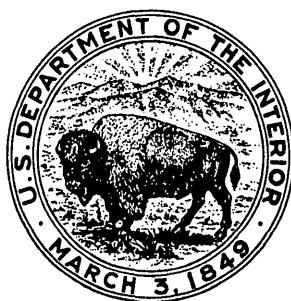


DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

**TRANSCONTINENTAL GEOPHYSICAL SURVEY (35°-39° N)
RADIOMETRIC AGE DETERMINATIONS OF ROCKS**

By
Richard F. Marvin

MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-537



A CONTRIBUTION TO THE UPPER MANTLE PROJECT

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INTRODUCTION

Because all the radiometric ages given by samples occurring between 35° and 39° N. latitude could not be shown on the four maps without undue clutter and crowding, the following tabulation was made as a supplement to the maps to present both plotted and unplotted ages and their localities. Ages excluded from this tabulation are (1) those that might be confusing such as Pb- α ages of detrital zircons found in a Paleozoic sediment but derived from Precambrian rocks; (2) those obtained from minerals that generally "leak" radiogenic argon and thus give much younger ages than cogenetic minerals which display good retention of radiogenic argon; and (3) lead-uranium ages of uranium minerals that gave ages older than the host rock. Generally, only the Pb^{207}/Pb^{206} age is tabulated although many Pb^{206}/U^{238} , Pb^{207}/U^{235} , and Pb^{208}/Th^{232} ages are listed in the reference cited for the Pb^{207}/Pb^{206} age.

Most analyzed materials are from igneous rocks, some are from metamorphic rocks, and a few are from sedimentary rocks. Of the ages tabulated, most indicate the time of crystallization of the analyzed mineral or rock, but many indicate the time or effect of some subsequent geologic event, such as regional metamorphism or igneous activity, which partly or completely reset the radioactive clocks in existing rocks. Such age distinctions are not made in this tabulation.

The data are presented alphabetically by State and, within the State, by age—Cenozoic, Mesozoic, Paleozoic, and Precambrian, but are listed systematically under the appropriate time division according to longitude-latitude designation.

All the ages given by a rock specimen or by closely related specimens are listed together. The rock type is reported as an aid in evaluating the possible areal extent of the listed age or ages.

RADIOMETRIC AGE DETERMINATIONS

Age and material analyzed: m.y., millions of years; ages set in *italic* are plotted on one of the four maps; material analyzed for radiogenic argon content indicated, in parentheses, by following symbols: B, biotite; C-T, columbite-tantalite; F, potassium feldspar; G, glass; Gl, glauconite; Gm, gummite; H, hornblende; Le, lepidolite; M, muscovite; Mi, mica; Mic., microlite; Min, minerals; Mz, monazite; P, pyroxene; Pl, plagioclase; Po, phlogopite; Sa, samarskite; T, tremolite; Th, thorite; U, uraninite; WR, whole rock; Z, zircon

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
ARIZONA					
<i>Cenozoic ages</i>					
110°08', 35°35'	Sec. 12, T. 25 N., R. 21 E.	Trachybasalt, Bidahochi Formation	K-Ar	<i>4.1</i> (WR)	Evernden and others (1964).
113°02', 35°21'	Chino	Hydrothermal alteration	K-Ar	<i>63</i> (B)	Schwartz (1959).
<i>Precambrian ages</i>					
112°53', 35°13'	S of Seligman	Chino Creek Granite	K-Ar	<i>1330</i> (B)	Damon and others (1962).
112°03', 36°05'	Zoroaster Creek, Grand Canyon.	Zoroaster Granite	K-Ar	<i>1340</i> (B)	Aldrich and others (1958).
112°07', 36°05'	Kaibab Trail, Grand Canyon.	Pegmatite in Vishnu Series.	Rb-Sr	<i>1350</i> (B)	Do.
			Rb-Sr	<i>1530</i> (M)	Giletti and Damon (1961); Damon and Giletti (1961).
112°40', 35°23'	Bright Angel Trail	Pegmatite in Brahma Schist, Vishnu Series.	K-Ar	<i>1,550</i> (M)	Do.
			Rb-Sr	<i>1410</i> (M)	Damon and others (1962).
			Rb-Sr	<i>1390</i> (B)	Giletti and Damon (1961); Damon and Giletti (1961).
113°40', 35°23'	Near Valentine	Migmatite zone in Vishnu Series.	K-Ar	<i>1240</i> (B)	Damon and others (1962).
			Rb-Sr	<i>1300</i> (B)	Giletti and Damon (1961); Damon and Giletti (1961).
113°59', 35°47'	Grand Wash Cliffs	Quartz monzonite	Rb-Sr	<i>1510</i> (B)	Wasserburg and Lanphere (1965).
				<i>1517</i> (B)	Do.
				<i>1608</i> (F)	Do.
				<i>1570</i> (F)	Do.
				<i>1500</i> (WR)	Do.
				<i>1630</i> (H)	Do.
				<i>1667</i> (F)	Do.
				<i>1663</i> (F)	Do.
				<i>1538</i> (Pl)	Do.
				<i>1731</i> (Pl)	Do.
				<i>1663</i> (M)	Do.
				<i>1659</i> (M)	Do.
				<i>1630</i> (F)	Do.
				<i>1520</i> (Pl)	Do.
				<i>1647</i> (F)	Do.
				<i>1663</i> (F)	Do.
				<i>1616</i> (F)	Do.
114°04', 35°15'	5 miles N of Kingman	do	Rb-Sr	<i>1593</i> (B)	Do.
				<i>1695</i> (H)	Do.
				<i>1610</i> (M)	Do.
				<i>1635</i> (M)	Do.
114°08', 35°29'	20 miles N of Kingman.	Inclusion in pegmatite	Rb-Sr	<i>1654</i> (F)	Do.
			Rb-Sr	<i>1515</i> (F)	Do.
114°09', 35°30'	22 miles N of Kingman.	Gneiss	Rb-Sr	<i>1325</i> (M)	Do.
				<i>1547</i> (F)	Do.
114°12', 35°25'	Chloride	Diana Granite	Rb-Sr	<i>1345</i> (B)	Do.
				<i>1606</i> (F)	Do.
114°12', 35°26'	N of Chloride	Chloride Granite	Rb-Sr	<i>1360</i> (B)	Do.
				<i>1350</i> (B)	Giletti and Damon (1961); Damon and Giletti (1961).
			Rb-Sr	<i>1210</i> (B)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
CALIFORNIA					
<i>Cenozoic ages</i>					
116°15', 35°28' (?)	Avawatz Mountain	Tuff in Avawatz Formation.	K-Ar	10.7(F)	Evernden and others (1964).
116°29', 35°09'	Sec. 8, T. 12 N, R. 5 E.	Tuff lens in sandstone	K-Ar	11.0(F) 12.3(B) 11.5(Pl)	Do. Do. Do.
116°21', 36°00'	Sec. 20, T. 22 N., R. 6 E.	Quartz monzonite	K-Ar	18.8 ± 1.2(B)	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
116°41', 36°01'	Black Mountains	do	Pb-α	30 ± 10(Z)	Drewes (1964).
116°42', 36°12'	Death Valley	do	Pb-α	45 ± 10(Z)	Do.
116°55', 36°05'	Death Valley	Schist	K-Ar	30(M)	Wasserburg and others (1959).
116°56', 36°14'	W of sec. 6, T. 20 S., R. 47 E.	Augen gneiss	K-Ar	14(B)	Stern and others (1966).
116°57', 36°14'	W of sec. 19, T. 19 S., R. 47 E.	Felsitic dike Augen gneiss	Pb-α K-Ar	50 ± 10(Z) 11(B)	Do. Do.
116°57', 36°16'	W of sec. 30, T. 19 S., R. 47 E.	Quartz monzonite	K-Ar	14(F)	Do.
116°58', 36°12' (?)	Mouth of Hanaupah Canyon.	Monzonite porphyry	Pb-α K-Ar	30 ± 10(Z) 12(F)	Do. Do.
117°55', 35°25' (?)	Last Chance Canyon	Tuff in Ricardo Formation.	Pb-α K-Ar	20 ± 10(Z) 10.0(B)	Do. Evernden and others (1964).
117°25', 36°02' (?)	Sec. 10, T. 21 S., R. 42 E.	Andesite	K-Ar	12.6(B) 13.0(Pl)	Evernden and James (1964).
117°52', 36°19'	Sec. 6, T. 19 S., R. 38 E.	Pumice chunks in Coso Formation.	K-Ar	2.2(B)	Evernden and others (1964).
117°55', 36°11'	Sec. 24, T. 20 S., R. 37½ E.	Andesite in Coso Formation.	K-Ar	2.0(B)	Do.
117°58', 37°25'	Sec. 19, T. 6 S., R. 37 E.	Basalt of Deep Springs Valley.	K-Ar	10.8 ± 1.0(WR) 10.9 ± 0.2(?)	Dalrymple (1963). Do.
118°16', 35°06' (?)	Tehachapi Pass, Tehachapi Mountains.	Tuff breccia in Kinnick Formation.	K-Ar	17.1(B)	Evernden and others (1964).
118°18', 36°55' (?)	Sawmill Canyon	Basalt	K-Ar	0.09 ± 0.09(WR) 0.06 ± 0.05(WR)	Dalrymple (1964b). Do.
118°25', 36°12'	Trout Meadows	do	K-Ar	3.5 ± 0.1(WR)	Dalrymple (1963).
118°18', 37°03'	Sec. 30, T. 10 S., R. 34 E.	Rhyolite	K-Ar	0.99 ± 0.04(G)	Cox and others (1963).
118°21', 37°28'	Sec. 4, T. 6 S., R. 33 E.	Bishop Tuff	K-Ar	0.736 ± 0.07(F) 0.754 ± 0.08(F)	Dalrymple and others (1965). Do.
118°29', 37°18'	Sec. 29, T. 7 S., R. 32 E.	Basalt of Coyote Flat	K-Ar	9.6 ± 0.2(WR)	Dalrymple (1963).
118°34', 37°46'	Sec. 16, T. 2 S., R. 31 E.	Basalt	K-Ar	3.42 avg.(WR)	Dalrymple and Hirooka (1965).
118°36', 37°33'	Sec. 31, T. 4 S., R. 31 E.	Basalt of Owens Gorge	K-Ar	3.2 ± 0.1(WR)	Dalrymple (1963).
118°40', 37°33'	Sec. 34, T. 4 S., R. 30 E.	Bishop Tuff	K-Ar	0.730 ± 0.07(F)	Dalrymple and others (1965).
118°46', 37°49'	Sec. 28, T. 1 S., R. 29 E.	do	K-Ar	0.692 ± 0.06(F) 0.639 ± 0.07(F) 0.717 ± 0.07(F)	Do. Do. Do.
118°49', 37°35'	Sec. 19, T. 4 S., R. 29 E.	Basalt of McGee Mountain.	K-Ar	2.6 ± 0.1(WR)	Dalrymple (1963).
118°53', 37°24'	Volcanic Knob	Basalt	K-Ar	3.6 ± 0.1(WR)	Do.
119°42', 35°23' (?)	Sec. 22, T. 29 S., R. 21 E.	Glauconitic sandstone (drill core).	K-Ar	23(Gl)	Evernden and others (1961).
119°00', 37°37'	Sec. 9, T. 4 S., R. 27 E.	Basalt	K-Ar	3.1 ± 0.1(WR)	Dalrymple (1964a).
119°02', 37°20'	Devils Table	do	K-Ar	3.5 ± 0.1(WR)	Dalrymple (1963).
119°03', 37°38'	Sec. 36, T. 3 N., R. 26 E.	Quartz latite	K-Ar	0.37 ± 0.04(Pl)	Dalrymple (1964a).
119°03', 37°41'	Sec. 13, T. 3 S., R. 26 E.	Basalt of San Joaquin Mountain.	K-Ar	3.1 ± 0.1(WR)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
CALIFORNIA—continued					
<i>Cenozoic ages—Continued</i>					
119°05', 37°38'	Near Devils Postpile National Monument.	Basalt	K-Ar	0.94 ± 0.16(Pl)	Dalrymple (1964b).
119°06', 37°43'	NW of Two Teats Mountain.	Two Teats Quartz Latite	K-Ar	3.0 ± 0.1(Pl)	Dalrymple (1964a).
119°10', 37°31'	Sec. 11, T. 5 S., R. 25 E.	Basalt of Pine Flat	K-Ar	3.5 ± 0.1(WR)	Do.
119°12', 37°33'	Sec. 36, T. 4 S., R. 25 E.	Snake Meadow Basalt	K-Ar	3.3 ± 0.1(WR)	Do.
119°24', 37°07'	Sec. 30, T. 9 S., R. 24 E.	Basalt of Sugarloaf Hill.	K-Ar	9.5 ± 0.3(WR)	Dalrymple (1963).
119°35', 37°59'	Rancheria Mountain	Latite	K-Ar	8.9 ± 0.2(B)	Do.
119°27', 38°26' (?)	West Walker River Canyon.	Latite welded tuff	K-Ar	10.7(B)	Evernden and others (1961).
119°36', 38°18'	Sec. 7, T. 5 N., R. 22 E.	Rhyolite tuff of Leavitt Creek.	K-Ar	29.5 ± 0.6(F)	Dalrymple (1964a).
119°47', 38°22'	S of Bald Peak	Basalt	K-Ar	9.3 ± 0.4(WR)	Do.
119°47', 38°33'	Near Silver Peak	Nobel Canyon Rhyolite	K-Ar	4.8 ± 0.1(B) 4.7 ± 0.1(Pl)	Do.
119°49', 38°20'	Sec. 29-30, T. 6 N., R. 20 E.	Basalt	K-Ar	0.15 ± 0.03(WR)	Dalrymple (1964b).
119°50', 38°19'	Sec. 1, T. 5 N., R. 19 E.	Rhyolite of Sonora Pass.	K-Ar	25.7 ± 0.5(B)	Dalrymple (1963).
		Lower Eagle Meadow Tuff.	K-Ar	26.1 ± 0.5(B) 23.3 ± 0.5(F)	Do.
119°50', 38°33'	Near Upper Kinney Lake.	Rhyolite tuff	K-Ar	20.7 ± 0.4(F)	Do.
120°07', 36°30' (?)	Sec. 33, T. 16 S., R. 17 E.	Glauconitic sandstone (drill core).	K-Ar	58(Gl)	Evernden and others (1961).
120°18', 36°11' (?)	Sec. 13, T. 20 S., R. 15 E.	do	K-Ar	59(B)	Do.
120°23', 36°11' (?)	Sec. 18, T. 20 S., R. 15 E.	do	K-Ar	42(Gl)	Do.
120°02', 37°55'	Sec. 19, T. 1 N., R. 18 E.	Latite of Jawbone Ridge.	K-Ar	9.0 ± 0.2(B)	Dalrymple (1963).
120°07', 37°50'	Sec. 28, T. 1 S., R. 17 E.	Rhyolite	K-Ar	28.5 ± 0.6(F)	Dalrymple (1964a).
120°18', 38°15'	Sec. 27, T. 5 N., R. 15 E.	Latite	K-Ar	9.2 ± 0.2(B)	Do.
120°21', 38°11'	Sec. 19, T. 4 N., R. 15 E.	Welded tuff of Rattlesnake Hill.	K-Ar	33.2 ± 0.7(Pl)	Do.
120°22', 38°11'	Sec. 19, T. 4 N., R. 15 E.	Latite of Table Mountain.	K-Ar	9.0 ± 0.2(Pl)	Do.
120°24', 38°07'	Sec. 11, T. 3 N., R. 14 E.	Upper tuff, Valley Springs Formation.	K-Ar	21.1 ± 0.4(F)	Do.
120°24', 38°07'	Sec. 14, T. 3 N., R. 14 E.	Lower tuff, Valley Springs Formation.	K-Ar	23.1 ± 0.5(F)	Do.
120°25', 38°45'	Sec. 3, T. 10 N., R. 14 E.	Rhyolite tuff of Plum Creek.	K-Ar	23.4 ± 0.5(F)	Do.
120°50', 38°12'	Sec. 11, T. 4 N., R. 10 E.	Upper tuff, Valley Springs Formation.	K-Ar	21.9 ± 0.4(B)	Do.
		Rhyolite from Valley Springs Formation.	K-Ar	19.9 ± 0.4(F)	Dalrymple (1963).
122°12', 37°53'	Berkeley Hills	Basalt	K-Ar	9.8(WR)	Evernden and others (1964).
122°12', 37°52'	Sec. 4, T. 1 S., R. 4 W.	Tuff, Siesta Formation	K-Ar	9.89(Pl)	Do.
122°13', 37°53'	Berkeley Hills	Basalt	K-Ar	9.8(WR)	Do.
122°13', 37°53' (?)	do	Volcanics of Grizzly Peak.	K-Ar	8.9(F)	Do.
122°13', 37°52' (?)	do	Olivine basalt	K-Ar	11.4(WR)	Do.
122°13', 37°53' (?)	do	Volcanics of Grizzly Peak.	K-Ar	8.9(F)	Do.
122°13', 37°53'	do	Olivine basalt	K-Ar	7.7(WR)	Do.
122°19', 38°01'	Pinole	Pinole Tuff, Pinole Formation.	K-Ar	5.2(F)	Do.
122°35', 38°35' (?)	Calistoga	Sonoma Tuff	K-Ar	3.4(Pl)	Evernden and James (1964).

