

## ***Age dates from other publications-list 2***

S.L. Nichols

Isochron/West, Bulletin of Isotopic Geochronology, v. 21, pp. 22-35

Downloaded from: <https://geoinfo.nmt.edu/publications/periodicals/isochronwest/home.cfml?Issue=21>

---

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



**ISOCHRON/WEST**  
*A Bulletin of Isotopic Geochronology*

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

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

## AGE DATES FROM OTHER PUBLICATIONS—LIST 2

by Susan L. Nichols, Nevada Bureau of Mines and Geology, University of Nevada, Reno, NV 89557

This is the second list summarizing age date information that has appeared in recent months in other publications.

The dates are grouped alphabetically by country; for Canada, Mexico, and the United States, by state or province. Under each geographical subdivision the ages are listed from oldest to youngest. The numbers in the citation column correspond with the numbered references at the end of the article. The letters in the laboratory column correspond with the key at the end of the list. Because of the abbreviated nature of the data, the user should refer to the original article for additional details.

This second list completes coverage of the following journals issued during 1977: American Association of

Petroleum Geologists Bulletin (vol. 61); American Journal of Science (vol. 277); Canadian Journal of Earth Sciences (vol. 14); Earth and Planetary Science Letters (vol. 33–37); Economic Geology (vol. 72); Geochimica et Cosmochimica Acta (vol. 41); Geological Society of America Abstracts with Programs (vol. 9); Geological Society of America Bulletin (vol. 88); Geology (vol. 5); Journal of Geology (vol. 85); and Journal of Research of the U. S. Geological Survey (vol. 5).

I would appreciate receiving any suggestions on additional journals which should be included. Also appreciated would be any corrections and/or suggested improvements.

AGE (MY)	MINERAL	FORMATION/ROCK	LOCATION	METHOD	SAMPLE NUMBER	LAB	CITATION
<b>BOLIVIA</b>							
20.1	biotite	Mondragon volcanics	19° 13'S, 65° 49'W	K-Ar	111J	S	18
19.8	muscovite	Huarmincuña intrusion	18° 40'S, 65° 40'W	K-Ar	111E	S	18
14.6	augite	Abaroa lava	17° 32'S, 69° 20'W	K-Ar	1T	S	18
6.0	biotite	Chijini tuff		K-Ar	1V	S	18
<b>BRAZIL</b>							
3600	whole rock	older rocks	northeastern Brazil	Rb-Sr		D	32
2800	whole rock	earlier event	northeastern Brazil	Rb-Sr		D	32
2000±200	whole rock	Trans-Amazonian orogeny	northeastern Brazil	Rb-Sr		D	32
1100±150	whole rock	Brazilian event	northeastern Brazil	Rb-Sr		D	32
700	whole rock	metamorphism of Brazilian orogeny	northeastern Brazil	Rb-Sr		D	32
540±30	biotite amphibole	regional cooling	northeastern Brazil	K-Ar		D	32
<b>CANADA</b>							
<b>British Columbia</b>							
163±7	whole rock	granodiorite	Wells Gray Provincial Park	Rb-Sr	(2 samples)		43
138±12	whole rock	granodiorite	Wells Gray Provincial Park	Rb-Sr	(5 samples)		43
119±11	biotite-whole rock	quartz diorite	Wells Gray Provincial Park	Rb-Sr	GD1		43
77±20	biotite-whole rock-hornblende	hornblendite	Wells Gray Provincial Park	Rb-Sr	HBL1		43
<b>Labrador</b>							
2386±60	whole rock	Okhakh Granite	Okhakh Island	Rb-Sr	(6 samples)	C	2
2383±48	biotite-whole rock	Saddle Island Granite	Saddle Island	Rb-Sr	B-73-158	C	2
2319±46	biotite-whole rock	Nänokhtut Granite	Nänokhtut Island	Rb-Sr	B-73-129	C	2
1576±76	whole rock	Loon Granite	Loon Island	Rb-Sr	(6 samples)	C	2
1482±45	hornblende	gabbro Harp Lake Complex	central Labrador	K-Ar		E	26
1449±44	hornblende	amphibolite Harp Lake Complex	central Labrador	K-Ar		E	26
1376±38	whole rock	Operngeviksoakh Granite	Operngeviksoakh Island	Rb-Sr	(6 samples)	C	2

## CANADA

## Labrador (continued)

1351±42	hornblende	granite Harp Lake Complex	central Labrador	K-Ar		E	26
1345±75	whole rock	Red Wine alkaline province	central Labrador	Rb-Sr	(11 samples)		5
1280±26	biotite-amazonite- whole rock	Manvers Granite	N of Port Manvers	Rb-Sr	(3 samples)	C	2
1260	whole rock	anorthosite Harp Lake Complex	central Labrador	K-Ar		E	26
1193±32	biotite	adamellite Harp Lake Complex	central Labrador	K-Ar		E	26
1024±74	(5 separates)	syenite Red Wine Complex	central Labrador	Rb-Sr	P8-311		5
969±64	(5 separates)	syenite Red Wine Complex	central Labrador	Rb-Sr	P8-312		5

## New Brunswick

489±14	whole rock	granite	north-central New Brunswick	Rb-Sr	(7 samples)	O	21
--------	------------	---------	--------------------------------	-------	-------------	---	----

## Newfoundland

500±30	whole rock	granite-diorite	eastern Newfoundland	Rb-Sr		B	4
490±10	hornblende	amphibolite, Hare Bay metamorphic aureole	Western Long Pond	Ar-Ar	1	H	14
488±10	hornblende	amphibolite, Hare Bay metamorphic aureole	Three Mountain Summits	Ar-Ar	2A	H	14
486±10	hornblende	amphibolite, Hare Bay metamorphic aureole	Three Mountain Summits	Ar-Ar	2B	H	14
475±10	separates	Grand Cove volcanic group	Burlington Peninsula	U-Pb		N	38
445-435	separates	later intrusive rocks (Dunamagon granite, Burlington granodiorite, and Seal Island Bight syenite)	Burlington Peninsula	U-Pb		N	38
420±20	whole rock	granite-granodiorite	eastern Newfoundland	Rb-Sr		B	4
420±10	hornblende	mafic dike western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	2A	H	15
413±5 376±5	muscovite biotite	schist western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	3	H	15
411±5	muscovite	schist western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	2B	H	15
408±10 380±5	hornblende biotite	mafic dike western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	4A	H	15
400±5	whole rock	granite	eastern Newfoundland	Rb-Sr		B	4
392±5 381±5	muscovite biotite	mafic dike western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	4B	H	15
390±5 368±5	muscovite biotite	schist western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	5B	H	15
386±5	biotite	Grenville basement rocks	northern Burlington Peninsula	Ar-Ar		H	15
386±5 366±5	hornblende biotite	schist western division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	5A	H	15
380±30	whole rock	granite-granodiorite	eastern Newfoundland	Rb-Sr		B	4
370±15	whole rock	granite	eastern Newfoundland	Rb-Sr		B	4
364±10 345±5	hornblende biotite	mafic volcanic unit Pacquet Harbour Group eastern division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	7	H	15

## CANADA

## Newfoundland (continued)

355±10	whole rock	granite	eastern Newfoundland	Rb-Sr		B	4
345±5	whole rock	granite-quartz monzonite	eastern Newfoundland	Rb-Sr		B	4
342±5	biotite	schist Mings Bight Group eastern division Fleur de Lys Supergroup	northern Burlington Peninsula	Ar-Ar	6	H	15
340±10	whole rock	granite	eastern Newfoundland	Rb-Sr		B	4
315±5	whole rock	granite	eastern Newfoundland	Rb-Sr		B	4

