TABLE 2. Compilation of K-Ar data from Turrin et al., (28).

Sample #	Age ± 1σ (ka)	Sample #	Age ± 1σ (ka)
Ql3 Flow		**Ql5 Flow**	
	199 ± 23	KA3667	120 ± 20
NNTS #1-86	153 ± 96	KA3668	40 ± 40
	65 ± 88		
		KA3687	-80 ± 420
	120 ± 66	KA3706	60 ± 160
NNTS #2-86	184 ± 110		
	92 ± 85	KA3665	110 ± 110
		KA3787	-170 ± 160
	418 ± 240	KA3655	90 ± 30
NNTS #3-86	451 ± 240	KA3721	70 ± 30
	871 ± 360		
		KA3662	40 ± 23
		KA3663	190 ± 13
	37 ± 29		
NNTS #4-86	42 ± 33	KA3659	150 ± 100
	137 ± 35	KA3728	200 ± 80
	336 ± 28		152 ± 11
TSV-1	38 ± 19	NNTS #5	156 ± 29
	3 ± 75		221 ± 34
			337 ± 15
		TVS 129	670 ± 400
			300 ± 100
		TVS 283	230 ± 40
Arithmetic mean:	196 ± 170		152 ± 174
SEM:	± 44		± 40
Weighted mean:	133 ± 10		115 ± 12

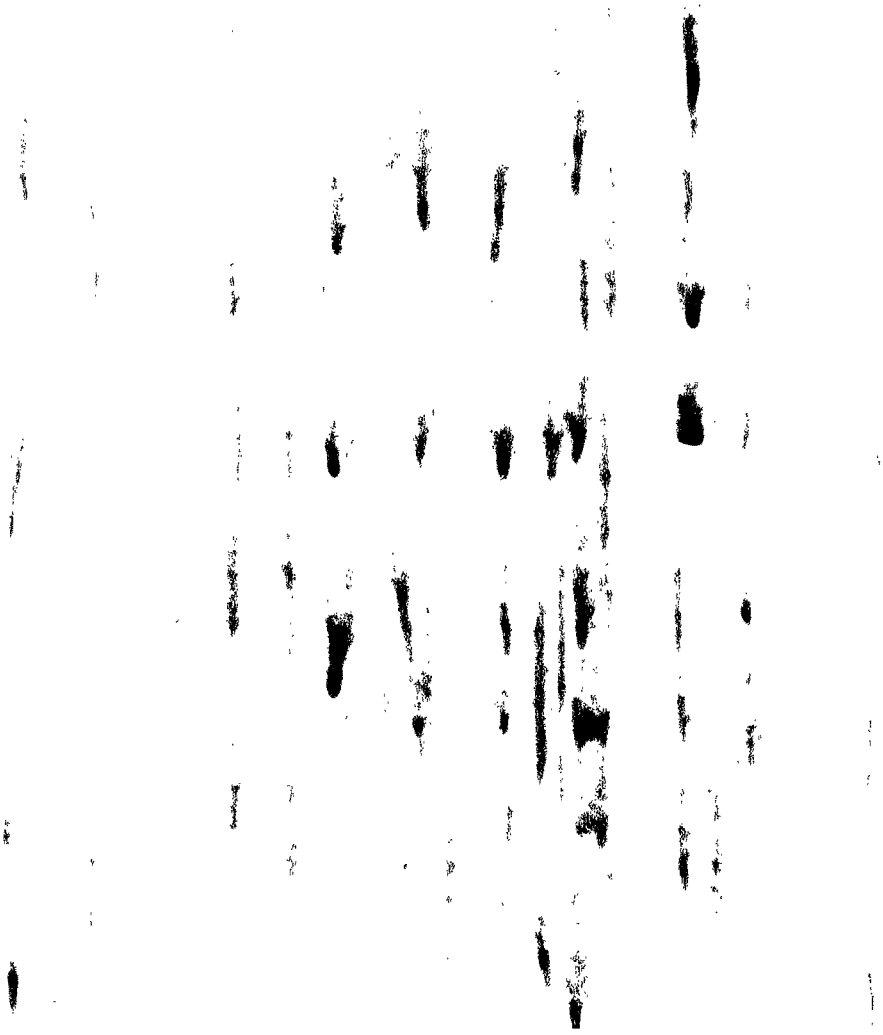
Brent Turrin
USGS

			Arith Mean ± 1 Sigma			**0.361**	**0.023**	
			Standard Error of the Mean (SEM)				**0.013**	
			Wt. Average ± 1 standard Error			**0.366**	**0.074**	
Sample	KA	%K2O	Weight	40Ar*mol/gm	%40AR*	Age	±	
SV-64		1.655		2.43E-13	0.02	-0.010	0.107	Errors too small
"		"		7.58E-13	2.1	0.318	0.041	"
"		"		2.102E-11	2.3	0.428	0.097	"
			Arith Mean ± 1 Sigma			**0.245**	**0.228**	Errors too small
			Standard Error of the Mean (SEM)				**0.132**	"
			Wt. Average ± 1 standard Error			**0.296**	**0.036**	"

BUCKBOARD MESA:

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#15-86	5380R	1.976	5.09646	1.176E-11	18.1	3.429	0.07	Site 1 Buckboard Mesa
"	5379R	"	5.10923	1.09E-11	27.8	3.179	0.07	"
"	5380C-1	"	1.60281	1.01E-11	28.8	2.946	0.13	"
	5380D-1	"	1.86356	9.42E-12	20.8	2.747	0.15	"
			Arith Mean ± 1 Sigma			**3.075**	**0.295**	
			Standard Error of the Mean (SEM)				**0.147**	
			Wt. Average ± 1 standard Error			**3.214**	**0.044**	
NNTS#16-86	5376	2.246	6.74725	1.148E-11	9.1	2.946	0.1	Site 2 Buckboard Mesa
"	5377	"	9.28721	1.152E-11	11.3	2.954	0.078	"
"	5377C-1	"	2.30676	1.133E-11	9.3	2.906	0.18	"
			Arith Mean ± 1 Sigma			**2.935**	**0.026**	
			Standard Error of the Mean (SEM)				**0.015**	
			Wt. Average ± 1 standard Error			**2.946**	**0.058**	

Site 1: "Northeast edge of Buckboard Mesa--typical fine-grained, aphyric Hawaiite"
" 2: "Kaersutite? Bearing lava flow north of Buckboard Mesa"



"	5999B-1	"	3.8[illegible]06	8.117E-12	36.5	3.662	0.12	"
"	5999C-1	"	4.3[illegible]23	8.355E-12	32.3	3.769	0.13	"
				Arith Mean ± 1 Sigma		**3.752**	**0.082**	
				Standard Error of the Mean (SEM)			**0.048**	
				Wt. Average ± 1 standard Error		**3.747**	**0.073**	

Site 1: "Dike complex in scoria where the road crosses the 3.7 Ma basalt of S.E. Crater Flat
Site 2: "Major mass of the 3.7 Ma extensive lava-flow outcrops in S.E. Crater Flat"

LITTLE BLACK PEAK (Sleeping Butte)

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#89-110	6017-1	1.445	3.01[illegible]94	2.441E-13	0.1	0.1	0.39	Little Black Peak
"	6017-2	"		6.206E-13	0.3	0.248	0,26	"
"	6017-3	"		7.6[illegible]3E-14	0	0.031	0,31	"
						0.146	0,177	
	6017C-1	"	2.03[illegible]32	8.0[illegible]1E-13	0.3	0.32	0.46	"
"	6017D-1	"	2.7[illegible]12	6.061E-13	"	0.24	0.5	"
				Arith Mean ± 1 Sigma		**0.235**	**0.087**	
				Standard Error of the Mean (SEM)			**0.043**	
				Wt. Average ± 1 standard Error		**0.176**	**0.157**	
INTS#89-111	6018-1	1.438	2.93777	9.814E-13	1.1	0.39	0.25	Little Black Peak
"	6018B-1	"	1.8[illegible]97	2.006E-13	0.4	0.1	0.17	"
"	6018C-1	"	1.81134	2.104E-13	"	0.08	0.21	"
"	6018D-1	"	2.46341	6.075E-13	1.3	0.24	0.18	"
				Arith Mean ± 1 Sigma		**0.203**	**0.144**	
				Standard Error of the Mean (SEM)			**0.072**	
				Wt. Average ± 1 standard Error		**0.182**	**0.098**	
				Arith Mean ± 1 Sigma		**0.217**	**0.115**	
				Standard Error of the Mean (SEM)			**0.043**	
				Wt. Average ± 1 standard Error		**0.180**	**0.083**	

Sample	KA	%K2O	Weight	40Ar*mol/gm	%40AR*	Age	±	
TSV-5		2.066		1.231E-12	4.4	0.409	0.018	Errors too small
"	"			5.36E-13	1.9	0.185	0.019	"
"	"			8.25E-13	6.8	0.278	0.395	"
				Arith Mean ± 1 Sigma		**0.291**	**0.113**	
				Standard Error of the Mean (SEM)			**0.065**	
				Wt. Average ± 1 standard Error		**0.303**	**0.013**	
TSV-6		1.656		1.054E-12	3.8	0.443	0.023	Errors too small
				4.75E-13	2.5	0.199	0.018	"
				Arith Mean ± 1 Sigma		**0.321**	**0.173**	
				Standard Error of the Mean (SEM)			**0.122**	
				Wt. Average ± 1 standard Error		**0.292**	**0.014**	

OLDER BASALT(at Sleeping Butte)

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
INTS#89-107	6020-1	1.528	0.94737	2.589E-11	73.4	9.74	0.27	Older Basalt @ SB
"	"	"	2.04139	2.645E-11	77.7	9.96	0.27	"
				Arith Mean ± 1 Sigma		**9.850**	**0.156**	
				Standard Error of the Mean (SEM)			**0.110**	
				Wt. Average ± 1 standard Error		**9.850**	**0.191**	

Hidden Cone (Sleeping Butte)

nple	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
INTS#89-109	6021-1	1.393	2.38813	8.115E-13	1.6	0.336	0.2	Hidden Cone
"	6021B-1	"	3.04045	9.[illegible]78E-13	1.6	0.38	0.17	"
	6021C-1	"	2.44410	8.[illegible]92E-13	2.5	0.368	0.090	

NORTHERMOST FLOW MARGIN

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
S#6-86	5591	.425	5.96376	4.501E-12	5.2	1.729	0.08	Site 1 Northermost
"	5528R-2	"	6.73495	5.095E-12	6	2.06	0.14	"
"	5598	"	"	4.83E-12	5.6	1.954	0.14	"
"	5528R-3	"	5.69496	2.201E-12	2.7	0.89	0.11	"
				Arith Mean ± 1 Sigma		**1.658**	**0.530**	
				Standard Error of the Mean (SEM)			**0.265**	
				Wt. Average ± 1 standard Error		**1.609**	**0.054**	
NNTS#7-86	5529	1.376	6.6492	2.555E-12	11.6	1.07	0.053	Site 2 Northernmost
"	5475	"	5.01985	2.461E-12	3.6	1.031	0.16	"
"	5475R-1	"	3.4543	2.427E-12	10.1	1.017	0.099	"
				Arith Mean ± 1 Sigma		**1.039**	**0.027**	
				Standard Error of the Mean (SEM)			**0.016**	
				Wt. Average ± 1 standard Error		**1.056**	**0.045**	

Site 1 "Basalt dike in cone scoria collected from Northernmost Cone, Crater Flat"
Site 2 "Sample of the northernmost lava center of Crater Flat, northwest edge of main lava flow."

