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SUMMARY OF RADIOMETRIC AGE DETERMINATIONS ON MESOZOIC AND CENOZOIC IGNEOUS ROCKS AND URANIUM AND BASE METAL DEPOSITS IN COLORADO

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During the last 20 years, over 400 radiometric age determinations have been made on rocks and ore deposits of Mesozoic and Cenozoic age in Colorado. This summary has been made as a convenience to any worker concerned with these ages.

Samples are tabulated according to locality number (keyed to map, fig. 1); each entry shows radiometric ages(s), rock type, analyzed mineral or rock material, latitude, longitude, and reference to source of data. The samples are cataloged in two major groups. Group I (samples 1-247) consists of K-Ar, fission-track, Rb-Sr, and Pb-α determinations. The ages indicated in this group are in general the age of the rock, though two samples indicate time of mineralization. Group II (samples 250-287) consists of U-Pb determinations; the ages possibly indicate the time of mineralization, but they are subject to various interpretations. Sample localities are arranged by county within the two groups. Group I contains 277 K-Ar ages, 44 fission-track ages, 11 Pb-α ages, and 7 Rb-Sr ages. Group II contains 89 U-Pb ages.

The total of 428 radiometric ages represents 287 distinct sample localities. Ninety-two of the ages are unpublished ages; many of them will be published in the next year or two together with their geologic implications. The analytical data, if not previously published, have been included for completeness of information and to aid those who want to evaluate the analytical data. For those ages for which the analytical data are not shown, the reader is referred to the literature sources given with the sample descriptions. For the K-Ar ages tabulated, the constants are: $\lambda_\beta = 0.585 \times 10^{-10} yr^{-1}$, $\lambda_\beta = 4.72 \times 10^{-10} yr^{-1}$, $K^{40}/K_{total} = 1.22 \times 10^{-4}$ g/g; abbreviations used in presenting the analytical data are: $*Ar^{40}$ = radiogenic argon-40; Ar^{40} = total argon-40. The constant used in fission-track calculations is $\lambda_F = 6.85 \times 10^{-17} yr^{-1}$.

CHRONOLOGY

Within the last 15 years, our understanding of the geologic age of many of the igneous bodies found in Colorado has been vastly expanded by radiometric ages. Many geologic questions have been answered and the geologic history is less speculative. Most of the large-scale igneous events that occurred in Colorado during the Mesozoic and Cenozoic have been placed in a fairly definite time sequence. However, many local geologic-geochronologic problems still remain unresolved.

Igneous activity in Colorado has been widespread, and, in some regions, volcanic materials are voluminous. Rocks range in age from about 75 m.y. to less than 50,000 years (unpublished data). Though some age determinations suggest that igneous activity may have started 80-85 m.y. ago, the validity of the radiometric ages older than 75 m.y. is questionable. For example, some of the igneous rocks dated at 80-85 m.y. intrude Cretaceous sedimentary rocks that are firmly dated at 70-75 m.y. Those ages that are considered geologically valid have been compiled into three histograms – one of volcanic rocks (flows, ashes, bentonites, etc.); one for dikes, sills, and small plugs; and one for stocks, laccoliths, and larger plutons (fig. 2). The histograms indicated two major periods of igneous activity in Colorado: (a) Late Cretaceous through Paleocene and (b) late Eocene through middle Miocene. Shorter periods of activity occurred from late Miocene almost to the present.

Volcanism occurred during both major periods of magmatism but was especially active during the Oligocene and Miocene. Volcanic rocks of Paleocene and Late Cretaceous age are found in southwestern and central Colorado. Rocks of this age range may have covered extensive areas of Colorado, but have since been removed by erosion. Histogram *A* (fig. 2) shows that no volcanic rocks have been reliably dated as Eocene. A few K-Ar ages on extrusive material (not shown on histogram *A*) fall within the late Eocene range, but these ages are thought to be too

