Argon dating at and near Medicine Lake volcano, California: Results and data

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INTRODUCTION

This report presents K-Ar and $^{40}Ar/^{39}Ar$ ages and supplementary data measured in support of geologic mapping at Medicine Lake volcano, northern California. Interpretation of the significance of these ages to be presented elsewhere (Donnelly-Nolan, in preparation). Sample locations are shown in Figures 1 and 2. Previous publications describing argon dating at and near the volcano include Brown and Mertzman (1979), Luedke and Lanphere (1980), Mertzman (1977, 1981, 1982, 1983), McKee and others (1983), Becker and others (1994), Herrero-Bervera and others, 1994, Donnelly-Nolan and others (1994, 1996), and Turrin (1996).

METHODS

All of the ages listed in Table 1 are conventional K-Ar ages measured in the USGS Menlo Park laboratory on whole-rock samples selected after thin-section examination. Decay constants (Steiger and Jager, 1977) are listed in Table 1. K_2O measurements were made by flame photometry after lithium metaborate fusion and dissolution (Ingamells, 1970). Ar analyses were by isotope-dilution mass spectrometry using a high-purity (>99.9%) ^{38}Ar tracer and techniques described previously (Dalrymple and Lanphere, 1969). All samples for Ar extraction were baked overnight at 280°C. Mass analyses were done on a 22.68 cm radius, multiple-collector mass spectrometer with a nominal 90° sector magnet, using automated data collection (Stacey and others, 1981; Sherrill and Dalrymple, 1980).

$^{40}Ar/^{39}Ar$ incremental-heating experiments in the Menlo Park laboratory (Table 2) were made on splits of approximately 100 mg of sample material. The resistance-heated furnace used to extract Ar is attached to the cleanup system and mass spectrometer described by Dalrymple (1989). The furnace is modified from the design of Staudacher and others (1978). Heating temperatures were controlled with an optical fiber thermometer. The fluence monitor for USGS $^{40}Ar/^{39}Ar$ analyses was 856003 sanidine, a secondary mineral standard with a reference age of 27.92 Ma.

In an incremental-heating experiment, the sample is heated to a given temperature and an apparent age is calculated for the gas extracted at that temperature. In calculating an apparent age, it is assumed that the non-radiogenic Ar in a sample is atmospheric in isotopic composition. Analytical data for the USGS determinations are given in Table 3.

$^{40}Ar/^{39}Ar$ ages measured at the Berkeley Geochronology Center (Table 2) used the techniques described in Herrero-Bervera and others (1994) and in Turrin (1996). Available analytical data are given in Table 4.

One additional table is included (Table 5) which compares ages determined on early rhyolite units of the volcano, both for this project and with previous work.

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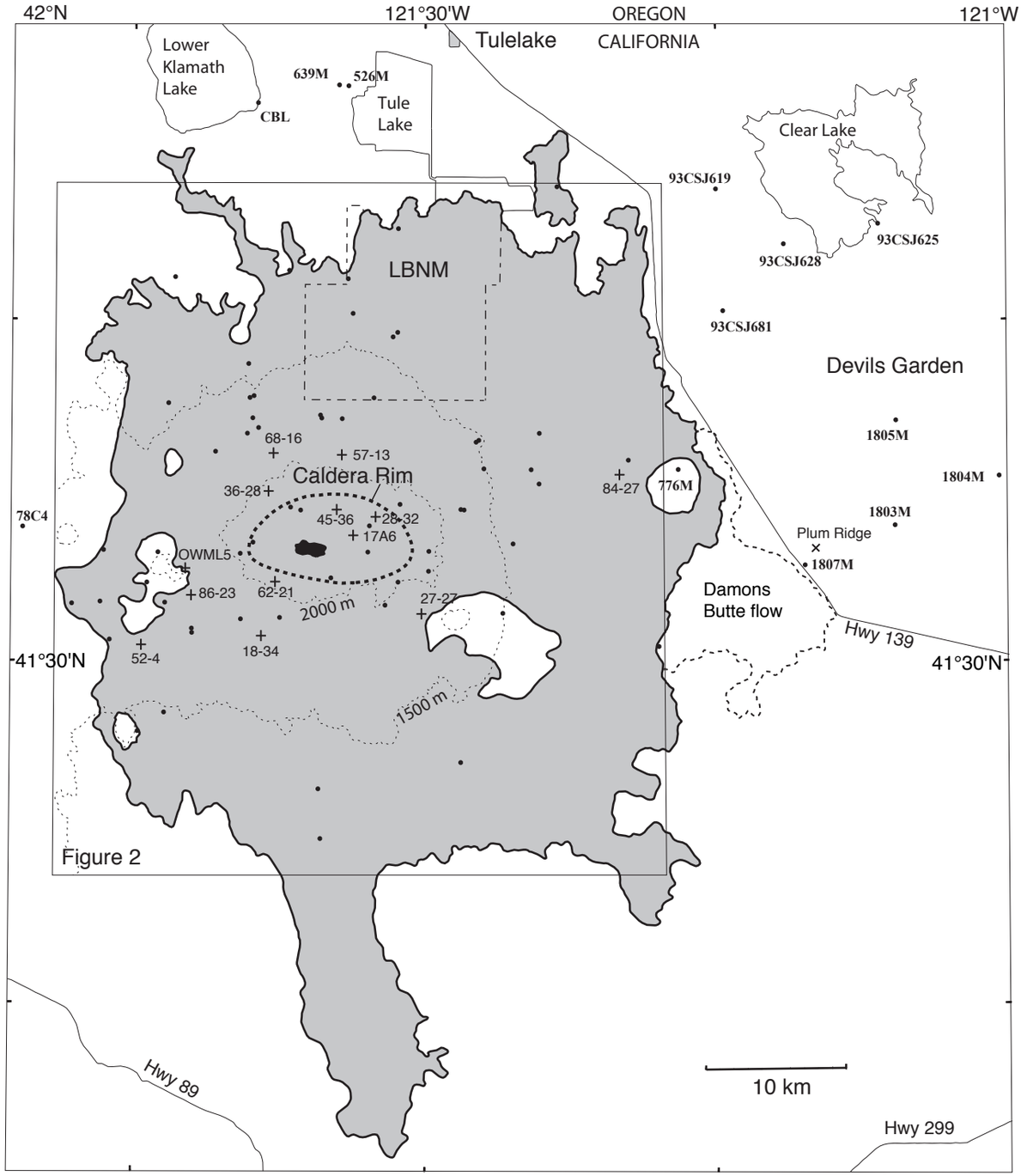

Figure 1. Location map showing approximate outline of Medicine Lake volcano lavas, which are shown in gray. Dots are locations of argon-dated samples with sample numbers shown only for rocks collected outside the area of Figure 2. The + symbols indicate locations of drill holes; hole identifiers are shown adjacent to symbol. LBNM is Lava Beds National Monument.

Figure 2. Enlarged location map showing argon-dated samples not labeled on Figure 1.

Table 1. Potassium-Argon Ages, Medicine Lake volcano and vicinity

All samples are whole-rock; all ages in ka (thousands of years) except as noted

Decay constant: $*\lambda_{\epsilon} = 0.581 \times 10^{-10}$ yr^{-1}; $\lambda_{\beta} = 4.962 \times 10^{-10}$ yr^{-1}; $^{40}K/K = 1.167 \times 10^{-4}$ mol/mol

Sample #	Description	Unit	Average age	Ages	Wt. % K_2O used	K_2O's n=	Weight (gms)	^{40}Ar (mole/g)	%^{40}Ar rad	Other information	Lat. 41°N Min.	Long. 121°W Min.
	MLV ages											
18M	Rhyolite E. of Callahan Flow, aphyric (obsidian)	rec	313±22	284±32 293±30 326±16	4.342±0.059	4	4.607 4.7961 7.3543	1.775×10^{-12} 1.834×10^{-12} 2.39×10^{-12}	19.6 22 35.7	same unit as 19M	40.81	35.38
19M	Rhyolite E. of Callahan Flow, aphyric (dull obsidian)	rec	335±21	309±18 393±27	4.280±0.144	2	6.9776 5.4488	1.902×10^{-12} 2.422×10^{-12}	18.9 11.6	same unit as 18M	40.77	35.37
	weighted avg, 18M + 19M		322±22									
	weighted avg.,18M,19M,68-16-753		301±10									
103M	Rhyolite E. of Glass Mountain (obsidian)	reg	707±28	607±44 732±22	4.735±0.106	2	5.026 4.6327	4.139×10^{-12} 4.993×10^{-12}	24.7 22.2	0.48±0.06 Ma (Mertzman, 1983, no.16); see Table 2, no.26: $^{40}Ar/^{39}Ar$ age	36.68	28.15
142M	Lower rhyolite W. of Callahan Flow, correlates with rhyolite of Grasshopper Flat (obsidian)	rgf	486±20	486±20	4.548±0.059	4	4.8562	3.189×10^{-12}	21.3	0.61±0.03 Ma (Mertzman, 1982, no.10); same unit as 1351M	41.68	38.90
	weighted avg. w/ 1351M		371±13									
155M	Rhyolite near Cougar Butte (obsidian)	rcb	590±22	574±21 609±23	4.407±0.025	3	6.6118 5.8732	3.645×10^{-12} 3.863×10^{-12}	44.7 50.6	0.43±0.04 Ma (Mertzman, 1982, no.11); same unit as 1359M; see Table 2, no.35: $^{40}Ar/^{39}Ar$ age	39.66	27.40
	weighted avg. w/ 1359M		569±19									
253M	Rhyolite of Grasshopper Flat (obsidian)	rgf	445±31	486±43 430±26	4.640±0.030	3	3.2236 5.3337	3.243×10^{-12} 2.877×10^{-12}	8.3 8.4	0.33±0.02 Ma (Mertzman, 1982, no.12; same unit as 1356M	31.24	42.00
	second sample		272±6	263±8 284±9	4.670±0.002	3	15.843 11.66	1.765×10^{-12} 1.913×10^{-12}	32.8 42.8			
	weighted avg. of 4 determinations		284±12									
	weighted avg. w/ 1356M		276±11									
256M	Rhyolite S. of Little Sand Butte (obsidian)	rsl	327±16	364±18 302±15	4.700±0.024	2	5.1722 9.372	2.467×10^{-12} 2.046×10^{-12}	10.1 8.2	0.24±0.03 Ma (Mertzman, 1982, no.9); same unit as 1365M	38.38	24.71
	weighted avg. w/ 1365M		313±11									
505M	Andesite of Typhoon Mesa	atm	254±25	284±44 242±49 241±35	1.705±0.010	3	17.4948 19.24 15.5504	6.979×10^{-13} 5.951×10^{-13} 5.915×10^{-13}	2.5 2 2.7		32.48	48.19
517M	Dacite E. of Lost Spring	dls	182±4	171±6 192±6	3.403±0.015	3	20.338 20.012	8.387×10^{-13} 9.443×10^{-13}	24.1 15.1	0.05±0.045 Ma (Mertzman, 1982, no.1)	30.95	46.23
675M	Rhyolite N.W. of Glass Mountain	rng	105±3	109±4 99±5	4.473±0.031	3	22.138 19.464	7.013×10^{-13} 6.347×10^{-13}	20.8 16.8	0.05±0.01 Ma (Mertzman, 1983, no.18)	36.97	31.40
684M	Rhyolite W. of Callahan Flow (upper); (obsidian)	rwc	349±7	339±10 360±11	4.647±0.032	3	9.964 12.529	2.270×10^{-12} 2.412×10^{-12}	26 33.7		40.69	38.90
999M	Andesite of the north rim	anr	78±6	74±12 78±8 83±11	1.721±0.018	3	19.851 32.383 17.17	1.841×10^{-13} 1.924×10^{-13} 2.067×10^{-13}	5.4 6.3 4.1	Table 2, no.15: $^{40}Ar/^{39}Ar$ age & Donnelly-Nolan & others, 1994	36.78	37.05

Table 1, cont.

