

Summary of radiometric ages of Oregon rocks supplement 1: July 1972 through December 1976

J.M. Laursen and P.E. Hammond

Isochron/West, Bulletin of Isotopic Geochronology, v. 23, pp. 3

Downloaded from: <https://geoinfo.nmt.edu/publications/periodicals/isochronwest/home.cfm?Issue=23>

Isochron/West was published at irregular intervals from 1971 to 1996. The journal was patterned after the journal *Radiocarbon* and covered isotopic age-dating (except carbon-14) on rocks and minerals from the Western Hemisphere. Initially, the geographic scope of papers was restricted to the western half of the United States, but was later expanded. The journal was sponsored and staffed by the New Mexico Bureau of Mines (now Geology) & Mineral Resources and the Nevada Bureau of Mines & Geology.



ISOCHRON/WEST
A Bulletin of Isotopic Geochronology

All back-issue papers are available for free: <https://geoinfo.nmt.edu/publications/periodicals/isochronwest>

This page is intentionally left blank to maintain order of facing pages.

SUMMARY OF RADIO-METRIC AGES OF OREGON ROCKS SUPPLEMENT 1: JULY 1972 THROUGH DECEMBER 1976

JENNIE McKEE LAURSEN
PAUL E. HAMMOND

Department of Earth Sciences, Portland State University, Portland, OR 97207

This paper summarizes information on 260 radiometric ages of diverse rocks in Oregon, compiled from published and unpublished sources, as a supplement to our earlier paper (Laurson and Hammond, 1974) in *Isochron/West*. Some dates here are corrections and additions to the earlier summary. Analytical methods include K-Ar, Pb-alpha, U-Pb, Pb^{207}/U^{235} , Pb^{208}/Th^{232} , Pb^{206}/U^{238} , and Rb/Sr. The list includes anomalous and discordant ages. We acknowledge R. L. Armstrong for his recommendations in the format for preparation of this summary.

The dates are grouped into geologic provinces and their subdivisions (fig. 1), and listed in order of province from oldest to youngest. When a rock unit has two or more ages, the oldest age is listed first, followed by decreasing ages in order for the same unit. Replicate dates on the same unit appearing in more than one report are also included.

Each description includes reference source, sample number where supplied by reference, analytical method, rock unit, and location, if such data were available. Analytical methods and constants are keyed to letters, identified in the first table. Locations can be easily spotted on topographic quadrangles of the U.S. Geological Survey.

CODES FOR METHODS AND CONSTANTS

Methods:

- a. K — atomic absorption
- b. K — atomic absorption done in duplicate
- c. K — using a modal 303 Perkin-Elmer atomic absorption spectrometer with a Na-Li alkali buffer
- d. K — using a flame photometer
- e. K — using a flame photometer with a lithium internal standard
- f. K — using Techtron AA4 spectrophotometer
- g. K — using Instrumentation Laboratories flame photometer with a lithium internal standard
- h. K — using Baird and Instrumentation Laboratories flame photometer with a lithium internal standard
- i. K — X-ray fluorescence
- j. K — Armstrong (1970)
- k. Ar — standard isotope dilution techniques
- l. Ar — using AE 1 MS-10 mass spectrometer
- m. Ar — using a Nier-type 6-inch 60° mass spectrometer
- n. Ar — using bulb tracer system and a Reynolds-type mass spectrometer
- o. Ar — Armstrong (1970)
- p. Ar — Baksi and Watkins (1973)
- q. Ar — Dalrymple and Lanphere (1969)
- r. Sr — isotopic compositions measured on an automated 60°-sector 12-inch-radius solid mass spectrometer

- s. Rb/Sr ratios determined by X-ray fluorescence
- t. sample concentrated by fractionation with heavy liquids

Constants:

- a. $\lambda_{\beta} = 4.72 \times 10^{-10} \text{ yr}^{-1}$
- b. $\lambda_{\epsilon} = 0.584 \times 10^{-10} \text{ yr}^{-1}$
- c. $\lambda_{\epsilon} = 0.585 \times 10^{-10} \text{ yr}^{-1}$
- d. $K^{40} = 0.0119 \text{ atom percent}$
- e. $K^{40}/K_{\text{total}} = 1.22 \times 10^{-4} \text{ gm/gm}$
- f. $\lambda = 1.42$
- g. $U^{238} \lambda = 0.155125 \times 10^{-9} \text{ yr}$
- h. $U^{235} \lambda = 0.984850 \times 10^{-9} \text{ yr}$
- i. $Th^{232} \lambda = 0.049475 \times 10^{-9} \text{ yr}$
- j. atomic ratio $U^{238}/U^{235} = 137.88$

SAMPLE DESCRIPTIONS

1c. COAST RANGE

1. *Snively and others (1974)* K-Ar
J. D. Obradovich (written commun., 1975). Yachats Basalt, andesitic basalt (Cape Perpetua; Waldport 15' quad., Lincoln Co., OR). From the upper part of the formation.
(plagioclase) $36.6 \pm 3.6 \text{ m.y.}$
2. *Snively and others (1973)* K-Ar
J. D. Obradovich (written commun., 1965). Depoe Bay Basalt from Mt. Hebo sill. *Analyzer:* Obradovich.
(whole rock) $16 \pm 0.65 \text{ m.y.}$
3. *Niem and Cressy (1973)* K-Ar
YU-E1
Ecola State Park sill, basalt ($45^{\circ}56'N$, $123^{\circ}59'W$; SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ S7,T5N,R10W; 500 ft S of parking lot, Indian Beach, approx. 2 mi N of Cannon Beach; Cannon Beach 15' quad., Clatsop Co., OR). *Analyzer:* Parker, Yale Univ. *Analytical data:* K = 1.28, 1.28%; $*Ar^{40} = .8144 \times 10^{-6} \text{ cc/gm}$ ($Ar_{\text{rad}} = 25\%$). *Method:* a, o. *Constants:* a, b, d.
(whole rock) $15.9 \pm 0.3 \text{ m.y.}$
4. *Niem and Cressy (1973)* K-Ar
YU-1N
Neahkahnie Mountain sill, basalt ($45^{\circ}45'N$, $123^{\circ}58'W$; SE $\frac{1}{4}$ S18,T3N,R10W; 200 ft S of second view point on U.S. Highway 101, approx. 11 mi S of Cannon Beach; Nehalem 15' quad., Tillamook Co., OR). *Analyzer:* Parker, Yale Univ. *Analytical data:* K = 1.28, 1.28%; $*Ar^{40} = .8144 \times 10^{-6} \text{ cc/gm}$ ($Ar_{\text{rad}} = 25\%$). *Method:* a, o. *Constants:* a, b, d.
(whole rock) $15.5 \pm 0.4 \text{ m.y.}$

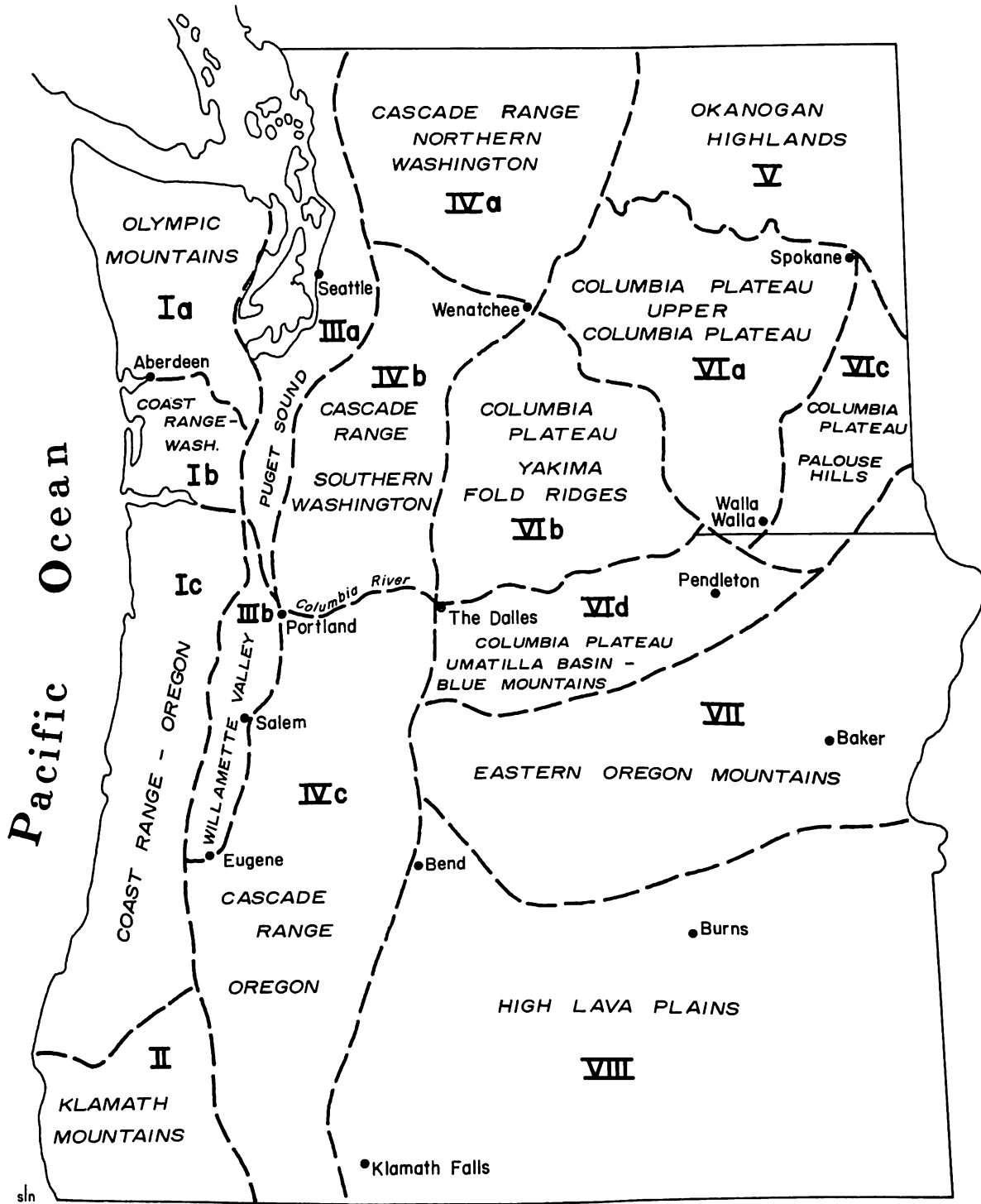


FIGURE 1. Geologic provinces of Oregon and Washington.

II. KLAMATH MOUNTAINS

1. *Hotz (1971)*

M. A. Lanphere (oral commun., 1970). Ashland pluton, granitic (Talent 15' quad., Jackson Co., OR).

- (hornblende) 166 m.y.
- (hornblende) 160 m.y.
- (biotite) 144 m.y.

K-Ar

2. *Hotz (1971)*

M. A. Lanphere (oral commun., 1970). Chetco Complex (Pearsoll Peak 15' quad., Josephine Co., OR).

- (hornblende) 151 m.y.
- (biotite) 151 m.y.
- (hornblende) 150 m.y.
- (hornblende) 150 m.y.
- (hornblende) 140 m.y.

K-Ar

3. *Coleman (1972)* K-Ar
54-RCG-65A
Amphibole gneiss (42°25.3'N, 124°0.4'W; NW¼ S33, T36S,R11W; Big Craggies; Collier Butte 15' quad., Curry Co., OR). *Analyzer:* K - Schlocker, Ar - Von Essen. *Analytical data:* K = .145%; *Ar⁴⁰ = 3.362 x 10⁻¹¹ moles/gm (Ar_{rad} = 50%). *Constants:* a, c, d.
(amphibole) 151±5 m.y.
4. *Hotz (1971)* K-Ar
M. A. Lanphere (oral commun., 1970). Greyback pluton, granitic (Oregon Caves 15' quad., Josephine Co., OR).
(hornblende) 149 m.y.
(biotite) 138 m.y.
5. *Coleman (1972)* K-Ar
34-RCG-65
Pearse Peak type diorite (42°39.6'N, 124°9.6'W; SW¼ S5,T34S,R12W; Iron Mountain; Agness 15' quad., Curry Co., OR). *Analyzer:* K - Schlocker, Ar - Von Essen. *Analytical data:* K = .728%; *Ar⁴⁰ = 1.620 x 10⁻¹⁰ moles/gm (Ar_{rad} = 78%). *Constants:* a, c, d.
(hornblende) 145±4 m.y.
6. *Hotz (1971)* K-Ar
M. A. Lanphere (oral commun., 1970). Gold Hill pluton, granitic (Gold Hill 15' quad., Jackson Co., OR).
(biotite) 142 m.y.
(hornblende) 139 m.y.
7. *Coleman (1972)* K-Ar
47-RGC-64-1
Pearse Peak type quartz diorite (T36S,R12W; near Game Lake; Collier Butte 15' quad., Curry Co., OR). *Analyzer:* K - Schlocker, Ar - Von Essen. *Analytical data:* K = 9.36%; *Ar⁴⁰ = 2.028 x 10⁻⁹ moles/gm (Ar_{rad} = 80%). *Constants:* a, c, d.
(muscovite) 141±4 m.y.
8. *Coleman (1972)* K-Ar
19-RGC-65
Pearse Peak type diorite (C S21,T33S,R14W; Pearse Peak; Port Orford 15' quad., Curry Co., OR). *Analyzer:* K - Schlocker, Ar - Von Essen. *Analytical data:* (biotite) K = 2.44%; *Ar⁴⁰ = 5.285 x 10⁻¹⁰ moles/gm (Ar_{rad} = 57, 69%); (hornblende) K = .450%; *Ar⁴⁰ = 9.542 x 10⁻¹¹ moles/gm. *Constants:* a, c, d.
(biotite) 141±4 m.y.
(hornblende) 137±4 m.y.
9. *Hotz (1971)* K-Ar
M. A. Lanphere (oral commun., 1970). White Rock pluton, granitic (Wimer 15' quad., Jackson Co., OR).
(hornblende) 138 m.y.
10. *Hotz (1971)* K-Ar
M. A. Lanphere (oral commun., 1970). Jacksonville pluton, granitic (Medford 15' quad., Jackson Co., OR).
(biotite) 138 m.y.
(hornblende) 134 m.y.
11. *Hotz (1971)* K-Ar
M. A. Lanphere (oral commun., 1971). Grants Pass pluton, granitic (Grants Pass 15' quad., Josephine Co., OR).
(hornblende) 136 m.y.

IVc. CASCADE RANGE

1. *Peck and others (1963)* Pb-alpha
Quartz monzonite (44°59.1'N, 122°26.5'W; SW¼SE¼ S4,T17S,R3E; Blue River 15' quad., Lane Co., OR). *Analyzer:* Jaffe. *Analytical data:* Pb = 8.0 ppm; alpha activity = 540 mr/hr. *Note:* stock at Nimrod, intrudes rocks of Little Butte volcanics.
(zircon) 35±10 m.y.
2. *Peck and others (1963)* Pb-alpha
Granodiorite (44°43.3'N, 122°14.1'W; NE¼SE¼ S7, T10S,R5E; Detroit 15' quad., Marion Co., OR). *Analyzer:* Jaffe. *Analytical data:* Pb = 1.65 ppm; alpha activity = 180 mr/hr. *Note:* stock near Detroit, intrudes Sardine Formation.
(zircon) 25±10 m.y.
3. *Denison (written commun., 1976)* K-Ar
Sample no. 3
Nohorn formation, "Big Black" andesite porphyry flow (44°55.25'N, 122°12'W; NE¼SW¼NE¼ S23,T7S, R5E; along Hugh Creek, USFS road S-741; Battle Ax 15' quad., Clackamas Co., OR). *Collector:* P. E. Hammond. *Analyzer:* Denison, Mobil Research and Development Corp. *Note:* from basal Nohorn formation, about 300 ft stratigraphically above top of Breitenbush Tuff.
(plagioclase) 16.5±1.0 m.y.
(plagioclase) 13.3±1.6 m.y.
(whole rock) 13.5±0.5 m.y.
(whole rock) 13.0±0.7 m.y.
4. *Denison (written commun., 1976)* K-Ar
Sample no. 6
Breitenbush Tuff, top unit, lithic-crystal (augite-quartz-plagioclase)-vitric tuff (44°35.9'N, 122°5'W; NW¼ NE¼NW¼ S28,T11S,R6E; along USFS road 103, upper Blowout Cr. area; Detroit 15' quad., Linn Co., OR). *Collector:* P. E. Hammond. *Analyzer:* Denison, Mobil Research and Development Corp. *Note:* about 1 mi SE of sample 5 [IV.c. 5].
(plagioclase) 13.1±0.6 m.y.
(plagioclase) 13.1±0.5 m.y.
5. *Denison (written commun., 1976)* K-Ar
Sample no. 5
Breitenbush Tuff, top unit, lithic-crystal (augite-quartz-plagioclase)-vitric tuff (44°36.25'N, 122°6'W; SE¼ SW¼NE¼ S20,T11S R6E; along USFS road 103, upper Blowout Cr. area; Detroit 15' quad., Linn Co., OR). *Collector:* P. E. Hammond. *Analyzer:* Denison, Mobil Research and Development Corp.
(plagioclase) 13.0±0.6 m.y.
(plagioclase) 12.2±0.6 m.y.