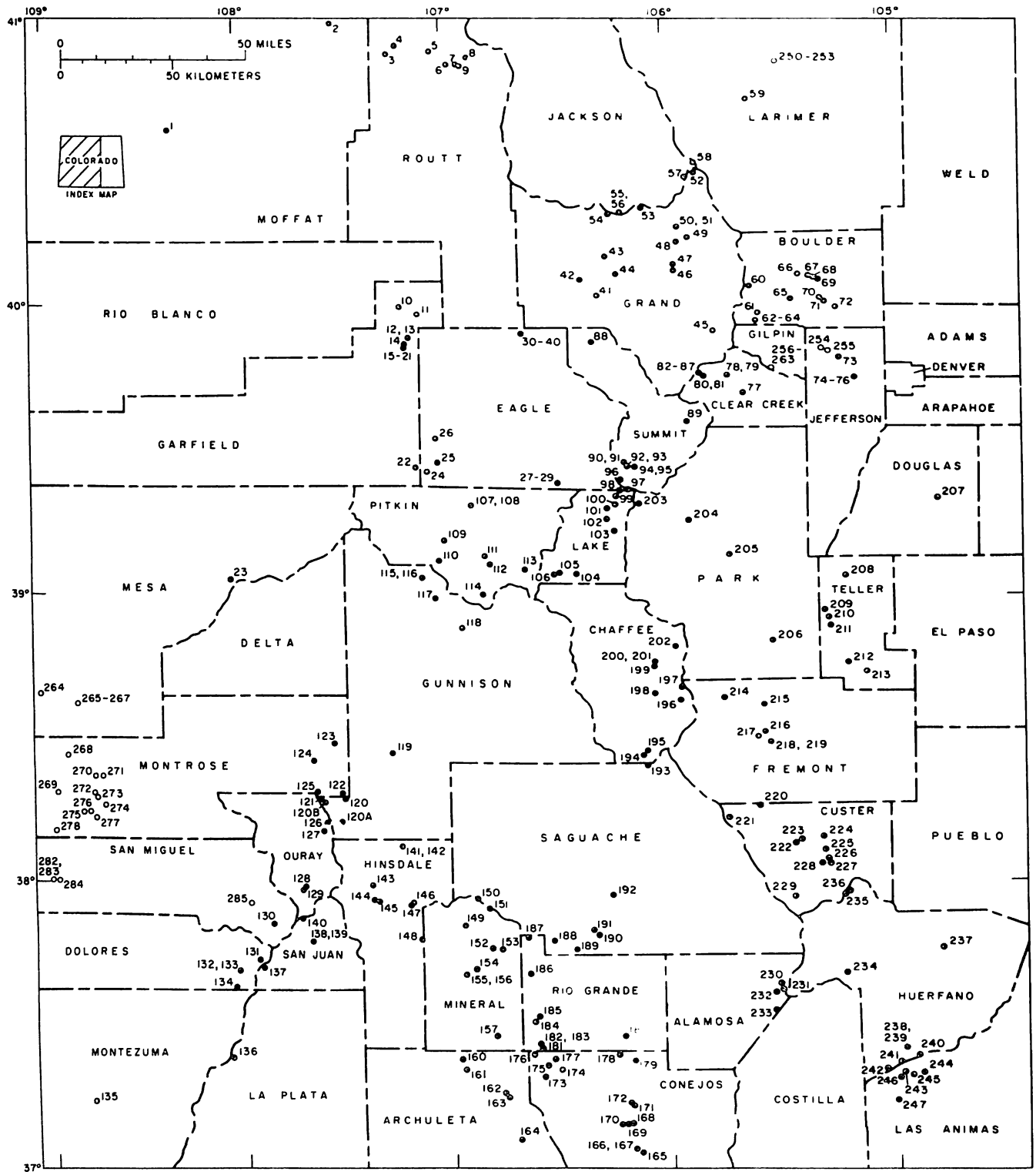

Figure 1. Map showing collection localities of Colorado samples analyzed for radiometric age(s). Open circles indicate uranium (vanadium) samples.

old because the analyzed material contains pre-eruptive detrital minerals (for example, see entry 207). Volcanic materials of Oligocene and Miocene age are widespread in north-central, central, and southwestern Colorado (Corbett, 1968; Izett and others, 1970; Epis and Chapin, 1968; Steven and others, 1967; Lipman and others, 1970). Rocks of this age were once more extensive than they are now (Steven and Epis, 1968). Pliocene and younger volcanic action has occurred in south-central Colorado and northwest Colorado (Segerstrom and Young, 1972; Larson, 1968).

Intrusive rocks of Late Cretaceous and Paleocene ages are fairly common; most of the larger intrusions are within the designated limits of the Colorado Mineral Belt (Tweto and Sims, 1963). Numerous stocks and even batholiths (unpublished USGS data) were emplaced during the period from late Eocene through early Miocene in central Colorado (Obradovich and others, 1969). Considerable intrusive activity occurred in the Spanish Peaks region (Stormer, 1972; Smith, 1973) of south-central Colorado during the Miocene.

The ages given by uranium (vanadium) ores (entries 250-287) have been subjected to considerable thought by many geologists as to their meaning. The wide range of ages, together with the diversity of ages within a single mine, makes the interpretation of these ages very difficult. A discussion of these interpretations not being the purpose of this compilation, the reader is referred to the writings of Banks and Silver (1964), Miller and Kulp (1963), and Fischer (p. 743-744, 1968), among many, for the geologic significance and implications of these U-Pb ages.

