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Potassium-argon age determinations from the Port Moller and Stepovak Bay quadrangles, Alaska Peninsula

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Reported here are 17 new potassium-argon age determinations on 11 volcanic rocks and 6 intrusive rocks from the Port Moller, Stepovak Bay and Simeonof Island quadrangles. These samples were collected during 1980 and 1981 by the authors and cooperators during a mapping study for these quadrangles. The samples dated yielded ages of Eocene or younger, ranging from 0.23 to 37.13 Ma.

Table 1 shows the analytical data. Each sample was extracted twice and the mean age is reported as the final age determination. Argon extraction and measurement was done using standard techniques of isotope dilution mass spectrometry, described in detail by Dalrymple and Lanphere (1969). Sample preparation, extraction and data reduction was done by the authors and Glenn Thackeray. Mass spectrometry included the authors and James E. Conrad, Leda Beck Gray-Pickthorn, Elliot Kullman and Malcolm Pringle. Potassium was determined by flame photometry using a lithium metaborate fusion technique (Engels and Ingamells, 1970). The potassium analyses were replicated three times and the mean is shown in table 1. Potassium analyses were Paul Block, Byron Lei, Sarah Neil, Laureano Espos, and Stuart Mac Pherson. The analytical error assigned to each age (table 1), is an estimate of the standard deviation of analytical precision using the method of Cox and Dalrymple (1967) and the authors calculated estimate of uncertainty in the concentration of ^{40}Ar tracer and potassium measurements. Table 2 consists of rock descriptions from hand sample and thin sections for each sample. Hand sample colors are assigned using Goddard (1948) except where noted that the Munsell Soil Color Chart (1975) was used.

References cited

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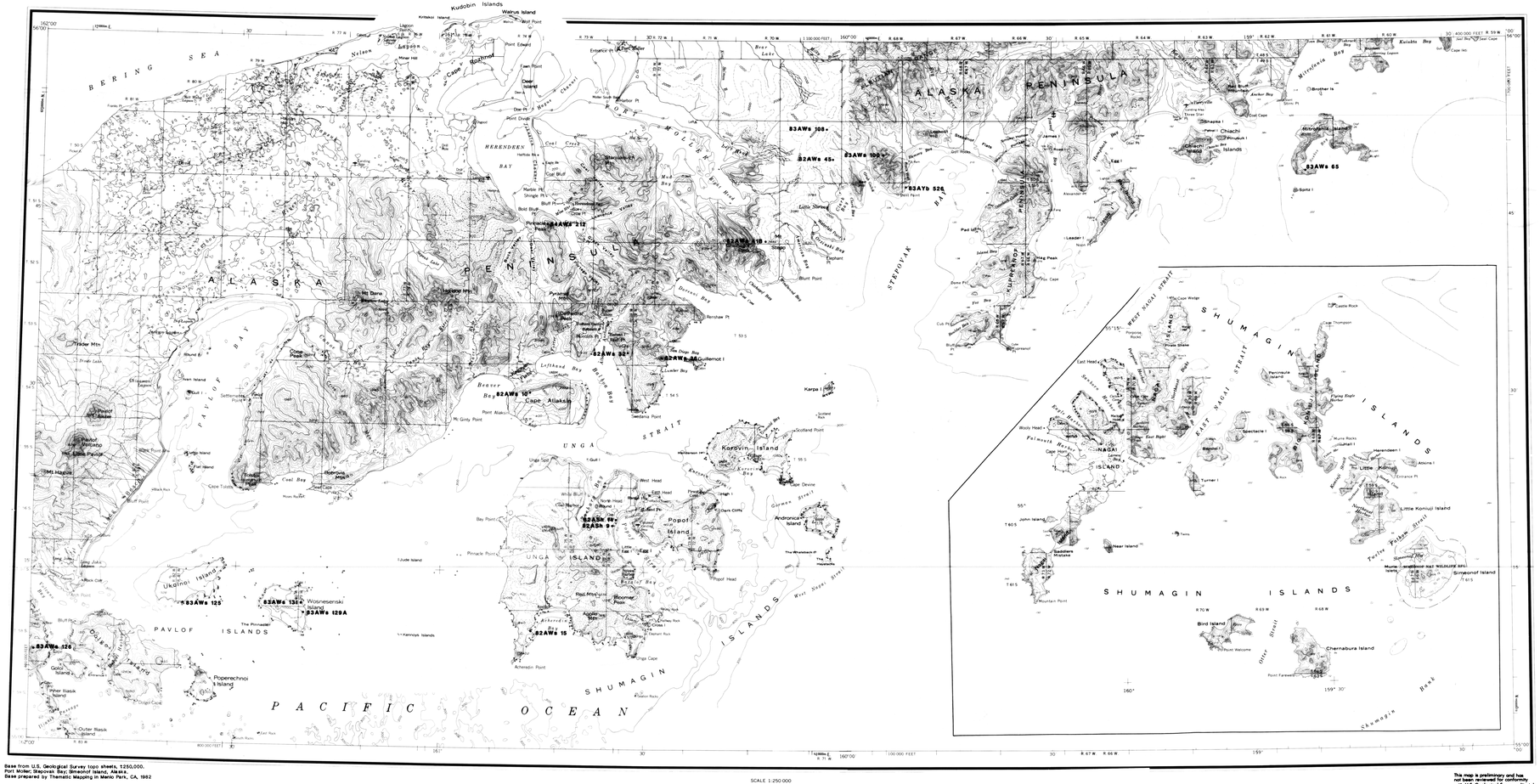
Table 1. Potassium-argon age determinations.