6. *Walker and others (1974)* K-Ar
DKA-1174
Molalla Formation, tuff (45°08.4'N, 122°32.5'W; Molalla 7½' quad., Clackamas Co., OR). *Analytical data:* K₂O = .152%; *Ar⁴⁰ = 35%.
(plagioclase) 12.9±1.0 m.y.
7. *Denison (written commun., 1976)* K-Ar
Sample no. 4
Breitenbush Tuff, uppermost unit, crystal-vitric tuff (44°41.5'N, 121°59.8'W; SW¼NW¼SE¼ S19,T10S R7E; along Highway 22 between Idanha and Whitewater Creek, 1 mi W of Whitewater Creek bridge; Mt. Jefferson 15' quad., Marion Co., OR). *Collector:* P. E. Hammond. *Analyzer:* Denison, Mobil Research and Development Corp. *Note:* same unit analyzed in Peck and others (1963), no. 18, p. 45-46.
(plagioclase) 12.7±0.8 m.y.
(plagioclase) 12.3±0.8 m.y.
8. *Walker and others (1974)* K-Ar
DKA-1175
Molalla Formation, tuff (45°08.4'N, 122°32.5'W; Molalla 7½' quad., Clackamas Co., OR). *Analytical data:* K₂O = .184%; *Ar⁴⁰ = 65%.
(plagioclase) 12.2±0.6 m.y.
9. *Armstrong and others (1975)* K-Ar
WR-248
Basaltic andesite (44°35'33"N, 121°35'01"W; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .730, .720%; *Ar⁴⁰ = .2805 x 10⁻⁶ cc/gm (Ar_{rad} = 11.9%), .2499 x 10⁻⁶ cc/gm (Ar_{rad} = 10%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 9.2±0.6 m.y.
10. *Armstrong and others (1975)* K-Ar
& WR-143-Hb
11. Porphyritic andesite lava (44°36'48"N, 121°34'36"W; from bench, 3900 ft elev., W face Green Ridge escarpment, 1.4 mi E of confluence of Sheep Creek and Metolius River; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* (hornblende from phenocrysts) K = .370%; *Ar⁴⁰ = .1199 x 10⁻⁶ cc/gm (Ar_{rad} = 13%); (whole rock) K = 1.205%; *Ar⁴⁰ = .3541 x 10⁻⁶ cc/gm (Ar_{rad} = 56%), .3472 x 10⁻⁶ cc/gm (Ar_{rad} = 45%). *Method:* i, j, k. *Constants:* a, b, d.
(hornblende) 8.1±0.6 m.y.
(whole rock) 7.3±0.1 m.y.
12. *Armstrong and others (1975)* K-Ar
MB-130
Basalt porphyry lava (44°13'10"N, 122°06'07"W; crest of ridge 0.7 mi N of Frissell Point, 4.3 mi NE of McKenzie Bridge, McKenzie Bridge 15' quad., Lane Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .715%; *Ar⁴⁰ = .170 x 10⁻⁶ cc/gm (Ar_{rad} = 32%), .179 x 10⁻⁶ cc/gm (Ar_{rad} = 32%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 6.2±0.2 m.y.
13. *Armstrong and others (1975)* K-Ar
MB-17
Porphyritic basaltic andesite lava (44°12'13"N, 122°02'00"W; in cut of Scott Creek road, 2000 ft elev., 6.8 mi NE of McKenzie Bridge; McKenzie Bridge 15' quad., Lane Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .873%; *Ar⁴⁰ = .2194 x 10⁻⁶ cc/gm (Ar_{rad} = 16%), .2155 x 10⁻⁶ cc/gm (Ar_{rad} = 33.6%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 6.2±0.2 m.y.
14. *Armstrong and others (1975)* K-Ar
WR-328
Andesite lava (44°40'38"N, 121°32'08"W; 3100 ft elev. on NE wall of Whitewater River Canyon, 0.7 mi NE of confluence of Whitewater and Metolius Rivers; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = 1.13%; *Ar⁴⁰ = .2843 x 10⁻⁶ cc/gm (Ar_{rad} = 8%), .2348 x 10⁻⁶ cc/gm (Ar_{rad} = 6%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 5.7±0.6 m.y.
15. *Armstrong and others (1975)* K-Ar
WR-246
Basaltic andesite lava (44°36'10"N, 121°34'36"W; from crest of Green Ridge, 5000 ft elev., 1.4 mi E of confluence of Walker Creek and Metolius River; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .795%; *Ar⁴⁰ = .1739 x 10⁻⁶ cc/gm (Ar_{rad} = 6%), .1629 x 10⁻⁶ cc/gm (Ar_{rad} = 5%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 5.3±0.7 m.y.
16. *Armstrong and others (1975)* K-Ar
EM-20
Basaltic andesite ash-flow tuff (44°16'39"N, 122°02'38"W; from welded zone in road cut, U.S. 126 opposite Trailbridge Reservoir; Echo Mtn 15' quad., Linn Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .656%; *Ar⁴⁰ = .147 x 10⁻⁶ cc/gm (Ar_{rad} = 23%), .172 x 10⁻⁶ cc/gm (Ar_{rad} = 22%), .127 x 10⁻⁶ cc/gm (Ar_{rad} = 15%), .113 x 10⁻⁶ cc/gm (Ar_{rad} = 10%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 5.3±0.2 m.y.
17. *Armstrong and others (1975)* K-Ar
WR-102
Andesite lava (44°33'20"N, 121°35'58"W; from crest of Green Ridge, 4500 ft elev., 1 mi E of Bridge 99 on Metolius River; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = 1.27%; *Ar⁴⁰ = .2669 x 10⁻⁶ cc/gm (Ar_{rad} = 33%), .2598 x 10⁻⁶ cc/gm (Ar_{rad} = 26%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 5.2±0.1 m.y.

18. *Armstrong and others (1975)* K-Ar
S-74
Basaltic andesite lava (44°25'37"N, 121°35'59"W; from crest S end of Green Ridge, 4000 ft elev., 11 mi N of Sisters; Sisters 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .913%; *Ar⁴⁰ = .197 x 10⁻⁶ cc/gm (Ar_{rad} = 17%), .184 x 10⁻⁶ cc/gm (Ar_{rad} = 17%), .188 x 10⁻⁶ cc/gm (Ar_{rad} = 17%), .160 x 10⁻⁶ cc/gm (Ar_{rad} = 10%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 5.0±0.2 m.y.
19. *Armstrong and others (1975)* K-Ar
EM-78
Basaltic andesite lava (44°19'32"N, 122°05'38"W; from crest NE ridge of Bunchgrass Mountain, 4880 ft elev., 4 mi NW of Trailbridge Reservoir; Echo Mtn 15' quad., Linn Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .956%; *Ar⁴⁰ = .188 x 10⁻⁶ cc/gm (Ar_{rad} = 46%), .194 x 10⁻⁶ cc/gm (Ar_{rad} = 22%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 5.0±0.1 m.y.
20. *Armstrong and others (1975)* K-Ar
HB-7
Basaltic andesite lava (44°17'20"N, 121°24'38"W; W rim Deep Creek Canyon, U.S. 126 roadcut, 7 mi E of Sisters; Henkle Butte 7½' quad., Deschutes Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .783%; *Ar⁴⁰ = .1499 x 10⁻⁶ cc/gm (Ar_{rad} = 5.3%), .1484 x 10⁻⁶ cc/gm (Ar_{rad} = 8.2%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 4.8±0.4 m.y.
21. *Armstrong and others (1975)* K-Ar
WR-189
Porphyritic basaltic andesite lava (44°30'13"N, 121°38'09"W; crest of ridge, 3250 ft elev., 1.1 mi S of Wizard Falls, 0.2 mi W of Metolius River; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .850%; *Ar⁴⁰ = .142 x 10⁻⁶ cc/gm (Ar_{rad} = 6%), .169 x 10⁻⁶ cc/gm (Ar_{rad} = 16%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 4.5±0.4 m.y.
22. *Armstrong and others (1975)* K-Ar
S-84
Basaltic andesite lava (44°19'10"N, 121°31'02"W; quarry on ridge W of Camp Polk site, 2.5 mi NE of Sisters; Sisters 15' quad., Deschutes Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .852%; *Ar⁴⁰ = .1137 x 10⁻⁶ cc/gm (Ar_{rad} = 9.7%), .1080 x 10⁻⁶ cc/gm (Ar_{rad} = 10%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* probably Gilbert paleomagnetic reversed epoch, 3.32-3.70 m.y.
(whole rock) 3.3±0.2 m.y.
23. *Armstrong and others (1975)* K-Ar
B-22
Basaltic andesite lava (44°28'41"N, 120°28'24"W; summit of Squaw Back Ridge, 14 mi N of Sisters; Squaw Back Ridge 7½' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = 1.153%; *Ar⁴⁰ = .1303 x 10⁻⁶ cc/gm (Ar_{rad} = 12.3%), .1317 x 10⁻⁶ cc/gm (Ar_{rad} = 12.4%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 2.9±0.2 m.y.
24. *Armstrong and others (1975)* K-Ar
MB-132
Olivine basalt lava (44°11'46"N, 122°00'50"W; columnar-jointed flow on Scott Creek Road, 2480 ft elev., 8 mi E of McKenzie Bridge, McKenzie Bridge 15' quad., Lane Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .374%; *Ar⁴⁰ = .0355 x 10⁻⁶ cc/gm (Ar_{rad} = 6%), .0403 x 10⁻⁶ cc/gm (Ar_{rad} = 10%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* probably Gauss paleomagnetic normal epoch, 2.43-2.8 m.y.
(whole rock) 2.6±0.2 m.y.
25. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
M4-127
Dacite dome complex (43°19.2'N, 121°53.3'W; Burn Butte; Burn Butte 7½' quad., Klamath Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .385%; *Ar⁴⁰ = 1.3946 x 10⁻¹² moles/gm (Ar_{rad} = 4.6%). *Method:* e. *Constants:* a, c, e.
(plagioclase) 2.45±0.94 m.y.
26. *Armstrong and others (1975)* K-Ar
MB-110
Olivine basalt lava (44°11'46"N, 122°00'50"W; from columnar-jointed flow on Scott Creek Road, 2480 ft elev., 8 mi E of McKenzie Bridge; McKenzie Bridge 15' quad., Lane Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .374%; *Ar⁴⁰ = .0295 x 10⁻⁶ cc/gm (Ar_{rad} = 93.0%), .0335 x 10⁻⁶ cc/gm (Ar_{rad} = 12%), .0332 x 10⁻⁶ cc/gm (Ar_{rad} = 9%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* probably Gauss paleomagnetic normal epoch, 2.43-2.8 m.y.
(whole rock) 2.1±0.1 m.y.
27. *Armstrong and others (1975)* K-Ar
WR-311
Porphyritic olivine-bearing basaltic andesite lava (44°39'12"N, 121°41'55"W; W face of Bald Peter, 5240 ft elev., 5 mi E of Mt. Jefferson; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .915%; *Ar⁴⁰ = .0707 x 10⁻⁶ cc/gm (Ar_{rad} = 8%), .0806 x 10⁻⁶ cc/gm (Ar_{rad} = 7%). *Method:* i, j, k. *Constants:* a, b, d.
(whole rock) 2.1±0.2 m.y.

28. *Armstrong and others (1975)* K-Ar
WR-308
 Porphyritic basaltic andesite lava (44°39'12"N, 121°41'38"W; W of crest road, 6520 ft elev., 0.1 mi SE of Bald Peter summit, 5 mi E of Mt. Jefferson; White-water River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Armstrong, Yale Univ. *Analytical data:* K = .980%; *Ar⁴⁰ = .0820 x 10⁻⁶ cc/gm (Ar_{rad} = 4%). *Method:* i, j, k. *Constants:* a, b, d.
 (whole rock) 2.1±0.2 m.y.
29. *Armstrong and others (1975)* K-Ar
WR-11
 Olivine-bearing basalt lava (44°34'21"N, 121°38'22"W; intracanyon, N side of Jefferson Creek valley, 3000 ft elev., 1 mi upstream from Metolius River; Whitewater River 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .290%; *Ar⁴⁰ = .0188 x 10⁻⁶ cc/gm (Ar_{rad} = 5%), .0181 x 10⁻⁶ cc/gm (Ar_{rad} = 3.9%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* this unit is older than more extensive intracanyon basalt flows along the Metolius River.
 (whole rock) 1.6±0.3 m.y.
30. *Armstrong and others (1975)* K-Ar
TFJ-431
 Basaltic andesite lava (44°19'45"N, 121°59'38"W; in cuts of U.S. 126, 2820 ft elev., 0.6 mi SE of Carmen Reservoir; Three Fingered Jack 15' quad., Linn Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .515%; *Ar⁴⁰ = .0227 x 10⁻⁶ cc/gm (Ar_{rad} = 4%), .0355 x 10⁻⁶ cc/gm (Ar_{rad} = 3%). *Method:* i, j, k. *Constants:* a, b, d.
 (whole rock) 1.4±0.3 m.y.
31. *Armstrong and others (1975)* K-Ar
TFJ-256
 Basaltic andesite lava (44°19'45"N, 121°59'38"W; in cuts of U.S. 126, 2820 ft elev., 0.6 mi SE of Carmen Reservoir; Three Fingered Jack 15' quad., Linn Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .847%; *Ar⁴⁰ = .0348 x 10⁻⁶ cc/gm (Ar_{rad} = 5%), .0401 x 10⁻⁶ cc/gm (Ar_{rad} = 4%). *Method:* i, j, k. *Constants:* a, b, d.
 (whole rock) 1.1±0.2 m.y.
32. *Armstrong and others (1975)* K-Ar
TFJ-363
 Porphyritic basaltic andesite lava (44°23'16"N, 121°46'00"W; at 4845 ft elev. on NE ridge of Cache Mountain, 4.5 mi SE of Santiam Pass; Three Fingered Jack 15' quad., Deschutes Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .921%; *Ar⁴⁰ = .329 x 10⁻⁶ cc/gm (Ar_{rad} = 13.8%), .0313 x 10⁻⁶ cc/gm (Ar_{rad} = 12.4%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* unit is a partially buried remnant of an older central High Cascade volcano, unrelated to late Pleistocene cinder cones on Cache Mountain summit.
 (whole rock) 0.88±0.05 m.y.
33. *Armstrong and others (1975)* K-Ar
EM-77
 Basaltic andesite lava (44°17'00"N, 122°00'48"W; in cut of U.S.F.S. road 1556, 2800 ft elev., 1.5 mi E of Trailbridge Reservoir on U.S. 126; Echo Mtn 15' quad., Linn Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .748%; *Ar⁴⁰ = .0195 x 10⁻⁶ cc/gm (Ar_{rad} = 9%), .0212 x 10⁻⁶ cc/gm (Ar_{rad} = 12%). *Method:* i, j, k. *Constants:* a, b, d.
 (whole rock) 0.68±0.05 m.y.
34. *Armstrong and others (1975)* K-Ar
TFJ-427
 Basaltic andesite lava (44°25'10"N, 121°24'20"W; sixth lava flow up gully from U.S. 20, 4000 ft elev., opposite Blue Lake; Three Fingered Jack 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .515%; *Ar⁴⁰ = .0114 x 10⁻⁶ cc/gm (Ar_{rad} = 3%), .0109 x 10⁻⁶ cc/gm (Ar_{rad} = 3%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* unit is paleomagnetically reversed and therefore must be at least 0.7 m.y. old.
 (whole rock) 0.54±0.14 m.y.
35. *Armstrong and others (1975)* K-Ar
B-4
 Dacite ash-flow tuff (44°08'06"N, 121°22'39"W; fresh core of large pumice bomb, outcrop adjacent to Tyler Road, 6 mi NW of Bend; Tumalo Dam 7½' quad., Deschutes Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = 2.86%; *Ar⁴⁰ = .0923 x 10⁻⁶ cc/gm (Ar_{rad} = .7%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* unit is overlain by paleomagnetically reversed High Cascade lavas, minimum age is the end of the Jaramillo normal paleomagnetic event, 0.89 m.y.
 (whole rock) 0.5±0.9 m.y.
36. *Armstrong and others (1975)* K-Ar
S-80
 Basaltic andesite lava (44°24'16"N, 121°37'42"W; road cut, 5200 ft elev. on NE side of Black Butte, 9 mi NW of Sisters; Sisters 15' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .141%; *Ar⁴⁰ = .0014 x 10⁻⁶ cc/gm (Ar_{rad} = .6%), .0036 x 10⁻⁶ cc/gm (Ar_{rad} = 1.5%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* lavas of Black Butte are paleomagnetically reversed and therefore must be at least 0.7 m.y. old.
 (whole rock) 0.45±0.3 m.y.
37. *Armstrong and others (1975)* K-Ar
S-23
 Basaltic andesite lava (44°24'16"N, 121°37'42"W; road cut, 5200 ft elev. on NE side of Black Butte, 9 mi NW of Sisters; Sisters 15' quad., Jefferson Co., OR).

Analyzer: Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .266%; *Ar⁴⁰ = .0043 x 10⁻⁶ cc/gm (Ar_{rad} = 1%), .0056 x 10⁻⁶ cc/gm (Ar_{rad} = 2%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* lavas of Black Butte are paleomagnetically reversed and therefore must be at least 0.7 m.y. old.

(whole rock) 0.45±0.2 m.y.

38. *Armstrong and others (1975)* K-Ar
TFJ-321

Basaltic andesite lava (44°25'58"N, 121°55'28"W; cut on Jackpine Road, W end of Potato Hill, 3 mi W of Santiam Pass; Three Fingered Jack 15' quad., Linn Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .540%; *Ar⁴⁰ = .0096 x 10⁻⁶ cc/gm (Ar_{rad} = 3%), .0090 x 10⁻⁶ cc/gm (Ar_{rad} = 3%). *Method:* i, j, k. *Constants:* a, b, d.

(whole rock) 0.43±0.12 m.y.

39. *Armstrong and others (1975)* K-Ar
BT-31

Holocrystalline dacite (44°10'40"N, 121°36'08"W; summit of Melvin Butte plug dome, 8 mi S of Sisters; Broken Top 15' quad., Deschutes Co., OR). *Analyzer:* Hales, Parker, Armstrong, Yale Univ. *Analytical data:* K = 3.04, 3.11%; *Ar⁴⁰ = .0513 x 10⁻⁶ cc/gm (Ar_{rad} = 1.2%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* one of three dacite domes partially buried by lavas from the central High Cascades.

(whole rock) 0.4±0.4 m.y.

40. *Armstrong and others (1975)* K-Ar
BT-72

Holocrystalline dacite (44°09'03"N, 121°34'00"W; summit of Three Creek Butte plug dome, 10 mi S of Sisters; Broken Top 15' quad., Deschutes Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = 2.86%; *Ar⁴⁰ = .0184 x 10⁻⁶ cc/gm (Ar_{rad} = .2%). *Method:* i, j, k. *Constants:* a, b, d. *Note:* one of three dacite domes partially buried by lavas from the central High Cascades.

(whole rock) 0.2±0.9 m.y.

41. *Armstrong and others (1975)* K-Ar
TS-137

Basaltic andesite lava (44°07'18"N, 121°51'18"W; from saddle on S ridge of Husband Volcano, 6900 ft elev., 16 mi SE of McKenzie Bridge; Three Sisters 15' quad., Lane Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .531%; *Ar⁴⁰ = .0033 x 10⁻⁶ cc/gm (Ar_{rad} = 1.7%), .0016 x 10⁻⁶ cc/gm (Ar_{rad} = .7%). *Method:* i, j, k. *Constants:* a, b, d.

(whole rock) 0.04±0.1 m.y.

VId. COLUMBIA PLATEAU — UMATILLA BASIN —
BLUE MOUNTAINS

1. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)

18-1(i)

Butler Canyon, flow 18, basalt (45°17'N, 121°10'W; Postage Stamp Butte 7½' quad., Wasco Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = 1.57%; *Ar⁴⁰ = 10.30 x 10⁷ cm³/g STP. *Method:* g, p. *Constants:* a, b, d.