## North West Territories

3002±51	whole rock	Grenville Lake Granitic Gneiss	W of Grenville Lake	Rb-Sr	(5 samples)	G	20
2712±218	whole rock	"Amoeba" Lake Mantled Gneiss	N of "Amoeba" Lake	Rb-Sr	(7 samples)	G	20
2561±186	whole rock	Origin Lake Granite Complex	E of Origin Lake	Rb-Sr	(9 samples)	G	20
2526±101	whole rock	Meyer Lake Migmatitic Complexes	E of Norris Lake	Rb-Sr	(8 samples)	G	20
2322±239	whole rock	Indin Lake Rhyolite	S of Indin Lake	Rb-Sr	(7 samples)	G	20
2258±245	whole rock	"Yellowknife" Greywacke	NW of Mattberry Lake	Rb-Sr	(7 samples)	G	20
2252±187	whole rock	Dune Lake Diapir	N of Dune Lake	Rb-Sr	(7 samples)	G	20
1935±193	whole rock	Muscovite Pegmatite	N of Grenville Lake	Rb-Sr	(5 samples)	G	20
1928±179	whole rock	Strachan Lake granodiorite	SW of Strachan Lake	Rb-Sr	(7 samples)	G	20
1808±96	whole rock	"Amoeba" Lake Migmatite	N of "Amoeba" Lake	Rb-Sr	(10 samples)	G	20

## Ontario

2710±50	zircon	granitic clasts in Sudbury breccia	near Cartier	U-Pb		M	25
2698±162	whole rock	Superior Province granite	north of Sudbury	Rb-Sr		M	25
2578±86	mineral separates	basement granite	vicinity of Gogone	Rb-Sr		M	25
1883±136	whole rock	Sudbury norite	Sudbury area	Rb-Sr		M	25
1866	mineral separates	Sudbury norite	Sudbury area	Rb-Sr		M	25
1838±401	whole rock	Sudbury diabase dikes	Southern Structural Province, Canadian Shield	K-Ar	(31 samples)		42
1748±64	mineral separates	Sudbury norite	Sudbury area	Rb-Sr		M	25
1741±194	mineral separates	Sudbury breccia	vicinity of Cartier	Rb-Sr		M	25
1701±146	mineral separates	basement granite	vicinity of Cartier	Rb-Sr		M	25

## Quebec

3009±353	whole rock	quartzofeldspathic gneiss	La Verendrye Park area Grenville Province	Rb-Sr	I		16
2857±92	whole rock	quartzofeldspathic gneiss	La Verendrye Park area Grenville Province	Rb-Sr	A		16
2584±109	whole rock	quartzofeldspathic gneiss	La Verendrye Park area Grenville Province	Rb-Sr	B		16
2548±94	whole rock	syenite stock	La Verendrye Park area Grenville Province	Rb-Sr	D		16
2430±297	whole rock	quartzofeldspathic gneiss	La Verendrye Park area Grenville Province	Rb-Sr	C		16
2058±1241	whole rock	quartzofeldspathic gneiss	La Verendrye Park area Grenville Province	Rb-Sr	G		16
1937±544	whole rock	granitic gneiss	La Verendrye Park area Grenville Province	Rb-Sr	H		16
1649±261	whole rock	aphebian metasedimentary rocks	La Verendrye Park area Grenville Province	Rb-Sr	J		16
1367±464	whole rock	charnockite	La Verendrye Park area Grenville Province	Rb-Sr	K		16

**CANADA****Quebec (continued)**

1170±140	whole rock	charnockite	La Verendrye Park area Grenville Province	Rb-Sr	M		16
1155±838	whole rock	granite	La Verendrye Park area Grenville Province	Rb-Sr	L		16

**Saskatchewan**

0.68±0.15	zircon	Wascana Creek Ash	Wascana Creek Valley	fission track	UA388	R	50
0.67±0.09	glass	Wascana Creek Ash	Wascana Creek Valley	fission track	UA388	R	50
0.60±0.12	glass	Wascana Creek Ash	Wascana Creek Valley	fission track	UA388	R	50
0.59±0.07	glass	Wascana Creek Ash	Wascana Creek Valley	fission track	UA256	R	50
0.58±0.07	glass	Wascana Creek Ash	Wascana Creek Valley	fission track	UA256	R	50
0.56±0.08	glass	Wascana Creek Ash	Wascana Creek Valley	fission track	UA388	R	50

**DOMINICAN REPUBLIC**

123.1±1.8	hornblende	amphibolite	Cordillera Central	K-Ar	1	H	27
122.6±1.8	plagioclase	Duarte Formation	near Haitian border				
55.0±3.4	hornblende	hornblendite	Cordillera Central	K-Ar	2	H	27
		Duarte Formation	N of Jarabacoa				

**GREENLAND**

3824±11	zircons	Isua formation	NE of Godthaab area West Greenland	U-Pb	(11 analyses)		39
3650	zircon	Amitsoq gneisses	Godthaab area West Greenland	U-Pb	(6 analyses)		39
55.4±3.7	zircon	granophyre of Sydtoffen Skaergaard intrusion	East Greenland	fission track	AG76-24	A	7
54.4±2.2	zircon	"sandwich horizon rock" Skaergaard intrusion	East Greenland	fission track	AG76-23	A	7
54.3±3.0	zircon						
50.8±2.7	zircon	Kangerdlugssuaq intrusion	East Greenland	fission track	AG75-23	A	7
38.1±3.1	apatite	upper zone b Skaergaard intrusion	East Greenland	fission track	AG75-20	A	7

**MEXICO****Baja California**

4.8±1	whole rock	basalt	W of Punta Santo Tomas	K-Ar	14701	J	17
3.6±1							
3.4±0.3	separates whole rock	lherzolite	San Quintin west coast of volcanic field, Baja California	Rb-Sr	(4 samples)		3
2.9±1	whole rock	basalt	W of Bahia San Quintin	K-Ar	15073	J	17
2.8±1							
1.0	whole rock	basalt	Soledad Ridge	K-Ar	14938	J	17
1.0							

**Durango, Sinaloa**

51.6±1.3	plagioclase	andesite	Sierra Madre Occidental	K-Ar	RK18	Q	36
36.5±1.7	feldspar	Cacaria rhyolitic intrusive	Sierra Madre Occidental	K-Ar	RK7	Q	36
32.1±1.9	feldspar	Registro tuffs	Sierra Madre Occidental	K-Ar	JL-JE-A	Q	36
31.4±0.7	feldspar	Registro tuffs	Sierra Madre Occidental	K-Ar	RK22	Q	36
31.4±0.7	feldspar	tuff Aguila Formation	Sierra Madre Occidental	K-Ar	K-LP-T	Q	36
31.2±1.5	plagioclase	tuff Tapias Formation	Sierra Madre Occidental	K-Ar	RK10	Q	36

