049

Age 346 m.y. Initial Sr⁸⁷/Sr⁸⁶.

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11} \text{yr}^{-1}$.

Lat. 37°21'10"S.; long. 145°48'17"E.

Warburton

Collected by I. McDougall.

See GA 876.

Ref.: VIC 3
GA 841

CORDIERITE NEVADITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 340 m.y., 344 m.y.

K 7.20% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.0217, 0.0221.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	304	16.5	53.3	0.9921
	298	16.4	52.4	0.9926
K-feldspar ..	461	23.4	57.4	1.0129

Age 359 ± 15 m.y. Initial Sr⁸⁷/Sr⁸⁶ 0.710 ± 0.005 (I).

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11} \text{yr}^{-1}$.

Lat. $37^{\circ}20'39''\text{S}$.; long. $145^{\circ}48'07''\text{E}$.

Warburton

Collected by I. McDougall.

Low K-Ar age (compared with GA 840, and with Rb-Sr age) indicates leakage of Ar from biotite. GA 841 combined with GA 840 and GA 217 gives isochron age of 359 ± 15 m.y.

Ref.: VIC 3
GA 876

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 365 m.y.

K 7.27% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.0235.

Lat. $37^{\circ}31'18''\text{S}$.; long. $145^{\circ}51'09''\text{E}$.

Warburton

Collected by I. McDougall.

Same lava as GA 875, GA samples 876, 875, 868, 867, 843, and 842 indicate age of 362 ± 6 m.y. for rhyodacite; there may have been argon loss from the biotites and this is a minimum age.

Ref.: VIC 3
GA 875

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 366 m.y.

K 7.39% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.0236.

Lat. $37^{\circ}31'04''\text{S}$.; long. $145^{\circ}52'28''\text{E}$.

Warburton

Collected by I. McDougall.

Probably same as GA 842, See GA 876.

Ref.: VIC 3
GA 868

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 356 m.y., 355 m.y.

K 7.13% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.0229, 0.0228.

Lat. $37^{\circ}31'24''\text{S}$.; long. $145^{\circ}48'17''\text{E}$.

Warburton

Collected by I. McDougall.

See GA 876. Statigraphically between GA 842 and GA 843.

Ref.: VIC 3
GA 867

BIOTITE RHYODACITE, CERBEREAN VOLCANICS

Biotite

K-Ar age 362 m.y.

K 7.42% $^{40}\text{Ar}/^{39}\text{Ar}$ 0.0233.

Lat. $37^{\circ}20'39''\text{S}$.; long. $145^{\circ}52'18''\text{E}$.

Warburton

Collected by I. McDougall.

See GA 876.

Ref.: VIC 3
GA 881

RYANS CREEK RHYOLITE

Age 368 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	292	7.78	108.4	1.2801
	292	7.77	108.7	1.289
K-feldspar ..	267	13.3	79.8	1.1501.

Initial Sr⁸⁷/Sr⁸⁶ 0.704 (A).

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11}\text{yr}^{-1}$.

Lat. 36°47'34"S.; long. 146°16'12"E.

Collected by I. McDougall.

Age nearly independent of initial Sr⁸⁷/Sr⁸⁶.

Wangaratta

Ref.: VIC 3
GA 883

BARJARG GRANITE

Age 369 $\pm$ 11 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total Rock ..	237	60.6	11.32	0.7680
K-feldspar ..	432	81.4	15.33	0.7869
Plagioclase ..	46	38.3	3.46	0.7269
Total Rock ..	344	26.2	37.93	0.9138
K-feldspar ..	600	41.9	41.42	0.9324

Initial Sr⁸⁷/Sr⁸⁶ 0.706 $\pm$ 0.003 (I).

$\beta\text{Rb}^{87} = 1.47 \cdot 10^{-11}\text{yr}^{-1}$.

883: lat. 36°55'00"S.; long. 146°54'E.

884: lat. 36°55'18"S.; long. 146°54'E.

Collected by I. McDougall.

Statistical treatment of results indicates that there was a uniform initial Sr⁸⁷/Sr⁸⁶ in the granite and that the granite has remained a chemically closed system.

Wangaratta

Wangaratta

Ref.: VIC 4
GA 1141

BASALT

Total Rock

K-Ar age 4.35 m.y.