BLACK CONE

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#8-86	5527A	1.516	6.36015	2.197E-12	6.3	0.835	0.16	Site 1 Black Cone
"	5527	"	6.1318	1.908E-12	3.9	0.726	0.18	"
"	5527R-1	"	5.19413	2.191E-12	7.8	0.833	0.089	"
				Arith Mean ± 1 Sigma		**0.798**	**0.062**	
				Standard Error of the Mean (SEM)			**0.036**	
				Wt. Average ± 1 standard Error		**0.817**	**0.071**	
NNTS#9-86	5530A	1.257	5.7034	2.052E-12	2.2	0.941	0.22	Site 2 Black Cone
"	5530A1	"	"	2.009E-12	"	0.921	0.2	"
"	5530B	"	6.0[illegible]4	1.613E-12	1.8	0.742	0.15	"
"	5998B-1	"	3.16667	1.705E-12	2.1	0.807	0.23	"
"	5998R-1	"	4.17178	1.663E-12	"	0.763	0.18	"
				Arith Mean ± 1 Sigma		**0.771**	**0.033**	
				Standard Error of the Mean (SEM)			**0.019**	
				Wt. Average ± 1 standard Error		**0.762**	**0.103**	

Site 1: "Aphyric olivine basalt at the south end of Black Cone lava flows"
Site 2: "Large welded spatter/lava pool in the crater fill sequence of Black Cone"

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#105-86	6023-1	1.438	1.84705	2.52E-12	10	1.01	0.14	SE Black Cone
"	6023B-1	"	4.0237	2.59E-12	19.7	1.04	0.07	"
				Arith Mean ± 1 Sigma		**1.025**	**0.021**	
				Standard Error of the Mean (SEM)			**0.015**	
				Wt. Average ± 1 standard Error		**1.034**	**0.063**	
NNTS#106-86	6035	1.446	1.87[illegible]	1.94E-12	6.8	0.77	0.15	NE Blackcone
"	6035B-1	"	4.1078[illegible]	2.871E-12	10.4	0.95	0.08	"
				Arith Mean ± 1 Sigma		**0.860**	**0.127**	
				Standard Error of the Mean (SEM)			**0.090**	
				Wt. Average ± 1 standard Error		**0.910**	**0.071**	
Black Cone data				Arith Mean ± 1 Sigma		***0.862***	***0.107***	***0.829***	***0.083***
				Standard Error of the Mean (SEM)			***0.031***		***0.026***
				Wt. Average ± 1 standard Error		***0.910***	***0.036***	***0.852***	***0.043***

RED CONE

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location

NNTS#10-86	6002A-1	1.33	1.1189	1.928E-12	3.6	0.836	0.15	Site 1 Red Cone	
"	6002A-2	"	"	1.934E-12	3.6	0.838	0.14	"	
"	6002B-1	"	2.82411	1.961E-12	3.1	0.85	0.2	"	
			Arith Mean ± 1 Sigma			**0.841**	**0.008**		
			Standard Error of the Mean (SEM)				**0.004**		
			Wt. Average ± 1 standard Error			**0.840**	**0.091**		
NNTS#11-86	5538A	1.511	7.36895	2.204E-12	2	0.841	0.3	Site 2 Red Cone	
"	5538B-1	"	6.7437	2.358E-12	2	0.9	0.2	"	
"	5538C-1	"	2.44012	3.839E-12	3.9	1.464	0.22	"	
			Arith Mean ± 1 Sigma			**1.068**	**0.344**	**0.95**	**0.25**
			Standard Error of the Mean (SEM)				**0.199**		**0.10**
			Wt. Average ± 1 standard Error			**1.094**	**0.133**	**0.92**	**0.08**

Site 1: "Sampled at the northeast edge of Red Cone lava, east of Sinnock locality"
Site 2: "Red Cone lava, collected 100 m west of Site 1 (NNTS#10-86)"

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location	
Sandia 5	3688	1.472	8.4616	2.35E-12	4.8	0.92	0.09	Red Cone Berk. Sinnock	
"	3705	"	7.4296	2.57E-12	5.5	1.01	0.09	"	
Sandia 6	3676	1.38	9.7733	2.5E-12	3.8	1.05	0.12	"	
"	3720	"	9.9132	2.03E-12	3.5	0.85	0.1	"	
Sandia 7	3704	1.471	8.8076	2.49E-12	8.3	0.98	0.05	"	
"	3689	"	6.5864	2.46E-12	8.5	0.97	0.05	"	
Sandia213	3693	1.408	8.085	2.55E-12	1.8	1.05	0.27	"	
"	3754	"	12.2504	2.71E-12	2.5	1.11	0.2	"	
Sandia 214	3694	1.408	9.155	2.76E-12	4	1.13	0.13	"	
"	3699	"	8.5735	2.66E-12	3.7	1.09	0.13	"	
Sandia 8	3690	1.519	7.8309	4.97E-12	1.9	1.89	0.53	"	
"	3703	"	7.7275	3.8E-12	1.2	1.44	2.5	"	
			Arith Mean ± 1 Sigma			**1.12**	**0.28**	**1.02**	**0.09**
			Standard Error of the Mean (SEM)				**0.08**		**0.03**
			Wt. Average ± 1 standard Error			**0.99**	**0.03**	**0.98**	**0.03**
All Red Cone data			Arith Mean ± 1 Sigma			*1.07*	*0.28*	*0.99*	*0.16*
			Standard Error of the Mean (SEM)				*0.07*		*0.04*
			Wt. Average ± 1 standard Error			*0.98*	*0.03*	*0.98*	*0.03*
								less Sandia 8	