Sample #	Description	Unit	Average age	Ages	Wt. % K_2O used	K_2O's n=	Weight (gms)	^{40}Ar (mole/g)	$\%^{40}Ar$ rad	Other information	Lat. 41°N	Long. 121°W
1013M	Andesite of the south rim	asr	108±7	96±12	1.763±0.003	4	19.018	$2.431x10^{-13}$	9.3	Table 2, no.16: $^{40}Ar/^{39}Ar$ age & Donnelly-Nolan & others, 1994	33.67	34.82
				111±11			21.611	$2.810x10^{-13}$	6.9			
				114±11			18.434	$2.901x10^{-13}$	5.6			
1162M	Rhyolite of Grasshopper Flat near Lost Iron Well (obsidian)	rgf	357±8	351±11	4.633±0.031	3	8.842	$2.346x10^{-12}$	23.9	0.29±0.02 Ma (Mertzman, 1982, no.9)	27.75	43.35
				364±11			10.417	$2.428x10^{-12}$	28.9			
1247M	Dacite E. of Glass Mountain	deg	203±6	202±9	3.537±0.025	3	12.884	$1.029x10^{-12}$	11.4	0.1±0.01 Ma (Mertzman, 1983, no.17)	36.17	26.81
				204±7			14.864	$1.039x10^{-12}$	14.9			
1268M	Basalt of Prisoners Rock	bp	273±18	254±36	0.643±0.006	4	11.602	$2.355x10^{-13}$	6.7		50.91	23.20
				269±26			15.88	$2.491x10^{-13}$	12.6			
				293±30			16.29	$2.714x10^{-13}$	5.1			
1351M	Lower rhyolite W. of Callahan Flow,correlates with rhyolite of Grasshopper Flat (obsidian)	rgf	362±8	364±11	4.640±0.054	4	15.377	$2.433x10^{-12}$	44.1	same unit as 142M	41.68	38.90
				361±11			14.476	$2.411x10^{-12}$	38.5			
1354M	Andesite of north rim, at cracks	anr	102±8	113±13	1.640±0.014	4	16.193	$2.669x10^{-13}$	4.3		35.20	38.92
				87±12			14.997	$2.043x10^{-13}$	5.5			
				108±14			16.49	$2.548x10^{-13}$	4.3			
	weighted avg. w/ 999M		87±7									
1355M	Dacite of Red Shale Butte	drs	88±7	97±11	1.892±0.023	4	17.049	$2.650x10^{-13}$	4.4		34.79	29.70
				82±9			15.716	$2.246x10^{-13}$	8			
1356M	Rhyolite of Grasshopper Flat (obsidian)	rgf	251±10	251±10	4.583±0.033	4	16.173	$1.659x10^{-12}$	9.6	same unit as 253M	31.24	42.00
1359M	Rhyolite near Cougar Butte (obsidian)	rcb	547±16	547±16	4.418±0.044	4	13.7497	$3.478x10^{-12}$	32.6	same unit as 155M	39.66	27.40
1360M	Dacite E. of the Callahan Flow	dec	194±4	198±6	3.690±0.024	4	15.2961	$1.051x10^{-12}$	24.1		40.70	34.30
				191±6			15.2628	$1.014x10^{-12}$	16.8			
1365M	Rhyolite S. of Little Sand Butte (obsidian)	rsl	308±6	304±9	4.718±0.039	4	14.813	$2.063x10^{-12}$	16.8	same unit as 256M	37.81	24.22
				312±9			14.224	$2.119x10^{-12}$	17			
1474M	Basaltic andesite of Fourmile Hill	mfh	130±36	146±36	0.899±0.013	4	14.6345	$1.889x10^{-13}$	3.6		39.98	39.25
				113±36			14.8584	$1.466x10^{-13}$	1.8			
52-4-628	Rhyolite at 628' in drill hole 52-4 (obsidian); *weighted avg.* w/ 253M & 1356M	rgf	382±8	389±12	4.632±0.084	4	14.695	$2.595x10^{-12}$	28.5	correlates with unit rgf	30.73	44.62
				378±9			11.655	$2.522x10^{-12}$	41			
			310±11									
57-13-1459	Rhyolite at 1459' in drill hole 57-13		324±7	320±10	4.463±0.068	4	15.596	$2.058x10^{-12}$	14.5	correlates with 68-16-1673	39.01	34.24
				328±10			14.915	$2.109x10^{-12}$	20.6			
	weighted avg. w/ 68-16-1673		354±11									
68-16-753	Rhyolite at 753' in drill hole 68-16	rec	297±6	304±8	4.320±0.064	4	14.738	$1.891x10^{-12}$	40.3	correlates with 18M & 19M	39.13	37.95
				290±8			15.992	$1.802x10^{-12}$	36.6			
68-16-1673	Rhyolite at 1673' in drill hole 68-16		397±8	385±12	4.583±0.068	4	9.776	$2.537x10^{-12}$	27.9	correlates with 57-13-1459	39.13	37.95
				410±12			10.602	$2.708x10^{-12}$	20.1			

Table 1, cont.

Sample #	Description	Unit	Average age	Ages	Wt. % K_2O used	K_2O's n=	Weight (gms)	^{40}Ar (mole/g)	$\%^{40}Ar$ rad	Other information	Lat. 41°N	Long. 121°W
	Pre-Medicine Lake volcano ages (or not MLV)											
135M	Dacite of Harris Mt.	odh	2.95±0.09 Ma	2.96±0.09 Ma 2.93±0.09 Ma	2.023±0.020	5	3.0941 6.5465	$8.635x10^{-12}$ $8.550x10^{-12}$	30.4 29.8		26.90	44.67
381M	Older rhyolite of Dock Well (W. dome)	ord	959±73	959±73	3.830±0.019	1	2.4127	$5.289x10^{-12}$	5.2		38.20	43.07
	second sample		823±28	826±49 814±46	3.847±0.031	3	8.954 8.492	$4.574x10^{-12}$ $4.511x10^{-12}$	6.6 7	0.95±0.14 Ma (Mertzman, 1982, no.5)		
	weighted avg. of 4 determinations		840±51	830±48			7.585	$4.599x10^{-12}$	6.7			
448M	Basalt near Gold Digger Pass	ob	910±49	906±53 921±82	0.720±0.004	4	18.09 19.266	$9.398x10^{-13}$ $9.553x10^{-13}$	7.2 4.4		47.05	37.03
460M	Older andesite of Pumice Stone Mountain	oap	928±42	928±42	1.318±0.007	5	8.3488	$1.760x10^{-12}$	11.5		34.80	43.78
	second sample			1.02±0.03 Ma 914±23	1.143±0.010	4	14.9486 15.5836	$1.680x10^{-12}$ $1.504x10^{-12}$	19.5 23.5			
	weighted avg. of 3 determinations		949±29									
469M	Older rhyolite of Red Cap Mountain	orr	965±24	1.031±0.025 Ma 905±24	3.610±0.018	2	6.1974 9.7439	$5.358x10^{-12}$ $4.703x10^{-12}$	31.4 58.4	1.01±0.05 Ma (Mertzman, 1982, no.7)	33.48	44.29
526M	Basaltic andesite dike near Winema Farms		3.12±0.09 Ma	3.06±0.09 Ma 3.17±0.09 Ma	1.180±0.011	5	6.5627 10.2604	$5.205x10^{-12}$ $5.397x10^{-12}$	43.9 14.6		55.32	33.95
639M	Basalt of High Rim		3.60±0.12 Ma	3.73±0.14 Ma 3.54±0.10 Ma	1.218±0.011	5	3.3517 6.4251	$6.538±10^{-12}$ $6.221±10^{-12}$	12.9 14.8		55.35	34.54
776M	Older basaltic andesite of Timber Mountain	omt	1.820±0.042 Ma	1.840±0.060 Ma 1.800±0.060 Ma	0.878±0.007	4	10.759 12.294	$2.328x10^{-12}$ $2.267x10^{-12}$	12.1 15.3		38.40	16.95
1223M	Older basaltic andesite of Bonita Butte	om	1.211±0.067 Ma	1.160±0.150 Ma 1.330±0.100 Ma 0.934±0.159 Ma 1.230±0.120 Ma	1.347±0.013	4	12.42 9.958 9.864 10.812	$2.245x10^{-12}$ $2.588x10^{-12}$ $1.812x10^{-12}$ $2.377x10^{-12}$	3.1 5.2 2.3 4.1		44.77	39.10
1229M	Older basaltic andesite of Black Mountain	omb	599±16	595±21 605±24	1.086±0.008	4	18.769 19.267	$9.315x10^{-13}$ $9.461x10^{-13}$	12.8 10.3		32.11	25.98
1803M	Basalt of Knobcone Butte		1.205±0.134 Ma		0.280±0.001	2	11.129	$4.851x10^{-13}$	12.4		35.95	5.86
1804M	Basalt of Hill 5160		975±156		0.264±0.004	2	12.493	$3.700x10^{-13}$	3.8		38.10	0.41
1805M	Basalt of Lone Pine Butte		1.047±0.107 Ma		0.400±0.003	2	11.223	$6.029x10^{-13}$	8.5		40.43	6.32
1807M	Basalt of Plum Ridge		629±176		0.252±0.000	2	10.341	$2.283x10^{-13}$	5.8		34.17	10.44
78C4	Andesite near Garner Mountain		52±3	51±3 52±3	1.672±0.028	2	4.5712 4.8532	$1.237x10^{-12}$ $1.248x10^{-12}$	12.3 8.8	collected by R. Luedke	35.85	50.82

Table 1, cont.

Sample #	Description	Unit	Average age	Ages	Wt. % K_2O used	K_2O's n=	Weight (gms)	^{40}Ar (mole/g)	$\%^{40}Ar$ rad	Other information	Lat. 41°N	Long. 121°W
CBL	Basalt of Chalk Bank Landing		1.07±0.87 Ma	1.07±0.87 Ma	0.107±0.003	4	15.5265	$1.655x10^{-13}$	0.5	collected by D. Adam	54.61	38.65
93CSJ628	Andesite N.W. of Double Head Mountain		1.540±0.140 Ma		2.261±0.012	4	9.93	$5.016x10^{-12}$	4.4	collected by J. Smith	48.34	11.61
93CSJ681	Basaltic andesite of Harvey Jones Butte		2.590±0.046 Ma	2.590±0.070 Ma 2.590±0.060 Ma	0.907±0.006	4	9.777	$3.384x10^{-12}$ $3.398x10^{-12}$	16.2 23.9	collected by J. Smith	45.44	14.65

Table 2. $^{40}Ar/^{39}Ar$ ages, Medicine Lake volcano and vicinity

All samples are whole-rock and all are in ka (except as noted)

Sample #	Description	Unit	Plateau Age	Isochron Age	Inverse Isochron Age	Lab.	Ref.	Lat. 41°N	Long. 121°W
114M	Andesite of Alcohol Crater	aac	114±5	113±11	113±10	USGS		34.81	32.98
160M	Andesite east of Six Shooter Pass	aes	307±24	311±19	311±19	USGS		41.36	43.27
194M	Dacite tuff of Antelope Well	dta	171±43		149±95	BGC	1	32.58	43.42
194M-1	Dacite tuff of Antelope Well; *plagioclase*	dta	128±24	124±69	136±37	USGS		32.58	43.42
194M-2	Dacite tuff of Antelope Well; *plagioclase*	dta	301±25	337±123	347±89	USGS		32.58	43.42
194M-3	Dacite tuff of Antelope Well; *plagioclase*	dta	241±18	301±151	302±96	USGS		32.58	43.42
253M	Rhyolite of Grasshopper Flat	rgf	383±1	383±1	383±1	BGC		31.24	42.00
383M	Basaltic andesite north of Lookout Butte	mnl	289±13	327±62	327±57	USGS		40.27	38.64
455M	Basaltic andesite west of Red Cap Mountain	mwr	309±17	316±25	315±24	BGC		34.91	46.53
471M	Andesite near Devils Homestead	adh	171±4	171±14	171±14	USGS		46.77	33.97
479M	Andesite correlated with Typhoon Mesa	atm	282±11	274±14	274±14	BGC		32.11	46.75
701M	Basalt of Little Sand Butte	bls	97±13	10±91	13±5	USGS		40.05	24.17
912M-c	Mafic inclusion in dacite of the south flank	ds	159±30	144±35	145±28	USGS		32.50	32.12
928M	Basaltic andesite E and NE of Shotgun Peak	msp	168±7	153±16	153±15	USGS		33.47	31.45
999M	Andesite of the north rim	anr	100±3			BGC	2	36.78	37.05
1013M	Andesite of the south rim	asr	124±3	126±3	126±3	BGC	2	33.67	34.82
1076M	Andesite east of Grasshopper Flat	aeg	236±33	223±125	211±70	BGC		31.93	37.55
1079M	Dacite tuff of Gillem Bluff; *plagioclase*	pre-MLV	2.023±0.020 Ma	2.008±0.022 Ma	2.011±0.022 Ma	USGS		47.30	33.92
1094M	Basaltic andesite under Giant Crater lava field	mug	180±28	151±40	149±30	BGC		31.74	39.67
1326M	Basalt of Little Mount Hoffman	blh	146±11	149±22	149±21	USGS		34.72	39.54
1360M	Dacite east of the Callahan Flow	dec	200±2	199±4	200±4	USGS		40.69	34.29
1403M	Basaltic andesite of Eagle Nest Butte	men	114±10	114±34	113±29	USGS		45.28	33.77
1521M	Basalt of Hovey Point	bhp	445±25	438±141	439±110	USGS		49.15	31.35
1529M	Basaltic andesite north of Medicine Lake	mnm	75±8	103±48	104±37	USGS		36.67	36.41
1620M	Andesite of Indian Butte	aib	22±13	43±48	41±12	USGS		38.49	27.03
1654M	Mafic inclusion in dacite S.W. of Kelley Pass	dsk	244±20	209±64	220±49	USGS		39.20	40.83
1707M	Rhyolite east of Glass Mountain	reg	475±29	418±55	413±47	USGS		36.62	28.08
1724M	Lake Basalt	bl	126±14	140±49	143±39	USGS		33.97	29.91
1797M	Basalt under Giant Crater lava field	bug	445±27	444±76	446±68	USGS		22.17	35.41