K 0.717% *Ar⁴⁰/K⁴⁰ 0.0002545.

Lat. 37°46'S. (approx.); long. 142°00'E. (approx.)

Collected by E. L. Lundelius.

Reliable minimum age.

Hamilton

J54/11/1
GA 5199

LAMPROPHYRE

Biotite

K-Ar age 17.1 m.y.

K 6.80% *Ar⁴⁰/K⁴⁰ 0.00100.

Portland No. 3 water bore, 5625-38 ft Lat. 38°20'44"S.; long. 141°35'25"E. Portland

Collected by Victorian Mines Department.

Minimum age of intrusion.

Western Australia

Ref.: WA 1

WOONGARRA VOLCANICS, HAMERSLEY GROUP

		Age 2100 m.y.			
		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
R255	Total Rock ..	114.7	6.77	48.75	2.129
GA 996		114.1	6.73	48.81	2.142
R259	Total Rock ..	91.9	87.6	3.024	0.807
GA 938		92.9	85.5	3.128	0.811
R258	Total Rock ..	170.3	40.18	12.20	1.096
GA 997		170.4	40.21	12.20	1.093
R656	Total Rock ..	107.0	30.58	10.07	0.995
GA 888		108.6	34.69	9.02	0.960
		105.9	34.45	8.85	0.961

Initial Sr⁸⁷/Sr⁸⁶ 0.700 = 0.719 (I).

R255: lat. 22°18'30"S.; long. 116°39'E.

R258, R259: lat. 22°26'30"S.; long. 117°01'E.

R656: lat. 22°33'S.; long. 116°48'E.

Collected by W. N. McLeod and others, G.S.W.A. Dacitic and rhyolitic igneous and pyroclastic rocks near the top of the Hamersley Group.

Insufficient data to determine age and initial Sr⁸⁷/Sr⁸⁶ ratios accurately; likely that rocks were formed with different initial Sr⁸⁷/Sr⁸⁶ ratios.

Wyloo

Mount Bruce

Wyloo

Ref.: WA 1

TUFFACEOUS SILTSTONE, VOLCANIC FACIES, WYLOO GROUP

		Age 1850 m.y. if Initial Sr ⁸⁷ /Sr ⁸⁶ 0.700(A) Age 1720 m.y. if Initial Sr ⁸⁷ /Sr ⁸⁶ 0.720(A)			
		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
R659	Total Rock ..	75.30	20.09	10.79	0.977
GA 936		74.7	19.55	11.00	0.978

Lat. 22°27'S.; long. 116°10'E.

Wyloo

Collected by W. N. McLeod and others, G.S.W.A. 1850 m.y. is a maximum age; 1720 m.y. is a minimum age since this is the indicated age for the intrusive Boolaloo Granite.

Ref.: WA 1

BOOLALOO GRANITE

				Age 1720 m.y.
				$\text{Sr}^{87}/\text{Sr}^{86}$
		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	$\text{Rb}^{87}/\text{Sr}^{86}$
R241	Total Rock ..	199.7	89.9	6.39
GA 937				0.872
R657	Total Rock ..	211.1	91.9	6.53
GA 889	K-feldspar ..	215.0	55.9	11.06
		216.2	56.1	11.07
		215.6	—	—
R657	Biotite	659.7	11.4	166.4
GA 889				4.733

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.720 (I).

Lat. 22°27'S.; long. 116°02'E.

Wyloo

Collected by N. W. McLeod and others, G.S.W.A.

Boolaloo Granite intrudes the Wyloo Group and is overlain by the Bangemall Group.

The high initial $\text{Sr}^{87}/\text{Sr}^{86}$ is probably an original feature of the rock, but in principle the complete internal mixing of radiogenic with common strontium in the granites' constituent minerals may also produce a linear arrangement of data-points, giving a high value for 'initial' $\text{Sr}^{87}/\text{Sr}^{86}$. Thus 1720 m.y. is a minimum age.