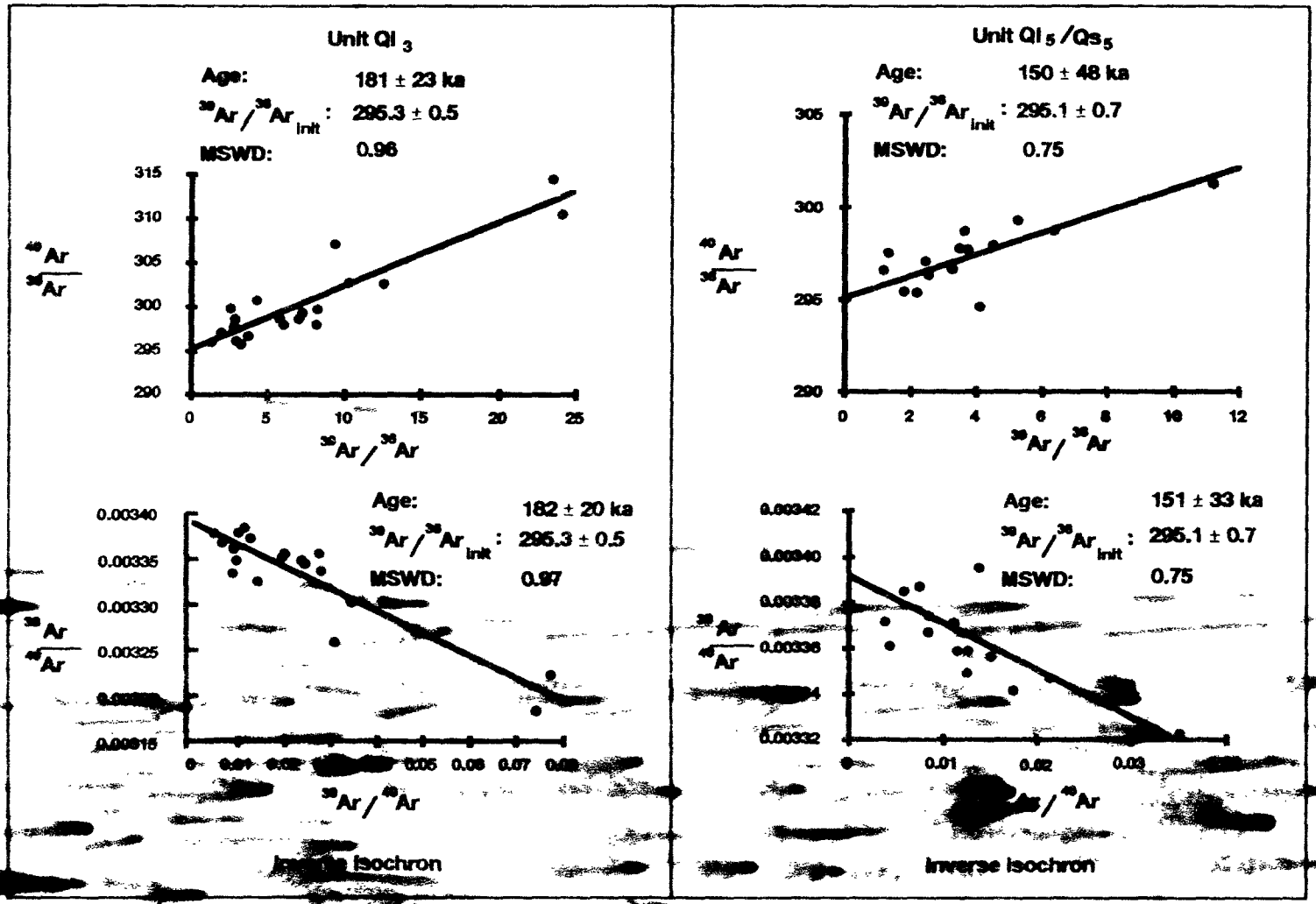
LITTLE CONE

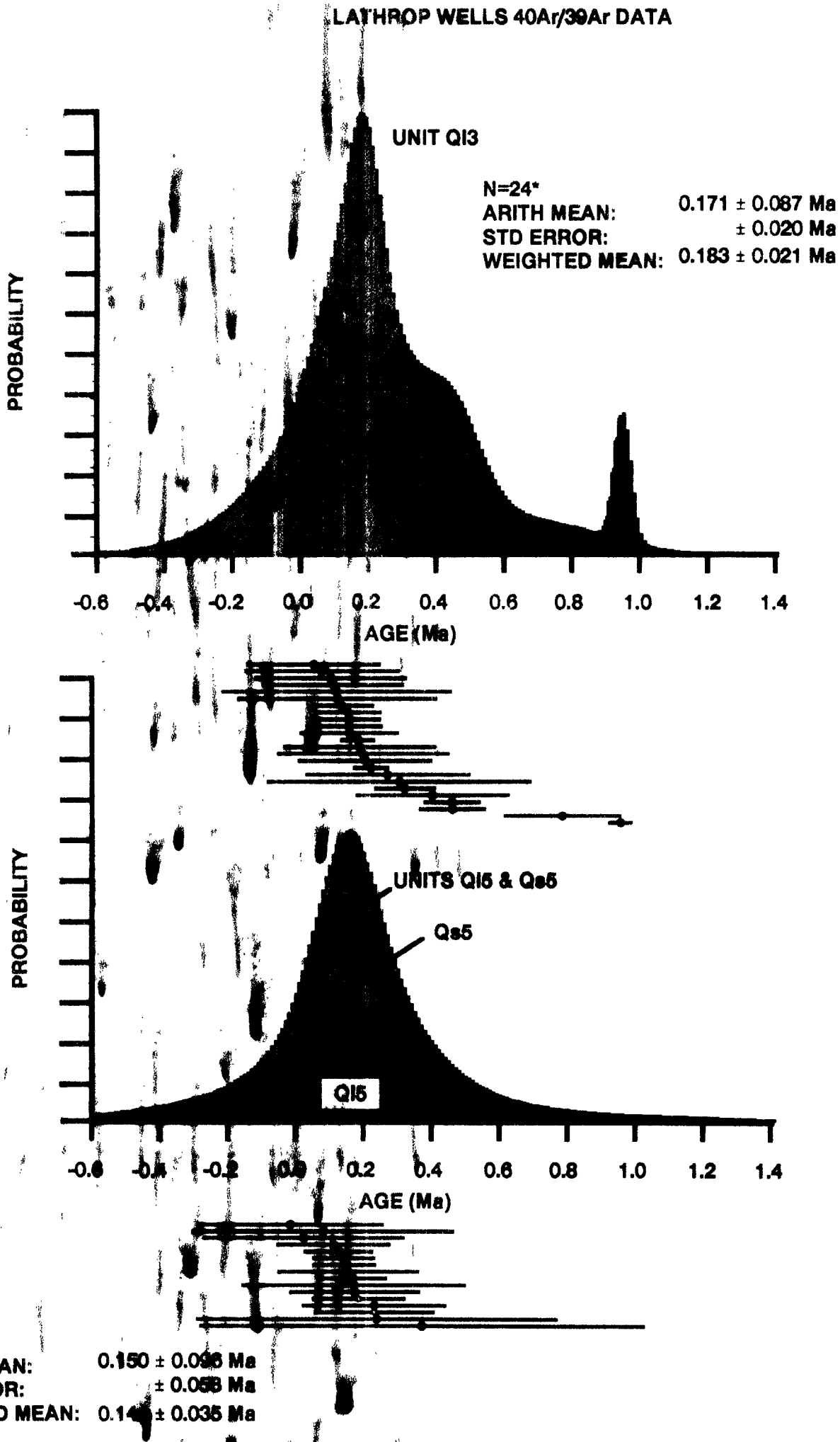
Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#12-86	5595	1.688	5.275	1.972E-12	2.6	0.673	0.07	Site 1 Little Cone
"	5595R-1	"	2.39	1.857E-12	3.8	0.634	0.15	"
			Arith Mean ± 1 Sigma			**0.654**	**0.028**	
			Standard Error of the Mean (SEM)				**0.020**	
			Wt. Average ± 1 standard Error			**0.666**	**0.063**	

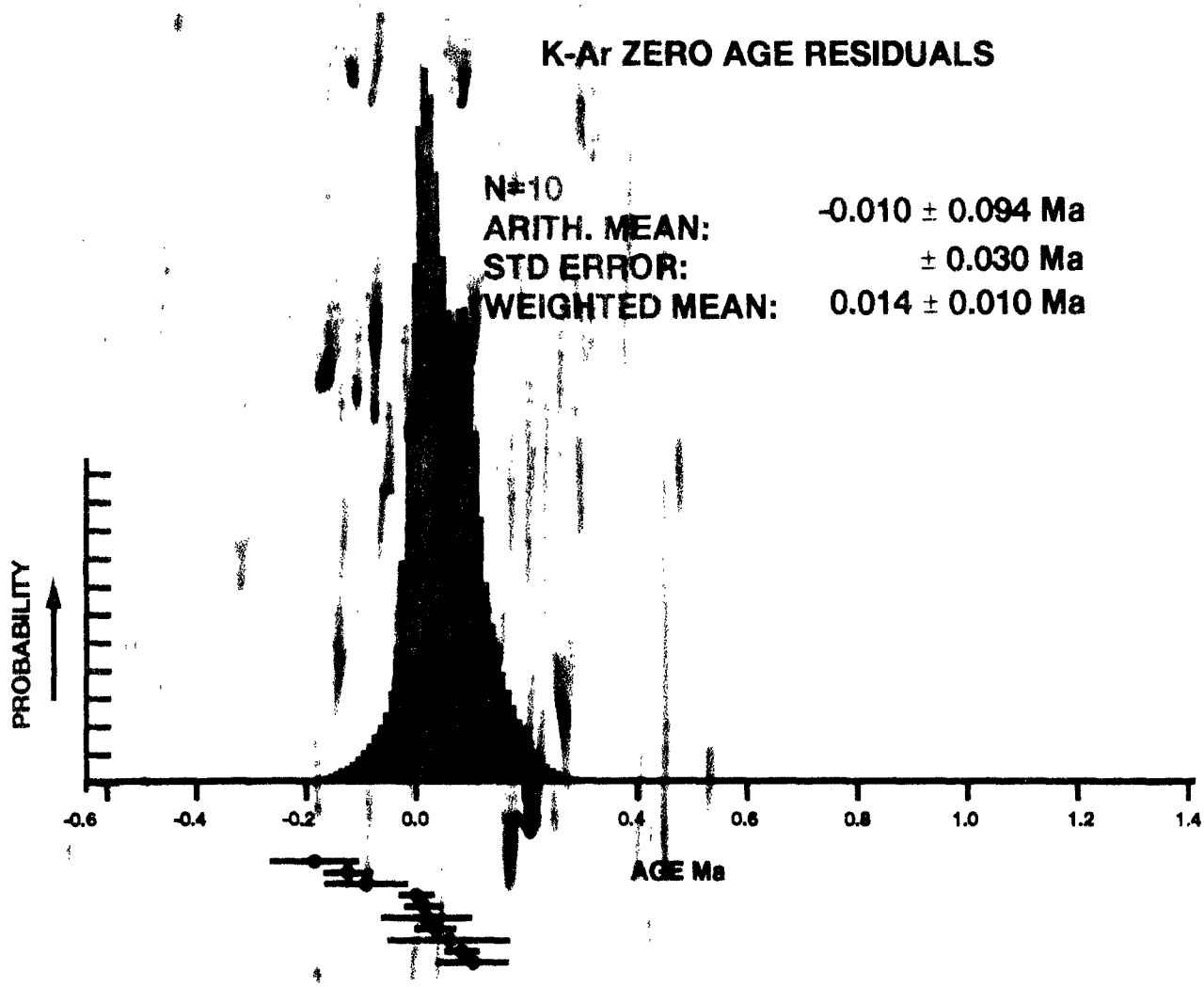
exposure of the Little Cone lava flow"