Table 2, cont. $^{40}Ar/^{39}Ar$ ages, Medicine Lake volcano and vicinity

Sample #	Description	Unit	Plateau Age	Isochron Age	Inverse Isochron Age	Lab.	Ref.	Lat. 41°N	Long. 121°W
1799M	Basalt of Damons Butte	bdb	144±15	149±27	155±23	USGS		30.64	18.03
1919M	Basalt of Yellowjacket Butte	byb	86±14	76±21	73±31	USGS		25.55	28.33
2058M	Basaltic andesite of the railroad	mrr	251±6	248±14	250±14	USGS		24.33	35.63
93CSJ619	Dacite of the Clear Lake Hills; *plagioclase*	pre-MLV	4.278±0.022 Ma	3.659±0.219 Ma	4.076±0.272 Ma	USGS		50.81	15.02
93CSJ625	Basalt south of Clear Lake Reservoir	pre-MLV	1.086±0.026 Ma	1.127±0.034 Ma	1.128±0.034 Ma	USGS		49.23	6.60
94CSJ780	Rhyolite tuff of Box Canyon; *plagioclase*	pre-MLV	1.006±0.025 Ma	1.124±0.143 Ma	1.139±0.126 Ma	USGS		46.91	42.88
MLV-004-92	Rhyolite near Cougar Butte	rcb	437±7			BGC		39.68	27.36
MLV-008-92	Lower rhyolite west of Callahan Flow = rgf	rgf	391±2			BGC		41.62	39.10
MLV-014-92	Lake Basalt (1724M site)	bl	123±27			BGC		33.97	29.91
MLV-016-92	Lake Basalt, east flank	bl	65±10	68±10		BGC	3	35.22	25.45
MLV-017-92	Rhyolite of Mount Hoffman	rmh	28±5			BGC		35.95	32.87
MLV-020-92	Basalt of Mammoth Crater	bmc	36±16	(=Total fusion age)		BGC		41.58	32.73
MLV-021-92	Andesite of Schonchin Butte	asb	65±23		52±10	BGC		44.46	31.45
84-27-94	Basalt of Tionesta	bt	896±56	68±163	54±16	BGC	3	38.86	19.54

Lab. column: USGS = analyses by M. Lanphere at USGS, Menlo Park CA; BGC = analyses by B. Turrin at Berkeley Geochronology Center

Ref. column: 1= Herrero-Bervera and others, 1994; 2 = Donnelly-Nolan and others, 1994; 3 = Turrin, 1996

TABLE 3. Data for $^{40}Ar/^{39}Ar$ experiments by M. Lanphere at USGS Menlo Park CA

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
114M Andesite of Alcohol Crater[J=0.00033896]											
plateau age=114 ± 5 ka; isochron age=113 ± 11 ka; inverse age=113 ± 10 ka; isochron intercept=295.6 ± 1.2; total gas age=133 ± 5 ka											
550	16.031	6.399	0.05861	-1.78E-16	-4.7	0.45	3.1	0.076	0.2	-0.466 ±	0.521
600	3.649	1.68	0.012263	1.69E-15	4.5	0.12	3.8	0.291	8	0.101 ±	0.015
650	2.601	1.8217	0.008647	4.39E-15	7.6	0.13	5.9	0.269	17.3	0.121 ±	0.009
700	2.722	1.8299	0.009142	3.83E-15	6.3	0.13	5.6	0.267	17.3	0.105 ±	0.009
750	3.764	2.105	0.012639	3.05E-15	5.4	0.15	4.7	0.232	11.6	0.124 ±	0.012
800	4.883	2.545	0.016563	2.88E-15	4.1	0.18	4.3	0.192	11.2	0.123 ±	0.014
850	6.588	1.9867	0.0224	1.17E-15	2	0.14	2.5	0.246	6.9	0.08 ±	0.02
900	7.564	2.367	0.02545	1.81E-15	3.2	0.17	2.6	0.207	5.9	0.147 ±	0.023
950	10.344	2.102	0.0351	9.82E-16	1.4	0.15	1.7	0.233	5.2	0.09 ±	0.029
1000	12.849	2.485	0.04344	1.41E-15	1.7	0.18	1.6	0.197	5	0.135 ±	0.034
1050	13.158	6.446	0.04469	3.94E-15	3.7	0.46	4.1	0.076	6.3	0.299 ±	0.036
1100	7.229	6.747	0.02489	2.13E-15	6	0.48	7.6	0.072	3.8	0.266 ±	0.032
1150	8.867	7.15	0.03026	8.48E-16	5.9	0.5	6.6	0.068	1.3	0.32 ±	0.078
160M Andesite east of Six Shooter Pass[J=0.0004041]											
plateau age=307 ± 24 ka; isochron age=311 ± 19 ka; inverse age=311 ± 19 ka; isochron intercept=295.4 ± 0.4; total gas age=522 ± 57 ka											
500	15.528	1.27	0.0508	1.33E-14	4	0.09	0.7	0.385	16.2	0.454 ±	0.046
550	12.498	1.6032	0.04133	9.65E-15	3.4	0.11	1.1	0.305	17.4	0.306 ±	0.039
600	13.62	2.073	0.04522	1.30E-14	3.2	0.15	1.3	0.236	22.9	0.314 ±	0.04
650	17.476	3.05	0.05856	1.08E-14	2.4	0.22	1.5	0.16	19.2	0.31 ±	0.052
700	29.81	3.907	0.10078	6.02E-15	1.2	0.28	1.1	0.125	12.8	0.26 ±	0.089
750	62.55	5.205	0.2115	4.40E-15	0.8	0.37	0.69	0.094	6.9	0.354 ±	0.187
800	152.22	5.879	0.518	-7.98E-16	-0.2	0.42	0.32	0.083	1.6	-0.273 ±	0.462
850	253.7	5.319	0.8617	-7.20E-16	-0.2	0.38	0.17	0.092	1.1	-0.371 ±	0.759
900	499.6	10.273	1.6765	3.54E-15	1	0.73	0.17	0.047	0.5	3.67 ±	2.06
950	1196.4	20.16	4.01	3.72E-15	1.1	1.4	0.14	0.024	0.2	9.64 ±	10.84
1000	1555.4	49	5.193	8.43E-15	1.6	3.5	0.27	0.0097	0.2	18.71 ±	12.15
1050	724.4	48.53	2.453	2.42E-15	0.5	3.4	0.56	0.0098	0.5	2.72 ±	3.21

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
1100	902.6	40.84	2.947	9.12E-15	3.9	2.9	0.39	0.0117	0.2	26.13 ±	8.96
1150	465.7	34.54	1.4728	5.93E-15	7.2	2.4	0.66	0.0138	0.1	24.73 ±	7.04
1250	973	28.74	3.008	4.03E-15	8.9	2	0.27	0.0167	0	63.29 ±	50.36
1400	189.84	23.45	0.474	1.56E-15	27.2	1.7	1.4	0.021	0	37.92 ±	21.65
194M-1 Plagioclase in dacite tuff of Antelope Well [J=0.00035651]											
plateau age=128 ± 24 ka; isochron age=124 ± 63 ka; inverse age=136 ± 37 ka; isochron intercept=295.0 ± 7.6; total gas age=834 ± 28 ka											
450	140.19	3.144	0.4175	1.46E-16	12.2	0.22	0.21	0.155	0	10.99 ±	15.56
500	280.7	0.06418	0.006393	6.19E-15	99.3	0.005	0.28	7.63	0.1	170.94 ±	6.22
550	122.97	0.012216	0.001216	1.43E-14	99.7	0.001	0.28	40.1	0.6	77.18 ±	0.98
600	43.47	18.335	0.15266	-1.87E-17	-0.3	1.3	3.4	0.026	0.8	-0.078 ±	0.718
601	21.86	20.01	0.07988	-2.32E-17	-0.4	1.4	7	0.024	1.4	-0.056 ±	0.408
650	10.137	20.8	0.03575	5.25E-16	12.8	1.5	16.3	0.023	2.1	0.848 ±	0.275
700	6.277	20.84	0.02524	3.22E-16	8.8	1.5	23.2	0.023	3	0.358 ±	0.191
750	5.553	20.27	0.02547	-2.07E-16	-5.2	1.4	22.4	0.024	3.6	-0.19 ±	0.158
800	3.858	20.96	0.018788	4.41E-17	1.2	1.5	31.4	0.023	4.8	0.03 ±	0.122
850	3.674	20.81	0.018034	8.84E-17	2	1.5	32.4	0.023	6.2	0.047 ±	0.098
900	3.106	20.45	0.016157	5.23E-17	1	1.4	35.6	0.024	9.1	0.019 ±	0.072
950	2.776	20.51	0.014277	5.39E-16	9.4	1.4	40.4	0.024	10.6	0.169 ±	0.064
1000	3.17	19.981	0.015301	7.81E-16	9.7	1.4	36.7	0.024	12.9	0.201 ±	0.056
1050	3.503	19.646	0.016437	6.74E-16	7.9	1.4	33.6	0.025	12.4	0.181 ±	0.057
1100	3.646	19.407	0.017187	4.02E-16	4.9	1.4	31.7	0.025	11.5	0.117 ±	0.06
1150	3.158	18.309	0.015715	4.70E-17	1.1	1.3	32.7	0.026	7	0.022 ±	0.087
1200	4.416	17.383	0.018524	2.58E-16	8.7	1.2	26.4	0.028	3.4	0.251 ±	0.166
1250	10.741	13.483	0.03953	1.72E-16	1.7	0.95	9.6	0.036	4.9	0.116 ±	0.119
1300	8.685	12.23	0.03058	7.07E-16	7.7	0.86	11.2	0.04	5.5	0.432 ±	0.107

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
194M-2 Plagioclase in dacite tuff of Antelope Well [J=0.00034710]											
plateau age=301 ± 25 ka; isochron age=337 ± 123 ka; inverse age=347 ± 89 ka; isochron intercept=291.9 ± 7.6; total gas age=301 ± 39 ka											
500	80.18	0.02686	0.724	-1.70E-16	-166.8	0.002	0.001	18.2	0	-85.77 ±	111.8
550	341.9	18.344	1.2113	-9.73E-17	-4.2	1.3	0.43	0.026	0	-9.22 ±	32.08
600	549.4	22.48	1.8321	3.42E-16	1.8	1.6	0.34	0.021	0.2	6.29 ±	8.94
650	111.56	22.72	0.3919	-2.74E-16	-2.1	1.6	1.6	0.021	0.7	-1.5 ±	1.075
700	34.76	22.84	0.12148	2.38E-16	2.2	1.6	5.3	0.021	1.9	0.483 ±	0.354
750	18.894	22.51	0.06814	2.96E-16	3.3	1.6	9.3	0.021	2.9	0.399 ±	0.235
800	11.816	21.41	0.04374	6.03E-16	5.7	1.5	13.8	0.023	5.5	0.425 ±	0.128
850	8.708	20.88	0.03367	5.70E-16	5.6	1.5	17.4	0.023	7.1	0.312 ±	0.101
900	6.425	20.82	0.02407	1.60E-15	16.2	1.5	24.3	0.023	9.3	0.662 ±	0.08
950	4.606	20.67	0.019742	1.05E-15	10.6	1.5	29.4	0.023	13.1	0.31 ±	0.062
1000	7.279	20.4	0.0291	1.00E-15	5.1	1.4	19.7	0.024	16.3	0.238 ±	0.056
1050	9.369	20.11	0.03668	5.89E-16	2.1	1.4	15.4	0.024	18	0.126 ±	0.055
1100	4.694	19.348	0.019577	1.27E-15	11	1.4	27.8	0.025	15	0.327 ±	0.056
1150	5.33	18.598	0.02377	-1.60E-16	-2.8	1.3	22	0.026	6.5	-0.096 ±	0.107
1200	8.72	18.782	0.03555	-1.31E-16	-2.6	1.3	14.8	0.026	3.5	-0.143 ±	0.19
194M-3 Plagioclase in dacite tuff of Antelope Well [J=0.00032718]											
plateau age=241 ± 18 ka; isocgron age=301 ± 151 ka; inverse age=302 ± 96 ka; isochron intercept=290.5 ± 12.2; total gas age=685 ± 33 ka											
600	1455	12.455	4.887	4.57E-16	0.8	0.88	0.072	0.039	0.1	7.13 ±	0.45
700	141.77	22.99	0.6039	-5.11E-14	-24.5	1.6	1.1	0.021	4.5	-20.98 ±	0.4
725	10.326	24.74	0.04207	-4.91E-17	-0.5	1.7	16.5	0.0195	3	-0.03 ±	0.114
775	6.781	23.51	0.02931	9.73E-17	1.1	1.7	22.5	0.02	4	0.044 ±	0.086
825	5.729	22.62	0.02411	6.30E-16	8.4	1.6	26.4	0.021	4	0.29 ±	0.087
875	5.555	22.2	0.02351	1.26E-15	8.1	1.6	26.5	0.022	8.5	0.27 ±	0.052
925	5.83	21.8	0.02464	1.20E-15	6.1	1.5	24.9	0.022	10.2	0.214 ±	0.048
975	6.837	21.68	0.02763	2.03E-15	6.9	1.5	22.1	0.022	13.1	0.283 ±	0.044
1025	6.714	21.53	0.02739	2.02E-15	6.1	1.5	22.1	0.022	15	0.244 ±	0.042
1075	6.898	20.67	0.02796	1.86E-15	5.1	1.5	20.8	0.023	16.1	0.211 ±	0.041
1125	6.628	19.438	0.02665	1.28E-15	5.5	1.4	20.5	0.025	10.6	0.219 ±	0.045
1175	8.548	16.782	0.03159	1.66E-15	7.1	1.2	14.9	0.029	8.3	0.363 ±	0.049
1225	14.827	16.335	0.0509	1.05E-15	7.7	1.2	9	0.03	2.8	0.681 ±	0.118