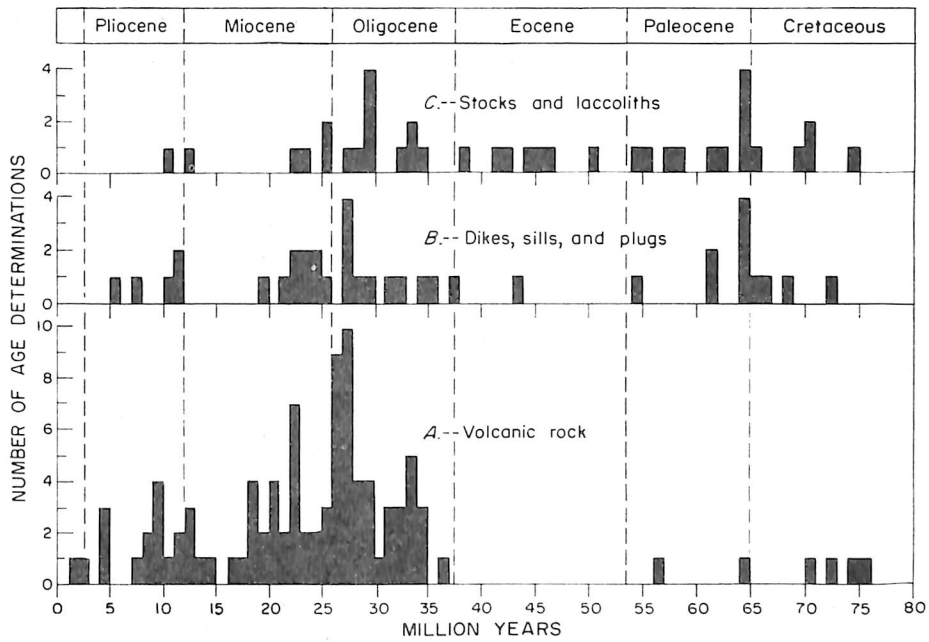

Figure 2. Three histograms of radiometric ages for Colorado igneous rocks.

SAMPLE DESCRIPTIONS

1. Izett and others (1970) K-Ar (biotite) 24.8±0.8 m.y.
   Table 3
   Browns Park Formation. Rhyolitic ash (approx. 40°36′45″N, 108°19′45″W; Moffat Co., CO). Collected by: G. A. Izett and N. M. Denson, U. S. Geological Survey; dated by: J. D. Obradovich, U. S. Geological Survey.

2. Buffler (1967) K-Ar (biotite) 9.5±0.5 m.y.
   No. KA1921
   Segerstrom and Young (1972)
   Basalt flow (approx. 40°58′50″N, 107° 31′25″W; Moffat Co., CO). Analytical data: $K_2O = 9.05\%$, $*Ar^{40}/\Sigma Ar^{40} = 69.3\%$. Collected by: R. T. Buffler, Univ. of California at Berkeley; dated by: K-Ar Laboratory, Univ. of California at Berkeley.

3. Buffler (1967) K-Ar (biotite) 11.1±0.5 m.y.
No. KA1809
Segerstrom and Young (1972)
Lamprophyre dike (approx. 40°52′30″N, 107°15′00″W; Brush Mt., Routt Co., CO). Analytical data: K_2O = 8.63%, $*Ar^{40}/\Sigma Ar^{40}$ = 53.6%. Collected by: R. T. Buffler, Univ. of California at Berkeley; dated by: K-Ar Laboratory, Univ. of California at Berkeley.

4. Segerstrom and Young (1972) K-Ar (sanidine) 9.0±0.3 m.y.
No. 2A, Table 6
Felsite porphyry (40°54′10″N, 107°12′30″W; East Gibraltar Peak, Routt Co., CO). Collected by: K. Segerstrom, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.
Comment: The sanidine concentrate also was analyzed by Isotopes, Inc., Westwood, New Jersey. The analytical results are as follows: K_2O = 10.43% and 10.69%, $*Ar^{40}$ (avg.) = 1.586×10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 87% and 84%, and age is 8.67 ± 0.09 m.y.

5. Buffler (1967) K-Ar (biotite) 7.6±0.4 m.y.
No. KA1846
Segerstrom and Young (1972)
Latite porphyry pluton (approx. 40°53′00″N, 107°02′50″W; City Mtn., Routt Co., CO). Analytical data: K_2O = 9.23%, $*Ar^{40}/\Sigma Ar^{40}$ = 43.5%. Collected by: R. T. Buffler, Univ. of California at Berkeley; dated by: K-Ar Laboratory, Univ. of California at Berkeley.

6. McDowell (1971) K-Ar (biotite) 9.5±0.3 m.y.
No. L-1030
Hahns Peak stock. Porphyritic quartz monzonite (approx. 40°50′30″N, 106°58′30″W; Routt Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

7. Segerstrom and Young (1972) K-Ar (biotite) 10.7±0.4 m.y.
No. 1C, Table 6 (sanidine) 11.5±0.4 m.y.
Quartz andesite dike (40°50′30″N, 106°55′45″W; Routt Co., CO). Collected by: K. Segerstrom and E. J. Young, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

8. Segerstrom and Young (1972) K-Ar (sanidine) 10.0±0.3 m.y.
No. 1A, Table 6
Porphyry at Hahns Peak (40°50′08″N, 106°55′02″W; Routt Co., CO). Collected by: K. Segerstrom and E. J. Young, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.
Comment: This sanidine concentrate also was analyzed seven times by Geochron, Inc., Cambridge, Massachusetts. The analytical results are as follows:

K_2O (percent)	$*Ar^{40}$ (avg.) (mole/gm)	$*Ar^{40}/\Sigma Ar^{40}$ (percent)	Age (m.y.)
11.22 and 11.13	1.486×10^{-10}	79 and 69	8.9 ± 0.4
10.71 and 10.80	1.649×10^{-10}	42 and 52	10.3 ± 0.4
10.97 and 11.05	1.686×10^{-10}	55 and 32	10.2 ± 0.6
10.72 and 10.98	1.871×10^{-10}	47 and 58	11.6 ± 0.7
10.71 and 10.80	1.649×10^{-10}	42 and 52	10.3 ± 0.4
10.97 and 11.05	1.685×10^{-10}	55 and 32	10.2 ± 0.6
10.53, 10.78, and 10.72	1.491×10^{-10}	61 and 56	9.4 ± 0.4

9. Segerstrom and Young (1972) K-Ar (sanidine) 10.3±0.3 m.y.
No. 7K, Table 6

Dacite porphyry dike (40°51′57″N, 106°53′10″W; Routt Co., CO). Collected by: K. Segerstrom and E. J. Young, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: The sanidine concentrate was also analyzed by Isotopes, Inc., Westwood, New Jersey. The analytical results are as follows: K_2O = 11.10% and 11.19%, $*Ar^{40}$ (avg.) = 1.351 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 88% and 86%, and age is 9.64 ± 0.16 m.y.

10. E. E. Larson (written commun., 1973) K-Ar (whole rock) 23.0±1.0 m.y.
Basalt (39°59′37″N, 107°12′04″W; Garfield Co., CO). Analytical data: K_2O = 1.03% and 1.02%, $*Ar^{40}$ = 0.3412 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 37%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from basalt flow which is called informally the Little Trappers Lake flow by E. E. Larson.

11. E. E. Larson (written commun., 1973) K-Ar (whole rock) 10.3±0.5 m.y.
Basaltic andesite (39°57′52″N, 107°07′52″W; SW side of Flat Topped Derby Peak, Garfield Co., CO). Analytical data: K_2O = 2.61% and 2.54%, $*Ar^{40}$ = 0.3932 x 10^{-10} mole/gm. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is correlated with top flow of Derby Peak (E. E. Larson, written commun., 1973).

12. E. E. Larson (written commun., 1973) K-Ar (whole rock) 9.6±0.5 m.y.
Basaltic andesite (39°52′43″N, 107°10′32″W; NW side of W Mountain, Garfield Co., CO). Analytical data: K_2O = 2.14% and 2.16%, $*Ar^{40}$ = 0.3217 x 10^{-10} and 0.2906 x 10^{-10} mole/gm. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from the top flow on W Mountain (E. E. Larson, written commun., 1973).

13. E. E. Larson (written commun., 1973) K-Ar (whole rock) 12.4±0.5 m.y.
Basaltic andesite (39°52′43″N, 107°10′32″W; NW side of W Mountain, Garfield Co., CO). Analytical data: K_2O = 1.63% and 1.66%, $*Ar^{40}$ = 0.3089 x 10^{-10} and 0.2987 and 10^{-10} mole/gm. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from the second flow from top on W Mountain (E. E. Larson, written commun., 1973).

14. E. E. Larson (written commun., 1973) K-Ar (whole rock) 13.17±0.5 m.y.
Basaltic andesite (39°51′28″N, 107°11′13″W; NW side of W Mountain, Garfield Co., CO). Analytical data: K_2O = 3.11% and 3.24%, $*Ar^{40}$ = 0.606 x 10^{-10} and 0.621 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 74% and 55%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from the third flow from the top on W Mountain (E. E. Larson, written commun., 1973).

15. E. E. Larson (written commun., 1973) K-Ar (whole rock) 21.4±1.0 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 1.42% and 1.49%, $*Ar^{40}$ = 0.4711 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 58%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample from flow No. 3 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

16. E. E. Larson (written commun., 1973) K-Ar (whole rock) 20.7±1.0 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 1.63% and 1.58%, $*Ar^{40}$ = 0.5024 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 53%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample from flow No. 4 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

17. E. E. Larson (written commun., 1973) K-Ar (whole rock) 22.2±1.0 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 1.03% and 0.991%, $*Ar^{40}$ = 0.344 x 10^{-10} and 0.314 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 35% and 36%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample from flow No. 6 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

18. E. E. Larson (written commun., 1973) K-Ar (whole rock) 18.5±0.8 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 1.00% and 0.997%, $*Ar^{40}$ = 0.2755 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 39%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from flow No. 10 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

19. E. E. Larson (written commun., 1973) K-Ar (whole rock) 19.9±0.8 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 3.30% and 3.25%, $*Ar^{40}$ = 1.006 x 10^{-10} and 0.9735 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 44% and 47%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from flow No. 14 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