Sample and Locality	Latitude and Longitude	Rock Type	Mineral	K_2O	mean K_2O	$^{40}Ar_{rad}$ $\times 10^{-12}$ mg/g	$^{40}Ar_{rad}$	$^{40}Ar_{tot}$	Apparent Age and error (m.y.)
82ASb9 Popof Strait	55 19.0°N 160 34.2°W	Tuff	BIO	7.88 7.92 7.91 7.95	7.915	374.4 394.44	27.55 31.16	32.56 ± .45 34.31 ± .43	mean....33.40 ± 1.38
82ASb14 Popof Strait	55 19.4°N 160 34.2°W	Andesite	PLAG-BF	0.226 0.234 0.230 0.228	0.229	12.23 12.50	60.12 71.38	36.73 ± .68 37.53 ± .76	mean....37.13 ± 1.16
82AWa10 Cape Alaskan	55 30.0°N 160 47.8°W	Andesite	PLAG-BF	0.404 0.405 0.404 0.401	0.404	5.868 6.254	39.48 56.24	10.07 ± .09 10.73 ± .13	mean....10.40 ± .49
82AWa15 Lake Prospect Unga Is.	55 10.1°N 160 46.5°W	Andesite	QSER	3.58 3.61 3.62 3.59	3.60	167.43 164.76	91.54 92.60	32.03 ± .30 31.52 ± .39	mean....31.78 ± .61
82AWa32 Swedania Peninsula	55 33.5°N 160 32.5°W	Andesite	PLAG-BF	0.590 0.593 0.601 0.598	0.596	7.907 8.963	58.09 66.68	9.20 ± .11 10.43 ± .12	mean....9.81 ± .88
82AWa36 Swedania Peninsula	55 33.1°N 160 27.7°W	Dacite	PLAG-BF	2.511 2.504	2.508	32.14 32.50	76.07 76.58	8.88 ± .04 8.98 ± .06	mean....8.93 ± .10
82AWa41b American Bay	55 43.1°N 160 12.4°W	Dacite	HBL	0.539 0.539	0.539	6.33 6.33	20.91 26.24	8.40 ± .11 8.13 ± .10	mean....8.27 ± .24
82AWa45 South of Bear Lake	55 50.2°N 160 01.78°W	Andesite	PLAG-BF	0.356 0.355	0.356	0.32 0.25	7.07 5.01	0.63 ± .03 0.44 ± .02	mean....0.53 ± .14
82AWa65 Mitrofania Island	55 49.0°N 158 51.6°W	Granodiorite	BIO	9.02 9.05	9.03	125.09 120.63	68.31 64.38	9.60 ± .07 9.26 ± .07	mean....9.43 ± .26
82AWa100 Ikatan Bay	55 50.4°N 159 54.8°W	Andesite	HBL	0.325 0.326	0.326	2.45 2.58	13.60 11.42	5.15 ± .10 4.90 ± .13	mean....5.33 ± .30
82AWa125 Unalaska "Onion"	55 12.0°N 161 37.7°W	Basalt	PLAG-BF	0.082 0.076	0.079	1.71 1.88	28.44 27.22	14.95 ± .82 16.43 ± .90	mean....15.69 ± 1.6
82AWa126 Moss Cape Gneiss	55 08.1°N 161 36.7°W	Diorite	BIO	9.51 9.58	9.55	42.87 43.46	34.95 32.70	3.12 ± .04 3.31 ± .06	mean....3.21 ± .14
82AWa129a Wosnesenski Island	55 11.4°N 161 20.2°W	Diorite	PLAG-BF	0.317 0.313	0.315	8.00 7.94	71.36 46.92	17.55 ± .21 17.42 ± .22	mean....17.48 ± .32
82AWa131 Wosnesenski Island	55 12.0°N 161 20.3°W	Basalt	WR-BF	0.251 0.251	0.251	2.95 3.16	16.10 10.10	8.14 ± .13 8.72 ± .14	mean....8.43 ± .45
83AFb526 Dent Point	55 47.8°N 159 51.0°W	Diorite	HBL	0.302 0.302	0.302	2.60 2.69	12.42 12.91	5.96 ± .12 6.17 ± .14	mean....6.07 ± .23
84AWa212 Pinnacle Peak	55 44.5°N 160 45.2°W	Basalt	PLAG-BF	0.517 0.501	0.509	0.494 0.486	10.18 7.42	0.67 ± .03 0.66 ± .04	mean....0.67 ± .05