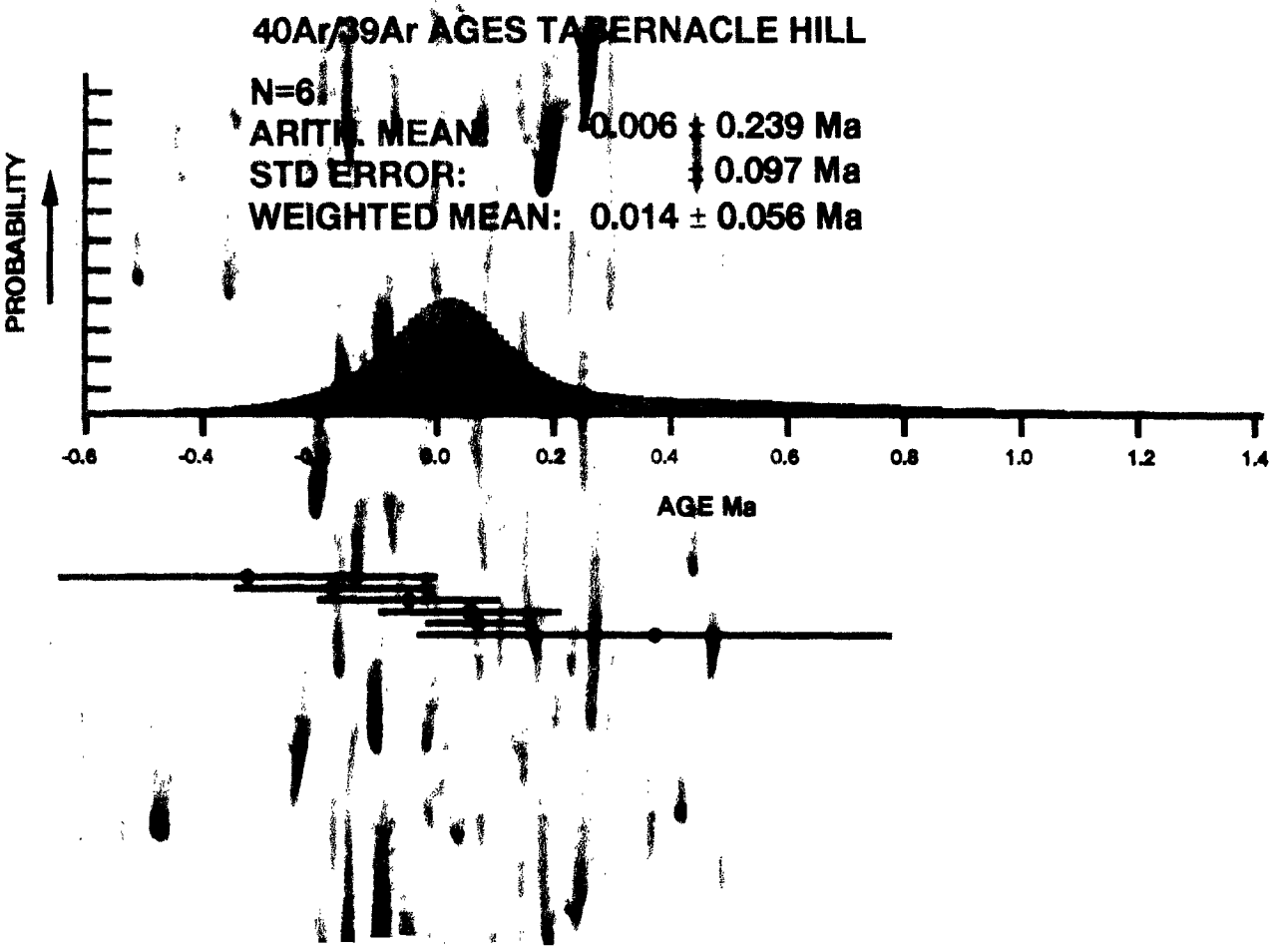
3.7 MA COMPLEX

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#13-86	5681-1	1.24	3.1937	9.718E-12	12.6	4.514	0.28	Site 1 3.7 Ma Complex
"	5681-3	"		9.914E-12	12.9	4.605	"	"
NNTS#13-86	5681B-1	1.24	1.54107	8.382E-12	26.4	3.894	0.2	Site 1 3.7 Ma Complex
"	5681C-1	"	3.91462	8.432E-12	22.2	3.913	0.18	"
"	5681R-1	"	1.46105	8.439	20.7	3.92	0.24	"
			Arith Mean ± 1 Sigma			**3.909**	**0.013**	
			Standard Error of the Mean (SEM)				**0.008**	
			Wt. Average ± 1 standard Error			**3.908**	**0.117**	
NNTS#14-86	5999A-1	1.277	3.28143	8.47E-12	34.1	3.824	0.13	Site 2 3.7 Ma Complex


Unit Ql 3
Age: 181 ± 23 ka
$^{39}Ar/^{36}Ar_{init}$: 295.3 ± 0.5
MSWD: 0.96
$^{40}Ar/^{36}Ar$
$^{36}Ar/^{36}Ar$
Age: 182 ± 20 ka
$^{39}Ar/^{36}Ar_{init}$: 295.3 ± 0.5
MSWD: 0.97
$^{36}Ar/^{40}Ar$
$^{39}Ar/^{40}Ar$
Inverse Isochron
Unit Ql 5 /Qs 5
Age: 150 ± 48 ka
$^{39}Ar/^{36}Ar_{init}$: 295.1 ± 0.7
MSWD: 0.75
$^{40}Ar/^{36}Ar$
$^{39}Ar/^{36}Ar$
Age: 151 ± 33 ka
$^{39}Ar/^{36}Ar_{init}$: 295.1 ± 0.7
MSWD: 0.75
$^{36}Ar/^{40}Ar$
$^{39}Ar/^{40}Ar$
Inverse Isochron


LATHROP WELLS 40Ar/39Ar DATA
UNIT QI3
N=24*
ARITH MEAN: 0.171 ± 0.087 Ma
STD ERROR: ± 0.020 Ma
WEIGHTED MEAN: 0.183 ± 0.021 Ma
PROBABILITY
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4
AGE (Ma)
UNITS QI5 & Qs5
Qs5
QI5
PROBABILITY
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4
AGE (Ma)
ARITH MEAN: 0.150 ± 0.096 Ma
STD ERROR: ± 0.058 Ma
WEIGHTED MEAN: 0.14[illegible] ± 0.035 Ma


K-Ar ZERO AGE RESIDUALS
N=10
ARITH. MEAN: -0.010 ± 0.094 Ma
STD ERROR: ± 0.030 Ma
WEIGHTED MEAN: 0.014 ± 0.010 Ma
PROBABILITY
-0.6
-0.4
-0.2
0.0
0.4
0.6
0.8
1.0
1.2
1.4
AGE Ma


40Ar/39Ar AGES TABERNACLE HILL
N=6
ARITH. MEAN: 0.006 ± 0.239 Ma
STD ERROR: ± 0.097 Ma
WEIGHTED MEAN: 0.014 ± 0.056 Ma
PROBABILITY
-0.6
-0.4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
AGE Ma

SUPPORTING EVIDENCE

The following evidence support the K-Ar $^{40}Ar/^{39}Ar$ age of 120 to 140 ka age for the Lathrop Wells volcanic center:

1. Uranium-thorium ages on alluvial deposits that contain primary and reworked cinders, 3 to 4 km northwest of the Lathrop Wells volcanic center and aligned with the direction of elongation of the cinder cone, require that that the cinders were deposited between 240 ± 30 and 145 ± 25 ka.
2. An uranium-thorium age of 150 -30/+40 ka on the lava flows from the Lathrop Wells volcanic center (Mike Morrel written and oral communication)
3. ^{36}Cl surface exposure ages on volcanic bombs, which are minimum ages because of spoliation of the volcanic bomb's original surface, indicate the the volcanic activity is greater than 69 to 105 ka (Fred Phillips oral communication).

CONCLUSIONS

1. The paleomagnetic data indicate that there are only two volcanic events at the Lathrop Wells volcanic center that are closely linked in time.
2. The combined weighted-averaged ages of the K-Ar and $^{40}Ar/^{39}Ar$ ages indicate that these two volcanic events occurred between 0.120 to 0.140 Ma. This age for Lathrop Wells is concordant with two independent isotopic geochronometers and with the chronology and stratigraphy of the surficial deposits in the Yucca Mountain region.
3. It appears that the geomorphic and soil profile evidence from which Wells et al., (3) obtain their 20 ka age for the Lathrop Wells volcanic center is incorrectly calibrated.

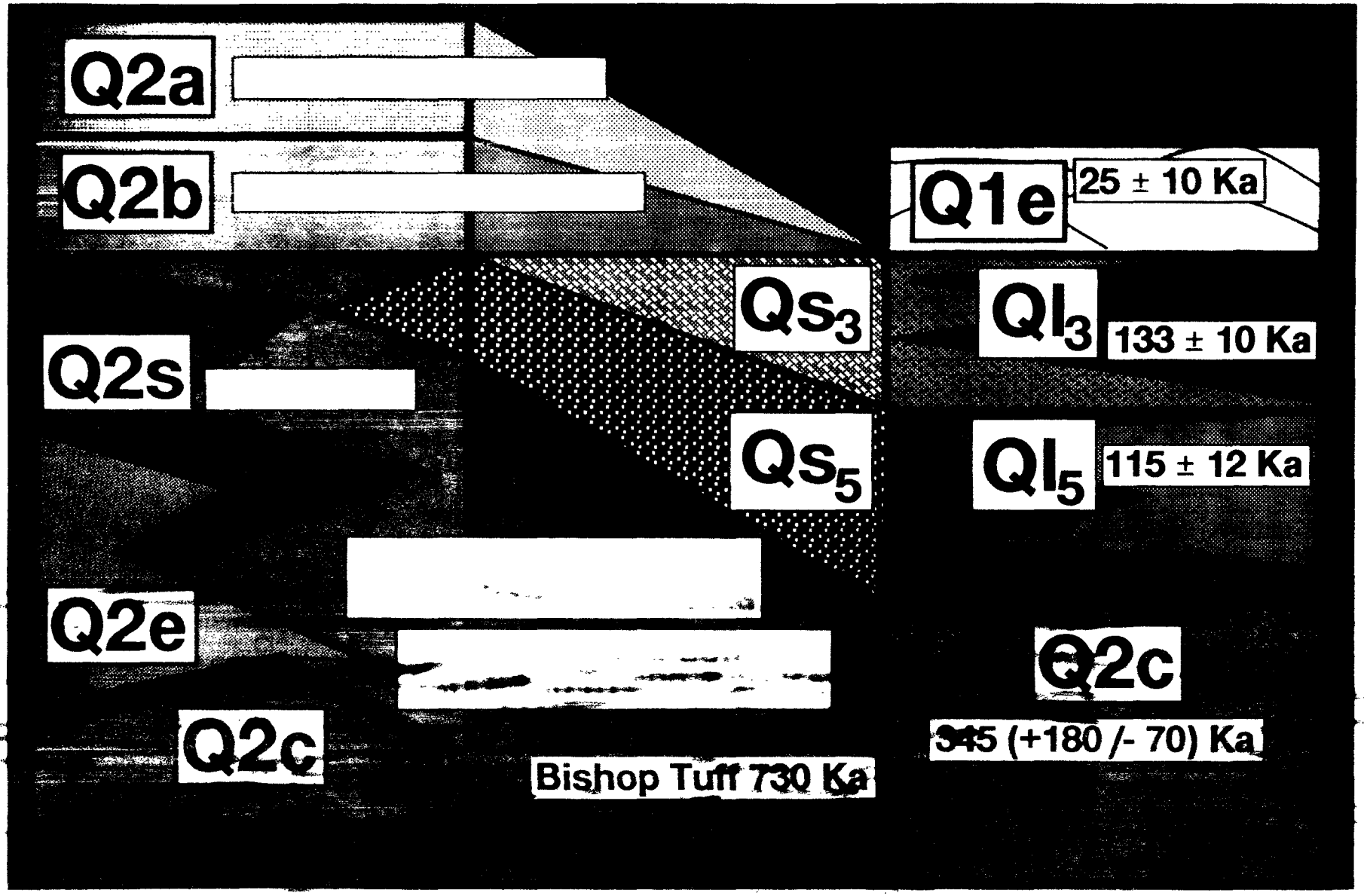

Q2a
Q2b
Q1e
25 ± 10 Ka
Qs3
Ql3
133 ± 10 Ka
Q2s
Qs5
Ql5
115 ± 12 Ka
Q2e
Q2c
345 (+180 /- 70) Ka
Q2c
Bishop Tuff 730 Ka

TABLE 2. Compilation of K-Ar data from Turrin et al., (28).