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
383M Basaltic andesite north of Lookout Butte [J=0.00039174]											
plateau age=289 ± 13 ka; isochron age=327 ± 62 ka; inverse age=327 ± 57 ka; isochron intercept=293.6 ± 3.0; total gas age=264 ± 14 ka											
450	30.53	0.7022	0.08384	2.21E-15	19.1	0.05	0.24	0.697	0.3	4.11 ±	1.13
500	16.279	2.771	0.0559	-4.84E-17	-0.1	0.2	1.4	0.177	4	-0.008 ±	0.067
550	13.104	3.684	0.04619	-3.24E-15	-1.8	0.26	2.2	0.133	12.3	-0.169 ±	0.039
600	11.165	3.872	0.03767	6.61E-15	3.2	0.27	2.9	0.126	16.9	0.251 ±	0.033
650	9.507	5.051	0.03215	6.19E-15	4.5	0.36	4.4	0.097	13.2	0.302 ±	0.03
700	7.57	6.833	0.026	7.43E-15	6	0.48	7.4	0.071	14.8	0.322 ±	0.027
750	6.821	8.624	0.02427	6.05E-15	5.4	0.61	10	0.056	15	0.26 ±	0.028
775	8.534	9.78	0.03014	3.32E-15	5.2	0.69	9.1	0.05	6.8	0.313 ±	0.042
800	11.104	10.645	0.03898	2.14E-15	4.2	0.75	7.7	0.046	4.1	0.334 ±	0.062
825	15.517	11.277	0.05462	8.79E-16	2	0.8	5.8	0.043	2.5	0.223 ±	0.095
850	17.658	11.628	0.06025	1.73E-15	4.6	0.82	5.4	0.042	1.9	0.583 ±	0.121
890	21.73	11.302	0.07523	8.81E-16	2	0.8	4.2	0.043	1.8	0.308 ±	0.129
940	28.33	10.253	0.09715	7.52E-16	1.7	0.72	3	0.047	1.4	0.341 ±	0.166
990	29.81	9.777	0.10345	6.91E-17	0.2	0.69	2.7	0.05	1.3	0.034 ±	0.181
1040	33.72	9.482	0.11187	2.31E-15	4.3	0.67	2.4	0.051	1.4	1.028 ±	0.17
1090	41.33	12.06	0.13837	1.96E-15	3.5	0.85	2.4	0.04	1.2	1.03 ±	0.203
1140	66.95	25.53	0.2269	1.83E-15	3	1.8	3.2	0.0188	0.8	1.443 ±	0.314
471M Andesite near Devils Homestead [J=0.00035292]											
plateau age=171 ± 4 ka; isochron age=171 ± 14 ka; inverse age=171 ± 14 ka; isochron intercept=295.6 ± 1.9; total gas age=187 ± 4 ka											
550	48.15	20.71	0.15916	1.86E-16	5.9	1.5	3.7	0.023	0	1.833 ±	1.997
600	7.918	2.492	0.02604	2.09E-15	5.4	0.18	2.7	0.196	2.8	0.274 ±	0.032
650	4.617	2.413	0.015273	3.14E-15	6.6	0.17	4.4	0.203	6	0.194 ±	0.016
700	3.191	2.243	0.010501	6.09E-15	8.6	0.16	6	0.218	12.8	0.175 ±	0.01
750	2.74	2.175	0.008923	6.35E-15	10.4	0.15	6.8	0.225	12.9	0.181 ±	0.009
800	2.793	1.9231	0.009135	4.64E-15	9.1	0.14	5.9	0.254	10.6	0.161 ±	0.01
850	3.294	1.7523	0.010735	5.68E-15	8.1	0.12	4.6	0.279	12.3	0.17 ±	0.01
900	3.756	1.7008	0.012377	4.17E-15	6.4	0.12	3.9	0.288	10	0.153 ±	0.011

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
950	5.244	1.2092	0.017138	4.06E-15	5.3	0.085	2	0.405	8.4	0.178 ±	0.015
1000	4.411	1.1437	0.014315	7.25E-15	6.3	0.081	2.2	0.428	15.2	0.176 ±	0.012
1025	6.856	2.529	0.02308	2.18E-15	3.6	0.18	3.1	0.193	5.1	0.157 ±	0.021
1050	15.872	16.01	0.05647	1.72E-15	3.2	1.1	8	0.03	1.9	0.33 ±	0.059
1075	12.352	24.83	0.04405	1.43E-15	11.3	1.8	15.8	0.0194	0.6	0.904 ±	0.135
1125	8.435	17.038	0.03075	1.74E-15	9	1.2	15.6	0.028	1.3	0.491 ±	0.066
701M Basalt of Little Sand Butte [J=0.00038602]											
plateau age=97 ± 13 ka; isochron age=10 ± 91 ka; inverse age=13 ± 5 ka; isochron intercept=301.1 ± 5.8; total gas age=31 ± 14 ka											
500	13.879	5.949	0.05233	-4.04E-15	-7.9	0.42	3.2	0.082	4.2	-0.764 ±	0.075
550	8.721	6.178	0.03188	-2.31E-15	-2.1	0.44	5.4	0.079	14	-0.13 ±	0.032
600	6.274	6.329	0.02266	1.30E-15	1.7	0.45	7.8	0.077	14.2	0.072 ±	0.027
650	5.602	6.215	0.02007	2.10E-15	3.4	0.44	8.7	0.078	12.6	0.132 ±	0.028
700	5.894	6.249	0.02157	5.52E-16	0.7	0.44	8.1	0.078	15.6	0.028 ±	0.026
750	6.722	6.964	0.02387	2.23E-15	3.7	0.49	8.2	0.07	10.2	0.173 ±	0.034
775	8.277	8.488	0.02989	8.07E-16	1.8	0.6	8	0.057	6	0.105 ±	0.052
800	10.076	10.488	0.03624	9.50E-16	2.4	0.74	8.1	0.046	4.5	0.167 ±	0.068
825	12.575	12.081	0.04547	3.97E-16	1.1	0.85	7.5	0.04	3.1	0.1 ±	0.094
850	14.423	12.643	0.05128	7.03E-16	2.2	0.89	6.9	0.038	2.5	0.223 ±	0.117
890	17.054	12.097	0.06134	-1.56E-16	-0.4	0.85	5.5	0.04	2.6	-0.047 ±	0.113
930	22.08	10.946	0.07778	8.74E-18	0	0.77	4	0.044	1.9	0.003 ±	0.156
970	29.23	10.565	0.10078	5.86E-16	1.1	0.75	2.9	0.046	2	0.226 ±	0.152
1020	46.53	16.008	0.1602	7.39E-16	1.1	1.1	2.8	0.03	1.6	0.368 ±	0.208
1120	73.54	50.34	0.2688	-2.23E-15	-2.3	3.6	5.3	0.0094	1.4	-1.234 ±	0.287
1250	52.35	58.47	0.19237	6.62E-16	0.7	4.1	8.5	0.008	2	0.261 ±	0.224
1400	48.46	51.38	0.17454	1.64E-15	2.4	3.6	8.3	0.0092	1.6	0.83 ±	0.236

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
912M-c Mafic inclusion in dacite of the south flank [J=0.00037202]											
plateau age=159 ± 30 ka; isochron age=144 ± 35 ka; inverse age=145 ± 28 ka; isochron intercept=295.9 ± 0.7; total gas age=159 ± 59 ka											
450	1229.1	12.789	4.291	-4.23E-16	-3.1	0.9	0.084	0.038	0	-25.88 ±	233.5
500	31.83	8.713	0.11015	8.58E-18	0	0.62	2.2	0.056	2	0.005 ±	0.397
550	19.821	9.639	0.06924	4.97E-16	0.8	0.68	3.9	0.05	5.7	0.109 ±	0.149
600	10.823	10.92	0.03869	2.70E-15	2.7	0.77	7.9	0.045	16.7	0.201 ±	0.058
650	10.274	12.431	0.03725	2.21E-15	2.9	0.88	9.4	0.039	13.7	0.202 ±	0.067
700	10.75	13.603	0.03967	1.09E-15	1.5	0.96	9.6	0.036	12.8	0.107 ±	0.072
750	13.866	13.938	0.05048	6.02E-16	0.8	0.98	7.8	0.035	10.4	0.072 ±	0.088
825	28.74	13.925	0.10039	1.58E-15	0.8	0.98	3.9	0.035	12.7	0.155 ±	0.097
900	38.61	14.766	0.13429	7.02E-16	0.4	1	3.1	0.033	8.6	0.102 ±	0.135
975	32.88	13.459	0.11335	1.23E-15	1.5	0.95	3.3	0.036	4.5	0.341 ±	0.195
1075	31.86	14.443	0.11122	8.44E-16	0.6	1	3.6	0.034	7.8	0.135 ±	0.131
1200	101.54	77.7	0.3635	1.73E-15	0.6	5.5	6	0.006	5.2	0.417 ±	0.337
928M Basaltic andesite E. and N.E. of Shotgun Peak [J=0.00036519]											
plateau age=168 ± 7 ka; isochron age=153 ± 16 ka; inverse age=153 ± 15 ka; isochron intercept=297.9 ± 2.3; total gas age=177 ± 11 ka											
450	715.3	3.141	2.026	1.73E-15	16.3	0.22	0.044	0.156	0	75.53 ±	88.74
500	9.38	2.975	0.03127	8.42E-16	4.1	0.21	2.7	0.164	1.1	0.255 ±	0.194
550	4.498	3.174	0.015326	3.42E-15	5.2	0.22	5.8	0.154	7.4	0.154 ±	0.031
600	2.673	2.938	0.008902	1.03E-14	10.7	0.21	9.3	0.166	18.3	0.189 ±	0.014
650	2.235	2.625	0.007557	6.63E-15	9.8	0.19	9.8	0.186	15.3	0.145 ±	0.016
700	2.134	2.42	0.00698	8.22E-15	12.8	0.17	9.7	0.202	15.3	0.18 ±	0.015
750	2.451	2.543	0.008165	6.33E-15	10.2	0.18	8.8	0.192	12.9	0.165 ±	0.018
800	3.129	2.983	0.01067	4.07E-15	7.1	0.21	7.9	0.164	9.3	0.147 ±	0.025
850	4.845	4.001	0.016896	2.53E-15	3.8	0.28	6.7	0.122	7	0.121 ±	0.033
900	6.337	5.566	0.02202	2.78E-15	4.6	0.39	7.1	0.088	4.8	0.193 ±	0.048
950	8.039	6.616	0.02765	2.95E-15	5.2	0.47	6.7	0.074	3.6	0.275 ±	0.063
1000	8.657	7.915	0.03103	6.28E-16	1.7	0.56	7.2	0.062	2.2	0.095 ±	0.1
1100	16.09	10.282	0.05577	2.50E-15	2.9	0.73	5.2	0.047	2.7	0.308 ±	0.089