## MEXICO

## Durango, Sinaloa (continued)

31.2±0.7	feldspar	tuff Tunal Formation	Sierra Madre Occidental	K-Ar	RK17	Q	36
31.0±0.7	feldspar	tuff Aguila Formation	Sierra Madre Occidental	K-Ar	RK20	Q	36
30.7±0.7	plagioclase	Cacaria rhyolitic Formation	Sierra Madre Occidental	K-Ar	JL-RD-A	Q	36
30.7±0.5	biotite	rhyolitic flow El Pino flow	Sierra Madre Occidental	K-Ar	RK23	Q	36
30.6±0.9	feldspar	tuff Santuario Formation	Sierra Madre Occidental	K-Ar	2-71-1	Q	36
30.0±0.7	feldspar	tuff Aguila Formation	Sierra Madre Occidental	K-Ar	RK5	Q	36
29.9±0.7	feldspar	tuff Santuario Formation	Sierra Madre Occidental	K-Ar	RK6	Q	36
29.8±0.6	whole rock	Caleras basalts	Sierra Madre Occidental	K-Ar	JL-BM-LB	Q	36
29.5±0.6	whole rock	Caleras basalts	Sierra Madre Occidental	K-Ar	JL-BR-SI	Q	36
29.2±0.7	feldspar	tuff Saltito Formation	Sierra Madre Occidental	K-Ar	RK14	Q	36
29.1±0.6	feldspar	tuff Garavito Formation	Sierra Madre Occidental	K-Ar	2-71-2	Q	36
28.9±0.6	feldspar	tuff Mimbres Formation	Sierra Madre Occidental	K-Ar	3-71-1	Q	36
28.8±1.1	feldspar	tuff Soldado Formation	Sierra Madre Occidental	K-Ar	RK15	Q	36
28.7±0.6	feldspar	tuff Saltito Formation	Sierra Madre Occidental	K-Ar	RK2	Q	36
28.6±0.6	feldspar	tuff	Sierra Madre Occidental	K-Ar	RK11	Q	36
28.6±0.5	whole rock	Caleras basalts	Sierra Madre Occidental	K-Ar	JL1	Q	36
28.5±1.5	feldspar	tuff	Sierra Madre Occidental	K-Ar	RK1	Q	36
28.3±0.6	feldspar	tuff Garavito Formation	Sierra Madre Occidental	K-Ar	RK3	Q	36
28.3±0.6	plagioclase	tuff Santa Maria Formation	Sierra Madre Occidental	K-Ar	RK4	Q	36
27.9±0.4	biotite	Las Adjuntas rhyolite	Sierra Madre Occidental	K-Ar	1-70-1	Q	36
27.7±0.4	biotite	Las Adjuntas rhyolite	Sierra Madre Occidental	K-Ar	4-22-71-1	Q	36
27.4±0.6	plagioclase						
23.9±0.5	feldspar	tuff Plateau units	Sierra Madre Occidental	K-Ar	3-71-3	Q	36
23.4±0.5	plagioclase	tuff Plateau units	Sierra Madre Occidental	K-Ar	3-71-4	Q	36
23.3±0.5	feldspar	tuff	Sierra Madre Occidental	K-Ar	3-71-6	Q	36
23.3±0.4	biotite	tuff	Sierra Madre Occidental	K-Ar	3-71-9	Q	36
23.2±0.5	feldspar	Canyon tuffs	Sierra Madre Occidental	K-Ar	3-71-2	Q	36
23.1±0.5	feldspar	tuff	Sierra Madre Occidental	K-Ar	3-71-8	Q	36
23.0±0.5	plagioclase	tuff Plateau units	Sierra Madre Occidental	K-Ar	3-71-7	Q	36
22.9±0.5	plagioclase	tuff	Sierra Madre Occidental	K-Ar	1-70-2	Q	36
21.5±0.5	plagioclase	tuff	Sierra Madre Occidental	K-Ar	3-71-9	Q	36
12.6±1.3	plagioclase	basalt Metates Formation	Sierra Madre Occidental	K-Ar	RK13	Q	36
12.4±0.4	amphibole	basalt Metates Formation	Sierra Madre Occidental	K-Ar	RK24	Q	36
11.7±0.3	amphibole	basalt Metates Formation	Sierra Madre Occidental	K-Ar	RK12	Q	36

## PANAMA

64.87±1.34	hornblende	quartz diorite	Azuero area	K-Ar	H-140-P	H	28
52.58±0.63	feldspar						
61.58±0.70	hornblende	quartz diorite	Cerro Azul area	K-Ar	P-75-1	H	28
51.11±0.58	feldspar						

**PANAMA**  
 (continued)

48.45±0.55	hornblende	quartz diorite	Rio Pito area	K-Ar	P-21-14M	H	28
49.23±0.57	feldspar						
36.41±2.06	hornblende	granodiorite	Petaquilla area	K-Ar	M-1001	H	28
28.98±0.35	feldspar						
5.9±0.10	biotite	quartz monzonite	Cerro Colorado	K-Ar	3	I	10
4.21±0.08	biotite	rhyodacite	Cerro Colorado	K-Ar	5	I	10
3.34±0.05	biotite	granodiorite	Cerro Colorado	K-Ar	GR-3	H	28
2.98±0.14	hornblende	trachyandesite tuff	Cerro Colorado	K-Ar	6	I	10

**PERU**

28.2±4.9	biotite	granodiorite porphyry	7° 03'S, 78° 20'W Michiquillay mine	K-Ar	Michi 43		46
18.7±1.4	whole rock	granodiorite porphyry	7° 03'S, 78° 20'W Michiquillay mine	K-Ar	Michi 23		46

**UNITED STATES**
**Alaska**

284±7	hornblende	Mt. Hubbard pluton	60° 20.1'N, 139° 12.6'W	K-Ar	19	K	23
279±8	hornblende	Mt. Hubbard pluton quartz diorite	60° 17.2'N, 139° 11.9'W	K-Ar	15	S	23
225±6	hornblende	Art Lewis Glacier pluton	50° 51.9'N, 138° 45'W	K-Ar	18	K	23
192.7±5.8	whole rock?	diorite	Kodiak Islands	K-Ar	11	K	9
192.2±5.8	muscovite	schist	Port Graham	K-Ar	6	K	9
192.1±5.8	muscovite	schist	Kodiak Islands	K-Ar	12	K	9
190.4±5.7	muscovite	schist	Seldovia	K-Ar	2	K	9
188.4±5.7	hornblende	diorite	Kodiak Islands	K-Ar	10	K	9
188±6	hornblende	Mt. St. Elias pluton	60° 17'N, 140° 53'W	K-Ar	7	S	23
87.2±3	biotite	quartz diorite					
187.6±5.6	white mica	schist	Kodiak Islands	K-Ar	8	K	9
170.6±5.1	crossite						
184.9±5.5	hornblende	dioritic migmatite	Kodiak Islands	K-Ar	9	K	9
184.4±5.5	amphibole	schist	Seldovia	K-Ar	3	K	9
192.2±5.8	muscovite						
165±5	biotite	Alsek River pluton granite	59° 25.5'N, 138° 00'W	K-Ar	13	S	23
162.9±4.9	crossite	blueschist	Seldovia	K-Ar	1	K	9
161.4±19.4	crossite	blueschist	Kodiak Islands	K-Ar	7	K	9
160±3.5	hornblende	Marble Point pluton tonalite	59° 56'N, 144° 24'W	K-Ar	1	S	23
148±4	hornblende	tonalite	59° 36.2'N, 138° 04.8'W	K-Ar	14	S	23
136±4	hornblende	Art Lewis Glacier pluton diorite	59° 49.3'N, 138° 44.7'W	K-Ar	16	S	23
67.2±2.0	amphibole	amphibolite	59° 51.1'N, 138° 59.8'W	K-Ar	2	K	24
65.4±2.0	amphibole	amphibolite	59° 23.8'N, 138° 24.6'W	K-Ar	5	K	24
63.8±1.9	amphibole	amphibolite	59° 49.6'N, 139° 1.8'W	K-Ar	1	K	24
61.0±2	hornblende	Novatak Glacier pluton tonalite	59° 37'N, 138° 31'W	K-Ar	11	S	23
58.5±1.7	amphibole	amphibolite	60° 18.1'N, 139° 31.9'W	K-Ar	10	K	24
51.1±3	hornblende	Mt. Stamy pluton diorite	59° 52.75'N, 139° 08.1'W	K-Ar	4	S	23
51.0±1.5	amphibole	schist	60° 20.9'N, 139° 50.0'W	K-Ar	11	K	24
47.3±1.4	biotite						
48.4±2	muscovite	Mt. Draper pluton granite	59° 45.5'N, 139° 06.2'W	K-Ar	5	S	23
42.7±2	biotite						
48.2±6	biotite	Grand Plateau Glacier pluton granite	59° 00.15'N, 138° 01.45'W	K-Ar	3	S	23
47.0±1.4	amphibole	amphibolite	59° 35.5'N, 138° 46.3'W	K-Ar	9	K	24