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
CALIFORNIA—continued					
<i>Mesozoic ages</i>					
115°30', 35°02' (?)	Northern Providence Mountains.	Quartz monzonite	Pb- α	94(Z)	Jaffe and others (1959).
116°08', 35°12' (?)	Soda Mountains	do	Pb-	96(Z)	Do.
116°22', 35°34'	Sec. 8 (proj.), T. 17 N., R. 6 E.	Diorite	K-Ar	126 \pm 7(B)	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
117°28', 35°12' (?)	Fremont Peak	Pegmatite	K-Ar	62.9 \pm 1.8(B)	Do.
		Granite	Pb- α	85 \pm 10(Z) 90 \pm 10(Mz)	USGS unpub. data.
117°27', 36°14'	Thompson Canyon, Argus Range.	Quartz monzonite	K-Ar	178(B)	Hall and MacKevett (1962).
117°29', 36°20'	Darwin Canyon, Argus Range.	do	Pb- α	180 \pm 20(Z)	Do.
		do	K-Ar	182(B)	Do.
117°44', 36°31' (?)	Hunter Mountain Batholith.	Quartz monzonite	Pb- α	210 \pm 25(Z)	Do.
118°34', 35°34' (?)	Kern River uranium area.	Isabella Granodiorite	Pb- α	190 \pm 20(Z)	USGS unpub. data.
118°00', 36°51'	Inyo Mountains.	Quartz monzonite of Paiute Monument.	Pb- α	83(Z)	Jaffe and others (1959).
			K-Ar	89(Z)	Do.
			Pb- α	96(Z)	Do.
			K-Ar	100 \pm 10(Z) 154(B)	USGS unpub. data. Kistler and others (1965).
118°00', 36°58'	Papoose Flat, Inyo Mountains.	Quartz monzonite	K-Ar	75(B)	Do.
118°02', 36°49'	Inyo Mountains	Quartz monzonite of Paiute Monument.	K-Ar	157(B)	Do.
118°08', 36°56'	do	Tinemaha Granodiorite	K-Ar	123(B)	Do.
118°20', 36°35'	Sierra Nevada	Quartz monzonite	K-Ar	77 \pm 15(Pl)	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
118°02', 37°00'	Papoose Flat, Inyo Mountains.	do	K-Ar	81(B)	Kistler and others (1965).
118°17', 37°04'	Sierra Nevada	Tinemaha Granodiorite	K-Ar	83(B)	Do.
118°19', 37°07'	do	do	K-Ar	91(B)	Do.
			K-Ar	170(H)	Do.
118°20', 37°08'	do	do	K-Ar	131(B)	Do.
			K-Ar	183(H)	Do.
			K-Ar	180(H)	Do.
			Pb- α	116(Z)	Jaffe and others (1959).
118°20', 37°05'	Sec. 14, T. 10 S., R. 33 E.	Granodiorite	Pb- α	116(Z)	Jaffe and others (1959).
118°22', 37°06'	McMurry Meadows, Sierra Nevada.	do	K-Ar	104(B)	Kistler and others (1965).
			Pb- α	151(H) 100(Mz)	Do. Jaffe and others (1959).
118°24', 37°14'	Sierra Nevada	Granite	K-Ar	81(B)	Kistler and others (1965).
118°25', 37°13'	do	do	K-Ar	87(B)	Do.
			Rb-Sr	87(B)	Do.
118°26', 37°13'	Coyote Flat, Sierra Nevada.	Granodiorite	K-Ar	88(B)	Do.
118°27', 37°06'	Sierra Nevada	Tinemaha Granodiorite.	K-Ar	78(B)	Do.
			K-Ar	150(H)	Do.
118°27', 37°07'	do	Granite	K-Ar	85(B)	Do.
118°27', 37°08'	Sec. 26, T. 9 S., R. 32 E.	Quartz monzonite	Pb- α	105(Z)	Jaffe and others (1959).
118°30', 37°07'	Sec. 32, T. 9 S., R. 32 E.	Granodiorite	Pb- α	112(Z)	Do.
118°31', 37°07'	Sierra Nevada	Inconsolable Granodiorite.	K-Ar	87(B)	Kistler and others (1965).
118°34', 37°10'	Sec. 14, T. 9 S., R. 31 E.	Granodiorite	Pb- α	98(H)	Do.
			Pb- α	93(Z)	Jaffe and others (1959).
118°35', 37°15'	Sec. 20, T. 8 S., R. 31 E.	Quartz monzonite	Pb- α	88(Th)	Do.
			Pb- α	110(Z)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
CALIFORNIA—continued					
<i>Mesozoic ages—Continued</i>					
118°36', 37°14'	Sierra Nevada	Tungsten Hills Quartz Monzonite.	Rb-Sr	75(B)	Kistler and others (1965).
118°37', 37°13'	do	Lamarek Granodiorite	K-Ar	76(B)	Do.
118°37', 37°25'	do	Wheeler Crest Quartz Monzonite.	K-Ar	77(B)	Do.
118°37', 37°26'	do	do	K-Ar	84(H)	Do.
118°38', 37°24'	do	do	K-Ar	69(B)	Do.
118°41', 37°22'	do	Tungsten Hills Quartz Monzonite.	K-Ar	96(H)	Do.
118°43', 37°21'	do	do	K-Ar	79(B)	Do.
118°43', 37°22'	W of Pine Creek mine.	Quartz monzonite	Pb- α	99(H)	Do.
118°43', 37°28'	Sierra Nevada	Round Valley Peak Granodiorite.	K-Ar	81(B)	Do.
118°44', 37°28'	Near Bishop	Granodiorite	Pb- α	74(B)	Do.
118°49', 37°13'	Goddard pendant, Sierra Nevada.	Sheared granodiorite	K-Ar	75(B)	Do.
118°56', 37°14'	Sierra Nevada	Mount Givens Granodiorite.	K-Ar	116(Z)	Jaffe and others (1959).
118°58', 37°05'	do	Granodiorite	K-Ar	87(B)	Kistler and others (1965).
118°59', 37°00'	do	Granodiorite	K-Ar	84(H)	Do.
119°03', 36°20'	Sec. 20, T. 18 S., R. 27 E.	do	K-Ar	88(Z)	Jaffe and others (1959).
119°05', 36°17'	Sec. 7, T. 19 S., R. 27 E.	Aplite	K-Ar	86(B)	Kistler and others (1965).
119°06', 36°17'	Sec. 7, T. 19 S., R. 27 E.	Granodiorite	K-Ar	85(B)	Do.
119°14', 36°57'	Sec. 27, T. 11 S., R. 25 E.	Schist	K-Ar	85(B)	Do.
119°15', 36°58'	Sec. 16, T. 11 S., R. 25 E.	Granodiorite	K-Ar	87(B)	Do.
119°29', 36°58'	Sierra Nevada	do	K-Ar	86(H)	Do.
119°31', 36°54'	do	Pyroxene-quartz diorite	K-Ar	83(B)	Do.
119°03', 37°19'	do	Mount Givens Granodiorite.	K-Ar	92(H)	Do.
119°05', 37°09'	do	Porphyritic biotite granite.	Rb-Sr	82(B)	Do.
119°08', 37°16'	do	Granodiorite	K-Ar	83(B)	Do.
119°09', 37°14'	do	Porphyritic biotite granite.	K-Ar	88(B)	Do.
119°17', 37°09'	do	do	K-Ar	82(B)	Do.
119°19', 37°06'	do	do	K-Ar	83(B)	Do.
119°22', 37°55'	Near Yosemite National Park.	Cathedral Peak Granite	K-Ar	83(B)	Do.
119°23', 37°03'	Sierra Nevada	Granodiorite	K-Ar	88(H)	Do.
119°24', 37°01'	do	do	K-Ar	92(B)	Do.
119°24', 37°55' (?)	Near Yosemite National Park.	Johnson Granite Porphyry.	K-Ar	91(H)	Do.
119°28', 37°49'	Sec. 28, T. 1 S., R. 23 E.	Half Dome Quartz Monzonite.	Pb- α	90(B)	Do.
				83.7(B)	Curtis and others (1958).
				89(B)	Kistler and others (1965).
				109(H)	Do.
				89(B)	Do.
				82.4(B)	Curtis and others (1958).
				88(Th)	Jaffe and others (1959).
				117(Z)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
CALIFORNIA—continued					
<i>Mesozoic ages—Continued</i>					
119°30', 37°50'.....	Near Yosemite National Park.	Pegmatite in Hoffman Quartz Monzonite.	K-Ar	76.9(B).....	Curtis and others (1958).
119°30', 37°51'.....	do.....	Pegmatite in Sentinel Granodiorite.	K-Ar	86.4(B).....	Do.
119°32', 37°44' (?)..	Yosemite National Park.	Half Dome Quartz Monzonite.	K-Ar	84.1(B).....	Do.
119°35', 37°44'.....	do.....	Sentinel Granodiorite..	K-Ar	88.4(B).....	Do.
119°43', 37°44'.....	Sec. 25, T. 2 S., R. 20 E.	El Capitan Granite.....	Pb- α	94(Z).....	Jaffe and others (1959).
119°44', 37°41'.....	Sec. 14, T. 3 S., R. 20 E.	Granodiorite.....	Pb- α	103(Z).....	Do.
119°44', 37°44'.....	Near Yosemite National Park.	El Capitan granite.....	K-Ar	92.2(B).....	Curtis and others (1958).
119°45', 37°43' (?)..	do.....	Gateway Granodiorite..	K-Ar	92.9(B).....	Do.
119°52', 38°22'.....	Sonora Pass area.....	Arch Rock Granite.....	K-Ar	95.3(B).....	Do.
		Granodiorite.....	K-Ar	87.0(B).....	Grommé and Merrill (1965).
119°55', 38°20'.....	do.....	Quartz monzonite.....	K-Ar	90.1(H).....	Do.
				83.0(B).....	Do.
				83.6(B).....	Do.
				84.2(H).....	Do.
120°34', 35°25' (?)..	Sec. 10, T. 29 S., R. 13 E.	Santa Margarita Granodiorite.	K-Ar	84.1(B).....	Curtis and others (1958).
120°03', 37°24'.....	Sec. 24, T. 6 S., R. 17 E.; Guadalupe Mountain.	Quartz monzonite.....	K-Ar	142.9(B).....	Do.
121°14', 36°26'.....	Sec. 29, T. 17 S., R. 7 E.	Gabilan Mesa Quartz Diorite.	K-Ar	83.8(B).....	Do.
121°40', 36°33'.....	Sec. 17, T. 16 S., R. 3 E.	Quartz diorite.....	K-Ar	66.0 \pm 1.8(B).....	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
121°56', 36°31'.....	Carmel Cove, Carmel Bay.	Santa Lucia Granodiorite.	K-Ar	81.6(B).....	Curtis and others (1958).
121°56', 36°37'.....	Monterey quadrangle..	Granitic rock.....	K-Ar	75.9 \pm 1.9(B).....	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
121°07', 38°49'.....	Sec. 18, T. 11 N., R. 8 E.	Quartz diorite.....	K-Ar	136(B).....	Evernden and others (1961).
121°14', 38°47'.....	Sec. 19, T. 11 N., R. 7 E.	Rocklin Granodiorite..	K-Ar	130.6(B).....	Curtis and others (1958).
122°03', 37°01'.....	Felton quadrangle....	Granitic rock.....	K-Ar	131.5(B).....	Do.
				71.0 \pm 0.9(B).....	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
122°25', 37°33'.....	Pilarcitas Dam Site...	Montara Quartz Diorite.	K-Ar	91.6(B).....	Curtis and others (1958).
122°30', 37°31'.....	Montara Mountain quadrangle.	Granitic rock.....	K-Ar	86.2 \pm 3.4(B).....	C. W. Chesterman (written commun. 1965); California Div. Mines (1965).
123°02', 37°45' (?)..	Farallon Islands.....	Farallon Quartz Diorite.	K-Ar	89.5(B).....	Curtis and others (1958).
123°00', 38°00' (?)..	Point Reyes(?).....	Point Reyes Granodiorite.	K-Ar	83.9(B).....	Do.
123°04', 38°10'.....	Bodega Head Pluton..	Quartz diorite.....	K-Ar	92 \pm 3(H).....	USGS unpub. data.
123°06', 38°32'.....	Sec. 17, T. 8 N., R. 11 W.	Metabasalt in glaucophane schist.	K-Ar	135(M).....	Lee and others (1964).
123°07', 38°32'.....	Sec. 18, T. 8 N., R. 11 W.	do.....	K-Ar	150(M).....	Do.
		Metashale in glaucophane schist.	Rb-Sr	150(M).....	Do.
			K-Ar	135(M).....	Do.
123°09', 38°43'.....	Sec. 11, T. 10 N., R. 12 W.	Metabasalt in glaucophane schist.	K-Ar	130(M).....	Do.
			K-Ar	140(M).....	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
CALIFORNIA—continued					
<i>Paleozoic age</i>					
119°05', 36°14'-----	Sec. 31, T. 19 S., R. 27 E.	Metachert in serpentinite.	K-Ar	307±30(T)-----	Putman and Alfors (1965).
<i>Precambrian ages</i>					
115°28', 35°28'-----	Mountain Pass district.	Gneiss-----	K-Ar	1580±40(B)-----	Lanphere (1964).
			Rb-Sr	1530±55(B)-----	Do.
115°31', 35°30'-----	-----do-----	-----do-----	K-Ar	1560±40(B)-----	Do.
			Rb-Sr	1460±50(B)-----	Do.
		Pegmatite-----	K-Ar	1660±40(B)-----	Do.
			Rb-Sr	1640±60(B)-----	Do.
				1600±60(F)-----	Do.
115°32', 35°29'-----	Near Birthday Shaft, Mountain Pass district.	Shonkinite-----	K-Ar	1440±35(B)-----	Do.
				1385±35(B)-----	Do.
			Rb-Sr	1380±50(B)-----	Do.
				1415±80(B)-----	Do.
	Mountain Pass district.	Barite carbonate rock.	Pb-α	1020(Mz)-----	Jaffe and others (1959).
		Shonkinite-----	Pb-α	932(Z)-----	Do.
				846(Z)-----	Do.
				811(Z)-----	Do.
				877(Z)-----	Do.
		Barite carbonate rock...	Pb-α	1000(Mz)-----	Do.
			Pb ²⁰⁸ /Th ²³²	925(Mz)-----	Jaffe (1955).
115°42', 35°42'-----	Winters Pass Hills-----	Pegmatite-----	Rb-Sr	1700±65(F)-----	Lanphere (1964).
116°08', 35°50'-----	Death Valley-----	Granite gneiss-----	K-Ar	990(B)-----	Wasserburg and others (1959).
			Rb-Sr	1410(B)-----	Do.
116°55', 35°59'-----	-----do-----	Schist-----	K-Ar	1500(Mi)-----	Do.