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
1079M Plagioclase in dacite tuff of Gillem Bluff [J=0.00037831]											
plateau age=2.023 ± 0.020 Ma; isochron age=2.008 ± 0.022 Ma; inverse age=2.011 ± 0.022 Ma; intercept=296.4 ± 0.7; total gas age=2.012 ± 0.026											
450	599.5	6.54	2.018	1.10E-15	0.6	0.42	0.066	0.075	0.6	2.47 ±	2.26
500	130.75	5.79	0.4316	4.30E-15	2.7	0.37	0.28	0.084	2.4	2.44 ±	0.36
550	11.773	6.531	0.03215	4.01E-15	22.6	0.42	4.2	0.075	3	1.826 ±	0.136
600	8.671	7.07	0.02084	8.44E-15	33.9	0.46	7	0.069	5.7	2.01 ±	0.08
650	7.737	7.725	0.017696	1.07E-14	38.4	0.5	8.9	0.063	7.1	2.04 ±	0.06
700	7.354	8.317	0.016522	1.30E-14	40.4	0.54	10.3	0.059	8.6	2.04 ±	0.06
750	7.442	8.989	0.016917	1.62E-14	40.1	0.58	10.9	0.054	10.8	2.05 ±	0.05
800	7.176	9.423	0.016299	1.69E-14	40.8	0.61	11.9	0.052	11.4	2.01 ±	0.05
850	6.533	9.709	0.014136	1.72E-14	45	0.63	14.1	0.05	11.6	2.02 ±	0.05
900	7.73	9.52	0.018505	1.74E-14	36.7	0.61	10.5	0.051	12.1	1.945 ±	0.049
950	7.322	9.717	0.016953	1.50E-14	39.6	0.63	11.8	0.05	10.2	1.989 ±	0.053
1000	8.457	10.039	0.019665	7.96E-15	38.4	0.65	10.5	0.048	4.8	2.23 ±	0.09
1050	11.092	9.983	0.02884	6.19E-15	28.6	0.64	7.1	0.049	3.8	2.18 ±	0.11
1100	10.962	10.04	0.02943	3.60E-15	26.2	0.65	7	0.048	2.5	1.969 ±	0.164
1150	10.365	10.082	0.02705	3.35E-15	28.7	0.65	7.6	0.048	2.2	2.05 ±	0.18
1200	8.744	9.999	0.0214	3.76E-15	34.6	0.65	9.6	0.049	2.5	2.07 ±	0.1
1350	12.667	10.233	0.04852	-3.46E-16	-8.3	0.66	4.3	0.048	0.6	-0.724 ±	0.334
1500	16.877	0.12773	0.07959	-2.71E-16	-39.3	0.008	0.033	3.84	0.1	-4.54 ±	2.66
1326 Basalt of Little Mount Hoffman [J=0.00036745]											
plateau age=146 ± 11 ka; isochron age=149 ± 22 ka; inverse age=149 ± 21 ka; isochron intercept=295.3 ± 1.5; total gas age=248 ± 12 ka											
450	93.17	665.3	0.4866	1.23E-17	4.9	47	38.4	0.0004	0	5.75 ±	106
500	37.69	-20.85113	0.10787	1.53E-16	10.8	-1.472	-5.432	-0.0238	0.1	2.67 ±	3.38
550	14.368	14.724	0.04852	8.78E-16	8.7	1	8.5	0.033	1.2	0.84 ±	0.188
600	6.968	10.767	0.02514	1.33E-15	6.2	0.76	12	0.045	5.4	0.289 ±	0.049
650	5.393	8.054	0.019302	1.80E-15	6.6	0.57	11.7	0.06	8.8	0.238 ±	0.032
700	4.812	7.09	0.017567	1.28E-15	4.4	0.5	11.3	0.069	10.7	0.14 ±	0.027
750	4.716	6.846	0.017094	1.72E-15	4.9	0.48	11.3	0.071	13	0.155 ±	0.024
800	5.743	6.007	0.02044	1.35E-15	3.5	0.42	8.3	0.081	11.7	0.134 ±	0.026
850	5.818	5.102	0.02039	1.13E-15	3.7	0.36	7	0.096	9.2	0.144 ±	0.029

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
900	7.405	6.495	0.02601	1.21E-15	3.5	0.46	7	0.075	8.3	0.172 ±	0.034
950	8.566	7.35	0.03027	9.44E-16	2.7	0.52	6.8	0.066	7.2	0.153 ±	0.039
1000	9.916	7.498	0.03519	4.46E-16	1.4	0.53	6	0.065	5.5	0.094 ±	0.049
1075	10.204	4.956	0.03514	1.33E-15	2.3	0.35	4	0.099	10.1	0.154 ±	0.034
1150	15.033	6.089	0.05088	1.88E-15	3.3	0.43	3.4	0.08	6.6	0.334 ±	0.05
1250	67.81	54.92	0.2307	5.73E-15	6.2	3.9	6.7	0.0086	2.3	2.89 ±	0.22
1360M Dacite east of the Callahan Flow [J=0.00032556]											
plateau age=200 ± 2 ka; isochron age=199 ± 4 ka; inverse age=200 ± 4 ka; isochron intercept=296.0 ± 7.6; total gas age=203 ± 2 ka											
550	10.698	0.8133	0.03681	-1.71E-17	-1.1		0.057	0.62	0.602	0.1 ±	0.663
600	8.139	0.2386	0.02627	2.66E-16	4.9		0.017	0.26	2.05	0.3 ±	0.149
650	7.066	0.2218	0.02281	6.08E-16	4.9		0.016	0.27	2.21	0.8 ±	0.058
700	3.851	0.2073	0.011501	2.57E-15	12.2		0.015	0.51	2.36	2.4 ±	0.02
750	1.5171	0.2097	0.00386	3.73E-15	26		0.015	1.5	2.34	4.1 ±	0.011
800	0.8197	0.2303	0.001626	4.87E-15	43.7		0.016	4	2.13	5.9 ±	0.007
850	0.578	0.2355	0.000836	7.79E-15	60.7		0.017	7.9	2.08	9.6 ±	0.005
900	0.4868	0.2438	0.000541	9.26E-15	71.3		0.017	12.7	2.01	11.5 ±	0.004
950	0.5765	0.2417	0.000887	9.18E-15	58		0.017	7.7	2.03	11.9 ±	0.004
1000	0.4588	0.2474	0.000461	9.72E-15	74.8		0.017	15.1	1.98	12.2 ±	0.004
1050	0.4572	0.2478	0.000491	8.68E-15	72.8		0.017	14.2	1.98	11.3 ±	0.004
1100	0.6005	0.2721	0.000957	8.80E-15	56.7		0.019	8	1.8	11.2 ±	0.004
1150	0.7384	0.2903	0.001466	6.72E-15	44.6		0.02	5.6	1.69	8.8 ±	0.005
1200	0.7212	0.3496	0.001416	4.45E-15	46		0.025	6.9	1.4	5.8 ±	0.008
1250	0.7939	0.3832	0.00159	3.58E-15	44.8		0.027	6.8	1.28	4.3 ±	0.01
1403M Basaltic andesite of Eagle Nest Butte [J=0.00038161]											
plateau age=114 ± 10 ka; isochron age=114 ± 34 ka; inverse age=113 ± 29 ka; isochron intercept=295.5 ± 1.1; total gas age=193 ± 11 ka											
550	131.27	181.54	0.4068	5.77E-16	19.9	12.8	12.5	0.0024	0	20.53 ±	0.235
600	9.939	13.555	0.0365	1.98E-16	2.8	0.96	10.4	0.036	1.2	0.195 ±	0.21
650	5.493	6.653	0.019617	1.01E-15	4.5	0.47	9.5	0.073	6.8	0.172 ±	0.203
700	3.982	5.239	0.014411	1.61E-15	4	0.37	10.2	0.093	16.9	0.11 ±	0.166

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
750	3.569	5.845	0.01315	1.83E-15	4.7	0.41	12.5	0.083	18.2	0.117 ±	0.164
800	4.501	6.779	0.01661	2.00E-15	3.5	0.48	11.5	0.072	21.5	0.107 ±	0.221
850	6.855	8.658	0.02515	1.13E-15	2.1	0.61	9.7	0.056	13.2	0.099 ±	0.303
900	10.72	10.813	0.03807	1.59E-15	3.4	0.76	8	0.045	7.2	0.256 ±	0.137
950	15.338	8.127	0.05287	9.07E-16	2.5	0.57	4.3	0.06	3.9	0.27 ±	0.07
1000	21.26	13.654	0.07345	1.33E-15	3.2	0.96	5.2	0.036	3.2	0.475 ±	0.091
1050	23.54	16.474	0.08047	2.34E-15	4.8	1.2	5.8	0.029	3.4	0.786 ±	0.093
1100	28.74	29.11	0.10269	2.12E-15	2.8	2.1	8	0.0165	4.3	0.569 ±	0.105
1521M Basalt of Hovey Point [J=0.00036096]											
plateau age=445 ± 25 ka; isochron age=438 ± 141 ka; inverse age=439 ± 110 ka; isochron intercept=295.4 ± 7.3; total gas age=433 ± 36 ka											
450	550.8	91.4	1.7269	3.85E-16	8.7	6.5	1.5	0.005	0	33.17 ±	46.34
500	25.28	21.35	0.10213	-5.63E-16	-12.4	1.5	5.9	0.023	1.1	-2.07 ±	0.74
550	13.084	10.514	0.04949	-4.14E-16	-5.1	0.74	6	0.046	3.8	-0.438 ±	0.216
600	5.522	12.49	0.016864	1.17E-15	28.5	0.88	20.8	0.039	4.6	1.035 ±	0.18
650	7.016	11.407	0.02392	1.88E-15	12.8	0.81	13.4	0.043	12.9	0.588 ±	0.068
700	6.284	11.568	0.02226	2.57E-15	10.6	0.82	14.6	0.042	23.7	0.438 ±	0.042
750	7.608	12.506	0.02652	2.64E-15	10.7	0.88	13.3	0.039	20.1	0.533 ±	0.049
800	10.239	14.4	0.03775	6.80E-16	2.7	1	10.7	0.034	14.8	0.185 ±	0.065
850	12.848	19.314	0.04741	6.58E-16	3.5	1.4	11.4	0.025	9.1	0.293 ±	0.101
900	21.04	21.73	0.07433	9.61E-16	4.2	1.5	8.2	0.022	6.7	0.579 ±	0.137
950	34.66	18.296	0.11765	7.40E-16	4.1	1.3	4.4	0.026	3.2	0.934 ±	0.269
1529M Basaltic andesite north of Medicine Lake [J=0.0003929]											
plateau age=75 ± 8 ka; isochron age=103 ± 48 ka; inverse age=104 ± 37 ka; isochron intercept=292.6 ± 4.2; total gas age=15 ± 13 ka											
450	78.077	8.419	0.5106	-1.22E-16	292.4	0.59	0.46	0.058	0	-170.57 ±	489.6
500	45.72	14.734	0.9293	1.94E-16	-498	1	0.45	0.033	0	-170.91 ±	369.3
501	42.26	2.111	0.14546	-1.48E-16	-1.3	0.15	0.41	0.23	0.3	-0.389 ±	0.772
550	4.602	2.124	0.015501	1.88E-15	4.3	0.15	3.8	0.23	8.9	0.14 ±	0.025
600	3.478	1.9714	0.011954	2.81E-15	3.1	0.14	4.6	0.25	24.1	0.077 ±	0.012
650	4.169	2.082	0.014253	1.59E-15	3.1	0.15	4.1	0.23	11.4	0.092 ±	0.02

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
700	5.198	2.335	0.018099	8.22E-16	0.8	0.16	3.6	0.21	17.7	0.031 ±	0.018
750	8.937	2.408	0.03066	1.09E-15	0.8	0.17	2.2	0.2	13.4	0.054 ±	0.027
800	14.826	2.947	0.05149	-1.75E-15	-1	0.21	1.6	0.16	11.2	-0.104 ±	0.044
850	23.19	2.973	0.0807	-1.45E-15	-1.8	0.21	1	0.16	3.3	-0.29 ±	0.083
900	36.47	2.213	0.12648	-2.03E-15	-2	0.16	0.49	0.23	2.6	-0.512 ±	0.118
950	61.02	1.6164	0.2093	-2.46E-15	-1.1	0.11	0.22	0.31	3.3	-0.492 ±	0.178
975	79.23	3.573	0.2685	3.73E-16	0.2	0.25	0.37	0.14	2	0.126 ±	0.23
1000	80.2	9.087	0.2715	1.45E-15	0.9	0.64	0.94	0.054	1.9	0.518 ±	0.234
1620M Andesite of Indian Butte [J=0.00036805]											
plateau age=22 ± 13 ka; isochron age=43 ± 48 ka; inverse age=41 ± 12 ka; isochron intercept=294.6 ± 1.6; total gas age=20 ± 13 ka											
550	27.58	13.188	0.09868	-9.43E-17	-1.8	0.93	3.8	0.037	0.2	-0.327 ±	1.258
600	15.094	4.673	0.05172	5.86E-16	1.3	0.33	2.5	0.105	3.5	0.131 ±	0.089
650	12.275	4.33	0.04186	1.61E-15	2.2	0.31	2.9	0.113	7.2	0.177 ±	0.05
700	9.671	3.887	0.03365	7.30E-16	0.5	0.27	3.2	0.126	17.3	0.034 ±	0.029
725	8.999	2.743	0.03118	2.47E-16	0.2	0.19	2.5	0.178	21.6	0.009 ±	0.026
750	10.352	3.303	0.036	-1.10E-16	-0.1	0.23	2.6	0.148	12.2	-0.007 ±	0.035
775	11.56	4.039	0.04015	3.09E-16	0.3	0.29	2.8	0.121	12.2	0.02 ±	0.037
800	15.538	4.82	0.05409	-3.03E-16	-0.3	0.34	2.5	0.101	7.8	-0.031 ±	0.053
825	22.34	6.421	0.07733	1.08E-16	0.1	0.45	2.3	0.076	4.6	0.019 ±	0.083
875	31.35	5.005	0.10937	-2.15E-15	-1.8	0.35	1.3	0.098	4.6	-0.37 ±	0.098
925	44.69	5.956	0.15299	-6.29E-17	-0.1	0.42	1.1	0.082	3	-0.017 ±	0.143
975	47.33	8.548	0.16223	1.78E-16	0.2	0.6	1.5	0.057	2.1	0.067 ±	0.177
1025	36.2	8.194	0.12314	9.29E-16	1.3	0.58	1.9	0.059	2.3	0.325 ±	0.153
1075	41.17	15.276	0.142	5.35E-16	1.2	1.1	3	0.032	1.3	0.318 ±	0.238
1654M Mafic inclusion in dacite southwest of Kelley Pass [J=0.00038058]											
plateau age=244 ± 20 ka; isochron age=209 ± 64 ka; inverse age=220 ± 49 ka; isochron intercept=297.3 ± 3.7; total gas age=298 ± 19ka											
450	7135.3	273.9	24.23	-2.43E-17	0	19.3	0.32	0.0014	0	-2.31 ±	642.8
480	122.74	164.45	0.5113	-4.33E-16	-12	11.6	9	0.0026	0.1	-11.45 ±	6.21
530	41.96	12.726	0.12808	8.28E-16	12.3	0.9	2.8	0.038	0.7	3.58 ±	0.87