**UNITED STATES**  
**Alaska (continued)**

46.8±1	muscovite	Mt. Vancouver pluton	60° 18.1'N, 139° 36.1'W	K-Ar	8	S	23
44.6±1	biotite	granodiorite					
30.6±1	biotite	Mt. Foresta pluton	60° 13.3'N, 139° 31'W	K-Ar	9	S	23
		granodiorite					
30.1±.9	biotite	schist	59° 35.5'N, 138° 46.3'W	K-Ar	8	K	24
25.3±1	biotite	Novatak Glacier pluton	59° 31.8'N, 138° 23.5'W	K-Ar	12	S	23
		quartz pegmatite dike					
24.1±3	biotite	Brabazon pluton	59° 19.95'N, 138° 21'W	K-Ar	6	S	23
		granodiorite					
23.5±0.7	muscovite	pegmatite	59° 52.1'N, 138° 58.8'W	K-Ar	17	K	24
23.4±.7	amphibole	amphibolite	60° 17.3'N, 140° 40.5'W	K-Ar	13	K	24
23.3±.7	biotite	schist	59° 22.2'N, 138° 6.6'W	K-Ar	7	K	24
21.9±1.0	amphibole	amphibolite	59° 48.2'N, 138° 53.3'W	K-Ar	14	S	24
20.9±3	muscovite	Valerie Glacier pluton	60° 07.6'N, 139° 28.5'W	K-Ar	10	S	23
18.5±1	hornblende	tonalite					
20.0±2	hornblende	porphyritic andesite	59° 49.65'N, 139° 17'W	K-Ar	2	S	23
19.4±.6	biotite	gneissic schist	59° 48.7'N, 138° 48.8'W	K-Ar	3	K	23
18.5±.6	amphibole	greenstone	59° 8.4'N, 138° 0.2'W	K-Ar	6	K	24
17.4±.5	biotite	schist	60° 17.3'N, 140° 40.5'W	K-Ar	12	K	24
4.1±.12	biotite	schist	59° 11.8'N, 138° 12.7'W	K-Ar	4	K	24
3.8±.15							
<b>Arizona</b>							
1710	whole rock	Granite at Payson	S31, T10½N, R11E	U-Pb			34
1440	whole rock	Ruin Granite	S33, T3N, R14E	U-Pb			34
1420	whole rock	Lawler Peak Granite	S27, T15N, R9W	U-Pb			34
36.1±1.0	hornblende	mafic inclusion	32° 27.5'N, 110° 53'W	K-Ar	ML-60	S	13
27.9±3.7	sphene			fission track			
23.5±0.7	biotite			K-Ar			
20.7±2.5	apatite			fission track			
29.1±3.0	sphene	quartz monzonite of	31° 31.5'N, 110° 50'W	fission track	BR-21	S	13
28.1±3.3	zircon	Samaniego Ridge		fission track			
23.4±1.2	hornblende			K-Ar			
23.1±0.7	biotite			K-Ar			
22.8±2.8	apatite			fission track			
27.5±3.1	sphene	quartz monzonite of	32° 27.5'N, 110° 52'W	fission track	ML-61	S	13
26.3±3.4	zircon	Samaniego Ridge		fission track			
24.0±0.7	biotite			K-Ar			
22.3±0.7	hornblende			K-Ar			
20.2±2.1	apatite			fission track			
27.2±3.1	sphene	quartz monzonite of	32° 31.5'N, 110° 48'W	fission track	BR-16	S	13
25.1±2.5	zircon	Samaniego Ridge		fission track			
23.2±0.7	biotite			K-Ar			
19.8±2.1	apatite			fission track			
24.1±0.7	muscovite	quartz monzonite of	32° 22'N, 110° 43'W	K-Ar	GGN-S1	S	13
22.7±0.7	biotite	Samaniego Ridge		K-Ar			
18.7±2.7	apatite			fission track			
22.1±0.7	biotite	quartz monzonite of	32° 28'N, 111° 02'W	K-Ar	RC-25	S	13
18.0±2.4	apatite	Tortolita Mountains		fission track			

**UNITED STATES**  
**Arizona (continued)**

21.1±0.6	hornblende	quartz monzonite of	32°29.5'N, 111°04'W	K-Ar	RC3-1	S	13
20.6±0.6	biotite	Samaniego Ridge		K-Ar			
16.5±2.1	apatite	quartz monzonite of	32°27.5'N, 110°58'W	fission track	ML-105	S	13
		Tortolita Mountains					
<b>California</b>							
1410	whole rock	Granite of Marble Mountains	S11, T5N, R14E eastern Mojave Desert	U-Pb			34
222±4.4	white mica	blueschist	SE of Fort Jones	K-Ar	1	S	22
222±2.5	white mica	blueschist	N of Yreka	K-Ar	3	S	22
214±2.9	white mica	blueschist	E of Fort Jones	K-Ar	2	S	22
71.7±0.8	quartz and feldspar	quartz monzonite	New York Mountains	K-Ar	(4 analyses)	H	8
23.4±0.7	biotite	granite	Chocolate Mountains	K-Ar	5	S	40
21.7±1.3	hornblende						
23.2±0.8	biotite	granite	Chocolate Mountains	K-Ar	4	S	40
20.8±1.7	hornblende						
21.0±0.6	biotite	granite	Chocolate Mountains	K-Ar	6	S	40
20.3±0.6	biotite						
20.0±0.6	hornblende						
18.6±0.6	biotite	granodiorite	eastern San Gabriel Mts.	K-Ar	1	S	40
14.5±0.4	biotite	granodiorite	eastern San Gabriel Mts.	K-Ar	2	S	40
14.0±0.6	biotite	granodiorite	eastern San Gabriel Mts.	K-Ar	9	S	40
14.0±0.4	biotite	granodiorite	eastern San Gabriel Mts.	K-Ar	3	S	40
3.6-3.0	phlogopite	phonolite	SE of Yosemite Valley	K-Ar			48
<b>Colorado</b>							
1460±70	hornblende	Eolus Granite	37°32.0'N, 107°26.0'W	K-Ar	Bsj-93	R	41
1390±60	biotite						
1390±40	biotite	syenite	38°19.3'N, 107°05.5'W	K-Ar	P7406	R	41
1390±40	biotite	biotite syenite	38°21.5'N, 107°07.7'W	K-Ar	2G3200	R	41
1380±40	biotite	syenite	38°23.8'N, 107°08.4'W	K-Ar	C9803	R	41
1330±36	biotite	syenite dike	38°20.7'N, 107°08.3'W	K-Ar	G3730N	R	41
762±15	plagioclase	diabase dike	38°16.1'N, 107°03.4'W	K-Ar	IH-21	R	41
731±23	aegirine	ljolite	38°15.2'N, 107°00.7'W	K-Ar	P-9-901	R	41
574±9	vermiculite	carbonatite dike	38°15.0'N, 107°01.0'W	K-Ar	IH-2-2d	R	41
574±9	biotite	pegmatitic dike	38°15.6'N, 107°01.4'W	K-Ar	IH-3-3	R	41
573±14	biotite	carbonatite	38°14.5'N, 107°04.0'W	K-Ar	IH-18	R	41
568±9	biotite	pegmatitic dike	38°15.3'N, 107°01.4'W	K-Ar	IH-1-2	R	41
568±9	phlogopite	mafic dike	38°13.8'N, 107°02.0'W	K-Ar	IH-11	R	41
567±10	biotite	pyroxenite	38°14.6'N, 107°01.7'W	K-Ar	J365N	R	41
561±10	muscovite	carbonatite	38°14.6'N, 107°04.0'W	K-Ar	J256	R	41
553±9	vermiculite	carbonatite dike	38°14.5'N, 107°03.3'W	K-Ar	IH-23-2a	R	41
551±30	riebeckite	fenite	38°16.0'N, 105°32.5'W	K-Ar	WM-63-723	R	41
550±54	sphene	ljolite	38°15.3'N, 107°00.9'W	fission track	P8649	R	41
55±12	apatite						
543±8	biotite	nepheline syenite	38°15.5'N, 107°01.0'W	K-Ar	IH-4	R	41
536±17	pyroxene	mafic nepheline	38°20.0'N, 105°29.0'W	K-Ar	WM-66-116c	R	41
510±13	biotite						
479±12	nepheline						
534±16	hornblende	quartz syenite	38°15.5'N, 105°22.0'W	K-Ar	63-B-20	R	41
519±13	biotite						
532±15	hornblende	mafic nepheline	38°18.0'N, 105°29.0'W	K-Ar	WM-62-115	R	41
507±17	biotite						
523±14	hornblende	syenite	38°20.0'N, 105°26.0'W	K-Ar	WM-62-140	R	41
510±13	biotite						