Sample #	Age ± 1σ (ka)	Sample #	Age ± 1σ (ka)
Ql3 Flow		**Ql5 Flow**	
	199 ± 23	KA3667	120 ± 20
NNTS #1-86	153 ± 96	KA3668	40 ± 40
	65 ± 88		
		KA3687	-80 ± 420
	120 ± 66	KA3706	60 ± 160
NNTS #2-86	184 ± 110		
	92 ± 85	KA3665	110 ± 110
		KA3787	-170 ± 160
	418 ± 240	KA3655	90 ± 30
NNTS #3-86	451 ± 240	KA3721	70 ± 30
	871 ± 360		
		KA3662	40 ± 23
		KA3663	190 ± 13
	37 ± 29		
NNTS #4-86	42 ± 33	KA3659	150 ± 100
	137 ± 35	KA3728	200 ± 80
	336 ± 28		152 ± 11
TSV-1	38 ± 19	NNTS #5	156 ± 29
	3 ± 75		221 ± 34
			337 ± 15
		TVS 129	670 ± 400
			300 ± 100
		TVS 283	230 ± 40
Arithmetic mean:	196 ± 170		152 ± 174
SEM:	± 44		± 40
Weighted mean:	133 ± 10		115 ± 12

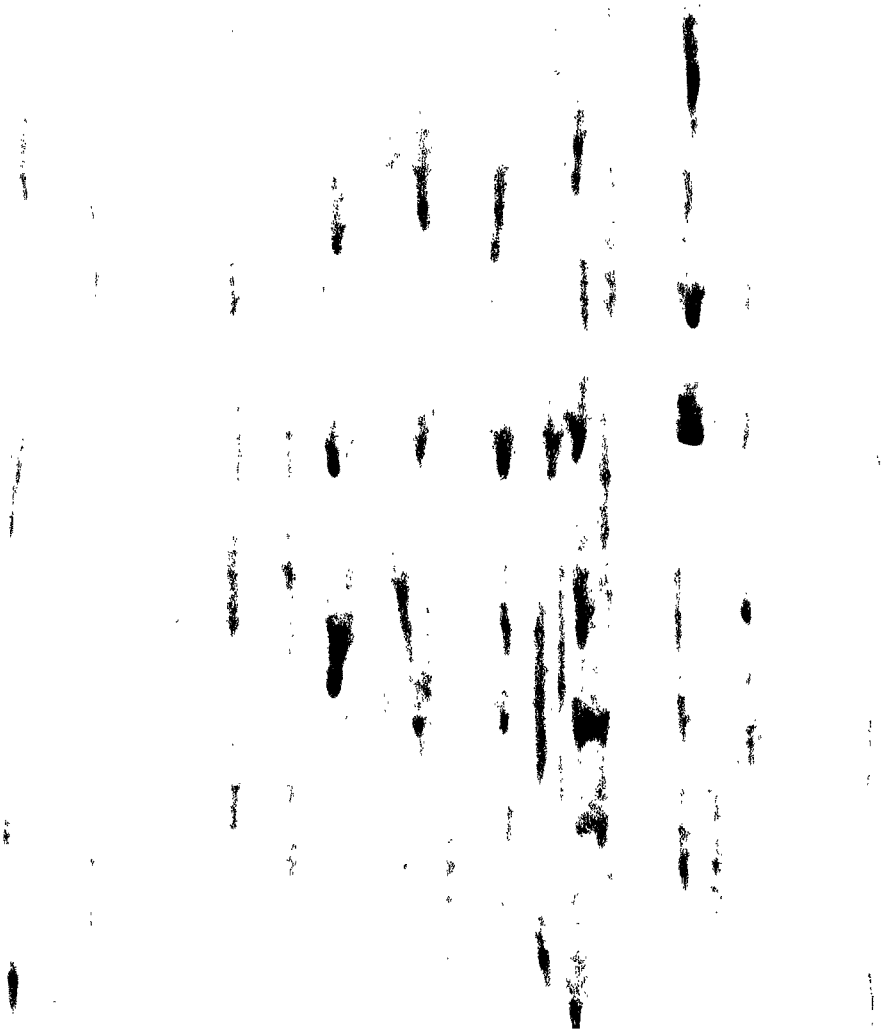
Brent Turrin
USGS

			Arith Mean ± 1 Sigma			**0.361**	**0.023**	
			Standard Error of the Mean (SEM)				**0.013**	
			Wt. Average ± 1 standard Error			**0.366**	**0.074**	
Sample	KA	%K2O	Weight	40Ar*mol/gm	%40AR*	Age	±	
SV-64		1.655		2.43E-13	0.02	-0.010	0.107	Errors too small
"		"		7.58E-13	2.1	0.318	0.041	"
"		"		2.102E-11	2.3	0.428	0.097	"
			Arith Mean ± 1 Sigma			**0.245**	**0.228**	Errors too small
			Standard Error of the Mean (SEM)				**0.132**	"
			Wt. Average ± 1 standard Error			**0.296**	**0.036**	"

BUCKBOARD MESA:

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#15-86	5380R	1.976	5.09646	1.176E-11	18.1	3.429	0.07	Site 1 Buckboard Mesa
"	5379R	"	5.10923	1.09E-11	27.8	3.179	0.07	"
"	5380C-1	"	1.60281	1.01E-11	28.8	2.946	0.13	"
	5380D-1	"	1.86356	9.42E-12	20.8	2.747	0.15	"
			Arith Mean ± 1 Sigma			**3.075**	**0.295**	
			Standard Error of the Mean (SEM)				**0.147**	
			Wt. Average ± 1 standard Error			**3.214**	**0.044**	
NNTS#16-86	5376	2.246	6.74725	1.148E-11	9.1	2.946	0.1	Site 2 Buckboard Mesa
"	5377	"	9.28721	1.152E-11	11.3	2.954	0.078	"
"	5377C-1	"	2.30676	1.133E-11	9.3	2.906	0.18	"
			Arith Mean ± 1 Sigma			**2.935**	**0.026**	
			Standard Error of the Mean (SEM)				**0.015**	
			Wt. Average ± 1 standard Error			**2.946**	**0.058**	

Site 1: "Northeast edge of Buckboard Mesa--typical fine-grained, aphyric Hawaiite"
" 2: "Kaersutite? Bearing lava flow north of Buckboard Mesa"



"	5999B-1	"	3.8[illegible]06	8.117E-12	36.5	3.662	0.12	"
"	5999C-1	"	4.3[illegible]23	8.355E-12	32.3	3.769	0.13	"
				Arith Mean ± 1 Sigma		**3.752**	**0.082**	
				Standard Error of the Mean (SEM)			**0.048**	
				Wt. Average ± 1 standard Error		**3.747**	**0.073**	

Site 1: "Dike complex in scoria where the road crosses the 3.7 Ma basalt of S.E. Crater Flat
Site 2: "Major mass of the 3.7 Ma extensive lava-flow outcrops in S.E. Crater Flat"

LITTLE BLACK PEAK (Sleeping Butte)

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#89-110	6017-1	1.445	3.01[illegible]94	2.441E-13	0.1	0.1	0.39	Little Black Peak
"	6017-2	"		6.206E-13	0.3	0.248	0,26	"
"	6017-3	"		7.6[illegible]3E-14	0	0.031	0,31	"
						0.146	0,177	
	6017C-1	"	2.03[illegible]32	8.0[illegible]1E-13	0.3	0.32	0.46	"
"	6017D-1	"	2.7[illegible]12	6.061E-13	"	0.24	0.5	"
				Arith Mean ± 1 Sigma		**0.235**	**0.087**	
				Standard Error of the Mean (SEM)			**0.043**	
				Wt. Average ± 1 standard Error		**0.176**	**0.157**	
INTS#89-111	6018-1	1.438	2.93777	9.814E-13	1.1	0.39	0.25	Little Black Peak
"	6018B-1	"	1.8[illegible]97	2.006E-13	0.4	0.1	0.17	"
"	6018C-1	"	1.81134	2.104E-13	"	0.08	0.21	"
"	6018D-1	"	2.46341	6.075E-13	1.3	0.24	0.18	"
				Arith Mean ± 1 Sigma		**0.203**	**0.144**	
				Standard Error of the Mean (SEM)			**0.072**	
				Wt. Average ± 1 standard Error		**0.182**	**0.098**	
				Arith Mean ± 1 Sigma		**0.217**	**0.115**	
				Standard Error of the Mean (SEM)			**0.043**	
				Wt. Average ± 1 standard Error		**0.180**	**0.083**	

Sample	KA	%K2O	Weight	40Ar*mol/gm	%40AR*	Age	±	
TSV-5		2.066		1.231E-12	4.4	0.409	0.018	Errors too small
"	"			5.36E-13	1.9	0.185	0.019	"
"	"			8.25E-13	6.8	0.278	0.395	"
				Arith Mean ± 1 Sigma		**0.291**	**0.113**	
				Standard Error of the Mean (SEM)			**0.065**	
				Wt. Average ± 1 standard Error		**0.303**	**0.013**	
TSV-6		1.656		1.054E-12	3.8	0.443	0.023	Errors too small
				4.75E-13	2.5	0.199	0.018	"
				Arith Mean ± 1 Sigma		**0.321**	**0.173**	
				Standard Error of the Mean (SEM)			**0.122**	
				Wt. Average ± 1 standard Error		**0.292**	**0.014**	

OLDER BASALT(at Sleeping Butte)

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
INTS#89-107	6020-1	1.528	0.94737	2.589E-11	73.4	9.74	0.27	Older Basalt @ SB
"	"	"	2.04139	2.645E-11	77.7	9.96	0.27	"
				Arith Mean ± 1 Sigma		**9.850**	**0.156**	
				Standard Error of the Mean (SEM)			**0.110**	
				Wt. Average ± 1 standard Error		**9.850**	**0.191**	

Hidden Cone (Sleeping Butte)

nple	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
INTS#89-109	6021-1	1.393	2.38813	8.115E-13	1.6	0.336	0.2	Hidden Cone
"	6021B-1	"	3.04045	9.[illegible]78E-13	1.6	0.38	0.17	"
	6021C-1	"	2.44410	8.[illegible]92E-13	2.5	0.368	0.090	

NORTHERMOST FLOW MARGIN

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
S#6-86	5591	.425	5.96376	4.501E-12	5.2	1.729	0.08	Site 1 Northermost
"	5528R-2	"	6.73495	5.095E-12	6	2.06	0.14	"
"	5598	"	"	4.83E-12	5.6	1.954	0.14	"
"	5528R-3	"	5.69496	2.201E-12	2.7	0.89	0.11	"
				Arith Mean ± 1 Sigma		**1.658**	**0.530**	
				Standard Error of the Mean (SEM)			**0.265**	
				Wt. Average ± 1 standard Error		**1.609**	**0.054**	
NNTS#7-86	5529	1.376	6.6492	2.555E-12	11.6	1.07	0.053	Site 2 Northernmost
"	5475	"	5.01985	2.461E-12	3.6	1.031	0.16	"
"	5475R-1	"	3.4543	2.427E-12	10.1	1.017	0.099	"
				Arith Mean ± 1 Sigma		**1.039**	**0.027**	
				Standard Error of the Mean (SEM)			**0.016**	
				Wt. Average ± 1 standard Error		**1.056**	**0.045**	

Site 1 "Basalt dike in cone scoria collected from Northernmost Cone, Crater Flat"
Site 2 "Sample of the northernmost lava center of Crater Flat, northwest edge of main lava flow."