Ref.: WA 1

PILBARA SYSTEM GRANITE

R670

GA 1052

				Age 2290 m.y.
				$\text{Sr}^{87}/\text{Sr}^{86}$
		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	$\text{Rb}^{87}/\text{Sr}^{86}$
	Total Rock ..	211.8	239.7	2.540
		210.5	238.7	2.538
	K-feldspar ..	584.3	256.0	6.563
		586.9	253.6	6.664

Initial $\text{Sr}^{87}/\text{Sr}^{86}$ 0.728 (I).

Lat. 21°14'S.; long. 117°52'E.

Pyramid

Collected by W. N. McLeod and others, G.S.W.A.

If post-emplacement rearrangement of radiogenic strontium has occurred the value of 2290 m.y. should be viewed as a minimum age. A maximum age of 3040 m.y. may be calculated if the initial $\text{Sr}^{87}/\text{Sr}^{86}$ is assumed to be 0.700.

Unpublished

E51/6/1

GA 718

(A) Plagioclase

K-Ar age 570 m.y.

K 0.449% *Ar⁴⁰/K⁴⁰ 0.03888.**(B) Pyroxene**

K-Ar age 196 m.y.

K 0.0807% *Ar⁴⁰/K⁴⁰ 0.01210.

Plagioclase from chips of dolerite and sedimentary rock, pyroxene probably comes entirely from the dolerite; Barlee No. 1 well, 7830 to 7850 ft and 7866 to 7870 ft.

Lat. 17°48'25"S.; long. 122°42'40"E.

Broome

Collected by W.A.P.E.T.

Pyroxene age is a minimum for the age of intrusion of the dolerite, and the plagioclase age is a minimum for the age of the source rocks from which the sediments were derived.

Ref.: WA 2
I51/5/1
GA 773

GNEISS

	$^{206}\text{Pb}/^{238}\text{U}$	$^{207}\text{Pb}/^{235}\text{U}$	$^{207}\text{Pb}/^{206}\text{Pb}$	$^{206}\text{Pb}/^{232}\text{Th}$
Zircon	0.350	8.73	0.181	0.00855
	1950 m.y.	2340 m.y.	2700 m.y.	174 m.y.

Continuous diffusion: 2900 m.y. Radiation damage 2840 m.y.

Oldfield River. Lat. 34°25'S.; long. 120°43'E.

Ravensthorpe

Collected by E. J. Malone.

Approx. age 2800 m.y.—age of metamorphism (and of pegmatite injection at Cattlin Creek).

Ref.: WA 3
Cardup 1-5

CARDUP SHALE

		Age 660 m.y. (approx.)			
		Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Comp. white shale ..	1.246	187	37.85	1.212	
Dark band ..	2.184	173	30.70	1.12	
White band ..	3.194	182	30.75	1.211	
Black shale ..	4.283	144	56.3	1.295	
Black shale ..	5.166	136	35.2	1.099	

Initial Sr⁸⁷/Sr⁸⁶ 0.735 or higher.

Darling Scarp, near Perth.

Pinjarra

Collected by R. T. Pidgeon.

Wide scatter in initial Sr⁸⁷/Sr⁸⁶ due to detrital micas. Age not accurately measured.

Ref.: WA 4
Z132

TEKTITE, WILUNA

Total Rock

K-Ar age 0.75 $\pm$ 0.06 m.y.

K 1.99% *Ar⁴⁰/K⁴⁰ 0.000044.

Lat. 26°36'S.; long. 120°13'E.

Wiluna

Collected by Cook.

Minimum age.