			Rb-Sr	1480(Mi)-----	Do.
		Pegmatites-----	K-Ar	1600(M)-----	Do.
				1730(M)-----	Do.
			Rb-Sr	1700(M)-----	Do.
				1660(M)-----	Do.
				1570(F)-----	Do.
116°55', 35°57'-----	Warm Spring Canyon, Panamint Range.	"Pahrump diabase" sill.	K-Ar	231(H)-----	Wasserburg and others (1964).
			Rb-Sr	840(P)-----	Do.
				1090(WR)-----	Do.
116°56', 36°14'-----	W of Sec. 6, T. 20 S., R. 47 E.	Augen gneiss-----	Pb ²⁰⁷ /Pb ²⁰⁶	1800(Z)-----	Stern and others (1966).
116°57', 36°14'-----	W of Sec. 30, T. 19 S., R. 47 E.	-----do-----	Pb ²⁰⁷ /Pb ²⁰⁶	1555(Z)-----	Do.
117°05', 36°04'(?)-	Panamint Range-----	Mafic flow in Kingston Peak Formation, Pahrump Series.	Rb-Sr	1330(WR)-----	Wasserburg and others (1964).
117°06', 36°02'(?)-	Pleasant Canyon, Panamint Range.	Augen gneiss-----	Rb-Sr	1600(WR)-----	Lanphere and others (1964).
				1580(WR)-----	Do.
				1410(WR)-----	Do.
				1470(WR)-----	Do.
				1290(WR)-----	Do.
				1380(WR)-----	Do.
		Cobble in conglomerate, Pahrump Series.	Rb-Sr	850(WR)-----	Wasserburg and others (1964).
117°06', 36°05'(?)-	Near Sentinel Peak, Panamint Range.	Dike in Pahrump Series.	Rb-Sr	1610(WR)-----	Do.
COLORADO					
<i>Cenozoic ages</i>					
106°32', 37°48'(?)-	Baughman Creek, San Juan Mountains.	Quartz latite porphyry--	Pb-α	17(Z)-----	Jaffe and others (1959).
				21(Z)-----	Do.
106°35', 37°22'-----	Klondike Mountain, San Juan Mountains.	Quartz latite-----	Pb-α	12(Z)-----	Do.
106°46', 37°15'-----	E of Square Top Mountain, San Juan Mountains.	Quartz latite porphyry--	Pb-α	10(Z)-----	Do.
				11(Z)-----	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
COLORADO—continued					
<i>Cenozoic ages—Continued</i>					
106°47', 37°15' (?)	Square Top Mountain, San Juan Mountains.	Granite	K-Ar	27.0(B) 21.4(B)	Faul and others (1959). Do.
106°49', 37°28' (?)	San Juan Mountains.	Treasure Mountain Rhyolite.	Pb- α	22(Z)	Jaffe and others (1959).
106°57', 37°51'	Near Sunnyside, San Juan Mountains.	Quartz latite	Pb- α	22(Z)	Do.
106°58', 37°21'	Jackson Mountain, San Juan Mountains.	Quartz latite porphyry	Pb- α	14(Z)	Do.
106°04', 38°39'	Near Salida	Quartz latite welded-tuff.	K-Ar	34 \pm 3(B) 34 \pm 3(G) 39 \pm 3(F) 15(Z)	USGS unpub. data. Do. Do. Do.
107°01', 38°03' (?)	Spring Creek, San Juan Mountains.	Rhyolite, Hinsdale Formation.	Pb- α	15(Z)	Jaffe and others (1959).
107°16', 38°27'	Sapinero Mesa	Welded-tuff	K-Ar	27 \pm 3(B)	USGS unpub. data.
107°22', 38°00' (?)	Alpine Gulch, San Juan Mountains.	Granite	Pb- α	23(Z)	Jaffe and others (1959).
107°33', 38°29'	Black Canyon of the Gunnison.	Ashflow in West Elk Breccia.	K-Ar	23 \pm 2(B) 25 \pm 2(B)	USGS unpub. data. Do.
<i>Paleozoic ages</i>					
105°18', 38°17' (?)	Wet Mountains	Albite syenite	Pb- α	580(Z) 601(Z) 590(Z) 644(Z) 605(Z) 655(Z)	Jaffe and others (1959). Do. Do. Do. Do. Do.
105°22', 38°15' (?)	do	Syenite	K-Ar	485 \pm 24(WR)	USGS unpub. data.
107°02', 38°15'	Iron Hill	do	Pb- α	525(Z) 583(Z)	Jaffe and others (1959). Do.
<i>Precambrian ages</i>					
102°59', 37°11'	Sec. 12, T. 33 S., R. 50 W.	Granite (drill cuttings)	Rb-Sr	1280 \pm 100(WR)	Muehlberger and others (in press).
104°11', 37°56'	Sec. 25, T. 24 S., R. 61 W.	Granite gneiss (drill core).	Rb-Sr	1600 \pm 90(WR)	Do.
104°53', 38°21'	Sec. 4, T. 20 S., R. 67 W.	do	Rb-Sr	1300 \pm 60(M)	Do.
104°56', 38°45'	Gold Camp Road	Mount Rosa Granite	K-Ar	1020(B)	Giffin and Kulp (1960).
104°57', 38°45'	Mount Rosa area	do	Pb- α	1110 \pm 125(Z)	USGS unpub. data.
104°57', 38°53'	Ute Pass	Pikes Peak Granite	K-Ar	1030(B)	Giffin and Kulp (1960)
104°57', 38°53' (?)	do	do	K-Ar	980(B)	Aldrich and others (1958). Do.
105°02', 37°58' (?)	Wet Mountains	San Isabel Granite	Rb-Sr	1020(B)	Do.
105°53', 37°38'	Sec. 16, T. 39 N., R. 10 E.	Granitic gneiss (drill core).	Pb- α K-Ar	1430 \pm 200(Z) 1260(B)	Boyer (1962). Muehlberger and others (in press).
105°02', 38°51'	Top of Pikes Peak	Pikes Peak Granite	K-Ar	1060(B)	Aldrich and others (1958). Do.
105°02', 38°51' (?)	Pikes Peak	Windy Point Granite	Rb-Sr	1080(B)	Do.
		Pikes Peak Granite	Pb ²⁰⁷ /Pb ²⁰⁶ K-Ar Pb- α	980(Z) 980(B) 1050 \pm 115(Z) 995 \pm 110(Z) 1055 \pm 115(Z)	Giffin and Kulp (1960). USGS unpub. data. Do. Do.
105°04', 38°53' (?)	Pikes Peak Toll Road	do	K-Ar	1010(B) 1030(B)	Giffin and Kulp (1960). Do.
105°16', 38°09'	Wet Mountains	Granite	Pb- α	1380 \pm 155(Z)	USGS unpub. data.
105°16', 38°26'	Arkansas River Canyon.	Biotite gneiss	K-Ar	1470(B)	Giffin and Kulp (1960).
105°17', 38°13'	Wet Mountains	Alaskitic granite	Pb- α	1360 \pm 150(Z)	USGS unpub. data.
		Alaskitic facies of gneiss	Pb-	1615 \pm 180(Z) 1600 \pm 180(Z)	Do. Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
COLORADO—continued					
<i>Precambrian ages—Continued</i>					
105°20', 38°28'	Royal Gorge	Granite	K-Ar	1540(B)	Giffin and Kulp (1960).
105°20', 38°12'(?)	Wet Mountains	do	Pb- α	755(Z)	Jaffe and others (1959).
		Granite gneiss	Pb-	1220(Z)	Do.
				1130(Z)	Do.
				1080(Z)	Do.
105°22', 38°13'	do	Metasediment	Pb-	1295 \pm 145 (Mz)	USGS unpub. data.
105°22', 38°11'	do	Gneiss	Pb-	1405 \pm 155 (Z)	Do.
105°33', 38°26'(?)	Arkansas River Canyon.	Biotite gneiss	K-Ar	1290(B)	Giffin and Kulp (1960).
105°49', 38°54'	Trout Creek Pass	Granite	K-Ar	1300(B)	Do.
106°20', 38°29'	Monarch Pass	Biotite gneiss	K-Ar	1430(B)	Do.
106°37', 38°35'	Sec. 22, T. 50, N., R. 3 E.	Pegmatites	Rb-Sr	1465(B)	Wetherill and Bickford (1965).
				1434(B)	Do.
				1444(B)	Do.
				1433(F)	Do.
106°38', 38°28'	Near Brown Derby Mine.	Granite	Rb-Sr	1275 \pm 30 (WR + Min) (isochron).	Do.
106°38', 38°28'	Near Doyleville	do	K-Ar	1280(B)	Aldrich and others (1958).
			Rb-Sr	1310(B)	Do.
			Pb ²⁰⁷ /Pb ²⁰⁶	1540 \pm 140 (Z)	Do.
106°38', 38°32'	Brown Derby mine; Sec. 3, T. 49 N., R. 3 E.	Pegmatite	K-Ar	1330 avg. (Le)	Do.
			Rb-Sr	1420 avg. (Le)	Do.
			Pb ²⁰⁷ /Pb ²⁰⁶	1350 (Mic)	Do.
				1390 (C-T)	Do.
				1170 (Mz)	Do.
106°38', 38°50'	NE of Almont	Granite	Rb-Sr	1397 \pm 35 (WR + Min) (isochron).	Wetherill and Bickford (1965).
106°39', 38°32'	Sec. 4, T. 50 N(?), R. 3 E.	do	Rb-Sr	1384 \pm 20 (WR + Min) (isochron).	Do.
106°40', 38°32'	Sec. 32, T. 50 N., R. 3 E.	Pegmatite	Rb-Sr	1250(M)	Do.
				1395 (WR)	Do.
				1366(B)	Do.
				1437(F)	Do.
106°40', 38°35'	Sec. 20, T. 50 N., R. 3 E.	do	Rb-Sr	1031(B)	Do.
				1129(B)	Do.
				1384(M)	Do.
				1390(F)	Do.
106°42', 38°16'	SW of Doyleville	Granite	Rb-Sr	1365 \pm 25 (WR + Min) (isochron).	Do.
107°26', 37°32'	Hinsdale County	Eolus Granite	K-Ar	1390 \pm 40 (B)	USGS unpub. data.
107°24', 38°27'	Curecanti Creek	Curecanti Quartz Monzonite	Rb-Sr	1460 \pm 70 (H)	Do.
				1130 \pm 50 (M)	Do.
107°26', 38°26'	Between Cinnarron and Sapinero.	Biotite gneiss	K-Ar	1130(B)	Giffin and Kulp (1960).
107°41', 38°33'	Black Canyon of the Gunnison.	do	K-Ar	980(B)	Do.
107°43', 38°34'	Vernal Mesa	Quartz monzonite from Vernal Mesa Granite.	Rb-Sr	1130 \pm 50 (B)	USGS unpub. data.
108°57', 37°02'	Sec. 7, T. 32 N., R. 19 W.	Leucogranite (drill core)	Rb-Sr	1810(F)	Fitzsimmons (1963).
108°35', 38°50'(?)	Unaweep Canyon	Granite of Uncompahgre Formation.	K-Ar	1300(B)	Aldrich and others (1955); (1958).
			Rb-Sr	1370(B)	Do.
			Pb ²⁰⁷ /Pb ²⁰⁶	1810 \pm 160 (Z?)	Do.
ILLINOIS					
<i>Paleozoic ages</i>					
88°20', 37°25'(?)	Downeys Bluff, Rosiclare.	Diabase	K-Ar	269 \pm 13 (B)	R. E. Zartman (written commun., 1965).
			Rb-Sr	260 \pm 30 (B)	Do.
88°22', 37°33'(?)	Hicks Dome	Explosion breccia	K-Ar	281 \pm 14 (H)	Do.
				258 \pm 13 (B)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
KANSAS					
<i>Mesozoic age</i>					
95°47', 37°45'	Woodson County	Mica periodotite	K-Ar	91 ± 5(B)	Do.
<i>Precambrian ages</i>					
95°42', 37°47'	Sec. 13, T. 26 S., R. 15 E.	Granite porphyry boulders.	Rb-Sr	1220 ± 80(F)	Muehlberger and others (in press).
96°58', 37°48'	Sec. 11, T. 26 S., R. 4 E.	Granite (drill cuttings)	Rb-Sr	1240 ± 210(F)	Do.
96°22', 38°40'	Sec. 30, T. 17 S., R. 7 E.	Gneissic granite (drill cuttings).	Rb-Sr	1190 ± 70(B)	Do.
96°36', 38°21'	Sec. 1, T. 20 S., R. 7 E.	Granite gneiss (drill cuttings).	Rb-Sr	1420 ± 100(F)	Do.
96°41', 38°32'	Sec. 14, T. 16 S., R. 9 E.	Micaceous quartzite (drill core).	Rb-Sr	1450 ± 120(F)	Do.
		Quartz-sericite schist (drill core).	K-Ar	1400 ± 110(WR)	Do.
			K-Ar	1260(WR)	Do.
			K-Ar	1290	Cole and Merriam (1962).
96°50', 38°03'	Sec. 13, T. 23 S., R. 5 E.	Granite gneiss (drill cuttings).	Rb-Sr	1400 ± 120(F)	Muehlberger and others (in press).
97°11', 37°15'	Sec. 23, T. 32 S., R. 2 E.	Granite (drill cuttings)	Rb-Sr	1340 ± 120(F)	Do.
98°28', 37°39'	Sec. 30, T. 27 S., R. 10 W.	Chloritized granite (drill core).	K-Ar	1100	Cole and others (1964).
			Rb-Sr	1350	Do.
98°28', 38°51'	Sec. 8, T. 14 S., R. 10 W.	Gneissic biotite granite (drill core).	Rb-Sr	1420 ± 140(WR)	Muehlberger and others (in press).
			K-Ar	1200(B)	Do.
98°47', 38°40'	Sec. 18, T. 16 S., R. 13 W.	Biotite quartzite (drill core).	Rb-Sr	1350 ± 190(WR)	Do.
99°00', 38°25'	Sec. 5, T. 19 S., R. 15 W.	Quartz-sericite schist (drill core).	K-Ar	1460	Cole and Merriam (1962).
99°05', 38°28'	Sec. 21, T. 18 S., R. 16 W.	do	K-Ar	1200	Do.
99°08', 38°31'	Sec. 5, T. 18 S., R. 16 W.	Gneissic granite (drill core).	K-Ar	1260	Do.
99°30', 38°31'	Sec. 36, T. 17 S., R. 11 W.	Altered chryastolite(?) schist (drill core).	K-Ar	1165	Do.
99°30', 38°45'	Sec. 12, T. 15 S., R. 20 W.	Altered granite gneiss (drill core).	K-Ar	900(B)	Cole and others (1964).
100°56', 38°45'	Sec. 13, T. 15 S., R. 33 W.	Biotite granite (drill cuttings).	Rb-Sr	1410 ± 150(F)	Muehlberger and others (in press).
101°18', 37°06'	Sec. 13, T. 34 S., R. 37 W.	Granite (drill core)	Rb-Sr	1260 ± 60(WR)	Do.
101°35', 38°50'	Sec. 18, T. 14 S., R. 38 W.	Gneissic biotite granite (drill cuttings).	Rb-Sr	1510 ± 120(F)	Do.
KENTUCKY					
<i>Paleozoic ages</i>					
88°11', 37°21' (?)	Adams Drill Hole	Diabase (drill core)	K-Ar	252 ± 13(B)	R. E. Zartman (written commun., 1965).
			Rb-Sr	295 ± 35(B)	Do.
MARYLAND					
<i>Paleozoic age</i>					
77°15', 38°59' (?)	Bear Island, Potomac River.	Granite	Pb-α	563(Z)	Jaffe and others (1959).