**UNITED STATES**  
**Colorado (continued)**

516±11	hornblende	syenite	38° 22.0'N, 105° 29.0'W	K-Ar	WM-62-143	R	41
506±13	biotite						
509±11	hornblende	syenite	38° 18.0'N, 105° 29.0'W	K-Ar	WH-62-114	R	41
506±43	sphene	syenite	38° 22.0'N, 105° 29.0'W	fission track	WM-62-143	R	41
293±62	apatite						
439±22	vermiculite	fenite	38° 16.0'N, 105° 32.7'W	K-Ar	WM-67-72B	R	41
323±46	vermiculite	fenite	38° 16.0'N, 105° 32.7'W	K-Ar	WM-63-707	R	41
217±7	vermiculite	altered mafic rock	38° 15.6'N, 105° 33.2'W	K-Ar	WM-67-1029a	R	41
25.7±5	apatite	minette dike Two Buttes intrusive center	southeastern Colorado	fission track			44

**Hawaii**

1.46±0.25	whole rock	tholeiitic basalt	southern Lanai	K-Ar	OXO68	R	6
1.42±0.13	whole rock	tholeiitic basalt	southern Lanai	K-Ar	OXO75	R	6
1.36±0.07	whole rock	tholeiitic basalt	southern Lanai	isochron	(6 samples)	R	6
1.35±0.05	whole rock	tholeiitic basalt	southern Lanai	K-Ar	OXO71	R	6
1.28±0.08	whole rock	tholeiitic basalt	southern Lanai	K-Ar	OXO78	R	6
1.25±0.04	whole rock	tholeiitic basalt	southern Lanai	isochron	(6 samples)	R	6
1.21±0.06	whole rock	tholeiitic basalt	southern Lanai	K-Ar	OXO79	R	6
1.20±0.17	whole rock	tholeiitic basalt	southern Lanai	K-Ar	OXO73	R	6

**Illinois**

65.7±1.4	glauconite	Owl Creek Formation	southern Illinois	K-Ar			45
60.6±1.3	glauconite	Clayton Formation	southern Illinois	K-Ar			45

**Maine**

221±8	amphibole	syenite	43° 36.0'N, 70° 50.2'W Newfield quad	K-Ar	Me/N1-67	P	19
125±3	biotite	diorite	43° 25.1'N, 70° 50.4'W York quad	K-Ar	Me-74-4	P	19
122±2	biotite	gabbro	43° 16.9'N, 70° 42.8'W Mt. Berwick quad	K-Ar	Me-556	P	19
120±2	biotite	gabbro	43° 29.4'N, 70° 43.7'W Kennebunk quad	K-Ar	Me 54	P	19
116±2	biotite	gabbro	43° 10.0'N, 70° 35.6'W York Beach quad	K-Ar	CNG-1	P	19
112±3	biotite	syenite	44° 01.5'N, 70° 49.5'W Fryeburg quad	K-Ar	Me/F1-67	P	19
108±2	biotite	syenite	43° 55.2'N, 70° 53.8'W Kezar Falls quad	K-Ar	Me/Kf2-67	P	19

**Massachusetts**

608±17	whole rock	Dedham granodiorite	Boston Basin eastern Massachusetts	Rb-Sr	(8 samples)		29
449±16	whole rock	magma and metasomatism	Boston Basin eastern Massachusetts	Rb-Sr	(6 samples)		29

**Michigan**

2706±144	whole rock	Puritan Quartz Monzonite	western part of Upper Peninsula of Michigan	Rb-Sr	(4 samples)	R	47
----------	------------	--------------------------	------------------------------------------------	-------	-------------	---	----

**Minnesota**

3280	zircon	Morton gneiss	Minnesota River Valley	U-Pb	(5 analyses)		39
2650	zircon	Grants Range Granite	S10-11, T62N, R12W	U-Pb			34
1450	whole rock	North Shore Volcanics Keweenawan Group		Rb-Sr	mafic samples		31

**UNITED STATES**  
**Minnesota (continued)**

1120-3990		North Shore Volcanics Keweenawan Group		U-Pb			31
1120	whole rock	North Shore Volcanics Keweenawan Group		Rb-Sr	ail samples		31
<b>New Hampshire</b>							
411±19	whole rock	Kinsman Quartz Monzonite	43°30'N, 72°30'W	Rb-Sr		L	35
405±78	whole rock	Bethlehem Gneiss	43°30'N, 72°30'W	Rb-Sr		L	35
402±5	whole rock	Spaulding Quartz Diorite	43°30'N, 72°30'W	Rb-Sr		L	35
359±11 or 330±3	whole rock	Concord Granite	43°30'N, 72°30'W	Rb-Sr		L	35
197±3 194±4	biotite	syenite	43°44.1'N, 71°26.3'W Winnepesaukee quad	Rb-Sr K-Ar	NH-74-9	P	19
194±4	biotite	Conway granite	44°09.4'N, 71°40.5'W Franconia quad	K-Ar	QNH61-3	P	19
188±5	amphibole	granite	44°25.8'N, 71°26.1'W Mt. Washington quad	K-Ar	NH-75-45	P	19
184±4	biotite	Conway granite	43°53.6'N, 70°58.8'W Kezar Falls quad	K-Ar	NH-74-28	P	19
180±4	biotite	Conway granite	44°02.2'N, 71°30.0'W Mt. Osceola quad	K-Ar	NH-75-40	P	19
175±5	biotite	Conway granite	43°54.8'N, 71°22.5'W Mt. Chocoura quad	K-Ar	NH-74-21	P	19
171±4	biotite	Conway granite	44°14.1'N, 71°03.8'W North Conway quad	K-Ar	NH-75-41	P	19
171±4	biotite	Conway granite	44°52.8'N, 71°32.4'W Averill quad	K-Ar	NH-74-30	P	19
165±4	biotite	Conway granite	44°38.1'N, 71°24.1'W Percy quad	K-Ar	NH-74-31	P	19
164±5 158±3	biotite	Belknap syenite	43°33.1'N, 71°22.1'W Winnepesaukee quad	Rb-Sr K-Ar	QNH61-21	P	19
156±3	biotite	granite porphyry	43°28.7'N, 71°16.1'W Gilmanton quad	K-Ar	NH-75-1	P	19
119±2	biotite	Conway granite	43°26.3'N, 72°25.8'W Claremont quad	K-Ar	QNH61-25	P	19
111±3	biotite	gabbro	43°00.1'N, 71°10.8'W Mt. Pawtuckaway quad	K-Ar	NH-74-2	P	19
110±3	biotite	Conway granite	43°45.8'N, 71°01.8'W Ossipee Lake quad	K-Ar	NH-75-2	P	19
<b>New Mexico</b>							
36.7±1.6	whole rock	phonolite	Diablo Plateau	Rb-Sr	(7 samples)	Q	1
36.0±1.1	biotite	phonolite	Alamo Mountain	K-Ar	AL-11	Q	1
35.0±1.1	biotite	syenite	Diablo Plateau	K-Ar	AS-5	Q	1
33.9±1.0	biotite	syenite	Cornudas Mountain	K-Ar	CO-4	Q	1
31.6±0.9	biotite	syenite	Deer Mountain	K-Ar	DE-5	Q	1
<b>Oregon</b>							
223±3.2	white mica	blueschist	Meyers Canyon N of Mitchell	K-Ar	4	S	22
<b>Puerto Rico</b>							
126±3	hornblende	amphibolite	San German 18°00'05"N, 67°05'19"W	K-Ar	43-2	R	12
112±1.5	hornblende- garnet	amphibolite	Maricao 18°10'00"N, 66°57'15"W	K-Ar	MM-217-C-1	R	12
109±9	hornblende	quartz diorite	Yabucoa 18°03'05"N, 65°59'20"W	K-Ar	52-1	R	12