1:250,000 SHEET INDEX OF PAPUA & NEW GUINEA
SHOWING AREAS FROM WHICH SAMPLES HAVE BEEN DATED

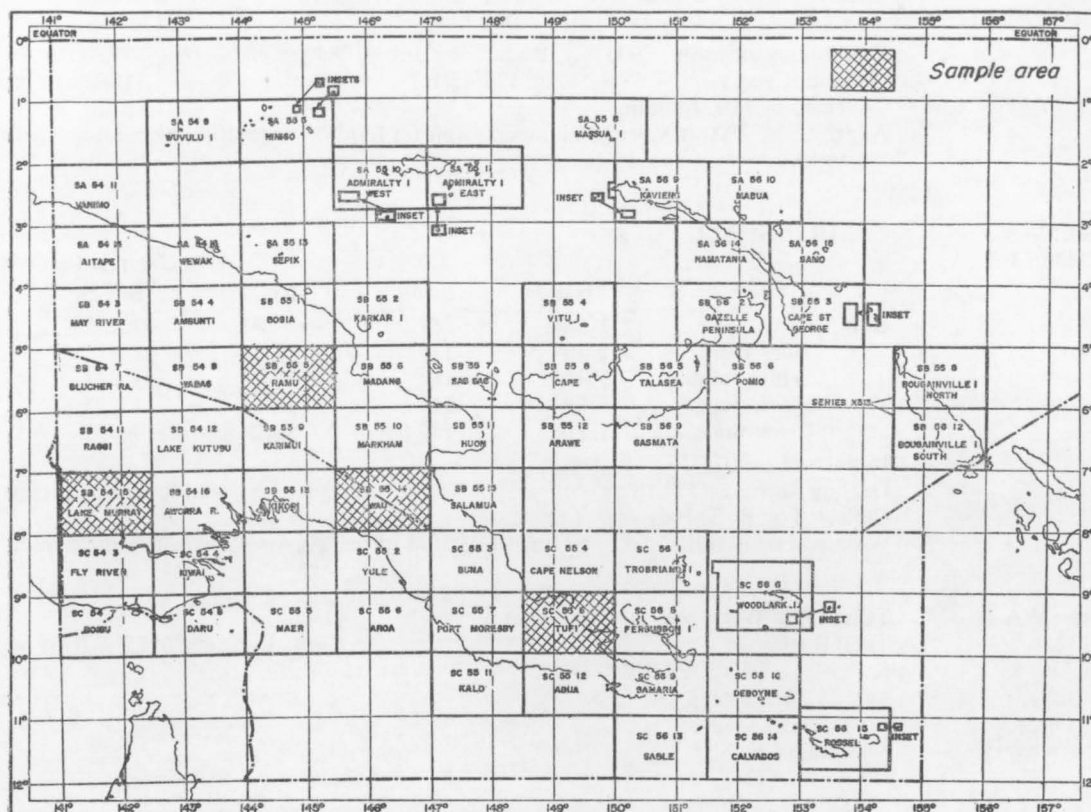


FIGURE 3

Territory of Papua and New Guinea

Unpublished
B54/15/1
GA 451

BIOTITE GRANITE

Biotite

K 4.99% $^{40}\text{Ar}/^{40}\text{K}$ 0.01470

Basement, Aramia No. 1 well, 8100 ft. Lat. $7^{\circ}40'S$.;
long. $142^{\circ}15'E$.

Collected by Australian Petroleum Co.

Not known whether this is age of intrusion or metamorphism.

K-Ar age 236 m.y.

Lake Murray

Ref.: PNG 1
B55/5/2
GA 981

GRANODIORITE

Age 195 m.y.

	Rb $\mu\text{g/g}$	Sr $\mu\text{g/g}$	Rb ⁸⁷ /Sr ⁸⁶	Sr ⁸⁷ /Sr ⁸⁶
Total rock ..	48.0	76.2	0.1810	0.7018
Biotite	549.0	4.75	332.4	1.6039

Initial Sr⁸⁷/Sr⁸⁶ 0.701 (I).

Lat. $5^{\circ}45'S$.; long. $145^{\circ}11'E$.

Collected by M. Plane.

Minimum age.

Ramu

Unpublished
C55/8/2
GA 1414

CAPE VOGEL BASICS

Total rock

K 0.196% $^{40}\text{Ar}/^{40}\text{K}$ 0.001646.

Lat. $9^{\circ}35'S$.; long. $149^{\circ}50'E$.

Collected by J. E. Thompson.

Minimum age.

K-Ar age 28.0 m.y.

Tufi

Ref.: PNG 2
B55/14
KA 1257

TUFF, OTIBANDA FORMATION

Plagioclase

K 0.282% $^{40}\text{Ar}/^{40}\text{K}$ 0.000445.

Lat. $7^{\circ}04'S$.; long. $146^{\circ}37'E$.

Collected by R. A. Stirton.

Average of KA 1257 and KA 1260 results is probably close to true age.

K-Ar age 7.6 m.y.