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
MISSOURI					
<i>Paleozoic ages</i>					
90°15', 37°45' (?)	SE of Avon, Cash Farm.	Kimberlite	K-Ar	377 ± 19(B)	R. E. Zartman (written commun., 1965).
	Saline Creek, SE of Avon.	Mica peridotite	Rb-Sr K-Ar Rb-Sr	420 ± 25(B) 388 ± 19(B) 365 ± 30(B)	Do. Do. Do.
<i>Precambrian ages</i>					
90°28', 37°34'	Near Fredericktown	Pegmatite(?)	K-Ar	1405(M)	Tilton and others (1962).
			Rb-Sr	1430(M)	Do.
			Pb ²⁰⁷ /Pb ²⁰⁶	1425(Z)	Do.
90°39', 37°40'	Near Graniteville	Granite	K-Ar	1280(B)	Do.
			Rb-Sr	1320(B)	Do.
90°42', 37°38'	Quarry, Sec. 22, T. 34 N., R. 3 E.	Pegmatite	K-Ar	1250(M)	Muehlberger and others (in press).
			Rb-Sr	1210(M)	Do.
90°43', 37°18'	Sec. 4, T. 30 N., R. 3 E.	Annapolis Rhyolite	Rb-Sr	1330 ± 80(WR)	Do.
90°48', 37°44'	Sec. 14, T. 35 N., R. 2 E.	Granitic rock	Rb-Sr	1120(B)	Do.
			K-Ar	1230(B)	Do.
90°48', 37°40'	Sec. 11, T. 34 N., R. 2 E.	Porphyritic Graniteville Granite (drill core).	Rb-Sr	1190 ± 60(WR)	Do.
90°50', 37°31'	Sec. 21, T. 33 N., R. 2 E.	Munger Granite Porphyry.	Rb-Sr	1220 ± 70(WR)	Do.
90°17', 38°51' (?)	Sec. 7, T. 47 N., R. 7 E.	Granite (drill core)	Rb-Sr	1330 ± 70(F)	Do.
90°45', 38°38'	Sec. 25, T. 45 N., R. 2 E.	Rhyolite porphyry (drill core).	Rb-Sr	1260 ± 60(WR)	Do.
90°54', 38°52'	Sec. 34, T. 48 N., R. 1 E.	Biotite diorite (drill core).	K-Ar	1400(B)	Do.
91°04', 38°07' (?)	Sec. 8, T. 39 N., R. 1 W.	Rhyolite porphyry	Rb-Sr	1290 ± 60(WR)	Do.
	Sec. 8, T. 39 N., R. 1 W.	Aplite	Rb-Sr	1310 ± 70(F)	Do.
92°06', 37°00'	Sec. 24, T. 27 N., R. 15 W.	Biotite diorite (drill core).	K-Ar	1270(B)	Do.
92°42', 37°54'	Near Decaturville	Pegmatite	K-Ar	1350(M)	Do.
	SW of Decaturville	do		1290(M)	Tilton and others (1962).
			Rb-Sr	1445(M)	Do.
92°48', 38°11'	Sec. 34, T. 40 N., R. 17 W.	Granite (drill core)	Rb-Sr	1520 ± 90(WR)	Muehlberger and others (in press).
94°09', 37°45'	Sec. 6, T. 34 N., R. 29 W.	Biotite adamellite (drill core).	Rb-Sr K-Ar	1370 ± 80(WR) 1330(B)	Do. Do.
NEVADA					
<i>Cenozoic ages</i>					
114°47', 35°40'	Sec. 24, Sec. 25, T. 26 S., R. 64 E.	Granite	Pb-α	38(Z)	Jaffe and others (1959).
114°50', 35°40'	Sec. 28, T. 26 S., R. 64 E.	do	K-Ar	26 ± 1(B)	Armstrong (1963).
114°50', 35°44'	Sec. 27, T. 25 S., R. 64 E.	Andesite	K-Ar	15 ± 2(B)	Do.
114°50', 35°59'	Sec. 4, T. 23 S., R. 64 E.	Granodiorite porphyry	K-Ar	16 ± 2(B)	Do.
114°31', 36°38'	Sec. 17, T. 15 S., R. 67 E.	Tuff in Horse Spring Formation.	K-Ar	23(B)	Schilling (1965).
114°32', 36°38'	Sec. 8, T. 15 S., R. 67 E.	do	K-Ar	23 ± 3(B)	Armstrong (1963).
114°50', 36°00'	Sec. 4, T. 23 S., R. 64 E.	Monzonite	Pb-α	53(Z)	Jaffe and others (1959).