BLACK CONE

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#8-86	5527A	1.516	6.36015	2.197E-12	6.3	0.835	0.16	Site 1 Black Cone
"	5527	"	6.1318	1.908E-12	3.9	0.726	0.18	"
"	5527R-1	"	5.19413	2.191E-12	7.8	0.833	0.089	"
				Arith Mean ± 1 Sigma		**0.798**	**0.062**	
				Standard Error of the Mean (SEM)			**0.036**	
				Wt. Average ± 1 standard Error		**0.817**	**0.071**	
NNTS#9-86	5530A	1.257	5.7034	2.052E-12	2.2	0.941	0.22	Site 2 Black Cone
"	5530A1	"	"	2.009E-12	"	0.921	0.2	"
"	5530B	"	6.0[illegible]4	1.613E-12	1.8	0.742	0.15	"
"	5998B-1	"	3.16667	1.705E-12	2.1	0.807	0.23	"
"	5998R-1	"	4.17178	1.663E-12	"	0.763	0.18	"
				Arith Mean ± 1 Sigma		**0.771**	**0.033**	
				Standard Error of the Mean (SEM)			**0.019**	
				Wt. Average ± 1 standard Error		**0.762**	**0.103**	

Site 1: "Aphyric olivine basalt at the south end of Black Cone lava flows"
Site 2: "Large welded spatter/lava pool in the crater fill sequence of Black Cone"

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#105-86	6023-1	1.438	1.84705	2.52E-12	10	1.01	0.14	SE Black Cone
"	6023B-1	"	4.0237	2.59E-12	19.7	1.04	0.07	"
				Arith Mean ± 1 Sigma		**1.025**	**0.021**	
				Standard Error of the Mean (SEM)			**0.015**	
				Wt. Average ± 1 standard Error		**1.034**	**0.063**	
NNTS#106-86	6035	1.446	1.87[illegible]	1.94E-12	6.8	0.77	0.15	NE Blackcone
"	6035B-1	"	4.1078[illegible]	2.871E-12	10.4	0.95	0.08	"
				Arith Mean ± 1 Sigma		**0.860**	**0.127**	
				Standard Error of the Mean (SEM)			**0.090**	
				Wt. Average ± 1 standard Error		**0.910**	**0.071**	
Black Cone data				Arith Mean ± 1 Sigma		***0.862***	***0.107***	***0.829***	***0.083***
				Standard Error of the Mean (SEM)			***0.031***		***0.026***
				Wt. Average ± 1 standard Error		***0.910***	***0.036***	***0.852***	***0.043***

RED CONE

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location

NNTS#10-86	6002A-1	1.33	1.1189	1.928E-12	3.6	0.836	0.15	Site 1 Red Cone	
"	6002A-2	"	"	1.934E-12	3.6	0.838	0.14	"	
"	6002B-1	"	2.82411	1.961E-12	3.1	0.85	0.2	"	
			Arith Mean ± 1 Sigma			**0.841**	**0.008**		
			Standard Error of the Mean (SEM)				**0.004**		
			Wt. Average ± 1 standard Error			**0.840**	**0.091**		
NNTS#11-86	5538A	1.511	7.36895	2.204E-12	2	0.841	0.3	Site 2 Red Cone	
"	5538B-1	"	6.7437	2.358E-12	2	0.9	0.2	"	
"	5538C-1	"	2.44012	3.839E-12	3.9	1.464	0.22	"	
			Arith Mean ± 1 Sigma			**1.068**	**0.344**	**0.95**	**0.25**
			Standard Error of the Mean (SEM)				**0.199**		**0.10**
			Wt. Average ± 1 standard Error			**1.094**	**0.133**	**0.92**	**0.08**

Site 1: "Sampled at the northeast edge of Red Cone lava, east of Sinnock locality"
Site 2: "Red Cone lava, collected 100 m west of Site 1 (NNTS#10-86)"

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location	
Sandia 5	3688	1.472	8.4616	2.35E-12	4.8	0.92	0.09	Red Cone Berk. Sinnock	
"	3705	"	7.4296	2.57E-12	5.5	1.01	0.09	"	
Sandia 6	3676	1.38	9.7733	2.5E-12	3.8	1.05	0.12	"	
"	3720	"	9.9132	2.03E-12	3.5	0.85	0.1	"	
Sandia 7	3704	1.471	8.8076	2.49E-12	8.3	0.98	0.05	"	
"	3689	"	6.5864	2.46E-12	8.5	0.97	0.05	"	
Sandia213	3693	1.408	8.085	2.55E-12	1.8	1.05	0.27	"	
"	3754	"	12.2504	2.71E-12	2.5	1.11	0.2	"	
Sandia 214	3694	1.408	9.155	2.76E-12	4	1.13	0.13	"	
"	3699	"	8.5735	2.66E-12	3.7	1.09	0.13	"	
Sandia 8	3690	1.519	7.8309	4.97E-12	1.9	1.89	0.53	"	
"	3703	"	7.7275	3.8E-12	1.2	1.44	2.5	"	
			Arith Mean ± 1 Sigma			**1.12**	**0.28**	**1.02**	**0.09**
			Standard Error of the Mean (SEM)				**0.08**		**0.03**
			Wt. Average ± 1 standard Error			**0.99**	**0.03**	**0.98**	**0.03**
All Red Cone data			Arith Mean ± 1 Sigma			*1.07*	*0.28*	*0.99*	*0.16*
			Standard Error of the Mean (SEM)				*0.07*		*0.04*
			Wt. Average ± 1 standard Error			*0.98*	*0.03*	*0.98*	*0.03*
								less Sandia 8	