Wau

Ref.: PNG 2
B55/14
KA 1260

TUFF, OTIBANDA FORMATION

Plagioclase

K 0.261% $^{40}\text{Ar}/^{40}\text{K}$ 0.00036.

Lat. $7^{\circ}04'S$.; long. $146^{\circ}37'E$.

Collected by R. A. Stirton.

See KA 1257.

K-Ar age 6.1 m.y.

Wau

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472	37	986	44	5325	42
473	37	1031	42	5334	45
474	37	1032	43	5400	45
494	59	1033	43	5404	45
495	59	1034	43	5409	45
496	59	1035	43	C-Pb1	38
497	59	1036	43	C-Pb11	38
498	56	1037	45	C-Pb17	38
499	57	1041	47	C-Pb28	38
500	57	1043	43	C-Pb29	38
501	57	1143	42	F1	61
502	57	1149	44	F0223	61
503	57	1150	44	Mol. 3	46
504	59	1217	41	Mol. 4	46
505	52	1219	61	R0256	61
506	52	1220	61		
507	57	1354	54		
529	52	1379	48		
530	34	1380	48	S. Australia	
531	35	5152	42	339	75
532	35	5159	55	341	64
533	59	5160	55	342	67
534	58	5161	55	343	67
535	58	5164	55	344	67
536	53	5165	55	345	66
537	54	5166	55	346	65
538	54	5169	58	347	66
539	52	5170	58	348	75
540	53	5171	58	349	65
				350	64

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S. Australia—continued					
351	68	487	78	1438	88
353	68	488	79	1439	85
354	64	489	79	1457	88
355	74	490	79	1537	82
357	74	491	79	1538	82
366	72	493	80		
367	72	613	77		
368	72	614	78	Victoria	
369	68	615	84	119	91
370	68	616	81	213	92
371	73	617	81	214	92
374	72	618	89	216	92
386	74	619	84	217	93
387	71	620	78	835	94
388	64	621	78	837	94
471	75	623	78	839	94
480	71	624	79	840	93
481	71	625	81	841	95
518	74	626	79	842	94
525	69	627	78	843	94
587	69	628	80	867	95
588	69	629	80	868	95
589	70	630	90	875	95
591	70	744	83	876	95
592	69	748	83	877	93
593	69	814	83	881	96
598	73	818	83	883	96
599	72	819	83	884	96
668	73	828	81	1141	96
704	70	870	90	1512	91
705	70	871	90	5199	96
706	66	1117	87	R0508	91
707	67	1118	85		
708	67	1119	85		
711	65	1120	82		
714	69	1121	82	W. Australia	
716	72	1122	84	718	98
717	69	1123	82	773	99
813 B	70	1139	84	888	97
1084	63	1140	84	889	98
1159	73	1238	86	936	97
1517	65	1355	87	937	98
R0456	75	1356	87	938	97
Z130	63	1357	86	996	97
Z131	63	1358	85	997	97
Z133	63	1419	86	1052	98
		1420	89	Cardup.	99
		1421	89	Z132	99
		1422	84		
Tasmania		1423	82		
235	90	1432	85	New Guinea	
304	89	1433	85	451	101
305	89	1434	88	981	101
335	80	1435	88	1414	101
440	89	1436	86	KA1257	101
485	77	1437	87	KA1260	101
486	77				