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
NEVADA—continued					
<i>Cenozoic ages—Continued</i>					
114°51', 36°01'-----	Sec. 20, T. 22 N., R. 64 E.	Andesite porphyry-----	K-Ar	13±2(B)-----	Armstrong (1963).
114°22', 37°50'-----	Sec. 27, T. 1 S., R. 68 E.	Ignimbrite in Needles Range Formation.	K-Ar	26±½(B)-----	Do.
114°10', 38°58'-----	Snake Range-----	Xenolith in quartz monzonite(?)	Pb-α	40±10(Z)-----	USGS unpub. data.
114°12', 38°58'-----	-----do-----	Aplite-----	K-Ar	31±3(M)-----	Do.
114°15', 38°56'-----	-----do-----	Xenolith in quartz monzonite(?)	Pb-α	20±10(Z)-----	Do.
114°18', 38°45'(?)-	-----do-----	Welded tuff-----	K-Ar	31±3(B)-----	Do.
114°56', 38°46'-----	Sec. 32, T. 11 N., R. 63 E.	Tuff-----	Pb-α	50±15(Z)-----	Do.
115°58', 36°54'-----	Sec. 32, T. 11 N., R. 63 E.	Tuff-----	K-Ar	32.0(B)-----	Evernden and others (1964).
115°58', 36°54'-----	Massachusetts Mountain.	Ammonia Tanks Member, Timber Mountain Tuff.	K-Ar	12.1±0.45(B)-----	R. W. Kistler (written commun., 1966).
115°52', 36°59'-----	Nye Canyon-----	Vitric tuff-----	K-Ar	11±1(F)-----	USGS unpub. data.
115°04', 37°22'-----	Sec. 6, T. 7 S., R. 62 E.	Ignimbrite-----	K-Ar	24±½(B)-----	Armstrong (1963).
115°59', 37°38'-----	NE of Belted Peak---	Tuffs of Antelope Springs.	K-Ar	25.3±0.68(B)-----	R. W. Kistler (written commun., 1966).
115°10', 38°57'-----	Sec. 31, T. 13 N., R. 61 E.	Welded tuffs-----	K-Ar	32.8(B)-----	Evernden and others (1964).
115°21', 38°36'-----	Sec. 4, T. 8 N., R. 59 E.	Ignimbrite in Needles Range Formation.	K-Ar	26±½(B)-----	Armstrong (1963).
115°27', 38°42'-----	Sec. 34, T. 10 N., R. 58 E.	Dacite(?) porphyry-----	K-Ar	30±½(B)-----	Do.
115°28', 38°50'-----	Sec. 5, T. 11 N., R. 58 E.	Adamellite-----	K-Ar	36±½(B)-----	Do.
115°30', 38°52'-----	Sec. 5, T. 11 N., R. 58 E.	-----do-----	K-Ar	27±½(B)-----	Do.
115°30', 38°52'-----	Sec. 36, T. 12 N., R. 57 E.	-----do-----	K-Ar	31±½(B)-----	Do.
115°35', 38°21'-----	Sec. 29, T. 6 N., R. 57 E.	-----do-----	K-Ar	36±½(B)-----	Do.
115°50', 38°09'-----	Sec. 7, T. 3 N., R. 55 E.; Quinn Canyon Range.	Rhyodacitic welded ash flow.	K-Ar	23±½(B)-----	Do.
115°57', 38°25'-----	Sec. 6, T. 6 N., R. 54 E.; Pancake Range.	-----do-----	K-Ar	22.6±0.7(B)-----	USGS unpub. data.
116°14', 36°59'-----	Piapi Canyon-----	Tiva Canyon Member, Paintbrush Tuff.	K-Ar	25.4±0.8(B)-----	Do.
116°16', 36°56'-----	Nye County-----	Fraction Tuff-----	K-Ar	12.4±0.46(B)-----	R. W. Kistler (written commun., 1966).
116°17', 36°54'-----	-----do-----	Topopah Spring Member, Paintbrush Tuff.	K-Ar	15.0±0.55(B)-----	Do.
116°53', 36°54'-----	SE of Topopah Spring.	Tiva Canyon Member, Paintbrush Tuff.	K-Ar	13.2±0.42(B)-----	Do.
116°06', 37°34'-----	Belted Peak-----	Tuff-----	K-Ar	12.4±0.40(B)-----	Do.
116°20', 37°37'-----	Trailer Pass, Kawich Range.	Fraction Tuff-----	K-Ar	26.1±0.71(B)-----	Do.
116°21', 37°04'-----	Nye County-----	Tuff-----	K-Ar	17.8±0.48(B)-----	Do.
116°25', 37°56'-----	SE of Kawich Peak---	-----do-----	K-Ar	9.4±1.98(B)-----	Do.
116°26', 37°03'-----	Nye County-----	Timber Mountain Tuff..	K-Ar	9.6±0.26(F)-----	Do.
116°26', 37°08'-----	NW of Scrugham Peak.	Spearhead Member, Thirsty Canyon Tuff.	K-Ar	21.5±0.48(B)-----	Do.
116°28', 37°12'-----	-----do-----	Ammonia Tanks Member, Timber Mountain Tuff.	K-Ar	11.7±0.43(B)-----	Do.
				7.5±0.20(F)-----	Do.
				11.4±0.50(B)-----	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
NEVADA—continued					
<i>Cenozoic ages—Continued</i>					
116°30', 37°04'	Nye County	Timber Mountain Tuff	K-Ar	11.1 ± 0.30(F)	R. W. Kistler (written commun., 1966).
116°32', 37°03'	Buttonhook Wash	do	K-Ar	10.5 ± 0.28(F)	Do.
116°35', 37°18'	NW of Black Mountain.	Labyrinth Canyon Member, Thirsty Canyon Tuff.	K-Ar	6.2 ± 0.17(F)	Do.
116°36', 37°02'	Piapi Canyon	Ammonia Tanks Member, Timber Mountain Tuff.	K-Ar	10.9 ± 0.35(B) 10.8 ± 0.40(F)	Do. Do.
116°36', 37°12'	do	Rainier Mesa Member, Timber Mountain Tuff.	K-Ar	11.2 ± 0.49(B) 10.4 ± 0.27(F)	Do. Do.
116°57', 38°44'	Sec. 8, T. 10 N., R. 45 E.; Toquinea Range.	Welded ash flow	K-Ar	26.1 ± 0.8(B)	USGS unpub. data.
117°11', 37°40'	Goldfield Hills	Dacite vitrophyre	K-Ar	21.1 ± 0.57(B)	R. W. Kistler (written commun., 1966).
117°30', 37°59'	Near Silver Peak	Granitic intrusive	K-Ar	19.5 ± 0.6(B)	USGS unpub. data.
117°41', 37°45'	do	Pegmatite	K-Ar	50.6 ± 1.5(M)	Do.
		Granitic complex	K-Ar	42.1 ± 1.3(B)	Do.
117°52', 37°58'	Darmes Coal mine near Coaldale Junction.	Tuff in Esmeralda Formation.	K-Ar	12.7(B)	Evernden and James (1964).
117°45', 38°32' (?)	Cedar Mountain area	do	K-Ar	11.5(F)	Evernden and others (1964).
				10.7(B)	Do.
117°48', 38°30'	Cedar Mountain; T. 8 N., R. 37 E.	Quartz monzonite	Pb-α	40 ± 10(Z)	Ross (1961).
118°05', 37°56'	T. 1 N., R. 35 E.	Tuff in Esmeralda Formation.	K-Ar	11.1(B)	Evernden and others (1964).
				11.4(B)	Do.
118°55', 38°31'	Sec. 6, T. 7 N., R. 28 E.	Rhyolite tuff in Aldrich Station Formation.	K-Ar	11.2(B)	Do.
				11.0(B)	Do.
				10.6(G)	Do.
				10.5(B)	Do.
				11.2(B)	Do.
		Tuff in Coal Valley Formation.	K-Ar	10.8(B)	Do.
119°19', 38°38'	Smith Valley	Dacite tuff in Morgan Ranch Formation.	K-Ar	9.3(B)	Do.
<i>Mesozoic ages</i>					
114°34', 36°25'	Sec. 36, T. 17 S., R. 66 E.	Tuff in Willow Tank Formation.	K-Ar	90.4 ± 2.7(B)	Schilling (1965).
114°12', 38°52'	T. 11 N., R. 69 E.; Lexington Creek.	Quartz monzonite	Pb-α	225 ± 25(Z)	Adair and Stringham (1960).
114°13', 38°52'	Snake Range	do	K-Ar	83 ± 4(M)	USGS unpub. data.
114°14', 38°56'	do	do	K-Ar	79 ± 4(M)	Do.
				73 ± 4(B)	Do.
				170 ± 20(Z)	Do.
114°15', 38°55'	T. 12 N., R. 69 E.; Snake Creek.	do	Pb-α	145 ± 20(Z)	Adair and Stringham (1960).
114°15', 38°56'	Snake Range	Xenolith in quartz monzonite(?)	Pb-α	220 ± 30(Z)	USGS unpub. data.
114°17', 38°56'	do	Quartz monzonite	K-Ar	124 ± 6(B)	Do.
			Pb-α	190 ± 20(Z)	Do.
114°21', 38°58'	Sec. 28, T. 13 N., R. 68 E.	Leuco-adamellite	K-Ar	89 ± 4(B)	Armstrong (1963).
	Snake Range	Aplite	K-Ar	100 ± 15(B)	Do.
			Pb-α	130 ± 6(M)	USGS unpub. data.
			Pb-α	190 ± 20(Z)	Do.
114°22', 38°58'	do	Quartz monzonite	K-Ar	94 ± 5(B)	Do.
			Pb-α	220 ± 25(Z)	Do.
116°04', 37°14' (?)	Climax Composite Stock; T. 8 S., R. 53 E.	do	K-Ar	93 ± 5 avg.(B)	Houser and Poole (1961), and USGS unpub. data.
			Pb-α	330 ± 35(Z)	Do.
				230 ± 25(Z)	Do.
116°12', 37°14'	Gold Meadows stock	Porphyritic quartz monzonite.	Pb-α	140 ± 20(Z)	USGS unpub. data.
				130 ± 20(Z)	Do.
116°13', 37°14'	do	Granite	Pb-α	80 ± 15(Z)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
NEVADA—continued					
<i>Mesozoic ages—Continued</i>					
117°41', 37°22' (?)	Southern Sylvania Mountains.	Quartz monzonite	K-Ar	155 ± 8(B)	Schilling (1965).
117°45', 37°43'	Sec. 34, T. 5 S., R. 38 E.	do	K-Ar	153 ± 5(B)	Do.
118°02', 38°20' (?)	Sec. 23(?), T. 6 N., R. 35 E.	do	K-Ar	68.7 ± 1.8(B)	Do.
<i>Precambrian ages</i>					
114°04', 36°39'	Sec. 9, T. 15 S., R. 71 E.	Pegmatite	K-Ar	1370 ± 140(M)	Do.
114°09', 36°17' (?)	North Virgin Mountains.	Gneiss	K-Ar	1390(B)	Wasserburg and Lanphere (1965).
			Rb-Sr	1620(WR)	Do.
		Amphibolite	K-Ar	1597(F)	Do.
		Pegmatite	Rb-Sr	1650(H)	Do.
				1360(F)	Do.
114°10', 36°17'	Snowflake mine; T. 18 S., R. 70 E.	do	K-Ar	1455(F)	Do.
				910(F)	Do.
				1385(M)	Do.
			Rb-Sr	1390(B)	Do.
				1707(F)	Do.
				1610(M)	Do.
				1353(B)	Do.
114°10', 36°15'	Gold Butte area	Pegmatite in rapakivi granite.	Rb-Sr	1061(F)	Do.
114°11', 36°17'	do	Rapakivi granite	Rb-Sr	1031(F)	Do.
				1032(F)	Do.
				822(B)	Do.
114°13', 36°11'	Nevada Mica mine, Gold Butte area.	Pegmatite	K-Ar	1185(M)	Do.
				785(F)	Do.
			Rb-Sr	1335(M)	Do.
				1682(F)	Do.
115°13', 35°29'	Crescent Peak; T. 28 S., R. 61 E.	Granite	Pb-α	927(Z)	Jaffe and others (1959).
115°00', 36°12'	Sec. 24, T. 20 S., R. 62 E.	do	K-Ar	1450 ^{±200} (B)	Armstrong (1963).
				1300 ^{±200} (B)	Do.
117°41', 37°48'	5 miles NW of Silver Peak.	Pegmatite	Rb-Sr	620-700(Le)	Schilling (1965).
NEW MEXICO					
<i>Cenozoic ages</i>					
106°00', 35°52'	Sec. 17, T. 19 N., R. 9 E.	Dacitic(?) vitric ash	Pb-α	18(Z)	Jaffe and others (1959).
106°02', 35°28'	Cerrillos Hills	Monzonite	Pb-α	32(Z)	Do.
				35(Z)	Do.
				46(Z)	Do.
				46(Z)	Do.
106°28', 35°45' (?)	Valles Mountains	Granodiorite	Pb-α	23(Z)	Do.
				16(Z)	Do.
107°44', 35°15'	Lobo Canyon	Obsidian boulder	K-Ar	2.3(F)	Bassett and others (1963a).
				2.8(F)	Do.
				1.8(G)	Do.
				1.1(G)	Do.
107°48', 35°12'	Grants Ridge	Volcanic rocks	K-Ar	3.3 avg.	Do.
<i>Precambrian ages</i>					
103°51', 36°47'	Sec. 4, T. 29 N., R. 29 E.	Granite (drill cuttings)	Rb-Sr	1270 ± 60(B)	Muehlberger and others (in press).
104°40', 35°54'	Sec. 12, T. 19 N., R. 21 E.	Granite (drill core)	Rb-Sr	1350 ± 120(F)	Do.
			K-Ar	1320(M)	Do.
104°43', 35°10'	Sec. 22, T. 11 N., R. 21 E.	Gneissic granite (drill core)	Rb-Sr	1610 ± 140(WR)	Do.
				1350(B)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
NEW MEXICO—continued					
<i>Precambrian ages—Continued</i>					
105°14', 35°35' (?)	Las Vegas	(?)	Pb ²⁰⁷ /Pb ²⁰⁶	1340(Mz)	Nier and others (1941).
105°35', 35°50' (?)	Pidlite mine	Pegmatite(?)	K-Ar	1280(Le)	Aldrich and others (1958).
			Rb-Sr	1490(Le)	Do.
105°55', 35°35'	SE of Santa Fe	Aplitic granite	Pb-α	718(Z)	Jaffe and others (1959).
105°48', 36°11'	Harding mine, near Dixon.	Pegmatite	Rb-Sr	1320(M)	Aldrich and others (1958).
				1290(M)	Do.
			K-Ar	1250(M)	Do.
			Rb-Sr	1350(M)	Do.
			K-Ar	1260(M)	Do.
			Rb-Sr	1260(M)	Do.
			Pb ²⁰⁷ /Pb ²⁰⁶	1180(Mic)	Do.
				940(Mic)	Do.
105°48', 36°11' (?)	Near Dixon	Conglomerate of Vadito Formation of Montgomery (1953).	Pb-α	1550 ± 175(Z)	USGS unpub. data.
106°27', 35°12'	Sandia Excarpment	Granite	Pb ²⁰⁷ /Pb ²⁰⁶	1475(Z)	Tilton and others (1962).
			K-Ar	1300(B)	Do.
			Rb-Sr	1340(B)	Do.
106°01', 36°31' (?)	Petaca	Pegmatite	Pb ²⁰⁷ /Pb ²⁰⁶	875 ± 30(Sa)	Eckelmann and Kulp (1957).
NORTH CAROLINA					
<i>Paleozoic ages</i>					
78°38', 35°52' (?)	Nello Teer quarry	Granite	K-Ar	238(B)	Kulp and Eckelmann (1961).
78°26', 36°20'	Graystone quarry, Henderson.	Migmatite	K-Ar	259(B)	Do.
79°56', 35°58'	Near High Point	Granite	K-Ar	352 ± 13(B)	Long and others (1959).
80°00', 35°15'	Montgomery County	Tuff	Pb-α	440 ± 60(Z)	White and others (1963).
				470 ± 60(Z)	Do.
80°34', 35°25'	Isenhour quarry, Concord.	Syenite	Pb-α	450 ± 50(Z)	Overstreet and others (1961).
		Granite	Pb-α	445 ± 50(Z)	Do.
				360 ± 40(Z)	Do.
				430 ± 50(Z)	Do.
				300 ± 35(Z)	Do.
		Gneissic granodiorite	Pb-α	505 ± 55(Z)	Do.
				495 ± 55(Z)	Do.
				380 ± 100(Z)	Do.
				470 ± 55(Z)	Do.
80°36', 35°22'	Near Concord	Saprolite from syenite.	Pb-α	410 ± 80(Z)	USGS unpub. data.
80°38', 35°22'	S of Concord	Augite syenite	Pb-α	305 ± 200(Z)	Overstreet and others (1961).
				540 ± 200(Z)	Do.
80°00', 36°30' (?)	Knight mine	Pegmatite	Rb-Sr	321 ± 17(M)	Deuser and Herzog (1962).
					Do.
80°15', 36°30' (?)	Spencer mine	do	Rb-Sr	276 ± 15(M)	
80°38', 36°31'	Near Mt. Airy	Granite	K-Ar	356 ± 13(B)	Long and others (1959).
81°05', 35°19'	Near Bessemer City	Bessemer Granite	Pb-α	491(Z)	Jaffe and others (1959).
81°16', 35°25'	Near Lincolnton	Carolina Gneiss	K-Ar	315 ± 11(M)	Long and others (1959).
81°26', 35°15'	6 miles E of Shelby	Cherryville Quartz Monzonite.	Pb-α	260(Mz)	Jaffe and others (1959).