20. E. E. Larson (written commun., 1973) K-Ar (whole rock) 20.05±0.8 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 1.942% and 1.946%, $*Ar^{40}$ = 0.516 x 10^{-10} and 0.560 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 43% and 47%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from flow No. 20 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

21. E. E. Larson (written commun., 1973) K-Ar (whole rock) 20.63±0.8 m.y.
Basalt (39°50′48″N, 107°11′13″W; Turret Peak, Garfield Co., CO). Analytical data: K_2O = 1.626% and 1.656%, $*Ar^{40}$ = 0.477 x 10^{-10} and 0.516 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 26% and 25%. Collected by: E. E. Larson, Univ. of Colorado; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from flow No. 27 as one counts upward from the lowest flow exposed on south side of Turret Peak (E. E. Larson, written commun., 1973).

22. E. E. Larson (written commun., 1973) K-Ar (whole rock) 8.68±0.4 m.y.
Basalt (39°25′21″N, 107°08′59″W; near Catherine, Garfield Co., CO). Analytical data: K_2O = 1.14%, $*Ar^{40}$ = 0.147 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 49%. Collected by: E. E. Larson, Univ. of Colorado, and F. E. Mutschler, Eastern Washington State College, Cheney; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from igneous flow known informally as Roaring Fork flow (E. E. Larson, written commun., 1973).

23. U. S. Geological Survey, 1966, p. A81 K-Ar (whole rock) 9.7±0.5 m.y.
Basalt (approx. 39°03′N, 108°03′W; Grand Mesa, Mesa Co., CO). Analytical data: K_2O = 0.97% and 0.97%, $*Ar^{40}$ = 1.356 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 39%. Collected by: J. R. Donnell and Warren Yeend, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

24. E. E. Larson (written commun., 1973) K-Ar (whole rock) 7.86±0.4 m.y.
Basalt (39°24′35″N, 107°05′52″W; near El Jebel, Eagle Co., CO). Analytical data: K_2O = 1.81%, $*Ar^{40}$ = 0.210 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 44%. Collected by: E. E. Larson, Univ. of Colorado, and F. E. Mutschler, Eastern Washington State College, Cheney; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from basalt flow which is called informally the Roaring Fork flow by E. E. Larson.

25. E. E. Larson (written commun., 1973) K-Ar (whole rock) 8.78±0.4 m.y.
Basalt (39°26′29″N, 107°02′36″W; north side of Basalt Mountain, Eagle Co., CO). Analytical data: K_2O = 2.25%, $*Ar^{40}$ = 0.293 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 51%. Collected by: E. E. Larson, Univ. of Colorado, and F. E. Mutschler, Eastern Washington State College, Cheney; dated by: M. Ozima, Univ. of Tokyo, Japan.

26. E. E. Larson (written commun., 1973) K-Ar (whole rock) 11.1±1.0 m.y.
Basalt (39°31′52″N, 107°03′01″W; west of Cottonwood Pass, Eagle Co., CO). Analytical data: K_2O = 2.17%, $*Ar^{40}$ = 0.358 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 7%. Collected by: E. E. Larson, Univ. of Colorado, and F. E. Mutschler, Eastern Washington State College, Cheney; dated by: M. Ozima, Univ. of Tokyo, Japan.

27. Pearson and others (1962) K-Ar (biotite) 69 m.y.
No. C-7 (biotite) 69 m.y.
Pearson and others (1966)
No. C-7, Table 3
Granodiorite (approx. 39°23′19″N, 106°29′00″W; Eagle Co., CO). Collected by: Ogden Tweto and R. C. Pearson, U. S. Geological Survey; dated by: R. C. Pearson and H. H. Thomas, U. S. Geological Survey.

28. U. S. Geological Survey unpublished age K-Ar (biotite) 64±3 m.y.
No. D-7
Granodiorite (approx. 39°23′10″N, 106°28′55″W; Eagle Co., CO). Analytical data: K_2O = 8.98%, $*Ar^{40}$ = 8.58 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 87%. Collected by: Ogden Tweto, U. S. Geological Survey; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey. Comment: Sample is from nearly the same location as item No. 27.

29. U. S. Geological Survey unpublished age K-Ar (biotite) 63±3 m.y.
No. D-6
Granodiorite (approx. 39°23′15″N, 106°29′00″W; Eagle Co., CO). Analytical data: K_2O = 8.86%, $*Ar^{40}$ = 8.41 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 86%. Collected by: Ogden Tweto, U. S. Geological Survey, dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey. Comment: Sample is from nearly the same location as item No. 27.