**UNITED STATES**  
**Puerto Rico (continued)**

100±16	actinolite	diorite	Patillas 18°02'50"N, 66°05'57"W	K-Ar	51-4	R	12
88.1±1.8	hornblende	quartz monzonite	Ciales 18°18'08"N, 66°24'39"W	K-Ar	20-1	R	12
86.1±2.1	hornblende	diorite porphyry	San German 18°00'11"N, 67°05'18"W	K-Ar	43-1	R	12
78.4±1.6	hornblende	diorite	Punta Guayanés 18°02'28"N, 65°51'14"W	K-Ar	53-1B	R	12
77.8±1.6	hornblende	diorite	Punta Guayanés 18°02'33"N, 65°51'19"W	K-Ar	53-1A	R	12
75.1±1.8	quartz-sericite	altered Santa Olaya Lava	Naranjito 18°17'23"N, 66°08'27"W	K-Ar	22-1	R	12
74.3±1.5 65.7±1.6	hornblende biotite	granodiorite	Numaco 18°07'33"N, 65°51'48"W	K-Ar	39-1	R	12
73.5±1.5 72.7±2.0	hornblende biotite	quartz monzonite	Juncos 18°09'08"N, 65°58'50"W	K-Ar	38-4	R	12
73.2±1.5	hornblende	quartz diorite	Jayuya 18°10'00"N, 66°36'22"W	K-Ar	33-16	R	12
70.7±1.7 69.0±3.3	biotite hornblende	quartz diorite porphyry	Jayuya (no lat., long.)	K-Ar	33-24	R	12
70.6±3.2 61.8±1.5	hornblende chlorite-biotite	quartz monzonite	Juncos 18°12'23"N, 65°52'41"W	K-Ar	38-5	R	12
68.4±2.1	hornblende	quartz monzonite	Utuaado 18°16'47"N, 66°39'25"W	K-Ar	18-5	R	12
67.2±1.4	hornblende	quartz diorite	Jayuya 18°12'13"N, 66°37'25"W	K-Ar	33-17	R	12
66.5±1.3	hornblende	quartz diorite	Jayuya 18°11'39"N, 66°31'25"W	K-Ar	33-25	R	12
66.3±2.9 65.7±1.6	hornblende biotite	quartz monzonite	Punta Guayanés 18°05'54"N, 65°50'22"W	K-Ar	53-2	R	12
65.2±1.3 48.1±1.2	hornblende biotite	altered diorite	Adjuntas 18°12'37"N, 66°40'41"W	K-Ar	32-129	R	12
60.4±1.2	hornblende	Guaracanal Andesite	Aguas Buenas 18°20'30"N, 66°05'44"W	K-Ar	23-18	R	12
48.2±1.3 47.3±1.0	biotite-chlorite hornblende	quartz diorite	Cayey 18°06'37"N, 66°14'45"W	K-Ar	50-4	R	12
46.2±1.1 45.7±2.2	biotite hornblende	quartz diorite	El Yunque 18°17'35"N, 65°47'40"W	K-Ar	25-1	R	12
44.3±4.0 41.8±5.6	hornblende hornblende	hornblende porphyry	Monte Guilarte 18°14'23"N, 66°51'26"W	K-Ar	31-1	R	12
43.4±1.3	quartz-sericite	gangue	Bayaney 18°15'20"N, 66°47'33"W	K-Ar	17-140	R	12
43.1±0.9 40.8±0.8	hornblende plagioclase	andesite porphyry	Central La Plata 18°20'13"N, 67°02'49"W	K-Ar	15-1	R	12
41.5±1.9	quartz-sericite	gangue	Bayaney 18°15'20"N, 66°47'33"W	K-Ar	17-141	R	12
41.3±1.9	hornblende	quartz diorite	Adjuntas 18°11'30"N, 66°40'43"W	K-Ar	32-5	R	12
37.9±1.5	hornblende	quartz diorite	Adjuntas 18°14'06"N, 66°43'19"W	K-Ar	32-12	R	12
<b>Texas</b>							
36.7±1.6	whole rock	phonolite	Diablo Plateau	Rb-Sr	(7 samples— see New Mex.)	Q	1
35.4±1.1	biotite	syenite	Mayfield Valley	K-Ar	MAY-4	Q	1
34.3±1.0	biotite	syenite	Mayfield Valley	K-Ar	MAY-1B	Q	1
34.1±1.0	biotite	syenite	Mayfield Valley	K-Ar	MAY-3	Q	1
<b>Utah</b>							
2510±170	whole rock	adamellite	central Grouse Creek Mtns.	Rb-Sr	(10 samples)	R	11