81°31', 35°32'	Toluca	Toluca Quartz Monzonite.	Pb ²⁰⁷ /Pb ²⁰⁶	480 ± 50(Z)	Davis and others (1962).
			Rb-Sr	250(B)	Do.
81°32', 35°32'	Acre rock quarry, Toluca.	do	Pb-α	442(Z)	Jaffe and others (1959).
		Pegmatite	Pb-α	427(Z)	Do.
				435(Z)	Do.
				380(Mz)	Do.
				377(Mz)	Do.
				456(Z)	Do.
81°32', 35°33'	NW of Toluca	Saprolite of gneissic granite.	Pb-α	319(Mz)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
NORTH CAROLINA—continued					
<i>Paleozoic ages—Continued</i>					
81°34', 35°16'	Shelby	Cherryville Quartz Monzonite.	Rb-Sr	375(B)	Davis and others (1962).
81°34', 35°16' (?)	Shelby area	Carolina Gneiss	Pb- α	350(M) 356(Z)	Do. Jaffe and others (1959).
		Schist of the Carolina gneiss.	Pb- α	400(Mz) 420(Z) 389(Mz) 393(Z) 395(Mz) 413(Mz)	Do. Do. Do. Do. Do. Do.
81°35', 35°50' (?)	McGee mine	Pegmatite	Rb-Sr	317 \pm 15(M)	Deuser and Herzog (1962).
81°44', 35°26'	Hollis	Toluca Quartz Monzonite.	Pb- α	377(Mz)	Jaffe and others (1959).
81°46', 35°58'	Mortimer	Gneiss	Rb-Sr	350(B)	Davis and others (1962).
81°50', 35°25' (?)	Rutherford County	Henderson Granite	Pb- α	357(Z)	Jaffe and others (1959).
81°25', 36°15' (?)	Haw mine	Pegmatite	Rb-Sr	334 \pm 17(M)	Deuser and Herzog (1962).
81°30', 36°26' (?)	Knob Hill mine	Gneiss	K-Ar	335(B)	Kinkel and others (1965).
			Rb-Sr	345(B) 310(B) 320(B)	Do. Do. Do.
81°30', 36°26' (?)	do	Ore zone gangue	K-Ar	435(B) 465(B)	Do. Do.
			Rb-Sr	320(B) 320(B)	Do. Do.
81°48', 36°13'	Near Valle Crucis	Cranberry Gneiss	K-Ar	378(WR)	Carr and Kulp (1957, listed for Virginia).
81°55', 36°05' (?)	C. Ridge mine	Pegmatite	Rb-Sr	348 \pm 17(M)	Deuser and Herzog (1962).
82°04', 35°57' (?)	Spruce Pine district	Saprolite of Cranberry Gneiss.	Pb- α	503(Z) 471(Z)	Jaffe and others (1959). Do.
		Pegmatite	K-Ar	332(Mi) 329(Mi) 346(Mi)	Carr and Kulp (1957). Do. Do.
	Spruce Pine area	Carolina Gneiss	K-Ar	341 \pm 13(M+B)	Long and others (1959).
		Pegmatite	K-Ar	334 \pm 15(M) 334 \pm 15(M) 348 \pm 15(M) 341 \pm 15(M)	Do. Do. Do. Do.
82°06', 35°58'	6 miles NNW of Spruce Pine.	do	K-Ar	335(M)	Aldrich and others (1958).
			Rb-Sr	375(M) 385(F)	Do. Do.
			Pb ²⁰⁷ /Pb ²⁰⁶	400 \pm 50(U)	Davis and others (1962).
	Spruce Pine area	do	K-Ar	420 \pm 50(U) 330(M)	Do. Goldich and others (1961).
82°10', 35°55' (?)	Abernathy mine	do	Rb-Sr	340 \pm 20(M)	Deuser and Herzog (1962).
				311 \pm 16(B) 280 \pm 30(Z)	Do. Overstreet and others (1961).
82°17', 35°14'	Jones mine	Syenite pegmatite	Pb- α	300 \pm 45(Z) 328 \pm 18(M)	Do. Deuser and Herzog (1962).
82°25', 35°50' (?)	Mudhole mine	Pegmatite	Rb-Sr		
82°33', 35°46'	Near Stocksville	Carolina Gneiss	K-Ar	357 \pm 13(B)	Long and others (1959).
82°58', 35°30'	Near Waynesville	do	Rb-Sr	330 \pm 13(B)	Do.
			K-Ar	344(M)	Kulp and Eckelmann (1961).
82°02', 36°02' (?)	Wiseman mine, Spruce Pine area.	Pegmatite	Pb ²⁰⁷ /Pb ²⁰⁶	380 \pm 80(Sa)	Eckelmann and Kulp (1957).
	McKinney mine, Spruce Pine area.	do	Pb ²⁰⁷ /Pb ²⁰⁶	300 \pm 40(Sa)	Do.
	Flat Rock mine, Spruce Pine area.	do	Pb ²⁰⁷ /Pb ²⁰⁶	342 \pm 20(Sa) 372 \pm 15(U) 355 \pm 20(Gm)	Do. Do. Do.
82°02', 36°02' (?)	Mars Hill, Spruce Pine area.	do	Pb ²⁰⁷ /Pb ²⁰⁶	235 \pm 70(Mz)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
NORTH CAROLINA—continued					
<i>Paleozoic ages—Continued</i>					
82°05', 36°03' (?)	Mitchell County	Pegmatite(?)	Pb ²⁰⁷ /Pb ²⁰⁶	405 ± 60(Sa)	Eckelmann and Kulp (1957).
82°11', 36°01'	Near Red Hill	Metadiabase dikes	K-Ar	433 ± 15(B)	Long and others (1959).
82°15', 36°01'	Deyton Bend	Banded gneiss	K-Ar	457 ± 21(B) 320(B)	Do. Davis and others (1962).
83°03', 35°33' (?)	Haywood County	Granitoid band in augen gneiss.	Rb-Sr Pb-α	355(B) 531(Z) 529(Z)	Do. Jaffe and others (1959). Do.
83°08', 35°06'	Near Cashier	Whiteside Granite	Ph-α	353(Mz)	Do.
83°14', 35°03'	Highlands	do	Pb-α	368(Mz)	Do.
83°17', 35°28'	4 miles W of Soco Gap.	Carolina Gneiss	K-Ar	359(B)	Kulp and Eckelmann (1961).
83°20', 35°03'	5 miles W of Highlands.	Whiteside Granite	Pb-α	413(Mz) 437(Mz)	Jaffe and others (1959). Do.
83°23', 35°12'	Near Franklin	Carolina Gneiss	K-Ar	307(B)	Kulp and Eckelmann (1961).
83°23', 35°16'	Gay	Pegmatite Carolina Gneiss	K-Ar K-Ar	348 ± 13(M) 438 ± 14(B)	Long and others (1959). Do.
83°25', 35°10' (?)	Iotla mine	Pegmatite	Rb-Sr Rb-Sr	333 ± 15(B) 512 ± 28(M)	Do. Deuser and Herzog (1962).
83°25', 35°34'	SE of Newfound Gap	Ocoee Series (Late Precambrian).	K-Ar	293 ± 15(B) 382(B)	Do. Kulp and Eckelmann (1961).
83°27', 35°26'	Bryson City	Pegmatite	K-Ar	535(Mi) 555(Mi)	Carr and Kulp (1957). Do.
83°30', 35°10' (?)	Grindstaff mine	do	Rb-Sr	340 ± 13(M) 508 ± 27(M)	Long and others (1959). Deuser and Herzog (1962).
83°30', 35°12'	6.3 miles E of Franklin.	Carolina Gneiss	Pb-α	256 ± 14(B) 587(Z)	Do. Jaffe and others (1959).
83°49', 35°13'	Near Andrews	Valleytown Formation	K-Ar	373(B)	Kulp and Eckelmann (1961).
<i>Precambrian ages</i>					
81°46', 35°58'	Mortimer	Gneiss	Pb ²⁰⁷ /Pb ²⁰⁶	1020(Z)	Davis and others (1962).
81°30', 36°26' (?)	Knob Ore mine	Ore zone gangue	K-Ar	1120(H)	Kinkel and others (1965).
81°41', 36°01'	Blowing Rock	Augen gneiss	Pb ²⁰⁷ /Pb ²⁰⁶	1055(Z)	Davis and others (1962).
		Blowing Rock Gneiss	Pb ²⁰⁷ /Pb ²⁰⁶	1060(Z)	Tilton and others (1960).
81°56', 36°02'	Near Crossnore	Granite gneiss	Pb-α Pb ²⁰⁷ /Pb ²⁰⁶	1020 ± 115(Z) 800 ± 50(Z)	USGS unpub. data. Davis and others (1962).
81°56', 36°14'	Dark Ridge	Gneiss	K-Ar K-Ar Rb-Sr	840(H) 660(B) 810(B)	Do. Do. Do.
82°42', 35°48'	Near White Rock	Cranberry Gneiss	K-Ar	695 ± 23(B)	Long and others (1959).
82°57', 35°49'	Max Patch Mountain	Max Patch Granite	Pb-α	912(Z)	Jaffe and others (1959) (listed under Tenn.).
82°15', 36°01'	Deyton Bend	Banded gneiss	Pb ²⁰⁷ /Pb ²⁰⁶	1270(Z)	Davis and others (1962).
83°20', 35°03'	5 miles W of Highlands.	Cranberry Gneiss Whiteside Granite	Pb-α Pb-α	1040(Z) 708(Z)	Stern and Rose (1961). Jaffe and others (1959).
83°30', 35°12'	6.3 miles E of Franklin.	Carolina Gneiss	Pb-α	622(Z)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
OKLAHOMA					
<i>Paleozoic ages</i>					
99°25', 35°01'	Sec. 9, T. 6 N., R. 21 W.	Headquarters granite	Rb-Sr	520±30(F)	Tilton and others (1962).
99°59', 35°11'	Sec. 7, T. 8 N., R. 26 W.	Diorite (drill cuttings)	K-Ar	500(B)	Muehlberger and others (in press).
<i>Precambrian ages</i>					
94°34', 35°24'	Sec. 20, T. 11 N., R. 26 E.	Rhyolite porphyry (drill core).	Rb-Sr	1230±180(WR)	Do.
94°53', 35°09'	Sec. 28, T. 8 N., R. 23 E.	Hornblende granite (drill core).	Rb-Sr	1200±90(F)	Do.
95°03', 36°23'	Sec. 15, T. 22 N., R. 21 E.	Spavinaw Granite	Rb-Sr	1280±100(F)	Do.
95°33', 36°15'	Sec. 36, T. 21 N., R. 16 E.	Micrographic granite porphyry (drill cuttings).	Rb-Sr	1230±140(F)	Do.
96°09', 36°34'	Sec. 8, T. 24 N., R. 11 E.	Rhyolite porphyry (drill cuttings).	Rb-Sr	1190±70(WR)	Do.
96°14', 35°58'	Sec. 10, T. 17 N., R. 10 E.	Micrographic granite porphyry (drill cuttings).	Rb-Sr	1160±50(WR)	Do.
96°18', 36°22'	Sec. 24, T. 22 N., R. 9 E.	Microgranite prophyry (drill cuttings).	Rb-Sr	1240±140(F)	Do.
96°27', 36°17'	Sec. 20, T. 21 N., R. 8 E.	Rhyolite porphyry (drill core).	Rb-Sr	1180±70(WR)	Do.
96°28', 36°37'	Sec. 29, T. 25 N., R. 8 E.	Microgranite porphyry (drill core).	Rb-Sr	1150±80(WR)	Do.
96°59', 36°26'	Sec. 33, T. 23 N., R. 3 E.	Rhyolite porphyry (drill core).	Rb-Sr	1270±100(WR)	Do.
97°27', 35°25'	Sec. 19, T. 11 N., R. 2 W.	Granite gneiss (drill cuttings).	Rb-Sr	1150±200(F)	Do.
97°13', 36°54'	Sec. 17, T. 28 N., R. 1 E.	Adamellite (drill core)	Rb-Sr	1220±90(F) 1210±120(WR)	Do. Do.
102°51', 36°56'	Sec. 33, T. 6 N., R. 2 E.	Micrographic granite (drill core).	Rb-Sr	1290±60(WR)	Do.
SOUTH CAROLINA					
<i>Paleozoic ages</i>					
81°17', 35°05'	Near Henry Knob, York County.	Yorkville Quartz Monzonite.	Pb-α	262(Z)	Jaffe and others (1959) (listed under North Carolina).
81°40', 35°03'	Near Gaffney	Gaffney Marble	K-Ar	309±11(Po)	Long and others (1959).
82°15', 35°04'	Near Tigerville	Pegmatite syenite(?)	Pb-α	255±30(Z) 270±30(Z) 260±30(Z)	Overstreet and others (1961). Do. Do.
TENNESSEE					
<i>Paleozoic ages</i>					
82°04', 36°12'	Roan Mountain	Beech Granite	K-Ar Rb-Sr	380(B) 420(B) 570(F)	Davis and others (1962). Do. Do.
82°06', 36°17'	Near Hopson	Cranberry Gneiss Beech Granite	K-Ar K-Ar Rb-Sr	357±13(B) 418±16(B) 439±17(B) 572±29(F)	Long and others (1959). Do. Do. Do.
83°57', 35°38'	Murray Gap	Glauconitic sandstone, Murray Shale, Chilhowee Group (Lower Cambrian).	K-Ar Rb-Sr	439(Gl) 552±30(Gl)	Hurley and others (1960). Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
TENNESSEE—continued					
<i>Paleozoic ages—Continued</i>					
84°16', 35°35'	Vonore	Bays Formation	U ²³⁸ /Pb ²⁰⁶	453 ± 10(WR)	Adams and others (1960).
84°22', 35°03'	Eureka mine, Ducktown.	Hornblendite	K-Ar	478(H)	Kinkel and others (1965).
	Boyd mine, Ducktown.	Ore zone gangue	K-Ar	387(H)	Do.
	Ducktown	Ocoee Series	K-Ar	327(M)	Kulp and Eckelmann (1961).
		Ore zone gangue	K-Ar	374(B)	Do.
				366(B)	Do.
84°29', 35°06'	4.5 miles W of Ducktown.	Ocoee Series (Late Precambrian).	K-Ar	434 ± 15(B)	Long and others (1959).
85°43', 35°57'	Slego Bridge, E of Smithville.	Bentonite in Chattanooga Shale.	Rb-Sr K-Ar	329 ± 13(B) 340 ± 7(B)	Do. Faul (1960).
85°44', 35°55'	Youngs Bend area, Smithville.	Chattanooga Shale	U ²³⁸ /Pb ²⁰⁶	350 avg.(WR)	Cobb and Kulp (1960).
85°56', 36°01'	Dowelltown	Carters Limestone, Stones River Group.	U ²³⁸ /Pb ²⁰⁶	446 ± 10(WR)	Adams and others (1960).
86°02', 36°05'	Alexandria	do.	U ²³⁸ /Pb ²⁰⁶	452 ± 10(WR)	Do.
86°46', 36°10'(?)	Nashville	do.	U ²³⁸ /Pb ²⁰⁶	438 ± 10(WR)	Do.
<i>Precambrian ages</i>					
82°03', 36°16'	Laurel Gap	Rare earth vein	Pb ²⁰⁷ /Pb ²⁰⁶	820(Z)	Davis and others (1962).
82°04', 36°12'	Roan Mountain	Beech Granite	Pb ²⁰⁷ /Pb ²⁰⁶	700(Z)	Do.
82°11', 36°14'	Near Hampton	Cranberry Gneiss	K-Ar	640 ± 22(B)	Long and others (1959).
			Rb-Sr	719 ± 25(B)	Do.
82°11', 36°17'	Pardee Point	Banded gneiss	Pb ²⁰⁷ /Pb ²⁰⁶	1230(Z)	Davis and others (1962).
			Rb-Sr	880(B)	Do.
		Granite gneiss	Pb ²⁰⁷ /Pb ²⁰⁶	940(Z)	Do.
			K-Ar	770(B)	Do.
			Rb-Sr	890(B)	Do.
		Cranberry Gneiss	K-Ar	770(B)	Tilton and others (1960).
			Rb-Sr	890(B)	Do.
			K-Ar	800 ± 27(B)	Long and others (1959).
			Rb-Sr	892 ± 30(B)	Do.
82°11', 36°16'	SE of Hampton	do.	K-Ar	674 ± 22(B)	Do.
82°11', 36°15'	do.	do.	K-Ar	648 ± 22(B)	Do.
82°11', 36°11'	SSE of Hampton	do.	K-Ar	527 ± 18(B)	Do.
84°22', 35°03'	Calloway mine, Ducktown.	Ore zone gangue	K-Ar	1045(H)	Kinkel and others (1965).
				992(H)	Do.
	Ducktown	do.	K-Ar	1200(B)	Do.
87°08', 35°20'	Near Campbellsville	Granite (drill core)	Rb-Sr	1120 ± 30(F)	Wasserburg and others (1962).
TEXAS					
<i>Precambrian ages</i>					
101°05', 35°26'(?)	Carson County	Granite (drill core)	Rb-Sr	1140 ± 120(F)	Muehlberger and others (in press).
101°27', 35°35'(?)	do.	Amphibolite gneiss (drill core).	K-Ar	1230(H)	Do.
101°50', 35°26'	Potter County	Granite (drill core)	Rb-Sr	1260 ± 40(F)	Wasserburg and others (1962).
				1190 ± 70(WR)	Do.
102°15', 35°57'(?)	Hartley County	Rhyolite porphyry (drill core).	Rb-Sr	1180 ± 130(F)	Muehlberger and others (in press).
102°35', 35°25'(?)	Oldham County	Micrographic granite porphyry (drill core).	Rb-Sr	1130 ± 100(WR)	Do.