(whole rock) 16.4±0.3 m.y.

2. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
14-1(i)

Butler Canyon, flow 14, basalt (45°17'N, 121°10'W; Postage Stamp Butte 7½' quad., Wasco Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = 1.53%; *Ar⁴⁰ = 8.94 x 10⁷ cm³/g STP. *Method:* g, p. *Constants:* a, b, c.

(whole rock) 14.6±0.3 m.y.

VII. EASTERN OREGON MOUNTAINS

1. *Armstrong and others (1976)* K-Ar
YU-WT 146

Wallowa batholith, early gabbro (Pre-Hurricane Divide) (45°16'02"N, 117°25'35"W; S34,T3S,R43E; Enterprise 15' quad., Wallowa Co., OR). *Analyzer:* Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data:* K = .278, .272, .277%; *Ar⁴⁰ = 1.84, 1.83 x 10⁻⁶ cc/gm (Ar_{rad} = 32, 29%). *Method:* a, k. *Constants:* a, b, d.

(hornblende) 160±5 m.y.

2. *Armstrong and others (1976)* Rb-Sr
252

Bald Mountain batholith, aplite (44°51'24"N, 118°14'20"W; Canyon City 1:250,000 sheet, Baker Co., OR). *Analytical data:* Initial Sr⁸⁷/Sr⁸⁶ = .70388±.00003; Rb = 104 ppm; Sr = 48 ppm; Rb/Sr = 2.16±.008; Sr⁸⁷/Sr⁸⁶ = .71787, .71820. *Method:* r, s. *Constants:* f.

(whole rock) 158±8 m.y.

3. *Armstrong and others (1976)* K-Ar
YU-WT 165

Bald Mountain batholith, gabbro (44°51'54"N, 118°5'19"W; S17,T8S,R38E; Canyon City 1:250,000 sheet, Baker Co., OR). *Analyzer:* Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data:* K = .201, .209, .210%; *Ar⁴⁰ = 1.354, 1.314 x 10⁻⁶ cc/gm (Ar_{rad} = 35, 45%). *Method:* a, k. *Constants:* a, b, d.

(hornblende) 155±5 m.y.

4. *Armstrong and others (1976)* K-Ar
WT-204

Wallowa batholith, hornblende-biotite granodiorite of Craig Mountain granodiorite (45°11'30"N, 117°14'01"W; Cornucopia 15' quad., Wallowa Co., OR). *Analyzer:* Kulp. *Analytical data:* K = 5.40%. *Method:* d. *Constants:* a, b, d.

(biotite) 149±5 m.y.

5. *Armstrong and others (1976)* Rb-Sr
Bald Mountain batholith (Baker Co., OR). *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .70391 \pm .00008$. *Method*: r, s. *Constants*: f. *Note*: see Armstrong and others (1976) for additional information on location and analytical data.
(whole rock) 147 ± 17 m.y.
6. *Armstrong and others (1976)* K-Ar
WT-211
Wallowa batholith, Pole Bridge quartz diorite ($45^{\circ}19'13''\text{N}$, $117^{\circ}25'44''\text{W}$; Enterprise 15' quad., Wallowa Co., OR). *Analyzer*: Kulp. *Analytical data*: K = 6.10%; $^{*}\text{Ar}^{40} = 36.4 \times 10^{-6}$ cc/gm. *Method*: d, k. *Constants*: a, b, d.
(biotite) 144 ± 5 m.y.
7. *Armstrong and others (1976)* K-Ar
YU-WT 216
Wallowa batholith, Pole Bridge unit, tonalite-granodiorite ($45^{\circ}18'21''\text{N}$, $117^{\circ}25'03''\text{W}$; S15, T3S, R43E; Enterprise 15' quad., Wallowa Co., OR). *Analyzer*: Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data*: (hornblende) K = .317, .337%; $^{*}\text{Ar}^{40} = 1.940, 1.947 \times 10^{-6}$ cc/gm ($\text{Ar}_{\text{rad}} = 35, 24\%$); (biotite) K = 6.97, 6.90%; $^{*}\text{Ar}^{40} = 36.02 \times 10^{-6}$ cc/gm ($\text{Ar}_{\text{rad}} = 76\%$). *Method*: a, k. *Constants*: a, b, d. *Note*: nearby sample gave 144 ± 5 m.y. biotite date.
(hornblende) 143 ± 4 m.y.
(biotite) 126 ± 4 m.y.
8. *Armstrong and others (1976)* Rb-Sr
821
Bald Mountain batholith, aplite ($44^{\circ}58'43''\text{N}$, $118^{\circ}10'39''\text{W}$; Canyon City 1:250,000 sheet, Baker Co., OR). *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .70393 \pm .00003$; Rb = 87 ppm; Sr = 87 ppm; Rb/Sr = $1.01 \pm .005$; $\text{Sr}^{87}/\text{Sr}^{86} = .70975, .70973$. *Method*: r, s. *Constants*: f.
(whole rock) 140 ± 7 m.y.
9. *Armstrong and others (1976)* K-Ar
YU-WT 35
Bald Mountain batholith, quartz diorite ($44^{\circ}52'13''\text{N}$, $118^{\circ}9'53''\text{W}$; Canyon City 1:250,000 sheet, Baker Co., OR). *Analyzer*: Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data*: (hornblende) K = .457, .458%; $^{*}\text{Ar}^{40} = 2.59, 2.73 \times 10^{-6}$ cc/gm ($\text{Ar}_{\text{rad}} = 77, 39\%$); (biotite) K = 6.21, 6.31%; $^{*}\text{Ar}^{40} = 33.97 \times 10^{-6}$ cc/gm ($\text{Ar}_{\text{rad}} = 83\%$). *Method*: a, k. *Constants*: a, b, d.
(hornblende) 140 ± 4 m.y.
(biotite) 131 ± 4 m.y.
10. *Armstrong and others (1976)* K-Ar
WT-745
Cornucopia stock, biotite-muscovite trondhjemite of Crater Lake cordierite trondhjemite ($45^{\circ}3'25''\text{N}$, $117^{\circ}16'37''\text{W}$; Eagle Cap 15' quad., Baker Co., OR). *Analyzer*: Kulp. *Analytical data*: K = 6.25%; $^{*}\text{Ar}^{40} = 35.4 \times 10^{-6}$ cc/gm. *Method*: d, k. *Constants*: a, b, d.
(biotite) 136 ± 4 m.y.
11. *Armstrong and others (1976)* K-Ar
WT-487
Wallowa batholith, granodiorite ($45^{\circ}7'14''\text{N}$, $117^{\circ}26'27''\text{W}$; Eagle Cap 15' quad., Union Co., OR). *Analyzer*: Kulp. *Analytical data*: K = 5.60%; $^{*}\text{Ar}^{40} = 31.4 \times 10^{-6}$ cc/gm. *Method*: d, k. *Constants*: a, b, d.
(biotite) 136 ± 4 m.y.
12. *Armstrong and others (1976)* Rb/Sr
YU-WT 216
Wallowa batholith, Pole Bridge unit, tonalite-granodiorite ($45^{\circ}18'21''\text{N}$, $117^{\circ}25'03''\text{W}$; Enterprise 15' quad., Wallowa Co., OR). *Analyzer*: Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .70341 \pm .00006$; (whole rock) Rb = 60 ppm; Sr = 465 ppm; Rb/Sr = $.129 \pm .001$; $\text{Sr}^{87}/\text{Sr}^{86} = .70404$; (biotite) Rb = 381; Sr = 16.5; Rb/Sr = 23.1 ± 1.2 ; $\text{Sr}^{87}/\text{Sr}^{86} = .83195$. *Method*: r, s.
(whole rock - biotite) 135 ± 7 m.y.
13. *Armstrong and others (1976)* Rb/Sr
1233
Wallowa batholith, Pole Bridge unit, aplite ($45^{\circ}17'54''\text{N}$, $117^{\circ}26'09''\text{W}$; Enterprise 15' quad., Wallowa Co., OR). *Analyzer*: Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .7033$; Rb = 123 ppm; Sr = 86 ppm; Rb/Sr = $1.44 \pm .1$; $\text{Sr}^{87}/\text{Sr}^{86} = .71129$. *Method*: r, s. *Constants*: f. *Note*: Pole Bridge unit is the oldest major unit of zoned tonalite-granodiorite.
(whole rock) 134 ± 7 m.y.
14. *Armstrong and others (1976)* Rb/Sr
YU-WT 35
Bald Mountain batholith, quartz diorite ($44^{\circ}52'13''\text{N}$, $118^{\circ}9'53''\text{W}$; Canyon City 1:250,000 sheet; Baker Co., OR). *Analyzer*: Hales, Oregon State Univ., & Armstrong. *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .70394 \pm .00004$; (whole rock) Rb = 29 ppm, Sr = 686 ppm; Rb/Sr = $.042 \pm .001$; $\text{Sr}^{87}/\text{Sr}^{86} = .7034, .70419$; (biotite) Rb = 183 ppm; Sr = 84 ppm; Rb/Sr = $2.19 \pm .02$; $\text{Sr}^{87}/\text{Sr}^{86} = .71590$. *Method*: r, s.
(whole rock - biotite) 133 ± 6 m.y.
15. *Armstrong and others (1976)* Rb/Sr
169
Wallowa batholith, aplite ($45^{\circ}11'03''\text{N}$, $117^{\circ}30'59''\text{W}$; China Cap $7\frac{1}{2}'$ quad., Union Co., OR). *Analyzer*: Hales, Oregon State Univ., & Armstrong, Yale Univ. *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .7033$; Rb = 86 ppm; Sr = 144 ppm; Rb/Sr = $.601 \pm .008$; $\text{Sr}^{87}/\text{Sr}^{86} = .70653, .70662$. *Method*: r, s. *Constants*: f.
(whole rock) 132 ± 13 m.y.
16. *Armstrong and others (1976)* Rb/Sr
Wallowa batholith, Pole Bridge unit, tonalite-granodiorite (Enterprise 15' quad., Wallowa Co., OR). *Analytical data*: Initial $\text{Sr}^{87}/\text{Sr}^{86} = .70332 \pm .00003$. *Method*: r, s. *Constants*: f. *Note*: oldest major unit of

- zoned tonalite-granodiorite. See Armstrong and others (1976) for additional information on locations and analytical data.
(whole rock) 130 ± 2.4 m.y.
17. *Armstrong and others (1976)* K-Ar
WT-818
Cornucopia stock, tonalite of Cornucopia tonalite ($45^{\circ}0'16''N$, $117^{\circ}19'02''W$; Eagle Cap 15' quad., Baker Co., OR). *Analyzer:* Kulp. *Analytical data:* (biotite) $K = 6.89\%$; $*Ar^{40} = 36.2 \times 10^{-6}$ cc/gm ($Ar_{rad} = 93\%$); (hornblende) $K = 1.03\%$; $*Ar^{40} = 3.76 \times 10^{-6}$ cc/gm ($Ar_{rad} = 81\%$). *Method:* d, k. *Constants:* a, b, d.
(biotite) 128 ± 4 m.y.
(hornblende) 125 ± 4 m.y.
18. *Armstrong and others (1976)* Rb/Sr
100
Wallowa batholith, Hurricane Divide unit, aplite ($45^{\circ}15'25''N$, $117^{\circ}25'08''W$; Enterprise 15' quad., Wallowa Co., OR). *Analyzer:* Hales, Oregon State Univ., & Armstrong, Yale Univ. *Analytical data:* Initial $Sr^{87}/Sr^{86} = .7033$; Rb = 82 ppm; Sr = 182 ppm; Rb/Sr = $.450 \pm .002$; $Sr^{87}/Sr^{86} = .70562$. *Method:* r, s. *Constants:* f.
(whole rock) 125 ± 6 m.y.
19. *Armstrong and others (1976)* Rb/Sr
461
Wallowa batholith, granodiorite ($45^{\circ}08'25''N$, $117^{\circ}21'34''W$; Eagle Cap 15' quad., Union Co., OR). *Analyzer:* Hales, Oregon State Univ. & Armstrong, Yale Univ. *Analytical data:* Initial $Sr^{87}/Sr^{86} = .7033$; Rb = 78 ppm; Sr = 251 ppm; Rb/Sr = $.309 \pm .004$; $Sr^{87}/Sr^{86} = .70488$. *Method:* r, s. *Constants:* f. *Note:* "late" felsic unit.
(whole rock) 124 ± 15 m.y.
20. *Armstrong and others (1976)* K-Ar
WT-811
Wallowa batholith, quartz diorite ($45^{\circ}17'42''N$, $117^{\circ}28'32''W$; Enterprise 15' quad., Wallowa Co., OR). *Analyzer:* Kulp. *Analytical data:* $K = 7.51, 7.54\%$; $*Ar^{40} = 38.2 \times 10^{-6}$ cc/gm. *Method:* d, k. *Constants:* a, b, d.
(biotite) 124 ± 4 m.y.
21. *Armstrong and others (1976)* K-Ar
WT-751
Wallowa batholith, biotite-hornblende quartz diorite of Needle Point quartz diorite ($45^{\circ}2'44''N$, $117^{\circ}25'22''W$; Eagle Cap 15' quad., Baker Co., OR). *Analyzer:* Kulp. *Analytical data:* $K = 6.87\%$; $*Ar^{40} = 34.1 \times 10^{-6}$ cc/gm ($Ar_{rad} = 74\%$). *Method:* d, k. *Constants:* a, b, d.
(biotite) 122 ± 4 m.y.
22. *Armstrong and others (1976)* K-Ar
WT-308
Wallowa batholith, quartz diorite of Craig Mountain quartz diorite ($45^{\circ}13'51''N$, $117^{\circ}10'02''W$; Cornucopia 15' quad., Wallowa Co., OR). *Analyzer:* Kulp. *Analytical data:* $K = 7.88\%$; $*Ar^{40} = 38.5 \times 10^{-6}$ cc/gm. *Method:* d, k. *Constants:* a, b, d.
(biotite) 119 ± 4 m.y.
23. *Armstrong and others (1976)* K-Ar
WR-987
Cornucopia stock, trondhjemite of Tramway trondhjemite ($45^{\circ}2'24''N$, $117^{\circ}14'06''W$; Cornucopia 15' quad., Baker Co., OR). *Analyzer:* Kulp. *Analytical data:* $K = 6.76\%$; $*Ar^{40} = 32.7 \times 10^{-6}$ cc/gm. *Method:* d, k. *Constants:* a, b, d.
(biotite) 118 ± 4 m.y.
24. *Armstrong and others (1976)* K-Ar
YU-WT 180
Wallowa batholith, granodiorite ($45^{\circ}11'43''N$, $117^{\circ}31'28''W$; S23,T4S,R42E; China Cap $7\frac{1}{2}'$ quad., Union Co., OR). *Analyzer:* Hales, Oregon State Univ., & Armstrong, Yale Univ. *Analytical data:* $K = 6.52, 6.47\%$; $*Ar^{40} = 31.49 \times 10^{-6}$ cc/gm ($Ar_{rad} = 78\%$). *Method:* a, k. *Constants:* a, b, d.
(biotite) 118 ± 4 m.y.
25. *Armstrong and others (1976)* K-Ar
WT-582
Wallowa batholith, hornblende-biotite quartz monzonite ($45^{\circ}16'22''N$, $117^{\circ}27'26''W$; Enterprise 15' quad., Wallowa Co., OR). *Analyzer:* Kulp. *Analytical data:* $K = 6.19, 6.11\%$. *Method:* d. *Constants:* a, b, d.
(biotite) 117 ± 3 m.y.
26. *Armstrong and others (1976)* Rb/Sr
180
Wallowa batholith, hornblende-biotite granodiorite ($45^{\circ}11'43''N$, $117^{\circ}31'28''W$; China Cap $7\frac{1}{2}'$ quad., Union Co., OR). *Analyzer:* Hales, Oregon State Univ., & Armstrong, Yale Univ. *Analytical data:* Initial $Sr^{87}/Sr^{86} = .7033$; Rb = 61 ppm; Sr = 415 ppm; Rb/Sr = $.146 \pm .002$; $Sr^{87}/Sr^{86} = .70393, .70403$. *Method:* r, s. *Constants:* f.
(whole rock) 113 ± 20 m.y.
27. *Armstrong and others (1976)* Rb/Sr
684
Wallowa batholith, hornblende-biotite granodiorite ($45^{\circ}07'17''N$, $117^{\circ}26'39''W$; Eagle Cap 15' quad., Union Co., OR). *Analyzer:* Hales, Oregon State Univ., & Armstrong, Yale Univ. *Analytical data:* Initial $Sr^{87}/Sr^{86} = .7033$; Rb = 74 ppm; Sr = 333 ppm; Rb/Sr = $.222 \pm .001$; $Sr^{87}/Sr^{86} = .70432$. *Method:* r, s. *Constants:* f. *Note:* "late" felsic unit.
(whole rock) 111 ± 17 m.y.
28. *Armstrong and others (1976)* K-Ar
WT-1019
Wallowa batholith, biotite-muscovite trondhjemite of Blue Lake cordierite trondhjemite ($45^{\circ}10'11''N$,