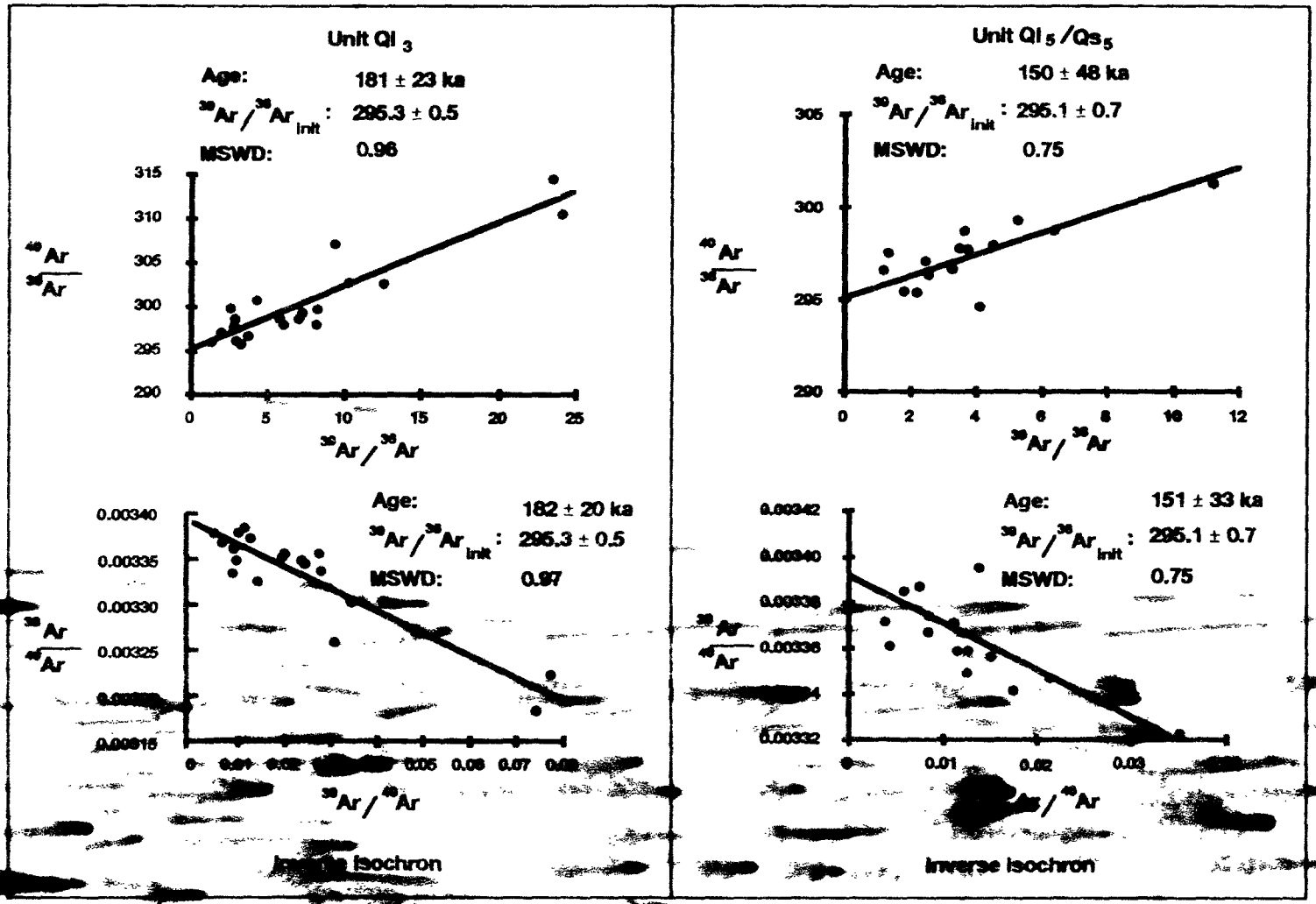
LITTLE CONE

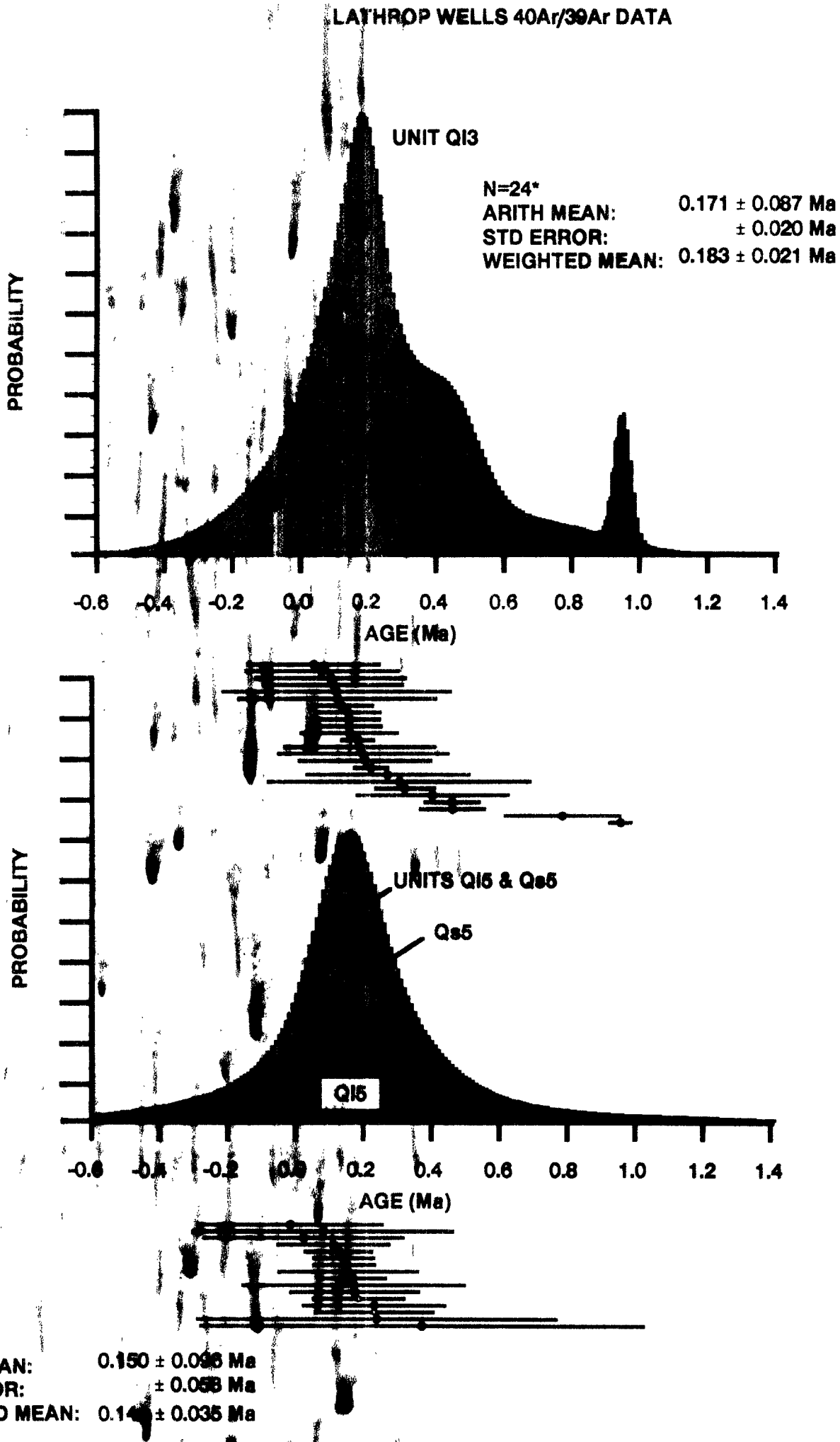
Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#12-86	5595	1.688	5.275	1.972E-12	2.6	0.673	0.07	Site 1 Little Cone
"	5595R-1	"	2.39	1.857E-12	3.8	0.634	0.15	"
			Arith Mean ± 1 Sigma			**0.654**	**0.028**	
			Standard Error of the Mean (SEM)				**0.020**	
			Wt. Average ± 1 standard Error			**0.666**	**0.063**	

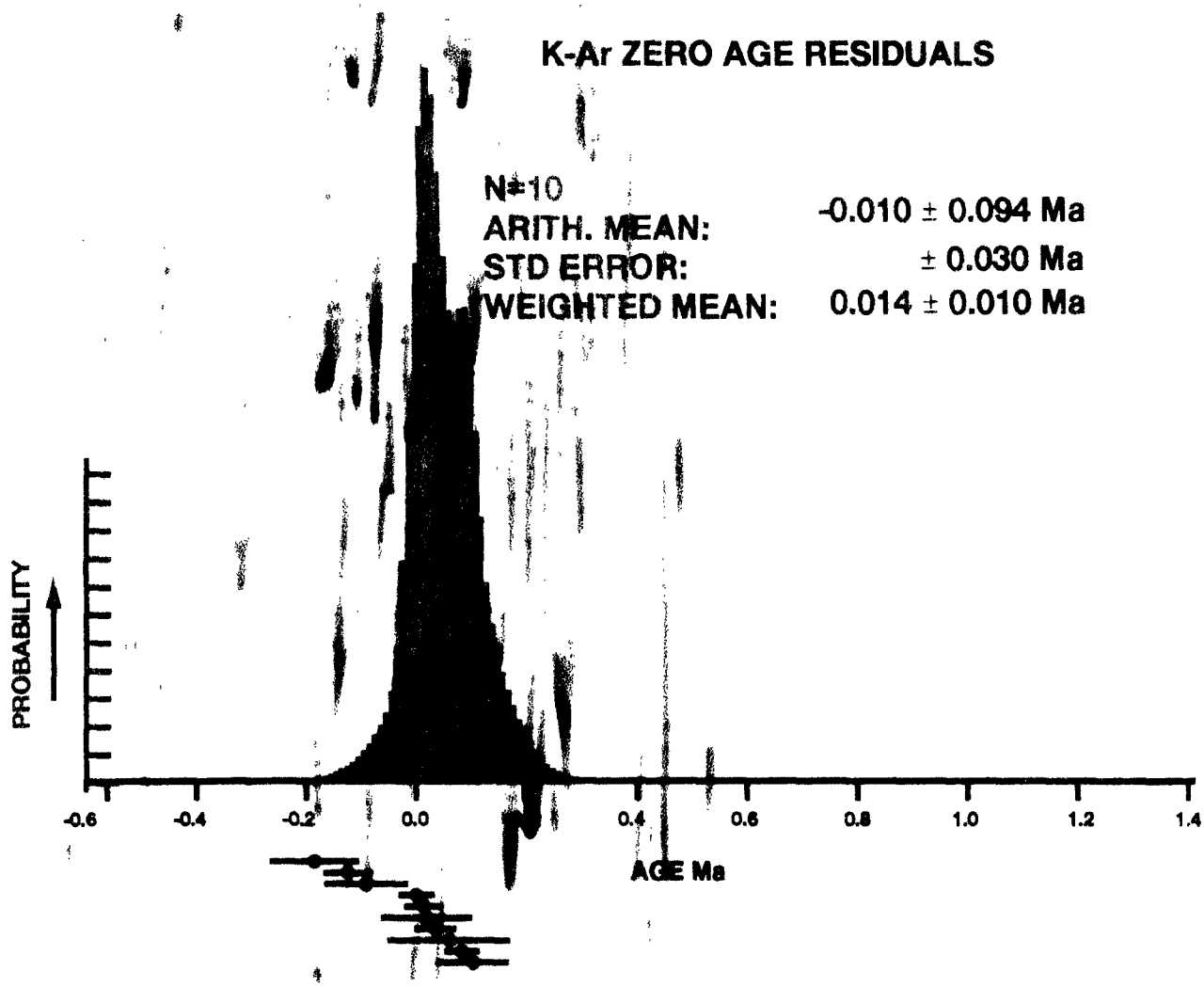
exposure of the Little Cone lava flow"