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
580	10.99	10.727	0.03739	9.25E-16	7.6	0.76	8.1	0.045	4.5	0.574 ±	0.126
630	7.125	10.099	0.02551	9.30E-16	6	0.71	11.1	0.048	8.9	0.294 ±	0.067
680	5.656	9.543	0.02009	1.77E-15	9.1	0.67	13.3	0.051	14.1	0.354 ±	0.045
730	4.926	10.267	0.019129	4.59E-16	2.6	0.72	15.1	0.047	14.8	0.087 ±	0.044
780	4.862	11.927	0.018666	1.38E-15	6.9	0.84	18	0.041	16.7	0.233 ±	0.041
830	6.154	13.717	0.02334	1.22E-15	6.4	0.97	16.5	0.035	12.6	0.273 ±	0.053
880	10.658	15.507	0.03887	9.82E-16	4.3	1.1	11.2	0.031	8.7	0.32 ±	0.075
930	16.187	17.311	0.05848	4.43E-16	2.1	1.2	8.3	0.028	5.2	0.239 ±	0.118
980	14.771	15.793	0.05311	3.15E-16	2.6	1.1	8.4	0.031	3.3	0.269 ±	0.174
1050	25.87	12	0.08942	3.85E-16	1.7	0.85	3.8	0.04	3.6	0.305 ±	0.169
1125	25.43	15.658	0.08998	9.86E-17	0.6	1.1	4.9	0.031	2.8	0.099 ±	0.208
1250	52.61	119.58	0.2075	1.29E-15	2.3	8.4	16.2	0.0038	3.9	0.922 ±	0.311
1707M Rhyolite east of Glass Mountain [J=0.00036888]											
plateau age=475 ± 29 ka; isochron age=418 ± 55 ka; inverse age=413 ± 47 ka; isochron intercept=319.2 ± 23; total gas age=480 ± 3 ka											
450	3.015	0.06159	0.007329	4.04E-15	28.2	0.004	0.23	7.96	1.5	0.565 ±	0.027
500	2.14	0.04075	0.004808	9.12E-15	33.5	0.003	0.23	12	3.9	0.477 ±	0.009
550	1.8797	0.04024	0.003942	1.84E-14	37.9	0.003	0.27	12.2	8	0.474 ±	0.006
600	1.7636	0.04374	0.00369	1.71E-14	38.1	0.003	0.32	11.2	7.9	0.447 ±	0.006
650	1.736	0.03755	0.00343	2.37E-14	41.5	0.003	0.29	13	10.2	0.479 ±	0.005
700	1.7243	0.04213	0.003456	2.71E-14	40.7	0.003	0.33	11.6	11.9	0.466 ±	0.004
725	1.7076	0.04431	0.003387	2.05E-14	41.3	0.003	0.35	11.1	9	0.469 ±	0.005
750	1.7095	0.04142	0.003358	1.81E-14	41.8	0.003	0.33	11.8	7.8	0.476 ±	0.005
775	1.7196	0.03936	0.00345	1.69E-14	40.6	0.003	0.31	12.4	7.5	0.465 ±	0.006
800	1.7331	0.043	0.003399	1.55E-14	42	0.003	0.34	11.4	6.6	0.484 ±	0.006
850	1.7437	0.03833	0.003447	1.49E-14	41.5	0.003	0.3	12.8	6.4	0.481 ±	0.006
900	1.8666	0.04126	0.003776	1.52E-14	40.1	0.003	0.29	11.9	6.3	0.498 ±	0.006
950	1.8961	0.03923	0.003811	1.28E-14	40.5	0.003	0.28	12.5	5.1	0.511 ±	0.007
1000	1.8288	0.03742	0.003693	8.57E-15	40.2	0.003	0.27	13.1	3.6	0.489 ±	0.01
1100	1.8324	0.02936	0.003478	7.00E-15	43.8	0.002	0.23	16.7	2.7	0.533 ±	0.013
1200	1.9545	0.009771	0.003919	3.70E-15	40.5	0.001	0.067	50.1	1.4	0.527 ±	0.023
1400	2.315	0.012291	0.004616	1.06E-15	40.9	0.001	0.072	39.9	0.3	0.63 ±	0.094

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
1724M Lake Basalt [J=0.00039461]											
plateau age=126 ± 14 ka; isochron age=140 ± 49 ka; inverse age=143 ± 39 ka; isochron intercept=294.4 ± 2.8; total gas age=149 ± 17 ka											
550	136.84	381.7	0.4488	5.84E-16	26.3	27	23.9	0.0009	0	34.67 ±	13.92
600	15.923	5.661	0.05421	8.70E-17	2.3	0.4	2.9	0.086	0.5	0.267 ±	0.581
650	7.061	9.807	0.02567	6.09E-16	4.1	0.69	10.7	0.05	4.2	0.207 ±	0.069
700	4.489	10.962	0.017953	5.89E-16	2.1	0.77	17.2	0.044	12.4	0.067 ±	0.032
750	3.754	11.177	0.015156	1.57E-15	5.4	0.79	20.7	0.043	15.3	0.146 ±	0.029
800	4.444	11.784	0.017887	1.39E-15	3.1	0.83	18.5	0.041	20.2	0.098 ±	0.029
850	6.334	13.923	0.02414	2.39E-15	5.7	0.98	16.2	0.035	13.1	0.257 ±	0.037
900	9.896	17.129	0.03781	6.66E-16	1.5	1.2	12.7	0.028	8.9	0.105 ±	0.051
950	14.728	13.905	0.05316	5.11E-16	1.2	0.98	7.3	0.035	5.8	0.124 ±	0.065
1000	19.837	10.823	0.07003	1.29E-16	0.2	0.76	4.3	0.045	6.2	0.03 ±	0.07
1050	34.19	6.434	0.11844	-1.22E-15	-0.8	0.45	1.5	0.076	8.8	-0.197 ±	0.103
1075	52.59	13.224	0.1779	1.99E-15	2.1	0.93	2.1	0.037	3.5	0.804 ±	0.16
1090	74.95	33.78	0.2561	1.20E-15	2.8	2.4	3.7	0.0142	1.1	1.52 ±	0.315
1797M Basalt under Giant Crater lava field [J=0.0004066]											
plateau age=445 ± 27 ka; isochron age=444 ± 76 ka; inverse age=446 ± 68 ka; isochron intercept=295.4 ± 1.9; total gas age=499 ± 32 ka											
450	414.4	14.416	0.04681	2.24E-16	97	1	8.7	0.034	0	275.6 ±	513.2
500	30.07	10.694	0.10283	9.24E-16	1.9	0.76	2.9	0.045	4.3	0.424 ±	0.164
550	22.35	12.324	0.07744	3.96E-15	2.2	0.87	4.5	0.039	21.3	0.366 ±	0.072
600	17.311	13.729	0.0604	4.00E-15	3.5	0.97	6.4	0.035	17.6	0.447 ±	0.064
650	12.63	15.344	0.04478	3.88E-15	5.3	1.1	9.6	0.032	15.4	0.497 ±	0.06
700	10.773	15.502	0.03877	3.07E-15	5.6	1.1	11.2	0.031	13.5	0.447 ±	0.062
750	11.914	14.064	0.04272	1.85E-15	3.8	0.99	9.3	0.034	10.7	0.34 ±	0.071
800	15	14.046	0.05187	1.83E-15	5.6	0.99	7.6	0.035	5.8	0.621 ±	0.116
850	20.26	16.065	0.07062	1.34E-15	3.6	1.1	6.4	0.03	4.9	0.538 ±	0.139
900	42.22	41.78	0.15193	9.46E-16	1.9	2.9	7.7	0.0114	3.1	0.603 ±	0.244
950	28.59	41.73	0.10487	2.88E-16	3.7	2.9	11.2	0.0114	0.7	0.805 ±	0.573
951	30.21	47.5	0.10893	2.96E-16	6.5	3.4	12.3	0.01	0.4	1.494 ±	1.58
1000	41.58	98.21	0.15809	7.66E-16	7.3	6.9	17.5	0.0046	0.6	2.37 ±	1
1100	40.2	174.83	0.17827	6.69E-16	5.1	12.3	27.6	0.0025	0.8	1.708 ±	0.902
1200	23.69	148.47	0.11124	1.34E-15	13.3	10.5	37.5	0.003	1	2.57 ±	0.68

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
1799M Basalt of Damons Butte [J=0.00042789]											
plateau age=144 ± 15 ka; isochron age=149 ± 27 ka; inverse age=155 ± 23 ka; isochron intercept=294.7 ± 2.7; total gas age=153 ± 19 ka											
500	75.26	34.57	0.2302	8.57E-16	13.4	2.4	4.2	0.0138	0.1	7.98 ±	3.12
550	5.841	9.793	0.02074	1.13E-15	9	0.69	13.3	0.05	2.9	0.408 ±	0.117
600	2.804	11.685	0.01204	1.85E-15	7.7	0.82	27.3	0.042	11.7	0.169 ±	0.038
650	2.682	13.537	0.012637	9.07E-16	2.7	0.96	30.1	0.036	17.3	0.056 ±	0.035
700	3.306	10.721	0.013565	2.05E-15	5.7	0.76	22.2	0.045	15	0.146 ±	0.033
750	3.554	8.473	0.013354	2.47E-15	8.8	0.6	17.8	0.057	10.9	0.241 ±	0.037
800	5.126	7.769	0.01885	1.09E-15	3.9	0.55	11.6	0.063	7.5	0.156 ±	0.05
850	7.011	9.208	0.02589	4.54E-16	1.8	0.65	10	0.053	4.9	0.098 ±	0.073
900	9.135	8.379	0.03272	5.49E-16	1.8	0.59	7.2	0.058	4.7	0.125 ±	0.079
950	10.471	9.359	0.03694	9.72E-16	3.2	0.66	7.1	0.052	4	0.259 ±	0.091
1000	25.51	11.966	0.08937	3.78E-16	0.4	0.84	3.8	0.041	5.4	0.074 ±	0.098
1050	10.896	14.523	0.04059	4.34E-16	1	1	10.1	0.033	5.5	0.084 ±	0.075
1100	19.832	38.62	0.07781	1.91E-16	0.2	2.7	13.9	0.0123	5.6	0.036 ±	0.116
1150	24.8	90.52	0.10837	9.36E-16	1.2	6.4	23.5	0.0051	4.2	0.24 ±	0.226
1200	17.293	73.7	0.0786	5.10E-17	1.1	5.2	26.3	0.0063	0.4	0.152 ±	0.963
1919M Basalt of Yellowjacket Butte [J=0.00041853]											
plateau age=86 ± 14 ka; isochron age=76 ± 21 ka; inverse age=73 ± 31 ka; isochron intercept=296.2 ± 1.8; total gas age=192 ± 18 ka											
500	169.27	2.516	0.001951	1.24E-16	99.8	0.18	36.2	0.194	0	123.43 ±	237.8
550	15.756	0.05835	0.05262	6.66E-18	1.3	0.004	0.031	8.4	0.1	0.159 ±	4.31
600	10.185	15.042	0.03473	2.73E-16	11.5	1.1	12.2	0.032	0.6	0.893 ±	0.592
650	6.254	10.157	0.02311	4.91E-16	4.3	0.72	12.3	0.048	4.5	0.204 ±	0.079
700	3.824	9.164	0.014926	9.22E-16	4.6	0.65	17.3	0.053	13.1	0.132 ±	0.034
750	3.298	9.17	0.013163	1.23E-15	5.2	0.65	19.6	0.053	17.8	0.129 ±	0.028
800	3.567	9.829	0.014711	3.50E-16	1	0.69	18.8	0.05	24.1	0.027 ±	0.026
850	4.876	11.106	0.019441	3.49E-16	1.1	0.78	16.1	0.044	16	0.041 ±	0.034
900	8.419	13.202	0.03174	5.30E-16	1.6	0.93	11.7	0.037	9.6	0.104 ±	0.05
950	14.911	13.468	0.054	1.56E-16	0.5	0.95	7	0.036	5.3	0.055 ±	0.081
1000	25.39	12.473	0.0885	4.13E-16	1.1	0.88	4	0.039	3.7	0.211 ±	0.118
1050	32.61	13.749	0.11393	9.53E-17	0.3	0.97	3.4	0.035	2.6	0.067 ±	0.158

TABLE 3. Cont.