28. (continued)
117°21'21"W; Eagle Cap 15' quad., Wallowa Co., OR). *Analyzer*: Kulp. *Analytical data*: K = 5.91%; *Ar⁴⁰ = 23.0 x 10⁻⁶ cc/gm (Ar_{rad} = 63%). *Method*: d, k. *Constants*: a, b, d.
(biotite) 95±3 m.y.
29. *Armstrong and others (1976)* K-Ar
WR-988
Cornucopia stock, pegmatite in Pine Lakes cordierite trondhjemite (45°2'14"N, 117°14'31"W; Cornucopia 15' quad., Baker Co., OR). *Analyzer*: Kulp. *Analytical data*: K = 6.31%; *Ar⁴⁰ = 23.9 x 10⁻⁶ cc/gm (Ar_{rad} = 84%). *Method*: d, k. *Constants*: a, b, d.
(book muscovite) 93±3 m.y.
- 30a. *Enlows and Parker (1972)* K-Ar
W-3-58
Hornblende andesite (44°1.7'N, 120°14.7'W; SE¼ S17, N½ S20, T12S, R21E; White Butte; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Parker. *Analytical data*: (hornblende) K = .4710, .4880, .4795%; Ar⁴⁰/³⁸ = .21901; (whole rock) K = 1.5100, 1.4900%; Ar⁴⁰/³⁸ = 1.96280. *Method*: c, k, m. *Note*: intrudes Cretaceous sedimentary rocks and Lower Clarno volcanic breccia.
(hornblende) 46.1110±3.9601 m.y.
(whole rock) 40.5524±0.9020 m.y.
- 30b. *Armstrong (written commun., 1974)* K-Ar
W-3-58
Analytical data: (hornblende) K = .480%(2); *Ar⁴⁰ = .894 x 10⁻⁶ cc/gm (Ar_{rad} = 12%); (whole rock) K = 1.50%; *Ar⁴⁰ = 2.455 x 10⁻⁶ cc/gm (Ar_{rad} = 45%).
(hornblende) 46.1±4 m.y.
(whole rock) 40.6±.9 m.y.
- 31a. *Enlows and Parker (1972)* K-Ar
KFO-1702B
Metabasalt (44°35.2'N, 120°6.8'W; S29, T11S, R22E; Marshall Butte; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Parker. *Analytical data*: K = 1.2000, 1.2000, 1.1900%; Ar⁴⁰/³⁸ = .89660, .99160. *Method*: c, k, m. *Note*: intrudes Cretaceous sedimentary rocks and is overlain by Upper Clarno mudflows.
(whole rock) 45.0299±0.9006 m.y.
(whole rock) 44.8056±0.8961 m.y.
- 31b. *Armstrong (written commun., 1974)* K-Ar
KFO-1702B
Analytical data: K = 1.20%(2); *Ar⁴⁰ = 2.172 x 10⁻⁶ cc/gm(2) (Ar_{rad} = 73%).
(whole rock) 44.9±0.07 m.y.
- 32a. *Enlows and Parker (1972)* K-Ar
KFO-1112
Lower Clarno Formation, andesite (44°36.0'N, 120°12.8'W; S21, T11S, R21E; Bridge Creek; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Parker. *Analytical data*: K = .9250, .9500%; Ar⁴⁰/³⁸ = .89660, .99160. *Method*: c, k, m.
(whole rock) 42.3114±0.8462 m.y.
(whole rock) 43.3548±0.8671 m.y.
- 32b. *Armstrong (written commun., 1974)* K-Ar
KFO-1112
Analytical data: K = .938%(2); *Ar⁴⁰ = 1.16222 x 10⁻⁶ cc/gm(2) (Ar_{rad} = 62%).
(whole rock) 42.8±.6 m.y.
33. *Walker and others (1974)* K-Ar
DAS-66-195
John Day Formation, ash-flow tuff (44°41.9'N, 120°36.1'W; Horse Heaven 7½' quad., Jefferson Co., OR). *Analytical data*: K₂O = 7.06%(2); *Ar⁴⁰ = 38.07 x 10⁻¹¹ moles/gm (Ar_{rad} = 74%).
(sanidine) 36.1±1.0 m.y.
- 34a. *Enlows and Parker (1972)* K-Ar
M-859
Diabase dike (44°5'N, 120°11'W; S26, T11S, R21E; W of landing strip; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Parker, Yale Univ. *Analytical data*: K = .8360, .8280, .8250%; Ar⁴⁰/³⁸ = 1.5636, 1.48080. *Method*: c, k, m. *Note*: cuts Cretaceous sedimentary rocks.
(whole rock) 33.4757±1.2738 m.y.
(whole rock) 33.2966±1.2327 m.y.
- 34b. *Armstrong (written commun., 1974)* K-Ar
M-859
Analytical data: K = .830%(3); *Ar⁴⁰ = 1.116 x 10⁻⁶ cc/gm(2) (Ar_{rad} = 26%).
(whole rock) 33.4±0.9 m.y.
- 35a. *Enlows and Parker (1972)* K-Ar
KFO-901
Upper Clarno Formation, andesite flow off Keyes Mountain (44°34'N, 120°7'W; SW¼ S32, T11S, R22E; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Parker. *Analytical data*: K = .1290, .1310%; Ar⁴⁰/³⁸ = .17265, .22100. *Method*: c, k, m.
(whole rock) 35.5886±3.4077 m.y.
(whole rock) 30.0923±4.7059 m.y.
- 35b. *Armstrong (written commun., 1974)* K-Ar
KFO-901
Analytical data: K = .130%; *Ar⁴⁰ = .172 x 10⁻⁶ cc/gm(2) (Ar_{rad} = 8%).
(whole rock) 32.8±3.0 m.y.
36. *Hay (1962)* K-Ar
No. 6
John Day Formation, olivine basalt (44°43.3'N, 120°12.9'W; near NW corner S9, T10S, R21E; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Curtis & Evernden. *Constants*: a, b, c. *Note*: stratigraphic position, lower 110 ft.
31 m.y.

37. *Hay (1962)* K-Ar
 No. 4
 John Day Formation, tuff (44°39.0'N, 120°16.0'W; near center N edge NE corner S1,T11S,R20E; Painted Hill 7½' quad., Wheeler Co., OR). *Analyzer*: Curtis & Evernden. *Constants*: a, b, d. *Note*: stratigraphic position, 165 ft. Sanidine $Or_{65}Ab + An_{35}$.
 (sanidine) 31 m.y.
- 38a₁. *Baksi (1974)* K-Ar
 3-1
 Picture Gorge Basalt. *Analyzer*: Baksi. *Analytical data*: K = .386%; *Ar⁴⁰ = 4.61, 2.55, 2.40, 2.44 x 10⁷ cm³/gm STP. *Constants*: a, b, d.
 (whole rock) 29.2 m.y.
 16.5 m.y.
 15.5 m.y.
 15.8 m.y.
- 38a₂. *Baksi (1974)* K-Ar
 3-1
 Picture Gorge Basalt. *Analyzer*: Baksi. *Analytical data*: K = .386%; *Ar⁴⁰ = 2.41 x 10⁷ cm³/gm STP; mesh size -100. *Constants*: a, b, d.
 (whole rock) 15.6 m.y.
- 38b. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
 3-13-1(i)
 Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer*: Baksi & Watkins. *Analytical data*: K = .386%; *Ar⁴⁰ = 2.41 x 10⁷ cm³/gm STP. *Method*: g, p. *Constants*: a, b, d.
 (whole rock) 15.6±0.4 m.y.
- 39a. *Enlows and Parker (1972)* K-Ar
 EMT-11
 Diabase dike (44°3'N, 120°10'W; S2,T12S,R21E; Nelson Creek; Mitchell 15' quad., Wheeler Co., OR). *Analyzer*: Parker. *Analytical data*: K = .8810, .8750, .8660%; Ar⁴⁰/³⁸ = .52722, .60354. *Method*: c, k, m. *Note*: cuts Cretaceous sedimentary rocks and Upper Clarno flows.
 (whole rock) 29.3317±0.5866 m.y.
 (whole rock) 29.4461±0.5889 m.y.
- 39b. *Armstrong (written commun., 1974)* K-Ar
 EMT-11
Analytical data: K = .874%(3); *Ar⁴⁰ = 1.0034 x 10⁻⁶ cc/gm(2) (Ar_{rad} = 66%).
 (whole rock) 29.4±0.4 m.y.
40. *Walker and others (1974)* K-Ar
 SC-1-70
 Hornblende andesite (45°1.5'N, 118°28.4'W; Fly Valley 7½' quad., Union Co., OR). *Analytical data*: K₂O = .523%; *Ar⁴⁰ = 2.186 x 10⁻¹¹ moles/gm (Ar_{rad} = 67%). *Note*: originally mapped as Clarno Formation.
 (plagioclase) 28.1±0.8 m.y.
- 41a. *Walker (1973)* K-Ar
 Porphyritic rhyodacite flow (45°3.8'N, 118°41.5'W; T6S,R33E; North Fork of Cable Creek; Pearson Ridge 7½' quad., Umatilla Co., OR).
 (anorthoclase) 27.4±1.5 m.y.
- 41b. *Walker and others (1974)* K-Ar
 CC-1
 John Day Formation(?), rhyolite (45°3.8'N, 118°41.5'W; Pearson Ridge 7½' quad., Umatilla Co., OR). *Analytical data*: K₂O = 5.15%(2); *Ar⁴⁰ = 21.02 x 10⁻¹¹ moles/gm (Ar_{rad} = 29%).
 (anorthoclase) 27.4±1.5 m.y.
- 42a. *Walker (1973)* K-Ar
 Rhyodacite flow (S9(?),T5S,R36E; between the Grande Ronde River and Beaver Creek; Little Beaver Creek 7½' quad., Union Co., OR).
 (biotite) 27.0±0.8 m.y.
- 42b. *Walker and others (1974)* K-Ar
 GWW-56-69
 John Day Formation(?), vitrophyre (45°9.2'N, 118°18.5'W; Little Beaver Creek 7½' quad., Union Co., OR). *Analytical data*: K₂O = 7.89%(2); *Ar⁴⁰ = 3.173 x 10⁻¹¹ moles/gm (Ar_{rad} = 89%).
 (biotite) 27.0±0.8 m.y.
- 43a₁. *Baksi (1974)* K-Ar
 1-1(ii)
 Picture Gorge Basalt. *Analyzer*: Baksi. *Analytical data*: K = .436%; *Ar⁴⁰ = 4.70 x 10⁷ cm³/gm STP. *Constants*: a, b, d.
 (whole rock) 26.7 m.y.
- 43a₂. *Baksi (1974)* K-Ar
 1-1(ii)
 Picture Gorge Basalt. *Analyzer*: Baksi. *Analytical data*: K = .436%; *Ar⁴⁰ = 2.79, 2.72 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants*: a, b, d.
 (whole rock) 16.0 m.y.
 15.5 m.y.
- 43a₃. *Baksi (1974)* K-Ar
 1-1(ii)
 Picture Gorge Basalt. *Analyzer*: Baksi. *Analytical data*: K = .436%; *Ar⁴⁰ = 2.71 x 10⁷ cm³/gm STP; mesh size -100. *Constants*: a, b, d.
 (whole rock) 15.5 m.y.
- 43b. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
 1-15-1(i)
 Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer*: Baksi & Watkins. *Analytical data*: K = .436%; *Ar⁴⁰ = 2.74 x 10⁷ cm³/gm STP. *Method*: g, p. *Constants*: a, b, d.
 (whole rock) 15.7±0.3 m.y.

44. *Hay (1962)* K-Ar
No. 1
John Day Formation, tuff (44°40'N, 120°14'W; SW corner S29,T10S,R21E; Mitchell 15' quad., Wheeler Co., OR). *Analyzer:* Curtis & Evernden. *Constants:* a, b, d. *Note:* stratigraphic position, about 1550 ft. (albite) 25 m.y.
45. *Hay (1962)* K-Ar
No. 2
John Day Formation, obsidian (44°39.3'N, 120°15.4'W; C N½ SW¼ S31,T10S,R21E; Painted Hills 7½' quad., Wheeler Co., OR). *Analyzer:* Curtis & Evernden. *Constants:* a, b, d. *Note:* stratigraphic position about 1145 ft. (obsidian) 25 m.y. (obsidian) 24 m.y.
46. *Hay (1963)* K-Ar
John Day Formation, altered pumice (44°41.4'N, 120°4.5'W; S edge NW¼ S22,T10S,R22E; Mitchell 15' quad., Wheeler Co., OR). *Note:* collected 30-50 ft above base of ignimbrite. (celadonite) 24±2.4 m.y.
47. *Hay (1962)* K-Ar
No. 3
John Day Formation, tuff (44°42.1'N, 120°16.0'W; NE¼ SE¼ S13,T10S,R20E, Painted Hills 7½' quad., Wheeler Co., OR). *Analyzer:* Curtis & Evernden. *Constants:* a, b, d. *Note:* stratigraphic position, 835 ft. (sanidine) 24 m.y.
48. *Hay (1962)* K-Ar
No. 5
John Day Formation (44°39.0'N, 120°16.9'W; near SW corner S36,T10S,R20E; Painted Hills 7½' quad., Wheeler Co., OR). *Analyzer:* Curtis & Evernden. *Constants:* a, b, d. *Note:* stratigraphic position, 65 ft. Authigenic orthoclase. (orthoclase) 22 m.y.
- 49a₁. *Baksi (1974)* K-Ar
8-2(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .495%; *Ar⁴⁰ = 4.17, 4.10, 3.99, 3.94, 3.27 x 10⁷ cm³/gm STP. *Constants:* a, b, d. (whole rock) 21.0 m.y.
20.6 m.y.
20.1 m.y.
19.8 m.y.
16.5 m.y.
- 49a₂. *Baksi (1974)* K-Ar
8-2(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .495%; *Ar⁴⁰ = 3.20, 3.18 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants:* a, b, d. (whole rock) 16.1 m.y. (whole rock) 16.0 m.y.
- 49a₃. *Baksi (1974)* K-Ar
8-2(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .495%; *Ar⁴⁰ = 3.16, 3.12 x 10⁷ cm³/gm STP; mesh size -100. *Constants:* a, b, d. (whole rock) 15.9 m.y. (whole rock) 15.7 m.y.
- 49b. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
8-8-2(i)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = .495%; *Ar⁴⁰ = 3.16 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d. (whole rock) 15.9±0.2 m.y.
50. *Armstrong and others (1975)* K-Ar
M-9
Deschutes Formation, basalt lava interbedded in Deschutes Formation (44°38'22"N. 121°16'06"W; 1600 ft elev. W wall of Deschutes River canyon, 2.5 mi N of Round Butte Dam; Seekseequa Junction 7½' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, Armstrong, Yale Univ. *Analytical data:* K = .223%; *Ar⁴⁰ = .1282 x 10⁻⁶ cc/gm (Ar_{rad} = 3.1%), .1564 x 10⁻⁶ cc/gm (Ar_{rad} = 4.1%). *Methods:* a, i, j, k. *Constants:* a, b, d. *Note:* near stratigraphic base of Deschutes Formation. (whole rock) 15.9±3.0 m.y.
- 51a. *Baksi (1974)* K-Ar
13-2(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .475%; *Ar⁴⁰ = 3.03, 3.02 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants:* a, b, d. (whole rock) 15.9 m.y. (whole rock) 15.8 m.y.
- 51b. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
13-3-2(i)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = .475%; *Ar⁴⁰ = 3.03 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d. (whole rock) 15.9±0.3 m.y.
52. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
2-2-2(ii)
Cow Canyon, flow 2, basalt (44°51'N, 120°54'W; Willowdale 15' quad., Wasco Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = 2.75%; *Ar⁴⁰ = 17.0 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d. (whole rock) 15.4±0.3 m.y.
53. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)

- 8-9-1(i)
Cow Canyon, flow 8, basalt (44°51'N, 120°54'W; Willowdale 15' quad., Wasco Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = 1.47%; *Ar⁴⁰ = 9.05 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 15.3±0.3 m.y.
54. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
19-2(ii)
Imnaha, flow 19, Hat Point section, basalt (45°32'N, 116°47'W; Imnaha 15' quad., Wallowa Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = 1.42%; *Ar⁴⁰ = 8.69 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 15.3±0.3 m.y.
55. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
8-2(i)
Imnaha, flow 8, Hat Point section, basalt (45°32'N, 116°47'W; Imnaha 15' quad., Wallowa Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = 1.24%; *Ar⁴⁰ = 7.55 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 15.2±0.3 m.y.
- 56a₁. *Baksi (1974)* K-Ar
5-2(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .656%; *Ar⁴⁰ = 4.00 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants:* a, b, d.
(whole rock) 15.2 m.y.
- 56a₂. *Baksi (1974)* K-Ar
5-2(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .656%; *Ar⁴⁰ = 3.96 x 10⁷ cm³/gm STP. *Constants:* a, b, d.
(whole rock) 15.1 m.y.
- 56a₃. *Baksi (1974)* K-Ar
5-2
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .658%; *Ar⁴⁰ = 3.88, 3.81 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants:* a, b, d.
(whole rock) 14.7 m.y.
(whole rock) 14.4 m.y.
- 56a₄. *Baksi (1974)* K-Ar
5-2
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .658%; *Ar⁴⁰ = 3.80 x 10⁷ cm³/gm STP; mesh size -100. *Constants:* a, b, d.
(whole rock) 14.4 m.y.
- 56a₅. *Baksi (1974)* K-Ar
5-2
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .658%; *Ar⁴⁰ = 3.71 x 10⁷ cm³/gm STP; *Constants:* a, b, d.
(whole rock) 14.1 m.y.
- 56b₁. *Baksi and Watkins (1973)* K-Ar
5-11-2(i)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = .658%; *Ar⁴⁰ = 3.83 x 10⁷ cm³/gm STP. *Constants:* a, b, d.
(whole rock) 14.5 m.y.
- 56b₂. *Baksi and Watkins (1973)* K-Ar
5-11-2(ii)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = .656%; *Ar⁴⁰ = 4.00 x 10⁷ cm³/gm STP. *Constants:* a, b, d.
(whole rock) 14.2 m.y.
- 56c. *Watkins and Baksi (1974)* K-Ar
5-2
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer:* Watkins & Baksi. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 14.7±0.3 m.y.
- 57a. *Baksi (1974)* K-Ar
14-1
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .632%; *Ar⁴⁰ = 3.80, 3.75 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants:* a, b, d.
(whole rock) 15.0 m.y.
(whole rock) 14.8 m.y.
- 57b. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
14-2-1(i)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* K = .632%; *Ar⁴⁰ = 3.78 x 10⁷ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 14.9±0.3 m.y.
- 58a₁. *Baksi (1974)* K-Ar
4-1(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .470%; *Ar⁴⁰ = 2.80 x 10⁷ cm³/gm STP; mesh size 10-30. *Constants:* a, b, d.
(whole rock) 14.9 m.y.
- 58a₂. *Baksi (1974)* K-Ar
4-1(i)
Picture Gorge Basalt. *Analyzer:* Baksi. *Analytical data:* K = .470%; *Ar⁴⁰ = 2.79 x 10⁷ cm³/gm STP; mesh size -100. *Constants:* a, b, d.
(whole rock) 14.8 m.y.