30. York and others (1971) K-Ar (whole rock) 22.0 m.y.
No. 1-4-1, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

31. York and others (1971) K-Ar (whole rock) 19.9 m.y.
No. 1-5-1, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

32. York and others (1971) K-Ar (whole rock) 17.5 m.y.
No. 1-5-2, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

33. York and others (1971) K-Ar (whole rock) 21.0 m.y.
No. 1-6-1, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

34. York and others (1971) K-Ar (whole rock) 22.3 m.y.
No. 1-7-1, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

35. York and others (1971) K-Ar (whole rock) 20.6 m.y.
No. 1-8-1, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

36. York and others (1971) K-Ar (whole rock) 24.3 m.y.
No. 4A, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

37. York and others (1971) K-Ar (whole rock) 23.0 m.y.
No. 8A, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

38. York and others (1971) K-Ar (whole rock) 23.0 m.y.
No. 10A, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

39. York and others (1971) K-Ar (whole rock) 24.0 m.y.
No. 16A, Table 3 (whole rock) 25.0 m.y.
Basalt (approx. 39°54′30″N, 106°38′30″W; Yarmony Mountain, Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

40. York and others (1971) K-Ar (whole rock) 21.9 m.y.
No. 1-3-1, Table 3
Basalt (approx. 39°54′30″N, 106°38′30″W; Eagle Co., CO). Dating done at Univ. of Toronto, Canada.

41. Izett and Barclay (1974) Fission track (zircon) 12.8±2.3 m.y.
No. 65G57
Rhyolitic ash fall (approx. 40°02′00″N, 106°17′55″W; Kremmling quad., Grand Co., CO). Analytical data: (zircon) spontaneous fission tracks ρ_s = 1.44 x 10^6 t/cm^2 (173 tracks), induced tracks $\frac{1}{2}\rho_i$ = 3.46 x 10^6 t/cm^2 (417 tracks), neutron flux ϕ = 1.01 x 10^{15} n/cm^2. Collected by: G. A. Izett, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

42. Izett and Barclay (1974) Fission track (zircon) 11.2±1.8 m.y.
No. 68G105
Rhyolitic ash fall (approx. 40°05′14″N, 106°22′26″W; Kremmling quad., Grand Co., CO). Analytical data: (zircon) spontaneous fission tracks ρ_s = 1.01 x 10^6 t/cm^2 (203 tracks), induced tracks $\frac{1}{2}\rho_i$ = 3.19 x 10^6 t/cm^2 (640 tracks), neutron flux ϕ = 1.15 x 10^{15} n/cm^2. Collected by: G. A. Izett, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

43. Naeser and others (1973) Fission track (zircon) 30.0±2.8 m.y.
Rhyolitic welded tuff (approx. 40°10′33″N, 106°15′31″W; Grand Co., CO). Analytical data: spontaneous fission tracks ρ_s = 7.02 x 10^6 t/cm^2 (877 tracks), induced tracks $\frac{1}{2}\rho_i$ = 7.01 x 10^6 t/cm^2 (876 tracks), neutron flux ϕ = 0.98 x 10^{15} n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

44. Taylor and others (1968) K-Ar (sanidine) 33±3 m.y.
No. 1, table 1
Izett (1968)
Rabbit Ears Volcanics. Rhyolite welded tuff (approx. 40°07′N, 106°12′30″W; Grand Co., CO). Collected by: G. A. Izett, U. S. Geological Survey; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

45. Taylor and others (1968) K-Ar (sanidine) 29±3 m.y.
No. 2, Table 1
Izett (1968)
Rhyolite tuff breccia (approx. 39°55′N, 105°46′45″W; Grand Co., CO). Collected by: G. A. Izett, U. S. Geological Survey; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

46. G. A. Izett (oral commun., 1973) Fission track (zircon) 22.7±2.3 m.y.
No. 72G-52
Rhyolitic ash fall (approx. 40°07′34″N, 105°57′14″W; Trail Mtn. quad., Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 4.36 \times 10^6$ t/cm^2 (686 tracks), induced tracks $\frac{1}{2}\rho_i = 5.93 \times 10^6$ t/cm^2 (933 tracks), neutron flux $\phi = 1.01 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

47. G. A. Izett (oral commun., 1973) K-Ar (whole rock) 26.0±0.9 m.y.
No. 72G42
Basalt (approx. 40°08′45″N, 105°56′40″W; Trail Mtn. quad., Grand Co., CO). Analytical data: K_2O = 1.126%, $*Ar^{40} = 0.435 \times 10^{-10}$ mole/gm, $*Ar^{40}/\Sigma Ar^{40} = 25\%$. Collected by: G. A. Izett, U. S. Geological Survey; dated by: J. D. Obradovich, U. S. Geological Survey.