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
UTAH					
<i>Cenozoic ages</i>					
109°15', 38°32'	Sec. 14, T. 26 S., R. 24 E.; La Sal Mountains.	Soda syenite porphyry ..	K-Ar	25.5 ± 2.5(P)	Stern and others (1965).
109°16', 38°32'	Sec. 15, T. 26 S., R. 24 E.; La Sal Mountains.	Monzonite porphyry	Pb ²⁰⁶ /U ²³⁸	32.2(Z)	Do.
			K-Ar	22.5 ± 3.3(P)	Do.
			Pb ²⁰⁶ /U ²³⁵	32.2(Z)	Do.
109°17', 38°34'	Sec. 5, T. 26 S., R. 24 E.; La Sal Mountains.	Diorite porphyry (relict hornblende?).	K-Ar	54.8 ± 1.5(H)	Do.
109°17', 38°33' (?) ..	Mineral Mountain; La Sal Mountains.	Syenite porphyry	Pb-α	25(Z)	Jaffe and others (1959).
				25(Z)	Do.
109°16', 38°33' (?) ..	North Mountain; La Sal Mountains.	Monzonite porphyry	Pb-α	55(Z)	Do.
				51(Z)	Do.
112°12', 38°27'	Newly Weds mine, Marysville area.	Pyroxene andesite of Bullion Canyon Volcanics.	K-Ar	29.5(F)	Bassett and others (1963b).
112°14', 38°30'	Mineral Hills mine, Marysville area.	Quartz monzonite	K-Ar	26.0(B)	Do.
	VCA mine, Marysville area.	.....do.....	K-Ar	24.3(B)	Do.
	Prospector mine, Marysville area.	.....do.....	K-Ar	23.6(B)	Do.
112°15', 38°28'	N of Marysville	Mount Belknap Volcanics.	K-Ar	17.8(G)	Do.
	Beaver Creek, Marysville area.	.....do.....	K-Ar	20.0(G)	Do.
				19.5(G)	Do.
112°15', 38°29'	N of Marysville .....	.....do.....	K-Ar	15.6(G)	Do.
112°15', 38°31'	Antelope Canyon, Marysville area.	.....do.....	K-Ar	13.7(G)	Do.
112°16', 38°23'	Deer Trail mine, Tushar Range.	Hydrothermal alteration.	K-Ar	13.5(M)	Do.
			Pb/U	13(U)	Do.
112°16', 38°30'	Deer Creek Canyon, Marysville area.	Mount Belknap Volcanics.	K-Ar	19.0(G)	Do.
113°12', 37°45'	Iron Springs district ..	Granodiorite porphyry ..	K-Ar	24 ± 7(B)	Armstrong (1963).
113°12', 37°46' (?) ..	.....do.....	Volcanic rock	Pb-α	19(Z)	Jaffe and others (1959).
		Three Peaks Intrusive	Pb-α	22(Z)	Do.
		Tuff	Pb-α	28(Z)	Do.
113°05', 38°27'	Rocky Range	Quartz monzonite	K-Ar	20.8 ± 0.6(B)	USGS unpub. data.
				27.0 ± 0.8(H)	Do.
113°07', 38°29'	OK Stock	Granodiorite	K-Ar	28.4 ± 0.9(H)	Do.
113°07', 38°24'	San Francisco district.	Porphyritic quartz monzonite.	K-Ar	20.9 ± 0.6(B)	Do.
113°14', 38°27'	Near San Francisco district.	Biotite tuff	K-Ar	22.4 ± 0.7(B)	USGS unpub. data.
113°16', 38°17' .....	.....do.....	Tuff in the Needles Range Formation.	K-Ar	29.0 ± 0.9(B)	Do.
				29.2 ± 0.9(H)	Do.
113°16', 38°27' .....	.....do.....	Red ignimbrite	K-Ar	21.9 ± 0.7(F)	Do.
113°19', 38°29'	Cactus Stock	Granodiorite	K-Ar	28.0 ± 0.8(B)	Do.
113°50', 38°37'	Condor Canyon, Needles Range.	Ignimbrite	K-Ar	26 ± 1(B)	Armstrong (1963).
				24 ± 1(B)	Do.
<i>Mesozoic ages</i>					
110°02', 38°46'	Sec. 3, T. 24 S., R. 17 E.	Bentonite in the Carmel Formation.	K-Ar	154(B)	Marvin and others (1965).
110°07', 38°44'	Sec. 11, T. 24 S., R. 16 E.	.....do.....	Rb-Sr	163 ± 10(B)	Do.
			K-Ar	140(B)	Do.
112°40', 37°13'	Sec. 30, T. 41 S., R. 7 W.	.....do.....	Rb-Sr	147 ± 15(B)	Do.
			K-Ar	162(B)	Do.
				151(B)	Do.
			Rb-Sr	163 ± 10(B)	Do.
				163 ± 15(B)	Do.
				148 ± 15(B)	Do.
113°48', 37°12'	Sec. 32, T. 40 S., R. 17 W.	.....do.....	K-Ar	165(B)	Do.
112°43', 38°23' (?) ..	Mineral Range	Granite	Pb-α	241(Z)	Armstrong (1963).