- 58a₃. *Baksi (1974)* K-Ar
4-1(i)
Picture Gorge Basalt. *Analyzer: Baksi. Analytical data: K = .470%; *Ar⁴⁰ = 12 x 10⁷ cm³/gm STP. Constants: a, b, d.*
(whole rock) 65 m.y.
- 58b₁. *Baksi (1974)* K-Ar
4-1(ii)
Picture Gorge Basalt. *Analyzer: Baksi. Analytical data: K = .451%; *Ar⁴⁰ = 2.65, 2.64 x 10⁷ cm³/gm STP; mesh size 10-30. Constants: a, b, d.*
(whole rock) 14.7 m.y.
(whole rock) 14.6 m.y.
- 58b₂. *Baksi (1974)* K-Ar
4-1(ii)
Picture Gorge Basalt. *Analyzer: Baksi. Analytical data: K = .451%; *Ar⁴⁰ = 10, 9.3, 6.9 x 10⁷ cm³/gm STP. Constants: a, b, d.*
(whole rock) 55 m.y.
(whole rock) 51 m.y.
(whole rock) 38 m.y.
- 58c₁. *Baksi (1974)* K-Ar
4-2(ii)
Picture Gorge Basalt. *Analyzer: Baksi. Analytical data: K = .426%; *Ar⁴⁰ = 2.52 x 10⁷ cm³/gm STP; mesh size 10-30. Constants: a, b, d.*
(whole rock) 14.7 m.y.
- 58c₂. *Baksi (1974)* K-Ar
4-2(ii)
Picture Gorge Basalt. *Analyzer: Baksi. Analytical data: K = .426%; *Ar⁴⁰ = 2.47 x 10⁷ cm³/gm STP; mesh size -100. Constants: a, b, d.*
(whole rock) 14.5 m.y.
- 58c₃. *Baksi (1974)* K-Ar
4-2(ii)
Picture Gorge Basalt. *Analyzer: Baksi. Analytical data: K = .426%; *Ar⁴⁰ = 4.07 x 10⁷ cm³/gm STP. Constants: a, b, d.*
(whole rock) 23.8 m.y.
- 58d₁. *Baksi and Watkins (1973)* K-Ar
4-12-1(i)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer: Baksi & Watkins. Analytical data: K = .470%; *Ar⁴⁰ = 2.80 x 10⁷ cm³/gm STP. Constants: a, b, d.*
(whole rock) 14.9 m.y.
- 58d₂. *Baksi and Watkins (1973)* K-Ar
4-12-1(i)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer: Baksi & Watkins. Analytical data: K = .451%; *Ar⁴⁰ = 2.65 x 10⁷ cm³/gm STP. Constants: a, b, d.*
(whole rock) 14.7 m.y.
- 58d₃. *Baksi and Watkins (1973)* K-Ar
4-12-2(ii)
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer: Baksi & Watkins. Analytical data: K = .426%; *Ar⁴⁰ = 2.50 x 10⁷ cm³/gm STP. Constants: a, b, d.*
(whole rock) 14.6 m.y.
- 58e. *Watkins and Baksi (1974)* K-Ar
4-1
Picture Gorge Basalt (44°31'N, 119°37'W; Picture Gorge 15' quad., Grant Co., OR). *Analyzer: Baksi & Watkins. Method: g, p. Constants: a, b, d.*
(whole rock) 14.7±0.2 m.y.
59. *Walker and others (1974)* K-Ar
BR-1-70
Dinner Creek Tuff(?), ash-flow tuff (44°34.5'N, 118°12.8'W; Canyon City 1:250,000 sheet; Baker Co., OR). *Analytical data: K₂O = .925%; *Ar⁴⁰ = 1.995 x 10⁻¹¹ moles/gm (Ar_{rad} = 81%).*
(plagioclase) 14.5±0.4 m.y.
60. *Walker and others (1974)* K-Ar
GWW-68-69
Dooley Rhyolite Breccia, rhyolite intrusive (44°34.7'N, 117°48.3'W; Dooley Mtn 7½' quad., Baker Co., OR). *Analytical data: K₂O = 1.296%; *Ar⁴⁰ = 2.747 x 10⁻¹¹ moles/gm (Ar_{rad} = 74%).*
(plagioclase) 14.3±0.4 m.y.
61. *Walker and others (1974)* K-Ar
GWW-22-69
Dinner Creek Tuff(?), ash-flow tuff (44°19.7'N, 118°8.5'W; Canyon City 1:250,000 sheet, Baker Co., OR). *Analytical data: K₂O = 1.837%; *Ar⁴⁰ = 3.485 x 10⁻¹¹ moles/gm (Ar_{rad} = 75%).*
(plagioclase) 14.1±0.4 m.y.
62. *Walker and others (1974)* K-Ar
GWW-16-69
Strawberry Volcanics, rhyolite (44°0.9'N, 118°50.5'W; Seneca 15' quad., Grant Co., OR). *Analytical data: K₂O = .525%; *Ar⁴⁰ = .948 x 10⁻¹¹ moles/gm (Ar_{rad} = 49%).*
(plagioclase) 12.2±0.4 m.y.
63. *Greene and others (1972)* K-Ar
Walker (1974)
Walker and others (1974)
RCG-61-1-65
Welded tuff of Twelvemile Table, ash-flow tuff (43°48.1'N, 120°1.2'W; E side of Hampton Butte; Crescent 1:250,000 sheet, Crook Co., OR). *Analyzer: Engels & Lanphere. Analytical data: K₂O = 6.76%; *Ar⁴⁰ = 9.298 x 10⁻¹¹ moles/gm (Ar_{rad} = 92%).*
(alkali feldspar) 9.29±0.23 m.y.
64. *Walker (1974)* K-Ar
Walker and others (1974)

- RCG-106-1-65*
Ash-flow tuff (43°48'N, 120°0.6'W; Crescent 1:250,000 sheet, Crook Co., OR). *Analyzer:* Schlocker, Kistler, Lanphere, Von Essen, & McKee. *Analytical data:* K₂O = 6.90%; *Ar⁴⁰ = 9.252 x 10⁻¹¹ moles/gm (Ar_{rad} = 88%).
(alkali feldspar) 9.05±0.28 m.y.
65. *Walker and others (1974)* K-Ar
GWW-123-64
Basalt (43°53'N, 120°47.4'W; West Butte 7½' quad., Deschutes Co., OR). *Analytical data:* K₂O = .34%; *Ar⁴⁰ = 33.1 x 10⁻¹¹ moles/gm (Ar_{rad} = 26%).
(plagioclase) 6.6±2.0 m.y.
66. *Greene and others (1972)* K-Ar
Walker and others (1974)
RCG-102-66
Basalt of Twelvemile Table (43°58.8'N, 119°54.1'W; Twelvemile Table; Burns 1:250,000 sheet, Crook Co., OR). *Analyzer:* Von Essen. *Analytical data:* K₂O = .306%; *Ar⁴⁰ = .268 x 10⁻¹¹ moles/gm (Ar_{rad} = 16%).
(whole rock) 5.92±0.41 m.y.
67. *Armstrong and others (1975)* K-Ar
M-8
Deschutes Formation, basalt lava interbed in Deschutes Formation (44°31'22"N, 121°18'01"W; 2050 ft elev., road cut 0.2 mi S of Deschutes Arm Bridge over Lake Chinook, 12 mi SW of Madras; Round Butte Dam 7½' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, & Armstrong, Yale Univ. *Analytical data:* K = .120%; *Ar⁴⁰ = .0244 x 10⁻⁶ cc/gm (Ar_{rad} = 2.6%), .0313 x 10⁻⁶ cc/gm (Ar_{rad} = 7.8%). *Method:* a, i, j, k. *Constants:* a, b, d. *Note:* unit lies 550 stratigraphic feet below M-2 [VII. 68].
(whole rock) 5.8±1.0 m.y.
68. *Armstrong and others (1975)* K-Ar
M-2
Olivine basalt (44°31'02"N, 121°18'32"W; lava, W rim of Deschutes Canyon, 2600 ft elev., 0.8 mi SW of Deschutes Arm Bridge over Lake Chinook, 12 mi SW of Madras; Round Butte Dam 7½' quad., Jefferson Co., OR). *Analyzer:* Hales, Parker, Taylor, & Armstrong, Yale Univ. *Analytical data:* K = .265%; *Ar⁴⁰ = .0573 x 10⁻⁶ cc/gm (Ar_{rad} = 6%), .0454 x 10⁻⁶ cc/gm (Ar_{rad} = 9.6%). *Method:* a, i, j, k. *Constants:* a, b, d.
(whole rock) 4.9±0.5 m.y.
69. *Walker and others (1974)* K-Ar
GWW-121-64
Ash-flow tuff (43°47.8'N, 120°22.8'W; Crescent 1:250,000 sheet, Crook Co., OR). *Analytical data:* (plagioclase) K₂O = .62%; *Ar⁴⁰ = .335 x 10⁻¹¹ moles/gm (Ar_{rad} = 59%); (glass) K₂O = 3.65%; *Ar⁴⁰ = 1.93 x 10⁻¹¹ moles/gm (Ar_{rad} = 71%).
(plagioclase) 3.6±0.6 m.y.
(glass) 3.6±0.2 m.y.
- ## VIII. HIGH LAVA PLAINS
- Harrold (1972)* K-Ar
YU-P-1
Andesite porphyry (42°06'30"N, 118°37'18"W; S8, T40S, R35E; 11.1 mi SE of Fields; Adel 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* K = 3.61, 3.60, 3.64%; *Ar⁴⁰ = 15.90 x 10⁻⁶ cc/gm (Ar_{rad} = 92%), 16.11 x 10⁻⁶ cc/gm (Ar_{rad} = 82%). *Constants:* a, b, d. *Note:* subjected to low-grade regional metamorphism.
(plagioclase) 108±1.5 m.y.
 - Harrold (1972)* K-Ar
YU-P-156-1
Metaquartz diorite (42°7'30"N, 118°37'45"W; 9.9 mi SE of Fields; Adel 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* K = 3.63%; *Ar⁴⁰ = 14.82 x 10⁻⁶ cc/gm (Ar_{rad} = 80%). *Constants:* a, b, d. *Note:* subjected to low-grade metamorphism.
(whole rock) 100±2.0 m.y.
 - Denison (1970)* K-Ar
Core 9576-9579
Andesite (42°08'N, 120°20'W; S2, T40S, R20E; Humble Oil & Refining Co. "Leavitt No. 1", core 9576-9579 ft; Lakeview NE 7½' quad., Lake Co., OR). *Analyzer:* Denison.
83.4±2 m.y.
79.8±4 m.y.
 - Harrold (1972)* K-Ar
YU-P-156
Aplite (42°7'30"N, 118°37'45"W; 9.9 mi SE of Fields; Adel 1:250,000 Sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* K = 8.72, 8.63%; *Ar⁴⁰ = 20.94 x 10⁻⁶ cc/gm (Ar_{rad} = 84%). *Constants:* a, b, d. *Note:* the low age probably due to considerable post-emplacement loss of radiogenic Ar from K-feldspar.
(microcline microperthite) 59.5±1.2 m.y.
 - Muntzert and Field (1968)* K-Ar
Quartz monzonite (Brattain district, Paisley Mountains).
33 m.y.
 - Armstrong and others (1976)* K-Ar
YU-JM-291
Adamellite (42°37'40"N, 120°32'0"W; NE¼ S13, T34S, R18E; E flank of Paisley Mountains, 10 km S of Paisley; Paisley 7½' quad., Lake Co., OR). *Analyzer:* Armstrong & Taylor, Yale Univ. *Analytical data:* (hornblende) K = 1.27, 1.26%; *Ar⁴⁰ = 1.71 x 10⁻⁶ cc/gm (Ar_{rad} = 29%); (biotite) K = 5.54, 5.45%; *Ar⁴⁰ = 7.23 x 10⁻⁶ cc/gm (Ar_{rad} = 50%), 7.23 x

5b.(continued)

10^{-6} cc/gm ($A_{\text{rad}} = 57\%$). *Method*: a, k. *Constants*: a, b, d.

(hornblende) 33.6 ± 1.0 m.y.
(biotite) 32.6 ± 1.0 m.y.

6. Denison (1970)

K-Ar

Cuttings 11840-11850

Basalt ($42^{\circ}24'N$, $120^{\circ}18'E$; S18,T36S,R20E; Humble Oil & Refining Co., 'Thomas Creek No. 1', cuttings 11840-11850 ft; Valley Falls $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer*: Denison.

30.3 ± 1.4 m.y.

29.7 ± 1.8 m.y.

7. Noble and others (1974)

K-Ar

GWW-3-60

Pantellerite lava (Hart Lake $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer*: K - Schlocker, Ar - McKee. *Analytical data*: K = 4.89%; $*Ar^{40} = 1.999 \times 10^{-10}$ moles/gm ($A_{\text{rad}} = 72.66\%$); K = 4.95%; $*Ar^{40} = 1.999 \times 10^{-10}$ moles/gm ($A_{\text{rad}} = 63.33\%$). *Method*: e, q. *Constants*: a, c, d.

(anorthoclase) 27.5 ± 0.8 m.y.

(anorthoclase) 27.1 ± 0.8 m.y.

8. Noble and others (1974)

K-Ar

GWW-4-60

Pantellerite lava (Hart Lake $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer*: K - Schlocker, Ar - McKee. *Analytical data*: K = 4.87%; $*Ar^{40} = 1.811 \times 10^{-10}$ moles/gm ($A_{\text{rad}} = 74.52\%$). *Method*: e, q. *Constants*: a, c, d.

(anorthoclase) 25.0 ± 0.8 m.y.

9. Greene and others (1972)

K-Ar

*Walker and others (1974)**RCG-166-68*

Andesite ($43^{\circ}52.2'N$, $118^{\circ}55.8'W$; W of Calamity Butte; Calamity Butte $15'$ quad., Harney Co., OR). *Analyzer*: Engels. *Analytical data*: $K_2O = .406\%$; $*Ar^{40} = 1.167 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 59\%$).

(plagioclase) 19.4 ± 0.8 m.y.

10. Walker and others (1974)

K-Ar

BC-1-64

Vitrophyre ($42^{\circ}22.8'N$, $117^{\circ}39.4'W$; Jordan Valley 1:250,000 sheet, Malheur Co., OR). *Analytical data*: (sanidine) $K_2O = 9.16\%$; $*Ar^{40} = 21.80 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 51\%$); (glass) $K_2O = 5.70\%$; $*Ar^{40} = 11.40 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 84\%$).

(sanidine) 16.0 ± 0.8 m.y.

(glass) 13.5 ± 0.6 m.y.

11. McKee and others (1975)

Rhyolite ash flows (McDermitt Caldera). *Note*: age of first ash-flows from McDermitt center.

17.5 m.y.

12. Dalrymple and others (1967)

K-Ar

W17

Rhyolite tuff ($42^{\circ}22.9'N$, $118^{\circ}3.2'W$; 2.4 km S of Ranch 4525, 30 mi E of Twelvemile Creek at elev. 4800 ft; Adel 1:250,000 sheet, Malheur Co., OR). *Analyzer*: Davis & Schlocker. *Analytical data*: $K_2O = 7.19, 7.36\%$; $*Ar^{40} = 17.09 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 80.0\%$); $*Ar^{40} = 17.05 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 83.7\%$); $*Ar^{40}/^{40}K = 9.288$. *Method*: e, k, n.

(sanidine) 15.81 ± 0.40 m.y.

13. Greene and others (1972)

K-Ar

*Walker and others (1974)**RCG-185-67*

Steens Basalt ($43^{\circ}04.7'N$, $118^{\circ}23.4'W$; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Von Essen. *Analytical data*: $K_2O = .262\%$; $*Ar^{40} = .593 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 39\%$).

(plagioclase) 15.3 ± 1.0 m.y.

14. Baksi and Watkins (1973)

K-Ar

*Watkins and Baksi (1974)**11-6*

Steens Basalt ($42^{\circ}40'N$, $118^{\circ}33'W$; Wildhorse Lake $7\frac{1}{2}'$ quad., Harney Co., OR). *Analyzer*: Baksi & Watkins. *Analytical data*: K = 1.61%; $*Ar^{40} = 9.89 \times 10^{-7}$ cm³/gm STP. *Method*: g, p. *Constants*: a, b, d.

(whole rock) 15.3 m.y.

15. Walker and others (1974)

K-Ar

DC-2-70

Dinner Creek Tuff, ash-flow tuff ($43^{\circ}47.7'N$, $117^{\circ}54.1'W$; Westfall Butte $15'$ quad., Malheur Co., OR). *Analytical data*: $K_2O = 1.482\%$; $*Ar^{40} = 3.283 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 73\%$). *Note*: probably same unit as Walker and others (1974) GWW-22-69 [VII. 61] and GWW-36-69 [VIII. 19].

(plagioclase) 14.9 ± 0.4 m.y.

16. MacLeod and others (1975)

K-Ar

*McKee and others (1976)**Col. no. 46**M4-114*

Silicic dome ($43^{\circ}38.9'N$, $118^{\circ}37.3'W$; Buchanan; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: McKee. *Analytical data*: $K_2O = 7.94\%$; $*Ar^{40} = 1.7360 \times 10^{-10}$ moles/gm ($A_{\text{rad}} = 49.9\%$). *Method*: e, q. *Constants*: a, c, d.

(sanidine) 14.74 ± 0.50 m.y.

17a. MacLeod and others (1975)

K-Ar

Col. no. 47

Rhyolitic dome ($43^{\circ}22.5'N$, $119^{\circ}52.2'W$; Wagontire Mountain; Burns 1:250,000 sheet, Harney Co., OR).

14.71 ± 1.10 m.y.