48. Naeser and others (1973) Fission track (zircon) 27.6±2.3 m.y.
Latite (approx. 40°13′22″N, 105°56′18″W; Trail Mountain, Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 4.97 \times 10^6$ t/cm^2 (1012 tracks), induced tracks $\frac{1}{2}\rho_i = 6.10 \times 10^6$ t/cm^2 (1242 tracks), neutron flux $\phi = 1.11 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

49. Naeser and others (1973) Fission track (zircon) 25.5±2.4 m.y.
No. 71G 103
Rhyolite flow (approx. 40°14′20″N, 105°53′15″W; Soda Creek, Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 4.18 \times 10^6$ t/cm^2 (813 tracks), induced tracks $\frac{1}{2}\rho_i = 5.08 \times 10^6$ t/cm^2 (987 tracks), neutron flux $\phi = 1.01 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

50. Naeser and others (1973) Fission track (zircon) 24.9±2.0 m.y.
No. 72N7
Rhyolite (approx. 40°16′45″N, 105°56′15″W; Porphyry Peaks, Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 5.73 \times 10^6$ t/cm^2 (1088 tracks), induced tracks $\frac{1}{2}\rho_i = 6.91 \times 10^6$ t/cm^2 (1311 tracks), neutron flux $\phi = 0.98 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

51. Naeser and others (1973) Fission track (zircon) 25.4±2.3 m.y.
No. 72N6
Rhyolite (approx. 40°16′45″N, 105°56′15″W; Porphyry Peaks, Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 4.66 \times 10^6$ t/cm^2 (906 tracks), induced tracks $\frac{1}{2}\rho_i = 5.49 \times 10^6$ t/cm^2 (1068 tracks), neutron flux $\phi = 0.98 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

52. Corbett (1968) K-Ar (biotite) 28±3 m.y.
No. 307B, Table 1
Quartz latite flow (40°28′00″N, 105°51′30″W; Lulu Mtn., Grand Co., CO). Collected by: M. K. Corbett; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

53. Naeser and others (1973) Fission track (zircon) 26.1±2.2 m.y.
Latite (?) porphyry (approx. 40°20′38″N, 106°05′43″W; Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 3.99 \times 10^6$ t/cm^2 (978 tracks), induced tracks $\frac{1}{2}\rho_i = 5.19 \times 10^6$ t/cm^2 (1273 tracks), neutron flux $\phi = 1.11 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

54. Naeser and others (1973) Fission track (zircon) 22.8±1.8 m.y.
No. Kit-8
Latite (?) porphyry (approx. 40°19′15″N, 106°14′30″W; Grand Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 4.23 \times 10^6$ t/cm^2 (1078 tracks), induced tracks $\frac{1}{2}\rho_i = 5.56 \times 10^6$ t/cm^2 (1417 tracks), neutron flux $\phi = 0.98 \times 10^{15}$ n/cm^2. Collected by: D. M. Kinney, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

55. J. D. Obradovich (written commun., 1973) K-Ar (biotite) 24.4±0.6 m.y.
Latite (?) porphyry, Haystack stock (near 40°19′N, 106°14′W; Jackson Co., CO). Analytical data: K_2O = 7.91%, $*Ar^{40} = 2.87 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 76\%$. Collected by: D. M. Kinney, U. S. Geological Survey; dated by: J. D. Obradovich, U. S. Geological Survey.

56. Naeser and others (1973) Fission track (zircon) 27.7±3.8 m.y.
No. DK-2
Latite (?) porphyry, Haystack stock (approx. 40°19′39″N, 106°11′20″W; Haystack Mtn., Jackson Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 2.89 \times 10^6$ t/cm^2 (388 tracks), induced tracks $\frac{1}{2}\rho_i = 3.54 \times 10^6$ t/cm^2 (476 tracks), neutron flux $\phi = 1.11 \times 10^{15}$ n/cm^2. Collected by: D. M. Kinney, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

57. Corbett (1968) K-Ar (biotite) 28±3 m.y.
No. 305B, Table 1
Never Summer stock. Granodiorite (40°27′00″N, 105°54′00″W; Lead Mtn., Jackson Co., CO). Collected by: M. K. Corbett; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

58. Corbett (1968) K-Ar (sanidine) 27±3 m.y.
No. 306S, Table 1
Rhyolite ash flow (40°30′00″N, 105°51′30″W; Iron Mtn., Jackson Co., CO). Collected by: M. K. Corbett; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

59. Bole (1971) K-Ar (hornblende) 54.6±1.1 m.y.
No. D-1, Table 2
Hornblende quartz latite porphyry dike (approx. 40°43′52″N, 105°37′18″W; Larimer Co., CO). Analytical data: K_2O = 3.06%, $*Ar^{40} = 2.504 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 55\%$. Collected by: C. E. Bole; dated by: C. E. Bole at Ohio State Univ.

60. Hart (1960) K-Ar (biotite) 70±2 m.y.
No. AOA, Table 1
Audubon stock (approx. 40°04′20″N, 105°37′W; Boulder Co., CO). Analytical data: K_2O = 5.83% and 6.20%, $*Ar^{40} = 6.34 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 69\%$. Collected by: S. R. Hart; dated by: S. R. Hart at Mass. Inst. of Tech. Comment: Hart (1960) states that the Audubon stock was emplaced 66.3±1.1 m.y. ago. This age was obtained by averaging the K-Ar ages given by biotite separates from a sample of the stock and four schist or granitic samples in the contact zone.