Temp (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	Moles $^{40}Ar_{rad}$	$^{40}Ar_{rad}$ (%)	$^{39}Ar_{Ca}$ (%)	$^{36}Ar_{Ca}$ (%)	K/Ca	^{39}Ar (%)	Age (Ma)	Std.dev.
1100	66.51	57.32	0.2332	1.73E-15	3.6	4	6.9	0.0082	1.7	1.866 ±	0.295
1150	96.51	242.4	0.3661	3.58E-15	8.8	17.1	18.6	0.0017	0.9	7.69 ±	0.77
2058M Basaltic andesite of the railroad [J=0.00042147]											
plateau age=251 ± 6 ka; isochron age=248± 14 ka; inverse age=250 ± 14 ka; isochron intercept=295.7 ± 2.1; total gas age=278 ± 7 ka											
600	82.12	1.7064	0.2573	8.78E-17	7.6	0.12	0.19	0.287	0	4.73 ±	9.94
650	49.44	0.4435	0.16475	1.56E-16	1.6	0.031	0.076	1.1	0.2	0.601 ±	0.687
700	14.587	0.04467	0.04835	2.96E-16	2.1	0.003	0.026	11	1.2	0.231 ±	0.14
750	9.046	0.11812	0.0289	5.91E-16	5.7	0.008	0.11	4.15	1.4	0.393 ±	0.117
800	7.34	0.0974	0.02356	9.40E-16	5.2	0.007	0.12	5.03	3	0.292 ±	0.057
850	6.714	0.04599	0.02182	9.33E-16	4	0.003	0.059	10.7	4.3	0.206 ±	0.042
900	5.944	0.06656	0.018846	1.90E-15	6.4	0.005	0.099	7.36	6.2	0.29 ±	0.031
950	6.004	0.05212	0.01945	1.95E-15	4.3	0.004	0.075	9.4	9.3	0.198 ±	0.024
1000	2.948	0.05278	0.008558	3.26E-15	14.4	0.004	0.17	9.28	9.6	0.322 ±	0.019
1050	1.7645	0.06615	0.004898	2.83E-15	18.3	0.005	0.38	7.41	10.9	0.245 ±	0.016
1100	1.087	0.05442	0.002564	3.42E-15	30.7	0.004	0.6	9	12.8	0.254 ±	0.013
1150	1.3402	0.06007	0.003478	2.85E-15	23.7	0.004	0.49	8.16	11.2	0.241 ±	0.015
1200	0.8838	0.06245	0.002015	2.67E-15	33.2	0.004	0.87	7.85	11.3	0.223 ±	0.015
1250	0.9486	0.0701	0.002034	2.31E-15	37.2	0.005	0.97	6.99	8.2	0.269 ±	0.02
1300	1.244	0.07989	0.002072	3.18E-15	51.3	0.006	1.1	6.13	6.2	0.485 ±	0.026
1035	1.4135	0.12082	0.002759	2.02E-15	43	0.009	1.2	4.06	4.1	0.462 ±	0.04

Table 4. Data for $^{40}Ar/^{39}Ar$ experiments by B. Turrin at Berkeley Geochronology Center

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar	Age (ka)	±1s (ka)
253M Rhyolite of Grasshopper Flat											
6238-01G	1000	5.1721	0.0161	0.0726	0.0165			5.8	0.3	238.5	79.0
6238-01H	1050	1.5010	0.0136	0.0715	0.0032			37.5	0.8	444.1	25.1
6238-01I	1100	0.9889	0.0133	0.0678	0.0016			53.1	1.6	414.8	12.2
6238-01J	1150	0.8623	0.0131	0.0712	0.0013			55.8	2.4	380.2	8.9
6238-01K	1200	0.7103	0.0129	0.0698	0.0008			65.7	3.9	368.6	5.5
6238-01L	1250	0.6350	0.0127	0.0684	0.0006			73.8	5.6	369.9	4.0
6238-01M	1300	0.6379	0.0129	0.0696	0.0005			76.0	8.0	382.8	2.9
6238-01N	1350	0.6348	0.0128	0.0700	0.0005			76.6	10.0	383.8	2.4
6238-01O	1400	0.6283	0.0128	0.0716	0.0005			76.8	10.3	380.8	2.4
6238-01P	1500	0.5776	0.0128	0.0893	0.0003			84.1	55.4	383.2	1.0
6238-01Q	1600	11.3509	0.0195	0.0806	0.0369			4.0	1.7	363.0	46.3
Plateau age = 383 ± 0.8 ka (n = 5, steps M-Q)											
Total fusion age = 381.9 ± 3.2											
$^{40}Ar/^{36}Ar$ intercept = 294.7 ± 1.6											
J = 0.0004377 ± 0.0000005											
MSWD = 0.4113916											
455M Basaltic andesite west of Red Cap Mountain											
6201-01B	550	37.9941	0.0452	0.0606	0.1257			2.2	1.6	67	291
6201-01C	600	29.1400	0.0408	0.0690	0.0974			1.2	9.1	276	256
6201-01D	650	60.2197	0.0610	0.0757	0.2021			0.8	11.6	392	278
6201-01E	700	441.9174	0.2984	0.2501	1.4726			1.5	16.4	5319	3662
6201-01F	750	55.1409	0.0531	0.2904	0.1810			3.0	0.5	1314	587
6201-01G	800	219.4769	0.1589	0.9158	0.7390			0.5	6.6	924	1138
6201-01H	850	56.7436	0.0503	1.9519	0.1916			0.5	9.1	225	179
6201-01I	900	8.2592	0.0173	3.0211	0.0274			4.8	26.9	311	25
6201-01J	950	6.0514	0.0169	2.9038	0.0198			7.0	8.0	332	29
6201-01K	1000	16.6903	0.0270	3.2481	0.0559			2.5	3.7	332	67
6201-01L	1050	20.3643	0.0364	8.5743	0.0703			1.1	3.3	185	80
6201-01M	1100	20.2633	0.0303	12.7593	0.0714			0.7	2.3	110	88
6201-01N	1150	28.1788	0.0333	11.6629	0.0966			1.8	0.8	411	224

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar	Age (ka)	±1s (ka)
Plateau age = 309 ± 17 ka (n = 13, steps B-N)											
Total fusion age = 1180 ± 770 ka											
J = 0.0004346 ± 0.0000005											
$^{40}Ar/^{36}Ar$ initial = 295.2 ± 0.8											
MSWD = 1.5											
479M Andesite correlated with Typhoon Mesa											
6194-01A	550	66.7785	0.0623	0.0599	0.2240			0.9	0.9	458	314
6194-01B	600	285.7406	0.1915	0.2234	0.9646			0.3	2.6	572	2097
6194-01C	650	432.2673	0.2855	0.4121	1.4455			1.2	7.9	4056	4179
6194-01D	700	57.7810	0.0510	0.2810	0.1953			0.2	9.5	78	293
6194-01E	750	27.5406	0.0309	0.4799	0.0919			1.5	16.1	337	96
6194-01F	800	15.7381	0.0226	0.7855	0.0522			2.3	22.2	285	41
6194-01G	850	3.7845	0.0148	1.2859	0.0119			9.2	24.2	277	12
6194-01H	900	8.0928	0.0177	2.2087	0.0263			6.0	7.4	384	57
6194-01I	950	21.9355	0.0278	3.5144	0.0710			5.5	1.9	958	133
6194-01J	1000	19.2512	0.0268	2.3223	0.0617			6.3	2.3	953	85
6194-01K	1050	12.9106	0.0261	3.1511	0.0420			5.8	3.0	595	56
6194-01L	1100	14.2195	0.0260	6.0306	0.0466			6.5	1.5	727	84
6194-01M	1150	29.2751	0.0341	8.5542	0.0956			5.7	0.4	1319	290
6194-01N	1200	47.4781	0.0462	8.6766	0.1537			5.8	0.2	2168	638
Plateau age = 282 ± 11 (n = 8, steps A-H)											
Total fusion age = 640 ± 460											
J = 0.0004378 ± 0.0000005											
$^{40}Ar/^{36}Ar$ initial = 296.1 ± 0.8											
MSWD = 0.8											
1013M Andesite of the south rim											
6199-01A	550	55.4466	0.0547	0.1317	0.1839			2.0	0.1	864	875
6199-01B	600	42.5197	0.0485	0.0689	0.1411			1.9	2.5	647	176
6199-01C	650	134.6919	0.1111	0.1540	0.4539			0.4	2.2	457	1438
6199-01D	700	384.1797	0.2704	0.4655	1.2993			0.1	5.0	217	7718
6199-01E	750	245.8819	0.1902	0.5644	0.8289			0.4	1.3	779	3671
6199-01F	800	162.3507	0.1360	0.6639	0.5484			0.2	1.4	283	2131

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$ ^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar	Age (ka)	±1s (ka)
6199-01G	850	31.5990	0.0375	1.2445	0.1071		0.1	5.8	28	205
6199-01H	900	1.3700	0.0117	0.9101	0.0043		11.3	30.0	122	5
6199-01I	950	0.5673	0.0111	0.6439	0.0015		28.0	27.4	125	4
6199-01J	1000	0.9232	0.0119	0.7873	0.0028		17.9	11.9	130	8
6199-01K	1050	2.1067	0.0160	1.5549	0.0070		7.3	5.8	120	16
6199-01L	1100	3.5614	0.0178	3.7427	0.0125		4.0	5.2	114	20
6199-01M	1150	6.7190	0.0185	3.9087	0.0229		3.6	1.0	191	84
6199-01N	1200	16.6357	0.0256	3.9329	0.0564		1.7	0.4	218	203

Plateau age = 124 ± 3 ka (n = 12, steps C-N)
Total fusion age = 160 ± 520
J = 0.0004361 ± 0.0000005
$^{40}Ar/^{36}Ar$ initial = 295.0 ± 1.1
MSWD = 0.3

1076M Andesite east of Grasshopper Flat

6208-01F	770	19.9176		1.4495	0.0674		0.5	0.8	84	659
6208-01G	800	19.7885		0.6354	0.0634		5.6	1.1	870	486
6208-01H	850	16.4785		1.2659	0.0570		-1.6	2.1	-210	240
6208-01I	900	16.5437		1.3033	0.0552		2.0	2.5	262	209
6208-01J	950	17.4649		2.1864	0.0588		1.5	2.0	200	254
6208-01K	1000	17.1810		3.6568	0.0578		2.2	8.0	296	143
6208-01L	1050	10.5151		6.1674	0.0361		3.0	63.9	253	45
6208-01M	1100	8.8932		18.5208	0.0339		3.1	18.4	218	56
6208-01N	1150	16.8679		24.6198	0.0571		11.0	1.2	1487	423

Plateau age = 236 ± 33 ka (n = 8, steps F-M)
Total fusion age = 259 ± 79 ka
J = 0.0004367 ± 0.000005
$^{40}Ar/^{36}Ar$ initial = 295.8 ± 4.6
MSWD = 1.0

1094M Basaltic andesite under Giant Crater lava field

6197-01B	600	208.2181	0.1586	0.0860	0.7083		-0.5	4.1	-833	1544
6197-01C	625	620.6958	0.4094	0.2005	2.1075		-0.3	5.3	-1600	6800
6197-01D	650	1313.5710	0.8042	0.5633	4.2327		4.8	8.5	48139	26715

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar	Age (ka)	±1s (ka)
6197-01E	675	103.1293	0.0836	0.2534	0.3438			1.5	2.1	1195	610
6197-01F	700	179.0475	0.1319	0.2736	0.6036			0.4	6.1	541	944
6197-01G	750	92.2119	0.0774	0.8777	0.3121			0.0	11.0	30	349
6197-01H	800	47.4476	0.0482	1.7160	0.1602			0.5	18.2	184	137
6197-01I	850	13.2364	0.0239	4.2071	0.0451			1.7	24.3	175	46
6197-01J	900	9.9308	0.0206	6.6368	0.0346			2.1	11.9	165	40
6197-01K	950	20.3377	0.0303	8.5559	0.0703			1.1	3.8	175	95
6197-01L	1000	31.0986	0.0435	8.5154	0.1052			2.2	2.0	523	175
6197-01M	1050	32.6565	0.0720	29.3958	0.1122			5.4	1.0	1385	251
6197-01O	1200	35.6430	0.0477	53.5576	0.1326			1.5	1.6	437	224

Plateau age = 180 ± 28 ka (n = 11, steps B-L)
Total fusion age = 4100 ± 2800 ka
J = 0.0004302 ± 0.000005
$^{40}Ar/^{36}Ar$ initial = 296.3 ± 0.8
MSWD = 1.1

MLV-004-92 Rhyolite near Cougar Butte

6809-01A	660	11.5345	0.2662721	3.66E-02	0.7187855			6.2		425	43
6809-01B	720	6.194462	0.3223609	1.85E-02	0.7551547			12.2		446	23
6809-01C	750	5.590806	0.5225238	1.66E-02	0.7063128			12.6		418	21
6809-01D	780	5.392256	0.3072876	1.58E-02	0.7257053			13.5		429	17
6809-01E	810	5.328634	0.1894166	1.56E-02	0.732546			13.8		433	15
6809-01F	850	5.39254	9.55E-02	1.57E-02	0.7447205			13.8		440	14
6809-01G	890	5.50263	5.01E-02	1.60E-02	0.7554469			13.7		447	14
6809-01H	940	5.543793	0.1324258	1.61E-02	0.7966768			14.4		471	14
6809-01I	1000	5.65867	0.1941475	1.62E-02	0.8702989			15.4		515	18
6809-01J	1100	5.852455	7.19E-02	1.65E-02	0.9621668			16.5		569	19
6809-01K	1350	6.880608	0.4604526	1.93E-02	1.21829			17.7		720	46