17b. McKee and others (1976)

K-Ar

M3-88

Silicic dome complex ($43^{\circ}22.5'N$, $119^{\circ}52.2'W$;

- Wagontire Mountain; Harney Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = .584\%$; $*Ar^{40} = 1.2739 \times 10^{-11}$ moles/gm ($Ar_{rad} = 29.1\%$). *Method:* e, q. *Constants:* a, c, d.
14.70±1.10 m.y.
18. *Walker and Repenning (1965)* K-Ar
G. T. James (oral commun., 1963)
Basalt (Adel 1:250,000 sheet).
14.5 m.y.
19. *Walker and others (1974)* K-Ar
GWW-36-69
Dinner Creek Tuff(?), ash-flow tuff (44°4.5'N, 118°10.6'W; Castle Rock 15' quad., Malheur Co., OR). *Analytical data:* $K_2O = 1.770\%$; $*Ar^{40} = 3.763 \times 10^{-10}$ moles/gm ($Ar_{rad} = 72\%$). *Note:* possibly same unit as Walker and others (1974) DC-2-70 [VIII. 15].
(plagioclase) 14.3±0.4 m.y.
20. *McKee and others (1975)* K-Ar
Rhyolite dome (in McDermitt Caldera). *Note:* probably represents last volcanic activity in McDermitt center.
13.7±2 m.y.
21. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
16-1(ii)
16-2(ii)
Owyhee Ridge, flow 16, basalt (43°37'N, 117°17'W; The Elbow 7½' quad., Malheur Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* $K = .895\%$; $*Ar^{40} = 4.90 \times 10^7$ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 13.6±0.3 m.y.
22. *Dalrymple and others (1967)* K-Ar
W-18
Rhyolite tuff (42°23.0'N, 117°39.7'W; 100 m E of ranch on Battle Creek; Jordan Valley 1:250,000 sheet, Malheur Co., OR). *Analyzers:* Davis & Schlocker. *Analytical data:* $K_2O = 8.51, 8.63\%$; $*Ar^{40} = 17.49 \times 10^{-11}$ moles/gm ($Ar_{rad} = 79.2\%$); $*Ar^{40} = 16.95 \times 10^{-11}$ moles/gm ($Ar_{rad} = 77.5\%$); $*Ar^{40}/^{40}K = 7.960$. *Method:* e, k, n.
(sanidine) 13.56±0.28 m.y.
23. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 45
M4-117
Rhyolite dome (42°6.8'N, 119°7.5'W; Hawkes Valley; Acty Mtn 7½' quad., Harney Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 7.26\%$; $*Ar^{40} = 1.4513 \times 10^{-10}$ moles/gm ($Ar_{rad} = 64.9\%$). *Method:* e, q. *Constants:* a, c, d.
(sanidine) 13.48±0.23 m.y.
24. *Baksi and Watkins (1973)* K-Ar
Watkins and Baksi (1974)
5-1(i)
Owyhee Ridge, flow 5, basalt (43°37'N, 117°17'W; The Elbow 7½' quad., Malheur Co., OR). *Analyzer:* Baksi & Watkins. *Analytical data:* $K = 1.04\%$; $*Ar^{40} = 5.58 \times 10^7$ cm³/gm STP. *Method:* g, p. *Constants:* a, b, d.
(whole rock) 13.4±0.3 m.y.
25. *Walker and others (1974)* K-Ar
GWW-68-62
Welded tuff (42°8.8'N, 118°10.5'W; Adel 1:250,000 sheet; Malheur Co., OR). *Analytical data:* $K_2O = 7.01\%$; $*Ar^{40} = 13.67 \times 10^{-11}$ moles/gm ($Ar_{rad} = 85\%$).
(alkali feldspar) 13.1 m.y.
26. *Greene and others (1972)* K-Ar
Walker and others (1974)
RCG-162-66
Basalt (43°54.0'N, 119°30.2'W; Delintment Lake 15' quad., Harney Co., OR). *Analyzer:* Engels. *Analytical data:* $K_2O = .152\%$; $*Ar^{40} = .264 \times 10^{-11}$ moles/gm ($Ar_{rad} = 4\%$). *Note:* underlies welded tuff of Devine Canyon.
(plagioclase) 11.8±5.1 m.y.
27. *Walker and others (1974)* K-Ar
KA 392
Rome Beds(?) ash bed (42°58'N, 117°35'W; Arock 7½' quad., Malheur Co., OR). *Analytical data:* $K_2O = 4.89\%$; ($Ar_{rad} = 79\%$).
(glass) 10.5±0.4 m.y.
- 28a. *MacLeod and others (1975)* K-Ar
Col. no. 44
Rhyolitic dome (42°25.5'N, 119°18.8'W; Beatys Butte; Harney Co., OR).
10.37±0.53 m.y.
- 28b. *McKee and others (1976)* K-Ar
M073-43
Silicic dome complex (42°25.5'N, 119°18.8'W; Beatys Butte; Beatys Butte 7½' quad., Harney Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 4.81\%$; $*Ar^{40} = 7.3861 \times 10^{-11}$ moles/gm ($Ar_{rad} = 37.0\%$). *Method:* e, q. *Constants:* a, c, d.
(obsidian) 10.36±0.53 m.y.
29. *Walker (1974)* K-Ar
Walker and others (1974)
RCG-281-1-67
Rhyodacite (43°12.2'N, 118°7.5'W; Duck Butte; Boise 1:250,000 sheet, Malheur Co., OR). *Analyzer:* K - Schlocker, Ar - Kistler, Lanphere, Von Essen, & McKee. *Analytical data:* (biotite) $K_2O = 7.75\%$; $*Ar^{40} = 11.52 \times 10^{-11}$ moles/gm ($Ar_{rad} = 51\%$); (plagioclase) $K = .754\%$; $*Ar^{40} = 1.066 \times 10^{-11}$

29. (continued)
moles/gm ($Ar_{rad} = 32\%$).
(biotite) 10.0 ± 0.4 m.y.
(plagioclase) 9.6 ± 0.6 m.y.
30. Walker (1974) K-Ar
Walker and others (1974)
GWW-140-61
Welded tuff of Devine Canyon, ash-flow tuff ($42^\circ 35.6'N$, $119^\circ 16.5'W$; Guano Reservoir $7\frac{1}{2}'$ quad., Harney Co., OR). *Analyzer*: Schlocker, Kistler, Lanphere, Von Essen, & McKee. *Analytical data*: (alkali feldspar) $K_2O = 6.67\%$; $*Ar^{40} = 9.872 \times 10^{-11}$ moles/gm ($Ar_{rad} = 56\%$); (glass) $K_2O = 5.32\%$; $*Ar^{40} = 7.160 \times 10^{-11}$ moles/gm ($Ar_{rad} = 36\%$). *Note*: same unit as Dalrymple and others (1967) W-16 [VIII. 35].
(alkali feldspar) 10.3 ± 0.3 m.y.
(glass) 9.1 ± 0.3 m.y.
31. Greene and others (1972) K-Ar
Welded tuff of Devine Canyon ($42^\circ 35'N$, $119^\circ 17'W$; W edge Catlow Valley; Guano Reservoir $7\frac{1}{2}'$ quad., Harney Co., OR). *Analyzer*: Kistler & Walthall. *Note*: mapped as welded tuff member of Drewsey Formation by Bowen, Gray, and Gregory (Shotwell, 1963) [Laursen and Hammond (1974), VIII. 22a and 22b, p. 31].
 9.7 ± 0.3 m.y.
32. Walker and Repenning (1965) K-Ar
Kistler, oral commun., 1963
Welded tuff (Adel 1:250,000 sheet). Mapped as unit Tst.
 9.7 m.y.
33. Greene and others (1972) K-Ar
Walker (1974)
Walker and others (1974)
GWW-16-65
Welded tuff of Devine Canyon, ash-flow tuff ($43^\circ 41.7'N$, $119^\circ 54.1'W$; near Swamp Creek; Burns 1:250,000 sheet, Deschutes Co., OR). *Analyzer*: Engels & Lanphere. *Analytical data*: $K_2O = 6.65\%$; $*Ar^{40} = 9.306 \times 10^{-11}$ moles/gm ($Ar_{rad} = 75\%$). *Note*: mapped as welded tuff member of Drewsey Formation by Bowen, Gray, and Gregory (Shotwell, 1963) [Laursen and Hammond (1974) VIII. 22a and 22b, p. 31].
(alkali feldspar) 9.45 ± 0.21 m.y.
34. Greene and others (1972) K-Ar
Walker (1974)
Walker and others (1974)
RCG-248-66
Welded tuff of Devine Canyon, ash-flow tuff ($43^\circ 45.5'N$, $118^\circ 59.9'W$; Devine Canyon; Calamity Butte $15'$ quad., Harney Co., OR). *Analyzer*: Von Essen. *Analytical data*: $K_2O = 7.12\%$; $*Ar^{40} = 9.710 \times 10^{-11}$ moles/gm ($Ar_{rad} = 15\%$). *Note*: mapped as welded tuff member of Drewsey Formation by Bowen, Gray, and Gregory (Shotwell, 1963) [Laursen and Hammond (1974) VIII. 22a and 22b, p. 31].
(sanidine) 9.21 ± 0.50 m.y.
35. Dalrymple and others (1967) K-Ar
W16
Drewsey Formation, welded tuff (lowest member) ($43^\circ 47.0'N$, $118^\circ 16.6'W$; NE $\frac{1}{4}$ SW $\frac{1}{4}$ S34,T20S, R36E; 150 m N30E from Drinkwater Pass; Drewsey $15'$ quad., Harney Co., OR). *Analyzer*: Davis & Schlocker. *Analytical data*: $K_2O = 7.26, 7.24\%$; $*Ar^{40} = 9.890 \times 10^{-11}$ moles/gm ($Ar_{rad} = 81.3\%$); $*Ar^{40} = 9.763 \times 10^{-11}$ moles/gm ($Ar_{rad} = 81.1\%$); $*Ar^{40}/^{40}K = 5.366$. *Method*: e, k, n.
(sanidine) 9.15 ± 0.19 m.y.
36. Parker and Armstrong (1972) K-Ar
YU-DP-300
Danforth Formation, basalt ($43^\circ 03'06''N$, $119^\circ 04'18''W$; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Parker. *Analytical data*: $K = .341, .348\%$; $*Ar^{40} = .124 \times 10^{-6}$ cc/gm ($Ar_{rad} = 4\%$); $.119 \times 10^{-6}$ cc/gm ($Ar_{rad} = 5\%$). *Method*: b, k, o. *Constants*: a, b, d.
(whole rock) 8.8 ± 1.4 m.y.
37. Parker and Armstrong (1972) K-Ar
YU-DP-311B
Prater Creek Member, Danforth Formation, rhyolite welded tuff ($43^\circ 09'03''N$, $119^\circ 22'23''W$; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Parker. *Analytical data*: $K = 3.73, 3.76\%$; $*Ar^{40} = 1.26 \times 10^{-6}$ cc/gm ($Ar_{rad} = 42\%$). *Method*: b, k, o. *Constants*: a, b, d.
(whole rock) 8.6 ± 0.2 m.y.
38. Greene and others (1972) K-Ar
Walker (1974)
Walker and others (1974)
GWW-176-62
Welded tuff of Devine Canyon, ash-flow tuff ($43^\circ 00.6'N$, $118^\circ 38.1'W$; Burns 1:250,000 sheet; Harney Co., OR). *Analyzer*: Kistler, Whitehead, Schlocker. *Analytical data*: $K_2O = 7.15\%$; $*Ar^{40} = 8.978 \times 10^{-11}$ moles/gm ($Ar_{rad} = 61\%$). *Note*: same unit as Dalrymple and others (1967) W-16 [VIII. 35]. Mapped as welded tuff member of Drewsey Formation by Bowen, Gray, and Gregory (Shotwell, 1963) [Laursen and Hammond (1974) VIII. 22a and 22b, p. 31].
(alkali feldspar) 8.5 ± 0.3 m.y.
39. Parker and Armstrong (1972) K-Ar
YU-DP-146
Danforth Formation, rhyolite ($43^\circ 13'30''N$, $119^\circ 21'11''W$; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Parker. *Analytical data*: $K = 4.26, 4.26\%$;

- *Ar⁴⁰ = 1.41 x 10⁻⁶ cc/gm (Ar_{rad} = 4%), 1.45 x 10⁻⁶ cc/gm (Ar_{rad} = 5%). *Method*: b, k, o. *Constants*: a, b, d.
(whole rock) 8.4±1.3 m.y.
40. *Parker and Armstrong (1972)* K-Ar
YU-DP-119
Danforth Formation, rhyolite (43°14'19"N, 119°13'30"W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Parker. *Analytical data*: K = 3.78, 3.79%; *Ar⁴⁰ = 1.26 x 10⁻⁶ cc/gm (Ar_{rad} = 59%), 1.23 x 10⁻⁶ cc/gm (Ar_{rad} = 47%). *Method*: b, k, o. *Constants*: a, b, d.
(whole rock) 8.2±0.12 m.y.
41. *Peterson and McIntyre (1970)* K-Ar
Rhyolite dome (S27,T37S,R18E; Thomas Creek; Cox Flat 7½' quad., Lake Co., OR). *Analyzer*: Atlantic-Richfield Co.
8.1±0.5 m.y.
42. *Parker and Armstrong (1972)* K-Ar
YU-DP-250
Danforth Formation, basalt (43°03'27"N, 119°03'45"W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Parker. *Analytical data*: K = .289, .293, .294%; *Ar⁴⁰ = .0922 x 10⁻⁶ cc/gm (Ar_{rad} = 8%). *Method*: b, k, o. *Constants*: a, b, d.
(whole rock) 7.9±0.9 m.y.
43. *Dalrymple and others (1967)* K-Ar
W13
Basalt flow (42°42.4'N, 117°49.2'W; at water level of reservoir at dam on Crooked Creek 3.8 km SW of confluence of Crooked and Rattlesnake Creeks; Jordan Valley 1:250,000 sheet, Malheur Co., OR). *Analyzer*: Davis & Schlocker. *Analytical data*: K₂O = .373, .375%; *Ar⁴⁰ = .436 x 10⁻¹¹ moles/gm (Ar_{rad} = 16.0%); *Ar⁴⁰/⁴⁰K = 4.611; K₂O = .371, .374%; *Ar⁴⁰ = .431 x 10⁻¹¹ moles/gm (Ar_{rad} = 15.8%); *Ar⁴⁰/⁴⁰K = 4.576. *Method*: e, k, n. *Note*: appears to overlie Trout Creek Formation.
(whole rock) 7.87±0.55 m.y.
(whole rock) 7.81±0.55 m.y.
44. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 38
M4-115
Silicic dome (43°49.8'N, 117°20.4'W; Double Mountain; Double Mtn 7½' quad., Malheur Co., OR). *Analyzer*: McKee. *Analytical data*: K₂O = 7.75, 7.61%; *Ar⁴⁰ = 8.9376 x 10⁻¹¹ moles/gm (Ar_{rad} = 54.3%). *Method*: e, q. *Constants*: a, c, d.
(sanidine) 7.86±0.21 m.y.
45. *Greene and others (1972)* K-Ar
Walker (1974)
Walker and others (1974)
RCG-54-5-66
Rhyodacite (43°30.8'N, 119°8.3'W; Burns Butte; Burns 15' quad., Harney Co., OR). *Analyzer*: Engels. *Analytical data*: K₂O = 1.55%; *Ar⁴⁰ = 1.338 x 10⁻¹¹ moles/gm (Ar_{rad} = 59%).
(plagioclase) 7.82±0.26 m.y.
46. *Parker and Armstrong (1972)* K-Ar
YU-DP-316D
Danforth Formation, rhyolite (43°17'02"N, 119°18'45"W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer*: Parker. *Analytical data*: K = 4.13, 3.03%; *Ar⁴⁰ = 1.28 x 10⁻⁶ cc/gm (Ar_{rad} = 16%). *Method*: b, k, o. *Constants*: a, b, d.
(whole rock) 7.8±0.5 m.y.
- 47a. *MacLeod and others (1975)* K-Ar
Col. no. 35
Rhyolitic dome (42°34.6'N, 120°37.1'W; McComb Butte; Morgan Butte 7½' quad., Lake Co., OR).
7.71±0.09 m.y.
- 47b. *McKee and others (1976)* K-Ar
MO73-39
Rhyolite dome (42°34.6'N, 120°37.1'W; McComb Butte; Morgan Butte 7½' quad., Lake Co., OR). *Analyzer*: McKee. *Analytical data*: K₂O = 4.47, 4.56%; *Ar⁴⁰ = 5.1516 x 10⁻¹¹ moles/gm (Ar_{rad} = 76.0%). *Method*: e, q. *Constants*: a, c, d.
(obsidian) 7.70±0.09 m.y.
48. *Peterson and McIntyre (1970)*
Rhyolite vitrophyre dome (Quartz Butte, Klamath or Lake Co., OR). *Analyzer*: Atlantic-Richfield Co.
7.6±0.4 m.y.
- 49a. *MacLeod and others (1975)* K-Ar
Col. no. 33
Rhyolitic dome (43°34.1'N, 119°8.2'W; Burns Butte; Burns 15' quad., Harney Co., OR).
7.55±0.10 m.y.
- 49b. *McKee and others (1976)* K-Ar
M3-79
Rhyolite dome (43°34.1'N, 119°8.2'W; Burns Butte; Burns 15' quad., Harney Co., OR). *Analyzer*: McKee. *Analytical data*: K₂O = 5.43%; *Ar⁴⁰ = 6.0653 x 10⁻¹¹ moles/gm (Ar_{rad} = 72.2%). *Method*: e, q. *Constants*: a, c, d.
(obsidian) 7.54±0.10 m.y.
- 50a. *MacLeod and others (1975)* K-Ar
Col. no. 32
Rhyolitic dome (42°36.0'N, 120°25.3'W; Tucker Hill; Tucker Hill 7½' quad., Lake Co., OR).
7.42±0.19 m.y.
- 50b. *McKee and others (1976)* K-Ar
MO73-40
Rhyolite dome (42°36.9'N, 120°25.3'W; Tucker Hill, Tucker Hill 7½' quad., Lake Co., OR). *Analyzer*: McKee. *Analytical data*: K₂O = 4.42%; *Ar⁴⁰ =