RADIOMETRIC AGE DETERMINATIONS—Continued

Long. W., lat. N.	Locality	Rock type	Age method	Age (m.y.) and material analyzed	Reference
UTAH—continued					
<i>Precambrian ages</i>					
113°52', 37°05'	Beaver Dam Mountains.	Amphibole	K-Ar	1660(H)	Wasserburg and Lanphere (1965).
		Pegmatite	Rb-Sr	1500(F)	Do.
		Granodiorite	Rb-Sr	1379(B)	Do.
VIRGINIA					
<i>Mesozoic ages</i>					
79°03', 38°07' (?)	Wenger Farm, Augusta County.	Teschenite, alkalic dike complex.	K-Ar	152 ± 5(B) 151 ± 10(H)	Johnson and Milton (in press). Do.
<i>Paleozoic ages</i>					
77°55', 37°21'	Morefield mine, Amelia County.	Pegmatite	Rb-Sr	261 ± 13(M)	Deuser and Herzog (1962).
77°58', 37°22'	Champion mine, Amelia County.	do	Rb-Sr	270 ± 13(M)	Do.
77°59', 37°21'	Rutherford #2 mine, Amelia County.	do	Rb-Sr	289 ± 14(M)	Do.
77°50', 38°05'	Sulphur mine	Ore zone gangue	K-Ar	365(B+M) 330(H) 305(B)	Kinkel and others (1965). Do. Do.
77°54', 38°02'	Arminius mine	do	K-Ar	301 ± 15(B)	Smith and others (1964).
78°11', 37°45'	Columbia	Granodiorite gneiss	K-Ar	400 ± 125(B) 400 ± 50(Z)	Do. Do.
78°18', 37°41'	Near Ore Bank	Biotitic slate in Arvonian Formation.	Rb-Sr Pb-α K-Ar	324 ± 12(B)	Do.
78°22', 37°45'	North of Big Island, James River.	Schist	K-Ar	287 ± 18(B+M)	Do.
78°30', 37°30' (?)	London-Virginia mine	Ore zone gangue	K-Ar	300(B)	Kinkel and others (1965).
78°16', 38°39'	1.7 miles W of Sperryville.	Granodiorite gneiss	Pb-α	508(Z) 510(Z)	Jaffe and others (1959). Do.
	1.6 miles W of Sperryville.	do	Pb-α	470(Z) 449(Z) 468(Mz)	Do. Do. Do.
78°20', 38°43'	Skyline Drive, Shenandoah National Park.	Hypersthene granodiorite gneiss.	Pb-α	567(Z) 586(Z)	Do. Do.
78°23', 38°34'	White Oak Canyon, Shenandoah National Park.	Old Rag Granite	Pb-α	417(Z) 428(Z)	Do. Do.
78°24', 38°58'	Near Strasburg	Bentonite in Martinsburg Shale (Ordovician).	Pb-α	410 ± 50(Z) 400 ± 45(Z)	USGS unpub. data. Do.
79°24', 37°22'	Near Good	Lynchburg Gneiss	K-Ar	370 ± 13(B)	Long and others (1959).
79°38', 38°27'	2½ miles NE of Hightown.	Granite felsophyre dike	Pb-α	316(Z)	Jaffe and others (1959).
80°55', 36°36' (?)	Gossan-Lead or Monarat mine.	Ore zone gangue	K-Ar	430(M)	Kinkel and others (1965).
81°11', 36°37'	Near Independence	Cranberry Gneiss	Rb-Sr K-Ar	310(M) 402(WR)	Do. Carr and Kulp (1957).
<i>Precambrian ages</i>					
78°19', 38°39'	Marys Rock Tunnel, Shenandoah National Park.	Granodiorite gneiss	K-Ar Rb-Sr Pb ²⁰⁷ /Pb ²⁰⁶	800(B) 880(B) 1150(Z)	Tilton and others (1960). Do. Tilton and others (1958).
78°16', 38°46'	Hogback Ridge, Shenandoah National Park.	do	Rb-Sr Rb-Sr	980 ± 90(F) 980 ± 90(F)	Doe and others (1965). Do.

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