**UNITED STATES**  
Utah (continued)

2180±190	whole rock	adamellite	Clear Creek Canyon	Rb-Sr	(5 samples)	R	11
38.2±2.0	whole rock	granodiorite	Immigrant Pass	Rb-Sr	(6 samples)	R	11
24.9±0.6	whole rock	adamellite	Red Butte Canyon	Rb-Sr	(6 samples)	R	11
18.9±6.3	apatite	alaskite dike	41°39.8'N, 113°44.8'W	fission track	9W-99-39	R	11
18.3±1.9	zircon	adamellite	41°42.8'N, 113°45.8'W	fission track	13W-29-11	R	11
13.7±3.7	apatite			track			
11.9±0.2	biotite-whole rock	adamellite	41°41.5'N, 113°44.4'W	Rb-Sr	9W-97-21	R	11
8.0±0.5	biotite-whole rock	adamellite	41°43.5'N, 113°42.4'W	Rb-Sr	10W-23-2A	R	11
<b>Vermont</b>							
122±3	biotite	diorite	Claremont quad	K-Ar	Vt 3	P	19
121±3	biotite	gabbro	43°26.7'N, 72°29.4'W Claremont quad	K-Ar	Vt-75-8	P	19
120±4	biotite	syenite	43°26.3'N, 72°27.2'W Claremont quad	K-Ar	Vt 32	P	19
120±2	biotite	Conway granite	43°26.3'N, 72°25.9'W Claremont quad	K-Ar	Vt 33	P	19
118±2	biotite	Conway granite	43°26.1'N, 72°25.1'W Claremont quad	K-Ar	Vt-75-1	P	19
<b>Washington</b>							
25.8	zircon	granodiorite Ohanepecosh Formation	46°52.1'N, 121°31.5'W	U-Pb	71-13	F	37
25.1	zircon	welded tuff of The Palisades	46°56.9'N, 121°36.1'W	U-Pb	71-16	F	37
24.1	zircon	quartz monzonite	46°55.1'N, 121°35.2'W	U-Pb	71-15	F	37
24.0							
22.6	zircon	welded tuff	47°00.9'N, 121°42.3'W	U-Pb	71-21	F	37
21.8							
17.6	zircon	granodiorite	46°47.4'N, 121°45.4'W	U-Pb	71-18	F	37
17.5							
17.4							
14.1	zircon	quartz diorite	46°53.7'N, 121°36.7'W	U-Pb	71-14	F	37
<b>Wisconsin</b>							
2743-2044	zircon	granitic gneiss	Linwood Township central Wisconsin	U-Pb	75-6		49
2672-1981	zircon	migmatite	near Pittsville central Wisconsin	U-Pb	75-10		49
1786-1586	zircon	rhyolite dike	near Pittsville central Wisconsin	U-Pb	74-2		49
1765-1498	zircon	tonalitic dike	Conant's Rapids central Wisconsin	U-Pb	75-8		49
1754-1448	zircon	granodioritic gneiss	near Conant's Rapids central Wisconsin	U-Pb	75-9E		49
<b>Wyoming</b>							
27.7±0.1	uraninite-coffinite	uranium mineralization	Crooks Gap district	U-Pb		R	33
<b>VENEZUELA</b>							
1357	whole rock	schist of El Alambique formation	Santo Domingo Valley region, northeastern Venezuelan Andes	Rb-Sr	(2 samples)		30
440±40	whole rock	granitic gneiss of El Batallón	La Grita region, southwestern Venezuelan Andes	Rb-Sr	(6 samples)		30
212	whole rock	banded gneiss of La Mitisus	Santo Domingo Valley region, northeastern Venezuelan Andes	Rb-Sr	(9 samples)		30

## VIRGIN ISLANDS

36.3±0.9 biotite quartz diorite 18°26'15"N, 64°26'10"W K-Ar V-G-1 R 12  
 34.2±1.6 hornblende

Laboratories: A—Australian Inst. Nuclear Sci; B—Carleton Univ., Ottawa; C—Dept. de Géol., Université de Montreal; D—Geochron Lab., Univ. of São Paulo; E—Geological Survey of Canada; F—Geophysical Lab., Carnegie Inst. of Wash.; G—Isotopic Lab. of McGill Univ.; H—Ohio State Univ.; I—Queen's Univ., Ontario, Canada; J—Teledyne Isotopes; K—Univ. of Alaska; L—Univ. of Arizona; M—Univ. of Calif., Los Angeles; N—Univ. of Calif., Santa Barbara; O—Univ. of New Brunswick; P—Univ. of Penn.; Q—Univ. of Texas, Austin; R—USGS (Denver); S—USGS (Menlo Park).

## REFERENCES

1. Barker, D. S., Long, L. E., Hoops, G. K., and Hodges, F. N. (1977) Petrology and Rb-Sr isotope geochemistry of intrusions in the Diablo Plateau, northern Trans-Pecos magmatic province, Texas and New Mexico: *Geol. Soc. America Bull.*, v. 88, p. 1437–1446.
2. Barton, J. M., Jr. (1977) Rb-Sr ages and tectonic setting of some granitic intrusions, coastal Labrador: *Can. Jour. Earth Sci.*, v. 14, p. 1635–1645.
3. Basu, A. R., and Murthy, V. R. (1977) Ancient lithospheric lherzolite xenolith in alkali basalt from Baja California: *Earth and Planetary Science Letters*, v. 35, p. 239–246.
4. Bell, K., Blenkinsap, J., and Strong, D. F. (1977) The geochronology of some granitic bodies from eastern Newfoundland and its bearing on Appalachian evolution: *Can. Jour. Earth Sci.*, v. 14, p. 456–476.
5. Blaxland, A. B., and Curtis, L. W. (1977) Chronology of the Red Wine alkaline province, central Labrador: *Can. Jour. Earth Sci.*, v. 14, p. 1940–1946.
6. Bonhommet, N., Beeson, M. H., and Dalrymple, G. B. (1977) A contribution to the geochronology and petrology of the island of Lanai, Hawaii: *Geol. Soc. America Bull.*, v. 88, p. 1282–1286.
7. Brooks, C. K., and Gleadow, A. J. W. (1977) A fission track age for the Skaergaard intrusion and the age of the East Greenland basalts: *Geology*, v. 5, p. 539–540.
8. Burchfiel, B. C., and Davis, G. A. (1977) Geology of the Sagamore Canyon-Slaughterhouse Spring area, New York Mountains, California: *Geol. Soc. America Bull.*, v. 11, p. 1623–1640.
9. Carden, J. R., Connelly, W., Forbes, R. B., and Turner, D. L. (1977) Blueschists of the Kodiak Islands, Alaska—an extension of the Seldovia schist terrane: *Geology*, v. 5, p. 529–533.
10. Clark, A. H., Farrar, E., and Kents, P. (1977) Potassium-argon age of the Cerro Colorado porphyry copper deposit, Panama: *Econ. Geology*, v. 72, p. 1154–1158.
11. Compton, R. R., Todd, V. R., Zartman, R. E., and Naeser, C. W. (1977) Oligocene and Miocene metamorphism, folding, and low-angle faulting in northwestern Utah: *Geol. Soc. America Bull.*, v. 88, p. 1237–1250.
12. Cox, D. P., Marvin, R. F., McGonigle, J. W., McIntyre, D. H., and Rogers, C. L. (1977) Potassium-argon geochronology of some metamorphic, igneous, and hydrothermal events in Puerto Rico and the Virgin Islands: *Jour. Research U. S. Geol. Survey*, v. 5, p. 689–703.
13. Creasey, S. C., Banks, N. G., Ashley, R. P., and Theodore, T. G. (1977) Middle Tertiary Plutonism in the Santa Catalina and Tortolita Mountains, Arizona: *Jour. Research U. S. Geol. Survey*, v. 5, p. 705–717.
14. Dallmeyer, R. D. (1977) Diachronous ophiolite obduction in western Newfoundland—evidence from  $^{40}\text{Ar}/^{39}\text{Ar}$  ages of the Hare Bay metamorphic aureole: *Amer. Jour. of Sci.*, v. 277, p. 61–72.
15. ——— (1977)  $^{40}\text{Ar}/^{39}\text{Ar}$  age spectra of minerals from the Fleur de Lys terrane in northwest Newfoundland—their bearing on chronology of metamorphism within the Appalachian orotectonic zone: *Jour. of Geology*, v. 85, p. 89–103.
16. Doig, R. (1977) Rb-Sr geochronology and evolution of the Grenville province in northwestern Quebec, Canada: *Geol. Soc. America Bull.*, v. 88, p. 1843–1856.
17. Doyle, L. J., and Gorsline, D. S. (1977) Marine geology of Baja California continental borderland, Mexico: *The Amer. Assoc. of Petroleum Geologists Bulletin*, v. 61, p. 903–917.
18. Everden, J. F., Stanislav, J. K., and Cherroni, M. C. (1977) Potassium-argon ages of some Bolivian rocks: *Econ. Geology*, v. 72, p. 1042–1061.
19. Foland, K. A., and Faul, H. (1977) Ages of the White Mountain intrusives—New Hampshire, Vermont, and Maine, USA: *Amer. Jour. of Sci.*, v. 277, p. 888–904.
20. Frith, R., Frith, R. A., and Doig, R. (1977) The geochronology of the granitic rocks along the Bear-Slave Structural Province boundary, northwestern Canadian Shield: *Can. Jour. Earth Sci.*, v. 14, p. 1356–1373.
21. Fyffe, L. R., Irrinki, R. R., and Cormier, R. F. (1977) A radiometric age of deformed granitic rocks in north-central New Brunswick: *Can. Jour. Earth Sci.*, v. 14, p. 1687–1689.
22. Hotz, P. E., Lanphere, M. A., and Swanson, D. A. (1977) Triassic blueschist from northern California and north-central Oregon: *Geology*, v. 5, p. 659–663.
23. Hudson, T., Plafker, G., and Lanphere, M. A. (1977) Intrusive rocks of the Yakutat—St. Elias area, south-central Alaska: *Jour. Research U. S. Geol. Survey*, v. 5, p. 155–172.
24. Hudson, T., Plafker, G., and Turner, D. L. (1977) Metamorphic rocks of the Yakutat—St. Elias area, south-central Alaska: *Jour. Research U. S. Geol. Survey*, v. 5, p. 173–184.
25. Hurst, R. W., Farhat, J. (1977) Geochronologic investigations of the Sudbury Nickel Irruptive and the Superior Province granites north of Sudbury: *Geochimica et Cosmochimica Acta*, v. 41, p. 1803–1815.
26. Irving, E., Emslie, R. F., and Park, J. K. (1977) Paleomagnetism of the Harp Lake Complex and associated rocks: *Can. Jour. Earth Sci.*, v. 14, p. 1187–1201.
27. Kesler, S. E., Sutter, J. F., Jones, L. M., and Walker, R. L. (1977) Early Cretaceous basement rocks in Hispaniola: *Geology*, v. 5, p. 245–247.
28. Kesler, S. E., Sutter, J. F., Issigonis, M. J., Jones, L. M., and Walker, R. L. (1977) Evolution of porphyry copper mineralization in an oceanic island arc—Panama: *Econ. Geology*, v. 72, p. 1142–1153.
29. Kovach, A., Hurlley, P. M., and Fairbairn, H. W. (1977) Rb-Sr whole rock age determinations of the Dedham granodiorite, eastern Massachusetts: *Amer. Jour. of Sci.*, v. 277, p. 905–912.
30. ——— (1977) Rb-Sr whole rock dating of metamorphic events in the Iglesias Complex, Venezuelan Andes: *Jour. of Geology*, v. 85, p. 372–377.
31. Leeman, W. P. (1977) Pb and Sr isotopic study of Keweenaw lavas and inferred ~4 b.y. old lithosphere beneath part of Minnesota: *Geol. Soc. America Abst. with Programs*, v. 9, p. 1068.
32. Long, L. E., and Brite Neves, B. B. (1977) Geochronology of Precambrian basement, northeastern Brazil: *Geol. Soc. America Abst. with Programs*, v. 9, p. 1074.
33. Ludwig, K. R. (1977) Timing of uranium mineralization in Gas Hills and Crooks Gap districts, Wyoming, as indicated by U-Pb isotope apparent ages: *Geol. Soc. America Bull.*, v. 9, p. 1078–1079.
34. Ludwig, K. R., and Silver, L. T. (1977) Lead-isotope inhomogeneity in Precambrian igneous K-feldspars: *Geochimica et Cosmochimica Acta*, v. 41, p. 1457–1471.