- 50b.(continued)
 4.8539×10^{-11} moles/gm ($A_{\text{rad}} = 55.0\%$). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 7.41 ± 0.19 m.y.
- 51a. *MacLeod and others (1975)* K-Ar
Col. no. 31
 Rhyolitic dome ($42^{\circ}18.3'N$, $120^{\circ}37.9'W$; Cougar Peak; Cougar Peak $7\frac{1}{2}'$ quad., Lake Co., OR).
 7.28 ± 0.50 m.y.
- 51b. *McKee and others (1976)* K-Ar
MO73-36
 Silicic dome complex ($42^{\circ}18.3'N$, $120^{\circ}37.9'W$; Cougar Peak, Cougar Peak $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 7.99\%$; $*Ar^{40} = 8.6047 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 25.7\%$). *Method:* e, q. *Constants:* a, c, d.
 (biotite) 7.27 ± 0.50 m.y.
52. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 30
MO73-37
 Rhyolite dome ($42^{\circ}23.8'N$, $120^{\circ}36.0'W$; Thomas Creek, Shoestring Butte $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 11.69\%$; $*Ar^{40} = 1.2449 \times 10^{-10}$ moles/gm ($A_{\text{rad}} = 40.0\%$). *Method:* e, q. *Constants:* a, c, d.
 (sanidine) 7.19 ± 0.32 m.y.
- 53a. *MacLeod and others (1975)* K-Ar
Col. no. 5
 Rhyolitic ash-flow tuff ($43^{\circ}5.2'N$, $121^{\circ}11.2'W$; W of Silver Lake, Bridge Creek Draw $7\frac{1}{2}'$ quad., Lake Co., OR).
 7.18 ± 1.54 m.y.
- 53b. *McKee and others (1976)* K-Ar
M4-73
 Rhyolitic ash-flow tuff ($43^{\circ}5.2'N$, $121^{\circ}11.2'W$; W of Silver Lake; Bridge Creek Draw $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = .335\%$; $*Ar^{40} = 3.5583 \times 10^{-12}$ moles/gm ($A_{\text{rad}} = 11.3\%$). *Method:* e, q. *Constants:* a, c, d.
 (plagioclase) 7.17 ± 1.54 m.y.
- 54a. *MacLeod and others (1976)* K-Ar
Col. no. 29
 Rhyolitic dome ($42^{\circ}16.1'N$, $120^{\circ}43.8'W$; Drews Ranch; Drews Reservoir $7\frac{1}{2}'$ quad., Lake Co., OR).
 7.14 ± 0.34 m.y.
- 54b. *McKee and others (1976)* K-Ar
MO73-34
 Rhyolitic dome ($42^{\circ}16.1'N$, $120^{\circ}43.8'W$; Drews Ranch; Drews Reservoir $7\frac{1}{2}'$ quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 4.42, 4.43\%$; $*Ar^{40} = 4.6760 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 31.9\%$). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 7.13 ± 0.34 m.y.
55. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 28
MO73-35
 Rhyolitic dome ($42^{\circ}19.7'N$, $120^{\circ}51.9'W$; Owens Butte; Fishhole Mtn $15'$ quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 6.55\%$; $*Ar^{40} = 6.8957 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 15.2\%$). *Method:* e, q. *Constants:* a, c, d.
 (biotite) 7.11 ± 0.94 m.y.
56. *Parker and Armstrong (1972)* K-Ar
YU-DP-243
 Danforth Formation, welded tuff ($43^{\circ}04'56''N$, $119^{\circ}03'45''W$; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* $K = 6.53, 6.51\%$; $*Ar^{40} = 1.837 \times 10^{-6}$ cc/gm ($A_{\text{rad}} = 59\%$). *Method:* b, k, o. *Constants:* a, b, d.
 (sanidine) 7.1 ± 0.10 m.y.
- 57a. *MacLeod and others (1975)* K-Ar
Col. no. 27
 Rhyolitic dome ($43^{\circ}9.1'N$, $120^{\circ}7.7'W$; Horse Mountain; Crescent 1:250,000 sheet, Lake Co., OR).
 6.92 ± 0.14 m.y.
- 57b. *McKee and others (1976)* K-Ar
MO73-14
 Rhyolite dome ($43^{\circ}9.1'N$, $120^{\circ}7.7'W$; Horse Mountain; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 4.38, 4.42\%$; $*Ar^{40} = 4.510 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 67.6\%$). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 6.91 ± 0.14 m.y.
58. *Greene and others (1972)* K-Ar
RCG-165-68
 Drinkwater Basalt ($43^{\circ}24.8'N$, $118^{\circ}34.8'W$; Crane $15'$ quad., Harney Co., OR). *Analyzer:* Engels. *Analytical data:* $K_2O = .216\%$; $*Ar^{40} = .221 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 18\%$).
 (plagioclase) 6.91 ± 1.09 m.y.
- 59a. *MacLeod and others (1975)* K-Ar
Col. no. 26
 Rhyolitic dome ($43^{\circ}2.8'N$, $120^{\circ}8.6'W$; S of Horse Mountain; Crescent 1:250,000 sheet, Lake Co., OR).
 6.84 ± 0.22 m.y.
- 59b. *McKee and others (1976)* K-Ar
M3-57
 Rhyolite dome ($43^{\circ}2.8'N$, $120^{\circ}8.6'W$; S of Horse Mountain; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 6.50, 6.52\%$; $*Ar^{40} = 6.589 \times 10^{-11}$ moles/gm ($A_{\text{rad}} = 44.7\%$). *Method:* e, q. *Constants:* a, c, d.
 6.83 ± 0.22 m.y.
60. *Greene and others (1972)* K-Ar
Walker (1974)
Walker and others (1974)

RCG-257-3-66

Welded tuff of Double O Ranch, ash-flow tuff (43° 37.7'N, 119°4.2'W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* Von Essen & Engels. *Analytical data:* K₂O = 4.93%; *Ar⁴⁰ = 4.978 x 10⁻¹¹ moles/gm (Ar_{rad} = 31%). *Note:* may be the same unit as Dalrymple and others (1967) units W14 and W15 [VIII. 63 and 74] and Evernden and others (1964) KA1206 [Laursen and Hammond (1974) VII. 27, p. 28].

(anorthoclase) 6.82±0.33 m.y.

61. *MacLeod and others (1975)* K-Ar
McKee and others (1976)

Col. no. 4
M4-74

Rhyolitic ash-flow tuff (43°1.6'N, 121°6.9'W; S of Silver Lake; Hager Mtn 7½' quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .404%; *Ar⁴⁰ = 4.0496 x 10⁻¹² moles/gm (Ar_{rad} = 12%). *Method:* e, q. *Constants:* a, c, d.

(plagioclase) 6.77±1.10 m.y.

62. *Parker and Armstrong (1972)* K-Ar
YU-DP-330

Double O Member, Danforth Formation, rhyolite welded tuff (43°09'03"N, 119°22'23"W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* K = 4.04, 4.03%; *Ar⁴⁰ = 1.044 x 10⁻⁶ cc/gm (Ar_{rad} = 10%), 1.106 x 10⁻⁶ cc/gm (Ar_{rad} = 11%). *Method:* b, k, o. *Constants:* a, b, d. *Note:* the Double O Member, also known as Rattlesnake Ignimbrite member of the Rattlesnake Formation, is a flow banded sample of YU-DP-311G [VIII. 65] that is oxidized and somewhat devitrified.

(whole rock) 6.7±4 m.y.

63. *Dalrymple and others (1967)* K-Ar
W14

Rattlesnake Formation, lower tuff, rhyolite tuff (S27,T12S,R25E; ½ mi N of Birch Creek School and ¼ mi W of Birch Creek at elev. 3300 ft; Dayville 30' quad., Wheeler Co., OR). *Analyzer:* Davis & Schlocker. *Analytical data:* K₂O = 5.00, 4.95%; *Ar⁴⁰ = 4.923 x 10⁻¹¹ moles/gm (Ar_{rad} = 39.6%); *Ar⁴⁰/⁴⁰K = 3.918. *Method:* e, k, n. *Note:* underlies W15 (Dalrymple and others, 1967) [VIII. 74].

(anorthoclase) 6.69±0.20 m.y.

64. *MacLeod and others (1975)* K-Ar
McKee and others (1976)

Col. no. 25

Rhyolite dome (43°15.0'N, 120°10.5'W; Elk Mountain; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 8.75%; *Ar⁴⁰ = 8.6407 x 10⁻¹¹ moles/gm (Ar_{rad} = 48.4%). *Method:* e, q. *Constants:* a, c, d.

(biotite) 6.67±0.18 m.y.

65. *Parker and Armstrong (1972)* K-Ar
YU-DP-311G

Double O Member, Danforth Formation, rhyolite welded tuff (43°09'03"N, 119°22'23"W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* K = 4.09, 4.09%; *Ar⁴⁰ = 1.092 x 10⁻⁶ cc/gm (Ar_{rad} = 26%), 1.083 x 10⁻⁶ cc/gm (Ar_{rad} = 21%). *Method:* b, k, o. *Constants:* a, b, d. *Note:* Double O Member also known as Rattlesnake Ignimbrite member of Rattlesnake Formation.

(whole rock) 6.6±0.2 m.y.

66. *Parker and Armstrong (1972)* K-Ar
YU-E-84-67

Double O Member, Danforth Formation, rhyolite welded tuff (44°19'00"N, 119°30'00"W; Aldrich Mtn 15' quad., Grant Co., OR). *Analyzer:* Parker. *Analytical data:* K = 4.41, 4.43%; *Ar⁴⁰ = .985 x 10⁻⁶ cc/gm (Ar_{rad} = 28%). *Method:* b, k, o. *Constants:* a, b, d. *Note:* the Double O Member also known as Rattlesnake Ignimbrite member of Rattlesnake Formation.

(anorthoclase) 6.6±0.2 m.y.

67. *Walker (1974)* K-Ar
Walker and others (1974)

PB-2-70

Rhyodacite dome (43°28.8'N, 119°18.0'W; Palarino Buttes; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* K - Schlocker, Ar - Kistler, Lanphere, Von Essen, McKee. *Analytical data:* (plagioclase) K₂O = 1.27%; *Ar⁴⁰ = 1.227 x 10⁻¹¹ moles/gm (Ar_{rad} = 31%), (biotite) K₂O = 8.27%; *Ar⁴⁰ = 7.434 x 10⁻¹¹ moles/gm (Ar_{rad} = 53%). *Note:* probably same as Parker and Armstrong (1972) unit YU-DP-214 [VIII. 71].

(plagioclase) 6.5±0.3 m.y.

(biotite) 6.1±0.2 m.y.

- 68a. *MacLeod and others (1975)* K-Ar
Col. no. 24

Rhyolite dome (43°22.6'N, 119°51.0'W; Egli Ridge; Burns 1:250,000 sheet, Harney Co., OR).

6.42±0.19 m.y.

- 68b. *McKee and others (1976)* K-Ar
M3-86

Rhyolite dome (43°22.8'N, 119°51.0'W; Egli Ridge; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 4.93%; *Ar⁴⁰ = 4.6723 x 10⁻¹¹ moles/gm (Ar_{rad} = 44.9%). *Method:* e, q. *Constants:* a, c, d.

(obsidian) 6.41±0.19 m.y.

69. *Parker and Armstrong (1972)* K-Ar
YU-Cottonwood

Double O Member, Danforth Formation, rhyolite welded tuff (44°26'36"N, 119°38'42"W; Dayville 30' quad., Grant Co., OR). *Analyzer:* Parker. Ana-

69. (continued)
lytical data: K = 3.76, 3.75%; *Ar⁴⁰ = .965 x 10⁻⁶ cc/gm (Ar_{rad} = 56%). *Method:* b, k, o. *Constants:* a, b, d. *Note:* the Double O Member also known as Rattlesnake Ignimbrite member of Rattlesnake Formation.
 (anorthoclase) 6.4±0.2 m.y.
70. *Parker and Armstrong (1972)* K-Ar
 YU-E-6-70
 Double O Member, Danforth Formation, rhyolite welded tuff (44°46'54"N, 119°27'51"W; Court Rock 15' quad., Grant Co., OR). *Analyzer:* Parker. *Analytical data:* K = 3.85, 3.83%; *Ar⁴⁰ = .985 x 10⁻⁶ cc/gm (Ar_{rad} = 28%). *Method:* b, k, o. *Constants:* a, b, d. *Note:* the Double O Member also known as Rattlesnake Ignimbrite member of Rattlesnake Formation.
 (anorthoclase) 6.4±0.2 m.y.
71. *Parker and Armstrong (1972)* K-Ar
 YU-DP-214
 Danforth Formation, rhyolite (43°30'18"N, 119°18'00"W; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* (biotite) K = 6.82, 6.97%; *Ar⁴⁰ = 1.755 x 10⁻⁶ cc/gm (Ar_{rad} = 35%); (whole rock) K = 4.07, 4.06%; *Ar⁴⁰ = .907 x 10⁻⁶ cc/gm (Ar_{rad} = 16%). *Method:* b, k, o. *Constants:* a, b, d.
 (biotite) 6.4±0.2 m.y.
 (whole rock) 5.6±0.4 m.y.
72. *McKee and others (1976)* K-Ar
 M4-42
 Rhyolite dome (43°17.2'N, 121°3.8'W; Connley Hills; Crescent 1:250,000 sheet; Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 3.63%; *Ar⁴⁰ = 3.3217 x 10⁻¹¹ moles/gm (Ar_{rad} = 22.5%). *Method:* e, q. *Constants:* a, c, d.
 (whole rock) 6.18±0.63 m.y.
73. *Walker and Swanson (1969)* K-Ar
 Basalt (flows near Millican, Deschutes Co., OR).
 6 m.y.
74. *Dalrymple and others (1967)* K-Ar
 W15
 Rattlesnake Formation, upper tuff (S27,T12S,R25E; ½ mi N of Birch Creek School and ¼ mi W of Birch Creek at elev. 3300 ft; Dayville 30' quad., Wheeler Co., OR). *Analyzer:* Davis & Schlocker. *Analytical data:* K₂O = 5.69, 5.67%; *Ar⁴⁰ = 4.998 x 10⁻¹¹ moles/gm (Ar_{rad} = 47.9%); *Ar⁴⁰/⁴⁰K = 3.484. *Method:* e, k, n. *Note:* overlies W14 (Dalrymple and others, 1967) [VIII. 63].
 (anorthoclase) 5.95±0.18 m.y.
75. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
 Col. no. 20
 M3-61
 Rhyolitic dome (43°0.6'N, 121°1.2'W; Hager Mountain; Hager Mtn 7½' quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 4.06%; *Ar⁴⁰ = 3.5467 x 10⁻¹¹ moles/gm (Ar_{rad} = 61.2%). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 5.90±0.09 m.y.
76. *Parker and Armstrong (1972)* K-Ar
 YU-DP-160
 Danforth Formation, andesite (43°16'30"N, 119°28'00"W; Dog Mtn 15' quad., Harney Co., OR). *Analyzer:* Parker. *Analytical data:* K = 1.79, 1.74%; *Ar⁴⁰ = .4651 x 10⁻⁶ cc/gm (Ar_{rad} = 8%), .3826 x 10⁻⁶ cc/gm (Ar_{rad} = 6%). *Methods:* b, k, o. *Constants:* a, b, d.
 (whole rock) 5.8±0.8 m.y.
- 77a. *MacLeod and others (1975)* K-Ar
 Col. no. 19
 Rhyolitic dome (43°29.0'N, 119°32.1'W; E of Squaw Butte; Burns 1:250,000 sheet, Harney Co., OR).
 5.70±0.67 m.y.
- 77b. *McKee and others (1976)* K-Ar
 M3-70
 Rhyolite dome (43°29.0'N, 119°32.1'W; E of Squaw Butte; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 5.046%; *Ar⁴⁰ = 4.2580 x 10⁻¹¹ moles/gm (Ar_{rad} = 75.1%). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 5.69±0.67 m.y.
78. *Greene and others (1972)* K-Ar
Walker (1974)
Walker and others (1974)
 RCG-121-66
 Welded tuff of Double O Ranch, ash-flow tuff (43°47.2'N, 119°18.9'W; Cricket Creek; Sawtooth Creek 15' quad., Harney Co., OR). *Analyzer:* Engels. *Analytical data:* K₂O = 4.65%; *Ar⁴⁰ = 3.713 x 10⁻¹¹ moles/gm (Ar_{rad} = 60%). *Note:* may be same unit as Dalrymple and others (1967) units W14 and W15 [VIII. 63 and 74] and Evernden and others (1964) KA1206 [Laursen and Hammond (1974) VII. 27, p. 28].
 (anorthoclase) 5.40±0.20 m.y.
79. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
 Col. no. 17
 M3-106
 Rhyolitic dome (42°35.6'N, 121°13.4'W; Black Hills; Riverbed Butte 15' quad., Klamath Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .930%; *Ar⁴⁰ = 7.4073 x 10⁻¹² moles/gm (Ar_{rad} = 18.1%). *Method:* e, q. *Constants:* a, c, d.
 (plagioclase) 5.38±0.54 m.y.
80. *MacLeod and others (1975)* K-Ar

- McKee and others (1976)*
Col. no. 15
M3-90
 Rhyolite dome (43°30.0'N, 119°46.7'W; Squaw Butte; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 4.22%; *Ar⁴⁰ = 3.2093 x 10⁻¹¹ moles/gm (Ar_{rad} = 61.4%). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 5.12±0.08 m.y.
81. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 16
M4-112
 Rhyolitic dome (43°16.5'N, 121°21.3'W; Bald Mountain; Crescent 1:250,000 sheet, Klamath Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .862%; *Ar⁴⁰ = 6.4694 x 10⁻¹² moles/gm (Ar_{rad} = 15.9%). *Method:* e, q. *Constants:* a, c, d.
 (plagioclase) 5.07±0.64 m.y.
- 82a. *MacLeod and others (1975)* K-Ar
Col. no. 14
 Rhyolitic dome (42°54.9'N, 121°8.5'W; Partin Butte; Sycan Marsh 15' quad., Lake Co., OR).
 5.02±0.20 m.y.
- 82b. *McKee and others (1976)* K-Ar
N4-130
 Rhyodacitic dome (42°54.9'N, 121°8.5'W; Partin Butte; Sycan Marsh 15' quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 3.77%; *Ar⁴⁰ = 2.7983 x 10⁻¹¹ moles/gm (Ar_{rad} = 39.5%). *Method:* e, q. *Constants:* a, c, d.
 (whole rock) 5.01±0.20 m.y.
83. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 13
MO73-33
 Rhyolite dome (43°33.3'N, 120°0.4'W; Glass Buttes; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 4.21, 4.15%; *Ar⁴⁰ = 3.0384 x 10⁻¹¹ moles/gm (Ar_{rad} = 16.9%). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 4.91±0.73 m.y.
84. *Walker (1974)* K-Ar
 Obsidian selvage on flow (43°32.2'N, 120°1.3'W; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* Schlocker, Lanphere, Von Essen, McKee. *Analytical data:* K₂O = 4.15, 4.21%; *Ar⁴⁰ = 3.038 x 10⁻¹¹ moles/gm (Ar_{rad} = 17%).
 (obsidian) 4.9±0.3 m.y.
85. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 12
M4-135
 Rhyolitic dome (43°19.2'N, 121°22.5'W; Bald Mountain area; Crescent 1:250,000 sheet, Klamath Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .826%; *Ar⁴⁰ = 5.9729 x 10⁻¹² moles/gm (Ar_{rad} = 19.7%). *Method:* e, q. *Constants:* a, c, d.
 (plagioclase) 4.88±0.59 m.y.
- 86a. *MacLeod and others (1975)* K-Ar
Col. no. 11
 Rhyolitic dome (42°56.6'N, 121°19.5'W; Yamsey Mountain area; Yamsey Mtn 15' quad., Lake Co., OR).
 4.68±0.17 m.y.
- 86b. *McKee and others (1976)* K-Ar
M4-131
 Rhyodacitic dome (42°56.6'N, 121°19.5'W; Yamsey Mountain area; Yamsey Mtn 15' quad., Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 2.414%; *Ar⁴⁰ = 1.6678 x 10⁻¹¹ moles/gm (Ar_{rad} = 36.7%). *Method:* e, q. *Constants:* a, c, d.
 (whole rock) 4.67±0.17 m.y.
87. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 3
M4-30
 Peyerl tuff, rhyolitic ash-flow tuff (43°21.7'N, 121°12.1'W; W of Fort Rock; Crescent 1:250,000, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .598%; *Ar⁴⁰ = 3.9579 x 10⁻¹² moles/gm (Ar_{rad} = 12.0%). *Methods:* e, q. *Constants:* a, c, d.
 (plagioclase) 4.47±0.84 m.y.
88. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 10
M4-84
 Rhyolitic dome (43°20.1'N, 121°22.8'W; Bald Mountain area; Crescent 1:250,000 sheet, Klamath Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 6.81%; *Ar⁴⁰ = 4.4662 x 10⁻¹¹ moles/gm (Ar_{rad} = 40.4%). *Method:* e, q. *Constants:* a, c, d.
 (biotite) 4.43±0.18 m.y.
89. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 9
MO73-32
 Rhyolitic dome (43°24.0'N, 120°53.0'W; Cougar Mountain; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 3.72, 3.71%; *Ar⁴⁰ = 2.3689 x 10⁻¹¹ moles/gm (Ar_{rad} = 24.7%). *Method:* e, q. *Constants:* a, c, d.
 4.31±0.34 m.y.
90. *Walker (1974)* K-Ar
Walker and others (1974)
FB-1-70
 Rhyodacite dome (43°37.5'N, 120°27.6'W; Frederick Butte; Crescent 1:250,000 sheet, Deschutes Co., OR).