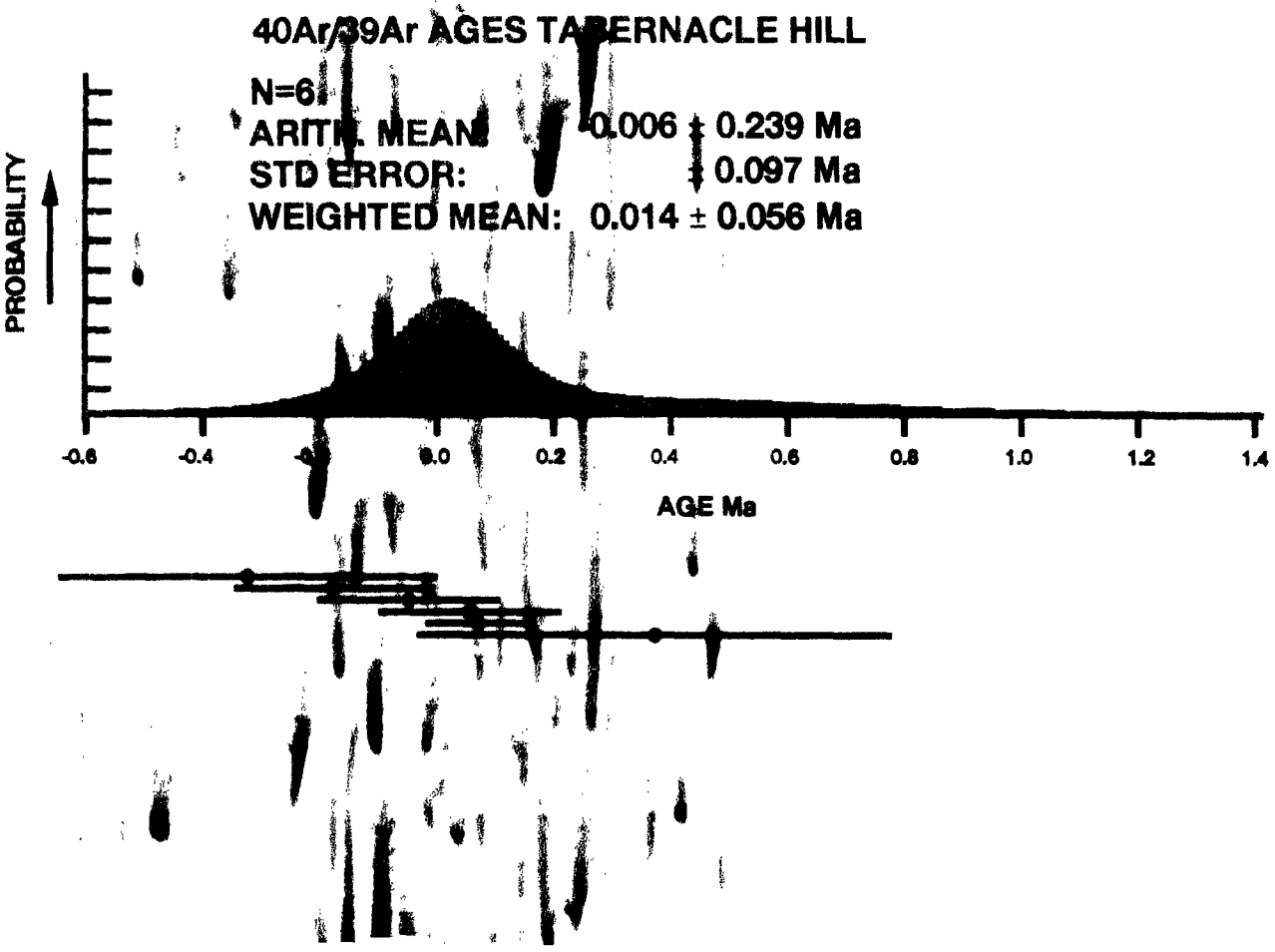
3.7 MA COMPLEX

Sample	KA	%K	Weight	40Ar*mol/gm	%40AR*	Age	±	Location
NNTS#13-86	5681-1	1.24	3.1937	9.718E-12	12.6	4.514	0.28	Site 1 3.7 Ma Complex
"	5681-3	"		9.914E-12	12.9	4.605	"	"
NNTS#13-86	5681B-1	1.24	1.54107	8.382E-12	26.4	3.894	0.2	Site 1 3.7 Ma Complex
"	5681C-1	"	3.91462	8.432E-12	22.2	3.913	0.18	"
"	5681R-1	"	1.46105	8.439	20.7	3.92	0.24	"
			Arith Mean ± 1 Sigma			**3.909**	**0.013**	
			Standard Error of the Mean (SEM)				**0.008**	
			Wt. Average ± 1 standard Error			**3.908**	**0.117**	
NNTS#14-86	5999A-1	1.277	3.28143	8.47E-12	34.1	3.824	0.13	Site 2 3.7 Ma Complex


Unit Ql 3
Age: 181 ± 23 ka
$^{39}Ar/^{36}Ar_{init}$: 295.3 ± 0.5
MSWD: 0.96
$^{40}Ar/^{36}Ar$
$^{36}Ar/^{36}Ar$
Age: 182 ± 20 ka
$^{39}Ar/^{36}Ar_{init}$: 295.3 ± 0.5
MSWD: 0.97
$^{36}Ar/^{40}Ar$
$^{39}Ar/^{40}Ar$
Inverse Isochron
Unit Ql 5 /Qs 5
Age: 150 ± 48 ka
$^{39}Ar/^{36}Ar_{init}$: 295.1 ± 0.7
MSWD: 0.75
$^{40}Ar/^{36}Ar$
$^{39}Ar/^{36}Ar$
Age: 151 ± 33 ka
$^{39}Ar/^{36}Ar_{init}$: 295.1 ± 0.7
MSWD: 0.75
$^{36}Ar/^{40}Ar$
$^{39}Ar/^{40}Ar$
Inverse Isochron


LATHROP WELLS 40Ar/39Ar DATA
UNIT QI3
N=24*
ARITH MEAN: 0.171 ± 0.087 Ma
STD ERROR: ± 0.020 Ma
WEIGHTED MEAN: 0.183 ± 0.021 Ma
PROBABILITY
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4
AGE (Ma)
UNITS QI5 & Qs5
Qs5
QI5
PROBABILITY
-0.6 -0.4 -0.2 0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4
AGE (Ma)
ARITH MEAN: 0.150 ± 0.096 Ma
STD ERROR: ± 0.058 Ma
WEIGHTED MEAN: 0.14[illegible] ± 0.035 Ma


K-Ar ZERO AGE RESIDUALS
N=10
ARITH. MEAN: -0.010 ± 0.094 Ma
STD ERROR: ± 0.030 Ma
WEIGHTED MEAN: 0.014 ± 0.010 Ma
PROBABILITY
-0.6
-0.4
-0.2
0.0
0.4
0.6
0.8
1.0
1.2
1.4
AGE Ma


40Ar/39Ar AGES TABERNACLE HILL
N=6
ARITH. MEAN: 0.006 ± 0.239 Ma
STD ERROR: ± 0.097 Ma
WEIGHTED MEAN: 0.014 ± 0.056 Ma
PROBABILITY
-0.6
-0.4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
AGE Ma

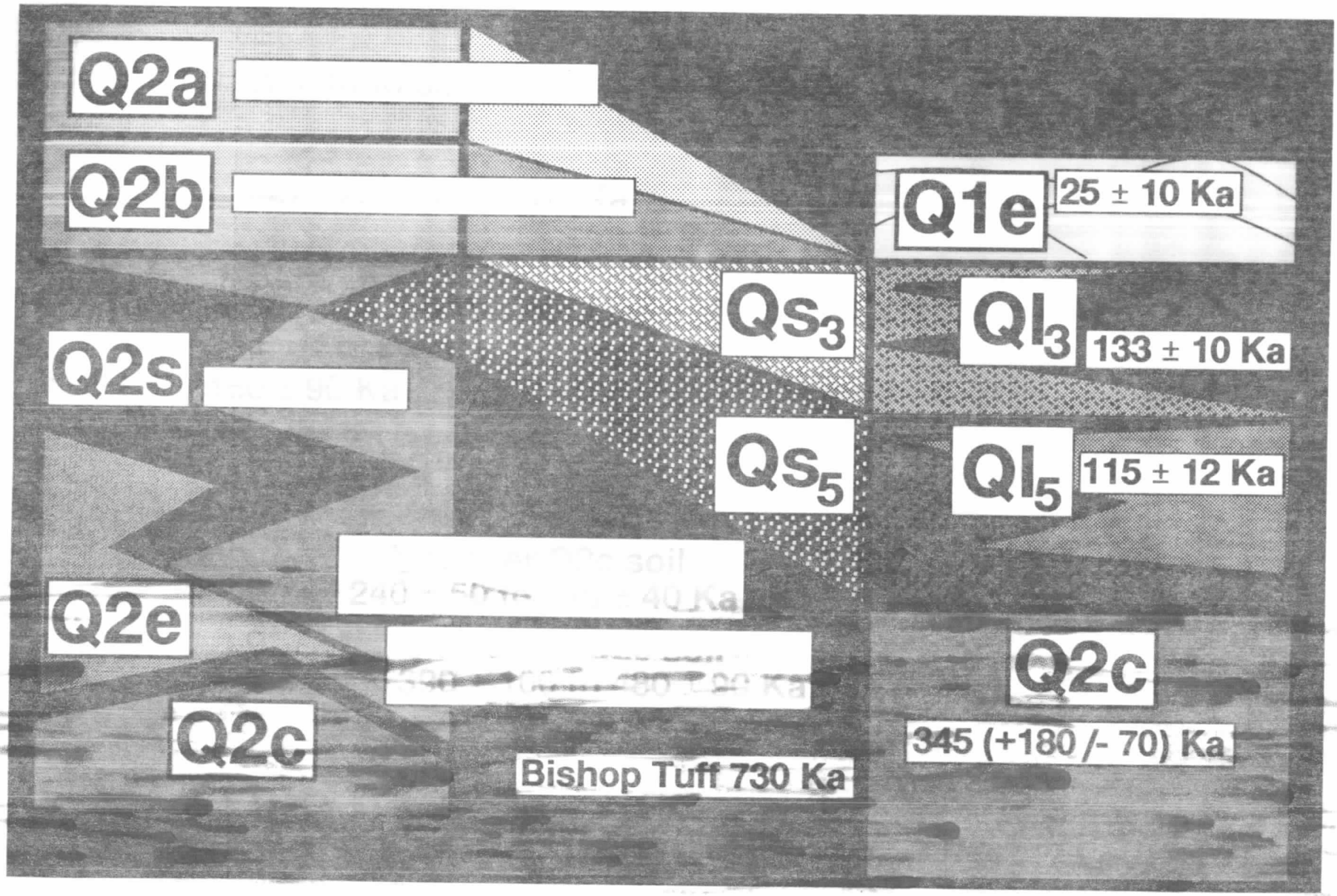
SUPPORTING EVIDENCE

The following evidence support the K-Ar $^{40}Ar/^{39}Ar$ age of 120 to 140 ka age for the Lathrop Wells volcanic center:

1. Uranium-thorium ages on alluvial deposits that contain primary and reworked cinders, 3 to 4 km northwest of the Lathrop Wells volcanic center and aligned with the direction of elongation of the cinder cone, require that that the cinders were deposited between 240 ± 30 and 145 ± 25 ka.
2. An uranium-thorium age of 150 -30/+40 ka on the lava flows from the Lathrop Wells volcanic center (Mike Morrel written and oral communication)
3. ^{36}Cl surface exposure ages on volcanic bombs, which are minimum ages because of spoliation of the volcanic bomb's original surface, indicate the the volcanic activity is greater than 69 to 105 ka (Fred Phillips oral communication).

CONCLUSIONS

1. The paleomagnetic data indicate that there are only two volcanic events at the Lathrop Wells volcanic center that are closely linked in time.
2. The combined weighted-averaged ages of the K-Ar and $^{40}Ar/^{39}Ar$ ages indicate that these two volcanic events occurred between 0.120 to 0.140 Ma. This age for Lathrop Wells is concordant with two independent isotopic geochronometers and with the chronology and stratigraphy of the surficial deposits in the Yucca Mountain region.
3. It appears that the geomorphic and soil profile evidence from which Wells et al., (3) obtain their 20 ka age for the Lathrop Wells volcanic center is incorrectly calibrated.


Q2a
Q2b
Q1e
25 ± 10 Ka
Qs3
Ql3
133 ± 10 Ka
Q2s
Qs5
Ql5
115 ± 12 Ka
Q2e
Q2c
345 (+180 /- 70) Ka
Q2c
Bishop Tuff 730 Ka