Age determinations calculated with constants given below:

$= 4.963 \times 10^{-10}$ year^{-1} $= 5.72 \times 10^{-11}$ year^{-1} $= 8.78 \times 10^{-13}$ year^{-1}

$^{40}K/K = 1.167 \times 10^{-4}$ atom percent.
BIO = biotite, HBL = hornblende, PLAG = plagioclase, QSER = whole-rock with quartz-sericite alteration, WR = whole-rock. BF = hydrofloric acid treated, see Wilson (1980).


BERING SEA
ALASKA PENINSULA
PACIFIC OCEAN
SHUMAGIN ISLANDS
PAVLOF ISLANDS
UNGA ISLAND
UNGA STRAIT
Popof Island
Korovin Island
Cape Alaskan
Cape Kekurnoi
Port Moller
Stepovak Bay
Kudobin Islands
Walrus Island
Kulubin Bay
Mitrofania Island
Simeonof Island
Chernabura Island
Bird Island
Little Koniuji Island
Nagai Island
Wosnesenski Island
Ukolnoi Island
Poperechnoi Island
Outer Rasik Island
Inner Rasik Island
Gore Island
Deer Island
Bird Island
Chignik Lagoon
Chignik Cape
Kennedy Islands
Kupreanof Point
Cape Devine
Bay Point
Pinnacle Point
Cape Tolstoi
Cape Pavlof
Pavlof Volcano
Mt. Dutton
Mt. Hague
Mt. Frosty
Mt. Cone
Mt. Dana
Mt. Emmons
Mt. Ginty Point
Mt. Dutton