TABLE 1. GA NUMBERS OR SAMPLE NUMBERS OF SPECIMENS

ERA	PERIOD	AGE OF BASE, m. y.	ANTARCTICA	NEW SOUTH WALES AND A.C.T.	NORTHERN TERRITORY	QUEENSLAND
PALEOZOIC	QUATERNARY	2			2134	
	TERTIARY	65		479,678,830		686,777,982,983,984,985,986,1031,1032,1033,1034, 1035,1036,1043,1143,1149,1150,5152,5158
	CRETACEOUS	136		Mol. 2		781,782,792,1037,5334
	JURASSIC	192		R112, R130, R117, 783		
MESOZOIC	TRIASSIC	225		303,1362,1364		220,1217,5297,5311,5314,5315,5318,5320,5321, 5323,5325, Mol. 3, Mol. 5
	PERMIAN	280		209,338,452,453,454,469, 1359,1360,1361,1363,1365		472,473,474,5295,5296,5298,5312,5313,5317, 5322,409,446,447,505,536,541,542,543,1354, 5159,5160,5176,5182,5183,5186,498,499,500, 501,502,503,507,534,535,5169,5170,5171,5177, 494,495,496,497,504,533,5172,5175,5187,5189
	CARBONIFEROUS	345		EssoA4, 470, Mol. 1, 48, 49, 59		399,607,747,1041,301,302,450,544,660,443, 444,445,506,539,540,448,537,538,666,5161, 5164,5165,5166,5181,5184,1220, R0256
	DEVONIAN	395		Esso1, 594, 595, 58		400,401,402,652,653,411,413,416,417,418,419 427,529,449,5180,1219, R0223
PALAEZOIC	SILURIAN	435		406,596,8c12,290,273,292,55 C4, C7, C9, C2, C5, 293		309,415,429,442,430,431
	ORDOVICIAN	500	762,763,764,765	106,405,437,439, Esso2, 272, 56, Binjura (3, 7, 9, 10)		412
	CAMERIAN	570	768	107,108,111,313,314,438		FI
		800	770	110, C6, 57	993,1059	659,5190,5409,5400,5404,658
PROTEROZOIC	ADELAIDEAN	1000		84391B, 84332B, 84336B, 85359B, 84348B, 312	5212	177,414
		1200		109	848,15,1057,1058,1158	410,428,441
		1400		84368B, 407, 84367B, 84365B 84349B	945, 946, 947, 949, 950 1127, 942, 943, 944	127,168,134,163,164,165,167,531
		1600		84341B	753,746,5406	128,129,130,131,132,135,162,166,175,422,530, 532,582,583,586,849,850,1379, C-Fe (1, 11, 17, 28, 29)
PROTEROZOIC	CARPENTARIAN	1800			752,754,10,483,484,558 559,1046,1047	126,135,172,378,379,584,585
		2000			125,159,581,1044	
	LOWER PROTEROZOIC	2500				
	ARCHAean	3100			24,656,675	

DATED FROM AUSTRALIAN TERRITORY, 1962-65

SOUTH AUSTRALIA	TASMANIA	PAPUA & NEW GUINEA	VICTORIA	WESTERN AUSTRALIA	AGE OF BASE, m.y.	PERIOD	ERA
2130, 2131, 2133				2132	2	QUATERNARY	MESO- ZOIC
		1414, KA1257, KA1260	1141, 5199		65	TERTIARY	
235, 630			1512		135	CRETACEOUS	
1439		981	RO508 (Geochron)	713(B)	192	JURASSIC	
		451			225	TRIASSIC	PALAEOZOIC
						PERMIAN	
					280		
	335, 745, 614, 613, 819, 1113, 1122, 1358, 1422, 1432		837, 119		345	CARBONIFEROUS	
518	485, 466, 437, 488, 489, 490, 491, 493, 613, 614, 615, 619, 620, 621 623, 624, 625, 626, 627, 628, 629, 744, 1119, 1139, 1140, 1357, 1422, 1435, 1436, 1437, 1438		213, 214, 215, 217 835, 838, 839, 840 841, 842, 843, 867 868, 875, 876, 877 881, 883, 884		395	DEVONIAN	
339, 355, RO456	1117, 1356, 1423				435	SILURIAN	
346, 347, 349, 357, 471, 524, 587, 589, 705, 711	305, 616, 617, 618, 870, 871, 1120, 1121, 1123, 1237, 1238				500	ORDOVICIAN	
	440, 828			718(A)	570	CAMBRIAN	
563, 592, 593, 714, 717, 1084, 346, 353 345, 351, 591, 707	304, 1419, 1420 1238, 1355, 1433, 1434, 1457			Cardup (1-5)	800		
706, 344, 704					1000	ADELAIDEAN	PROTEROZOIC
342, 369, 370, 716					1200		
					1400		
341, 354, 388, 599, 1517, 480, 481, 366, 367, 368, 374, 371, 1159, 386 350, 598, 813B				389, 937	1800	CARPENTARIAN	
387, 668				936	2000	LOWER PROTEROZOIC	
				888, 933, 996 997, 1052	2500		
343, 708				773	3100	ARCHAEOAN	