35. Lyons, J. B., and Livingston, D. E. (1977) Rb-Sr age of the New Hampshire Plutonic Series: *Geol. Soc. America Bull.*, v. 88, p. 1808–1812.
36. Mc Dowell, F. W., and Keizer, R. P. (1977) Timing of mid-Tertiary volcanism in the Sierra Madre Occidental between Durango City and Mazatlan, Mexico: *Geol. Soc. America Bull.*, v. 88, p. 1479–1487.
37. Mattinson, J. M. (1977) Emplacement history of the Tatoosh volcanic-plutonic complex, Washington—ages of zircons: *Geol. Soc. America Bull.*, v. 88, p. 1509–1514.
38. ——— (1977) U-Pb ages of some crystalline rocks from the Burlington Peninsula, Newfoundland, and implications for the age of Fleur de Lys metamorphism: *Can. Jour. Earth Sci.*, v. 14, p. 2316–2324.
39. Michard-Vitrac, A., Lancelot, J., Allégre, C. J., and Moorbath, S. (1977) U-Pb ages on single zircons from the early Precambrian rocks of West Greenland and the Minnesota River Valley: *Earth and Planetary Science Letters*, v. 35, p. 449–453.
40. Miller, F. K., and Morton, D. M. (1977) Comparison of granitic intrusions in the Pelona and Orocopia Schists, southern California: *Jour. Research U. S. Geol. Survey*, v. 5, p. 643–649.
41. Olson, J. C., Marvin, R. F., Parker, R. L., and Mehnert, H. H. (1977) Age and tectonic setting of lower Paleozoic alkalic and mafic rocks, carbonates, and thorium in south-central Colorado: *Jour. Research U. S. Geol. Survey*, v. 5, p. 673–687.
42. Palmer, H. C., Merz, B. A., and Hayatsu, A. (1977) The Sudbury dikes of the Grenville Front region—paleomagnetism, petrochemistry, and K-Ar age studies: *Can. Jour. Earth Sci.*, v. 14, p. 1867–1887.
43. Pigage, L. C. (1977) Rb-Sr dates for granodiorite intrusions on the northeast margin of the Shuswap Metamorphic Complex, Cariboo Mountains, British Columbia: *Can. Jour. Earth Sci.*, v. 14, p. 1690–1695.
44. Pilione, L. J., Gold, D. P., and Kreiger, W. E. (1977) Fission track age of apatite from a lamprophyre dike in the Two Buttes igneous complex, southeastern Colorado: *Geol. Soc. America Abst. with Programs*, v. 9, p. 641–642.
45. Reed, P. C. Masters, J. M., and Glass, H. D. (1977) Lithology and geochronology of Cretaceous and Tertiary marine deposits in Illinois: *Geol. Soc. America Abst. with Programs*, v. 9, p. 646.
46. Shibata, K., and Uchida, K. (1976) K-Ar ages of altered rocks from the Michiquillay Mine, Peru: *Bull. of the Geol. (ical) Survey of Japan*, v. 27, p. 745–749.
47. Sims, P. K., Peterman, Z. E., and Prinz, W. C. (1977) Geology and Rb-Sr age of Precambrian W Puritan Quartz Monzonite, northern Michigan: *Jour. Research U. S. Geol. Survey*, v. 5, p. 185–192.
48. Van Kooten, G. K., and Peck, D. L. (1977) Highly potassic phonolite of Pliocene age near Merced Peak, central Sierra Nevada, California: *Geol. Soc. America Bull.*, v. 9, p. 1208–1209.
49. Van Schmus, W. R., and Anderson, J. L. (1977) Gneiss and migmatite of Archean age in the Precambrian basement of central Wisconsin: *Geology*, v. 5, p. 45–48.
50. Westgate, J. A. (1977) Wascana Creek Ash (Middle Pleistocene) in southern Saskatchewan: characterization, source, fission track age, paleomagnetism and stratigraphic significance: *Can. Jour. Earth Sci.*, v. 14, p. 357–374.



NEW MEXICO TECH PRINT PLANT

Camera-ready copy provided by the Nevada  
Bureau of Mines and Geology

Presswork: Text and cover printed on Davidson 600

Paper: Body on 60-lb white offset; cover on 65-lb  
Russett

Ink: Vanson rubber base plus all-purpose black