90. (continued)
Analyzer: Schlocker, Kistler, Lanphere, Von Essen, McKee. *Analytical data:* $K_2O = .377\%$; $^{40}Ar = .219 \times 10^{-11}$ moles/gm ($A_{rad} = 13\%$).
 (plagioclase) 3.9 ± 0.4 m.y.
91. *Walker (1970)*
Walker (1974)
R. F. Marvin, written commun., 1965
 Pumiceous ash-flow tuff ($43^\circ 47.8'N$, $120^\circ 22.8'W$; W of Hampton Butte along Crook-Deschutes Co. line; Crescent 1:250,000 sheet, Crook Co., OR). *Analyzer:* Marvin, Mehnert, Obradovich, Mountjoy. *Analytical data:* (plagioclase) $K_2O = .62, .63\%$; $^{40}Ar = .335 \times 10^{-11}$ moles/gm ($A_{rad} = 59\%$); (glass) $K_2O = 3.63, 3.67\%$; $^{40}Ar = 1.93 \times 10^{-11}$ moles/gm ($A_{rad} = 71\%$).
 (plagioclase) 3.6 ± 0.6 m.y.
 (glass) 3.6 ± 0.2 m.y.
- 92a. *Walker (1974)* K-Ar
M3-33
 Obsidian selvedge of flow ($43^\circ 31.8'N$, $120^\circ 46.8'W$; Squaw Ridge; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* Schlocker, Kistler, Lanphere, Von Essen, McKee. *Analytical data:* $K_2O = 3.98\%$; $^{40}Ar = 2.116 \times 10^{-11}$ moles/gm ($A_{rad} = 54\%$).
 (obsidian) 3.6 ± 0.1 m.y.
- 92b. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 7
M3-33
 Rhyolite dome ($43^\circ 31.8'N$, $120^\circ 46.8'W$; Squaw Ridge; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 3.98\%$; $^{40}Ar = 2.1157 \times 10^{-11}$ moles/gm ($A_{rad} = 53.5\%$). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 3.59 ± 0.07 m.y.
- 93a. *MacLeod and others (1975)* K-Ar
Col. no. 2
 Rhyolitic ash-flow tuff ($43^\circ 22.5'N$, $121^\circ 17.3'W$; W of Fort Rock; Crescent 1:250,000 sheet, Lake Co., OR).
 (obsidian) 3.35 ± 0.44 m.y.
- 93b. *McKee and others (1976)* K-Ar
M4-48
 Rhyolitic ash-flow tuff ($43^\circ 22.5'N$, $121^\circ 17.3'W$; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 3.36\%$; $^{40}Ar = 1.7969 \times 10^{-11}$ moles/gm ($A_{rad} = 15.8\%$). *Method:* e, q. *Constants:* a, c, d.
 (obsidian) 3.34 ± 0.44 m.y.
94. *Parker and Armstrong (1972)* K-Ar
YU-DP-41
 Harney Formation, basalt ($43^\circ 14'19''N$, $119^\circ 13'30''W$; Burns 1:250,000 sheet, Harney Co., OR).
Analyzer: Parker. *Analytical data:* $K = .655, .669\%$; $^{40}Ar = .0709 \times 10^{-6}$ cc/gm ($A_{rad} = 9\%$), $.0766 \times 10^{-6}$ cc/gm ($A_{rad} = 6\%$). *Method:* b, k, o. *Constants:* a, b, d.
 (whole rock) 2.8 ± 0.2 m.y.
95. *Parker and Armstrong (1972)* K-Ar
YU-DP-158
 Harney Formation, rhyolite ($43^\circ 13'48''N$, $119^\circ 12'00''W$; Burns 1:250,000 sheet, Harney Co., OR). *Analyzer:* Parker. *Analytical data:* (biotite) $K = 5.35, 5.38\%$; $^{40}Ar = .569 \times 10^{-6}$ cc/gm ($A_{rad} = 7\%$); (whole rock) $K = 3.75, 3.66\%$; $^{40}Ar = .307 \times 10^{-6}$ cc/gm ($A_{rad} = 9\%$). *Method:* b, k, o. *Constants:* a, b, d.
 (biotite) 2.7 ± 0.4 m.y.
 (whole rock) 2.1 ± 0.24 m.y.
96. *Parker and Armstrong (1972)* K-Ar
YU-DP-14
 Harney Formation, basalt ($43^\circ 26'24''N$, $119^\circ 00'23''W$; Dog Mtn 15' quad., Harney Co., OR). *Analyzer:* Parker. *Analytical data:* $K = .244, .239\%$; $^{40}Ar = .0280 \times 10^{-6}$ cc/gm ($A_{rad} = 7\%$), $.0229 \times 10^{-6}$ cc/gm ($A_{rad} = 5\%$). *Method:* b, k, o. *Constants:* a, b, d.
 (whole rock) 2.6 ± 0.3 m.y.
97. *Greene and others (1972)* K-Ar
Walker and others (1974)
RCG-32-67
 Harney Formation(?), basalt ($43^\circ 27.0'N$, $119^\circ 00.5'W$; Wrights Point, capping flow, N of Malheur Lake; Dog Mtn 15' quad., Harney Co., OR). *Analyzer:* Engels. *Analytical data:* $K_2O = .356\%$; $^{40}Ar = .125 \times 10^{-11}$ moles/gm ($A_{rad} = 39\%$).
 (whole rock) 2.38 ± 0.07 m.y.
- 98a. *MacLeod and others (1975)* K-Ar
Col. no. 5
 Rhyolitic dome ($43^\circ 33.5'N$, $120^\circ 49.8'W$; Long Butte; Crescent 1:250,000 sheet, Lake Co., OR).
 2.30 ± 0.32 m.y.
- 98b. *McKee and others (1976)* K-Ar
N3-31
 Rhyolite dome ($43^\circ 33.5'N$, $120^\circ 49.8'W$; Long Butte; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* McKee. *Analytical data:* $K_2O = 7.34, 7.43\%$; $^{40}Ar = 2.5079 \times 10^{-11}$ moles/gm ($A_{rad} = 16.5\%$). *Method:* e, q. *Constants:* a, c, d.
 (sanidine) 2.29 ± 0.32 m.y.
- 99a. *Walker (1974)* K-Ar
MO-73-31
 Obsidian selvedge on flow ($43^\circ 37.2'N$, $120^\circ 53.1'W$; Quartz Mountain; Crescent 1:250,000 sheet, Lake Co., OR). *Analyzer:* Schlocker, Kistler, Lanphere, Von Essen, McKee. *Analytical data:* $K_2O = 3.83, 3.84\%$; $^{40}Ar = .627 \times 10^{-11}$ moles/gm ($A_{rad} = 36\%$).
 (obsidian) 1.1 ± 0.05 m.y.

- 99b. *MacLeod and others (1975)* K-Ar
Col. no. 4
 Rhyolitic dome (43°37.5'N, 120°53.3'W; Quartz Mountain; Crescent 1:250,000 sheet, Deschutes Co., OR).
1.11±0.05 m.y.
- 99c. *McKee and others (1976)* K-Ar
MO73-31
 Rhyolite dome (43°37.5'N, 120°53.3'W; Crescent 1:250,000 sheet, Deschutes Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 3.83, 3.84%; *Ar⁴⁰ = 6.2684 x 10⁻¹² moles/gm (Ar_{rad} = 36.4%). *Method:* e, q. *Constants:* a, c, d.
(obsidian) 1.1±0.05 m.y.
- 100a. *Walker (1974)* K-Ar
MO-73-29
 Obsidian (43°40.1'N, 120°59.5'W; East Butte; Crescent 1:250,000 sheet, Deschutes Co., OR). *Analyzer:* Schlocker, Kistler, Lanphere, Von Essen, McKee. *Analytical data:* K₂O = 3.84%; *Ar⁴⁰ = .482 x 10⁻¹¹ moles/gm (Ar_{rad} = 23%).
(obsidian) 0.85±0.04 m.y.
- 100b. *MacLeod and others (1975)* K-Ar
Col. no. 3
 Rhyolitic dome (43°39.9'N, 120°59.6'W; East Butte; Crescent 1:250,000, Deschutes Co., OR).
0.85±0.05 m.y.
- 100c. *McKee and others (1976)* K-Ar
MO73-29
 Rhyolite dome (43°39.9'N, 120°59.6'W; East Butte; Crescent 1:250,000 sheet; Deschutes Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 3.84%; *Ar⁴⁰ = 4.8229 x 10⁻¹² moles/gm (Ar_{rad} = 22.8%). *Method:* e, q. *Constants:* a, c, d.
(obsidian) 0.84±0.04 m.y.
- 101a. *Walker (1974)* K-Ar
M3-53
 Obsidian (43°41.3'N, 121°02.0'W; China Hat; Crescent 1:250,000 sheet, Deschutes Co., OR). *Analyzer:* Schlocker, Kistler, Lanphere, Von Essen, McKee. *Analytical data:* K₂O = 3.80%; *Ar⁴⁰ = .428 x 10⁻¹¹ moles/gm (Ar_{rad} = 7%).
(obsidian) 0.76±0.1 m.y.
- 101b. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 2
M3-53
 Rhyolite dome (43°40.8'N, 121°3.0'W; China Hat; Crescent 1:250,000 sheet, Deschutes Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 3.69%; *Ar⁴⁰ = 4.2764 x 10⁻¹² moles/gm (Ar_{rad} = 7.2%). *Method:* e, q. *Constants:* a, c, d.
(obsidian) 0.78±0.20 m.y.
102. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 1
M3-99
 Rhyodacite ash-flow tuff (43°49.4'N, 121°1.1'W; N of China Hat; Evans Well 7½' quad., Deschutes Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = .501%; *Ar⁴⁰ = .5476 x 10⁻¹² moles/gm (Ar_{rad} = .05%). *Method:* e, q. *Constants:* a, c, d.
(plagioclase) 0.70±0.70 m.y.
103. *MacLeod and others (1975)* K-Ar
McKee and others (1976)
Col. no. 1
M4-16
 Rhyolite dome (43°43.8'N, 121°21.6'W; East McKay Butte; Paulina Peak 7½' quad., Deschutes Co., OR). *Analyzer:* McKee. *Analytical data:* K₂O = 4.01%; *Ar⁴⁰ = 3.4419 x 10⁻¹² moles/gm (Ar_{rad} = .05%). *Method:* e, q. *Constants:* a, c, d.
(obsidian) 0.58±0.10 m.y.

REFERENCES

- Armstrong, R. L. (1970) Geochronology of Tertiary igneous rocks, eastern Basin and Range Province, western Utah, eastern Nevada, and vicinity, U.S.A.: *Geochim. et Cosmochim. Acta*, 34, p. 203-232.
- Armstrong, R. L., and others (1975) K-Ar dates for volcanic rocks, central Cascade Range of Oregon: *Isochron/West*, no. 13, p. 5-10.
- Armstrong, R. L., Taubeneck, W. H., and Hales, P. O. (1976) Rb-Sr and K-Ar ages and Sr isotopic compositions of some granitic rocks of Oregon and Washington: *Isochron/West*, no. 17, p. 27-32.
- Baksi, A. K., (1974) Isotopic fractionation of a loosely held atmospheric argon component in the Picture Gorge basalts: *Earth Plant. Sci. Letters*, v. 21, p. 431-438.
- Baksi, A. K., and Watkins, N. D. (1973) Volcanic production rates: Comparison of oceanic ridges, islands, and the Columbia Plateau basalts: *Science*, v. 180, no. 4085, p. 493-496.
- Coleman, R. G. (1972) The Colebrooke Schist of southwestern Oregon and its relation to the tectonic evolution of the region: *U.S. Geol. Survey Bull.* 1339.
- Dalrymple, G. B., and others (1967) Pliocene geomagnetic polarity epochs: *Earth Plant. Sci. Letters*, no. 2, p. 163-173.
- Dalrymple, G. B., and Lanphere, M. A. (1969) Potassium-argon dating principles, techniques and applications to geochronology: San Francisco, Calif., W. H. Freeman and Co.
- Denison, R. E. (1970) Oil test cones age dated: *The OreBin*, v. 32, no. 9, p. 184.
- Enlows, H. E., and Parker, D. J. (1972) Geochronology of the Clarno igneous activity in the Mitchell quadrangle, Wheeler County, Oregon: *The OreBin*, v. 34, p. 104-110.
- Greene, R. C., Walker, G. W., and Corcoran, R. E. (1972) Geologic map of the Burns quadrangle: U.S. Geol. Survey Map I-680.
- Harrold, J. L. (1972) K-Ar dates for plutonic rocks, Humboldt County, Nevada, and Harney County, Oregon: *Isochron/West*, no. 5, p. 1-5.
- Hay, R. L. (1962) Origin and diagenetic alteration of the lower part of the John Day Formation near Mitchell, Oregon: *Geol. Soc. America Buddington Memoir*, p. 191-216.
- (1963) Stratigraphy and zeolitic diagenesis of the John Day Formation of Oregon: *Univ. California Pubs. in Geol. Sci.*, v. 42, p. 199-262.
- Hotz, P. E. (1971) Plutonic rocks of the Klamath Mountains, Calif. and Oreg.: U.S. Geol. Survey Prof. Paper 684B, p. 1-B20.
- Laursen, J. M., and Hammond, P. E. (1974) Summary of radiometric ages of Oregon and Washington rocks, through June 1972: *Isochron/West*, no. 9, p. 1-32.

- MacLeod, N. S., Walker, G. W., and McKee, E. H. (1975) Geothermal significance of eastward increase in age of upper Cenozoic rhyolite domes in southeastern Oregon: U. S. Geol. Survey open-file report 75-348.
- McKee, E. H., Greene, R. C., and Foord, E. E. (1975) Chronology of volcanism, tectonism, and mineralization of the McDermitt Caldera, Nevada-Oregon [abs.]: Geol. Soc. America Abs. with Programs, v. 7, p. 629.
- McKee, E. H., MacLeod, N. S., and Walker, G. W. (1976) Potassium-argon ages of late Cenozoic silicic volcanic rocks, southeast Oregon: *Isochron/West*, no. 15, p. 37-41.
- Muntzert, J. K., and Field, C. W. (1968) Geology and mineral deposits of the Brattain District, Lake County, Oregon: Geol. Soc. America Spec. Paper 121, p. 616-617.
- Niem, A. R., and Cressy, F. B., Jr. (1973) K-Ar dates for sills from the Neahkahnie Mountain and Tillamook Head areas of the northwestern Oregon coast: *Isochron/West*, no. 7, p. 13-15.
- Noble, D. C., McKee, E. H., and Walker, G. W. (1974) Pantellerite from the Hart Mountain area, southwestern Oregon - interpretation of radiometric, chemical, and isotope data: U.S. Geol. Survey Jour. Research, v. 2, p. 25-29.
- Parker, D., and Armstrong, R. L. (1972) K-Ar dates and Sr isotope initial ratios for volcanic rocks in the Harney Basin, Oregon: *Isochron/West*, no. 5, p. 7-12.
- Peck, D. L., and others (1963) Geology of the central and northern parts of the western Cascade Range in Oregon: U.S. Geol. Survey Prof. Paper 449.
- Peterson, N. V., and McIntyre, J. R. (1970) The reconnaissance geology and mineral resources of eastern Klamath County and western Lake County, Oregon: State of Oregon Dept. of Geology and Mineral Indus. Bull. 66.
- Shotwell, J. A. (1963) The Juntura Basin - studies in earth history and paleoecology: *American Philos. Soc. Trans.*, v. 53, pt. 1, 77p.
- Snively, P. D., Jr., and MacLeod, N. S. (1974) Yachets basalt - an upper Eocene differentiated volcanic sequence in the Oregon Coast Range: U.S. Geol. Survey Jour. Research, v. 2, p. 395-403.
- Snively, P. D., Jr., MacLeod, N. S., and Wagner, H. C. (1973) Miocene tholeiitic basalt of coastal Oregon and Washington and their relations to coeval basalt of the Columbia Plateau: Geol. Soc. America Bull., v. 84, p. 387-424.
- Walker, G. W. (1970) Cenozoic ash-flow tuffs of Oregon: *The Ore-Bin*, v. 32, no. 6, p. 97-115.
- _____(1973) Reconnaissance geologic map of the Pendleton quadrangle, Oregon and Washington: U.S. Geol. Survey Map I-727.
- _____(1974) Some implications of late Cenozoic volcanism to geothermal potential in the high lava plains of south-central Oregon: U.S. Geol. Survey open-file report.
- Walker, G. W., Dalrymple, G. B., and Lanphere, M. A. (1974) Index to potassium-argon ages of Cenozoic volcanic rocks of Oregon: U.S. Geol. Survey Misc. Field Studies Map MF-569.
- Walker, G. W., and Repenning, C. A. (1965) Reconnaissance geologic map of the Adel quadrangle, Lake, Harney, and Malheur Counties, Oregon: U.S. Geol. Survey Map I-446.
- Walker, G. W., and Swanson, D. A. (1969) Discussion of paper by H. E. Whelher and H. A. Coombs, "Late Cenozoic mesa basalt sheet in northwestern United States": *Bull. Volcanol.*, v. 32, p. 581-585.
- Watkins, N. D., and Baksi, A. K. (1974) Magnetostratigraphy and oroclinal folding of the Columbia River, Steens and Owyhee basalts in Oregon, Washington, and Idaho: *Amer. Jour. Sci.*, v. 274, p. 148-189.