Plateau age = 437.1 ± 6.7 ka (n=7, steps A-G)
Total fusion age = 471 ± 16ka
$^{40}Ar/^{36}Ar$ initial = 294.9 ± 2.6
J =
MSWD = 0.8

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar Age (ka)	±1s (ka)
MLV-008-92 Lower rhyolite west of Callahan Flow (powder)										
6827-01A	760	6.278712	1.82E-02	7.70E-02	1.88E-02	0.712626		11.4	431	23
6827-01B	795	0.923601	1.43E-02	0.0782252	9.79E-04	0.6316958		69.0	393	7
6827-01C	831	0.8451759	1.53E-02	8.03E-02	7.22E-04	0.6294202		75.2	392	7
6827-01D	868	0.8364397	1.48E-02	7.86E-02	7.22E-04	0.620623		75.0	386	6
6827-01E	904	0.8592699	1.48E-02	7.79E-02	7.78E-04	0.6266806		73.7	390	6
6827-01F	940	0.948755	1.49E-02	7.79E-02	1.08E-03	0.6280611		66.8	391	6
6827-01G	975	0.8928887	1.47E-02	7.67E-02	8.86E-04	0.6284603		71.1	391	6
6827-01H	1011	0.8798807	1.47E-02	7.77E-02	8.26E-04	0.6331514		72.7	394	7
6827-01I	1048	1.037567	1.46E-02	9.07E-02	1.29E-03	0.6535724		63.5	407	8
6827-01J	1101	1.576075	1.50E-02	9.23E-02	2.99E-03	0.6916852		44.1	431	18
6827-01K	1190	1.398656	1.47E-02	8.60E-02	2.46E-03	0.6692882		48.1	417	11
6827-01L	1512	14.39404	2.34E-02	0.2379536	4.59E-02	0.8368423		5.8	521	61
Plateau age = 391 ± 2 ka (n=8, steps A-H)										
Total fusion age =										
J = 0.000345 ± 0.000005										
$^{40}Ar/^{36}Ar$ initial =										
MSWD =										
MLV-014-92 Lake Basalt (1724M site)										
6829-01C	766	181.9422	0.1323654	2.130739	0.6119313	1.272827		0.7	817	1445
6829-01D	809	39.27193	4.18E-02	4.349382	0.1334935	0.1493269		0.4	96	188
6829-01E	852	19.59004	2.78E-02	6.769291	6.72E-02	0.2388202		1.2	153	87
6829-01F	895	9.200212	1.99E-02	8.088644	3.26E-02	0.1780429		1.9	114	42
6829-01G	939	10.2117	2.01E-02	7.578131	3.58E-02	0.1918538		1.9	123	45
6829-01H	981	17.61159	2.53E-02	8.314636	6.10E-02	0.2043968		1.2	131	77
6829-01I	1024	60.47002	5.32E-02	10.21348	0.2068575	0.1175052		0.2	75	282
Plateau age = 123 ± 27 (n = 7, steps C-I)										
Total fusion age =										
J = 0.000356										
$^{40}Ar/^{36}Ar$ initial =										
MSWD =										

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar	Age (ka)	±1s (ka)
MLV-016-92 Lake Basalt, east flank (data from Turrin, 1996)											
6828-02D	795	25.3708	0.0339	2.5209	0.0866	7.33		-0.1	5.2	-19	111
6828-02E	813	27.6505	0.0352	2.9131	0.0942	1.25		0.1	0.8	10	126
6828-02F	832	19.6220	0.0293	4.0601	0.0672	1.64		0.3	1.5	44	89
6828-02G	850	12.9269	0.0240	4.9887	0.0444	1.96		1.4	2.7	119	59
6828-02H	868	16.5139	0.0254	5.4134	0.0565	7.38		1.3	7.9	136	71
6828-02I	886	6.5813	0.0189	5.2849	0.0231	6.36		2.4	17.0	103	29
6828-02J	903	3.7083	0.0175	5.3047	0.0136	3.30		2.2	15.7	53	18
6828-02K	921	3.7726	0.0184	5.7611	0.0139	1.94		2.7	9.1	65	19
6828-02L	940	4.8528	0.0199	6.5320	0.0178	1.76		2.0	6.5	62	28
6828-02M	959	6.0973	0.0214	7.2551	0.0223	1.77		1.0	5.1	41	34
6828-02N	977	7.7178	0.0228	7.8263	0.0283	1.72		-0.7	3.9	-33	38
6828-02O	993	10.8424	0.0260	8.2910	0.0380	2.01		2.2	3.2	157	56
6828-02P	1010	14.8345	0.0286	7.8719	0.0526	2.35		-0.7	2.8	-66	75
6828-02Q	1046	19.3874	0.0325	5.6111	0.0677	6.13		-0.9	5.6	-118	-86
6828-02R	1083	25.4060	0.0367	5.4786	0.0878	7.12		-0.4	4.9	-74	-115
6828-02S	1154	72.9348	0.0693	19.3980	0.2503	3.62		0.6	0.9	-286	-345
6828-02T	1297	26.3468	0.0405	22.5928	0.0953	11.2		-0.4	7.5	-62	-130
Plateau age = 65 ± 10 ka (n = 10, steps D-M)											
Total fusion age = 41 ± 19 ka											
J = 0.000356											
$^{40}Ar/^{36}Ar$ initial = 294.6 ± 0.8											
MSWD = 1.8											
MLV-017-92 Rhyolite of Mount Hoffman											
6820-01A	725	5.694029	1.89E-02	0.2079746	1.90E-02	7.43E-02		1.3		46	23
6820-01B	760	2.139158	1.65E-02	0.251862	7.17E-03	3.18E-02		1.5		20	9
6820-01C	796	2.151766	1.67E-02	0.2626261	7.19E-03	3.76E-02		1.8		23	9
6820-01D	831	2.179277	1.67E-02	0.2473247	7.27E-03	4.12E-02		1.9		25	10
6820-01E	868	2.202302	1.65E-02	0.2712605	7.26E-03	6.96E-02		3.2		43	10
6820-01G	975	2.874001	1.75E-02	0.9468883	9.16E-03	0.2310406		8.1		143	28
6820-01H	975	2.883863	0.0175311	0.9482795	9.14E-03	0.2480674		8.6		154	20
6820-01I	1046	3.308423	1.79E-02	1.857564	1.04E-02	0.3791229		11.5		235	30
6820-01J	1550	8.428307	2.08E-02	3.838092	2.66E-02	0.8458053		10.0		523	44

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar Age (ka)	±1s (ka)
Plateau age = 28 ± 5 ka (n = 5, steps A-E)										
Total fusion age =										
J = 0.000343 ± 0.000005										
$^{40}Ar/^{36}Ar$ initial =										
MSWD =										
MLV-020-92 Basalt of Mammoth Crater										
6824-01E	780	36.06165		0.2961163	0.1215434	0.1596714		0.4	96	102
6824-01F	806	33.21315		0.2764547	0.11208	0.1060781		0.3	63	50
6824-01G	830	31.32972		0.2519242	0.1058437	6.36E-02		0.2	38	86
6824-01H	855	26.12564		0.2637485	8.82E-02	0.0879904		0.3	53	42
6824-01I	880	19.76553		0.2701008	6.69E-02	1.36E-02		0.1	8	29
6824-01J	905	11.09913		0.2754547	3.78E-02	-7.07E-02		-0.6	-42	16
6824-01K	929	9.283259		0.3113599	3.15E-02	-2.03E-02		-0.2	-12	18
6824-01L	954	8.870646		0.3376323	3.00E-02	1.02E-02		0.1	6	14
6824-01M	1003	8.614202		0.4098364	2.93E-02	-2.44E-02		-0.3	-15	11
6824-01N	1102	8.988492		0.615153	3.01E-02	0.1310751		1.5	78	11
Total fusion age = 36 ± 16 ka										
$^{40}Ar/^{36}Ar$ initial = 295.9 ± 0.6										
J = 0.000332 ± 0.000006										
MSWD = 7.7										
MLV-021-92 Andesite of Schonchin Butte										
6824-02B	675	66.4710		6.4816	0.2209	1.683336		2.5	1008	494
6824-02C	700	36.9555		1.3379	0.1236	0.5273134		1.4	316	246
6824-02D	725	27.4216		0.3814	9.37E-02	-0.2443824		-0.9	-146	136
6824-02E	750	21.3155		0.9117	7.23E-02	1.60E-02		0.1	9	70
6824-02F	775	16.5867		0.3040	5.59E-02	8.62E-02		0.5	52	68
6824-02G	800	16.0639		0.6179	4.37E-02	0.1775405		1.4	106	51
6824-02H	850	10.5526		1.2255	3.56E-02	0.1263156		1.2	76	38
6824-02I	900	10.5163		2.2048	3.57E-02	0.1176284		1.1	71	69
6824-02J	975	12.4792		1.4915	4.31E-02	-0.1371585		-1.1	-82	229
6824-02K	1050	15.7534		3.0899	5.43E-02	-5.43E-02		-0.3	-32	430
6824-02L	1275	11.8279		19.7040	4.49E-02	5.09E-02		0.4	31	87

Table 4, cont.

Lab #	Temp. °C	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40*}Ar/^{39}Ar$	^{40}Ar Moles x 10^{-13}	% ^{40}Ar Rad.	% ^{39}Ar	Age (ka)	±1s (ka)

Plateau age = 65 ± 23 ka (n = 11, steps B-L)
Total fusion age = 63 ± 93 ka
$^{40}Ar/^{36}Ar$ initial = 295.7 ± 1.3
J =
MSWD = 2.9

84-27-94 Basalt of Tionesta (data from Turrin, 1996)

8195-01A	700	359.4786	0.2481	9.3548	1.1750		0.535	3.6	1.6	3005	1874
8195-01B	750	240.4905	0.1578	13.2766	0.7804		0.480	4.6	2.2	2539	993
8195-01C	775	196.6317	0.1397	17.6941	0.6330		0.396	5.6	2.2	2557	728
8195-01D	800	141.5450	0.0978	23.2794	0.4483		0.558	7.7	4.2	2553	410
8195-01E	825	104.2381	0.0771	25.6951	0.3364		0.455	6.6	4.6	1611	280
8195-01F	850	91.2698	0.0727	22.1938	0.2997		0.422	4.9	4.9	1046	234
8195-01G	875	82.5349	0.0635	21.5624	0.2687		0.455	5.9	5.8	1132	196
8195-01H	901	67.0430	0.0540	23.2465	0.2190		0.421	6.2	6.7	979	151
8195-01I	950	66.6362	0.0522	19.0183	0.2167		0.726	6.2	11.6	962	109
8195-01J	1000	60.0434	0.0491	15.6397	0.1961		0.944	5.6	16.8	777	81
8195-01K	1100	75.3622	0.0579	13.9246	0.2466		1.56	4.8	22.1	836	86
8195-01L	1200	123.3804	0.0870	16.0252	0.4011		2.01	5.0	17.4	1427	198

Inverse isochron age is preferred: 54 ± 16 ka
Plateau age 896 ± 56 ka (n = 6, steps F-K)
Total fusion age = 1200 ± 210 ka
J = 0.0001272
$^{40}Ar/^{36}Ar$ initial = 311.8 ± 2.8
MSWD = 1.1

Table 5. Comparison of early rhyolite ages, Medicine Lake volcano

Ages in ka (thousands of years) except as noted

Rhyolite Unit	K-Ar Ages	Sample #	$^{40}Ar/^{39}Ar$ Age	Sample #	Previously Published K-Ar Ages, in Ma
rcb	547±16	1359M	437±7	MLV-004-92	0.43±0.04 (Mertzman, 1982, no. 11)
	574±21	155M			
	609±23	155M			
rgf	364±11	1351M	391 ± 2	MLV-008-92	0.61±0.03 (Mertzman, 1982, no. 10)
	361±11	1351M			
	486±20	142M			
	389±12	52-4-628			0.29±0.02 (Mertzman, 1982, no. 8)
	378±9	52-4-628			0.33±0.02 (Mertzman, 1982, no. 12)
	251±10	1356M			
	351±11	1162M			
	364±11	1162M			
	486±43	253M	383±1	253M	
	430±26	253M			
	263±8	253M			
	284±9	253M			
			387±6 = simple mean and one std. dev.		
rsl	304±9	1365M			0.24±0.03 (Mertzman, 1982, no. 9)
	312±9	1365M			
	364±18	256M			
	302±15	256M			
reg	607±44	103M	475±29	1707M	0.48±0.06 (Mertzman, 1983, no. 16)
	732±22	103M			