61. U. S. Geological Survey unpublished age Fission track (zircon) 62.6±6.3 m.y.
No. 458
Caribou stock. Quartz monzonite (?) (approx. 39°58′40″N, 105°34′55″W; Boulder Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 1.16 \times 10^7$ t/cm^2 (1185 tracks), induced tracks $\frac{1}{2}\rho_i = 0.584 \times 10^7$ t/cm^2 (595 tracks), neutron flux $\phi = 1.03 \times 10^{15}$ n/cm^2. Collected by: G. J. Neuerburg, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

62. Hart (1964) K-Ar (coarse biotite) 54.8 m.y.
No. BCOA, Table 4 (fine biotite-hornblende) 53.7 m.y.
Rb-Sr (coarse biotite) 63±9 m.y.
Eldora stock. Quartz monzonite (approx. 39°54′15″N, 105°35′20″W; Boulder Co., CO) Collected by: S. R. Hart; dated by: S. R. Hart.

63. McDowell (1971) K-Ar (biotite) 59.1±1.8 m.y.
No. L-1124
Eldora stock. Quartz monzonite (approx. 39°57′N, 105°35′30″W; Boulder Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

64. Naeser and Faul (1969) Fission track (apatite) 73±7 m.y.
No. EC-1 (sphene) 67.1±7.5 m.y.
Bryan Mountain (Eldora) stock. Quartz monzonite (approx. 39°57′N, 105°35′30″W; Boulder Co., CO). Analytical data: (apatite) spontaneous fission tracks $\rho_s = 1.66 \times 10^5$ t/cm^2 (505 tracks), induced tracks $\frac{1}{2}\rho_i = 1.71 \times 10^5$ t/cm^2 (298 tracks), neutron flux $\phi = 1.27 \times 10^{15}$ t/cm^2; (sphene) spontaneous fission tracks $\rho_s = 9.63 \times 10^5$ t/cm^2 (487 tracks), induced tracks $\frac{1}{2}\rho_i = 13.53 \times 10^5$ t/cm^2 (921 tracks), neutron flux $\phi = 3.09 \times 10^{15}$ n/cm^2. Collected by: C. W. Naeser; dated by: C. W. Naeser, U. S. Geological Survey. Comment: The 74-m.y. (apatite) and 72-m.y. (sphene) ages that were listed by Naeser and Faul (1969) have recently been recalculated.

65. Young (1972) K-Ar (hornblende) 44 m.y.
Diorite-monzonite stock (near 40°02′N, 105°27′W; Boulder Co., CO). Analytical data: not available; dated by: C. E. Hedge, U. S. Geological Survey.

66. McDowell (1971) K-Ar (hornblende) 77.6±2.3 m.y.
No. L-1031 (hornblende) 71.8±2.2 m.y.
Jamestown stock. Granodiorite (approx. 40°07′N, 105°24′W; Boulder Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

67. C. T. Wrucke (oral commun., 1973) K-Ar (biotite) 54.5±1.9 m.y.
Fission track (apatite) 52.9±8 m.y.
Fission track (zircon) 51.1±4.2 m.y.
Granodiorite pluton (40°06′54″N, 105°21′53″W; Boulder Co., CO). Analytical data: (biotite) $K_2O = 8.73\%$ and 8.73%, $*Ar^{40} = 7.124 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 94\%$; (apatite) spontaneous fission tracks $\rho_s = 2.82 \times 10^5$ t/cm^2 (588 tracks), induced tracks $\frac{1}{2}\rho_i = 3.55 \times 10^5$ t/cm^2 (740 tracks), neutron flux $\phi = 1.09 \times 10^{15}$ n/cm^2; (zircon) spontaneous fission tracks $\rho_s = 7.15 \times 10^6$ t/cm^2 (1490 tracks), induced tracks $\frac{1}{2}\rho_i = 4.49 \times 10^6$ t/cm^2 (935 tracks), neutron flux $\phi = 1.05 \times 10^{15}$ n/cm^2. Collected by: C. T. Wrucke, U. S. Geological Survey; dated by: (K-Ar) R. F. Marvin and H. H. Mehnert, (fission track) C. W. Naeser, U. S. Geological Survey.

68. C. T. Wrucke (oral commun., 1973) K-Ar (biotite) 64.2±2.2 m.y.
No. B743
Quartz latite dike (40°06′26″N, 105°21′07W; Boulder Co., CO). Analytical data: (biotite) $K_2O = 9.14\%$ and 9.22%, $*Ar^{40} = 8.842 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 91\%$. Collected by: C. T. Wrucke, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

69. C. T. Wrucke (oral commun., 1973) K-Ar (hornblende) 45.4±1.0 m.y.
No. B1382 Fission track (sphene) 50.6±7.1 m.y.
Monzonite porphyry stock (40°05′42″N, 105°19′42″W; Boulder Co., CO). Analytical data: (hornblende) $K_2O = 1.497\%$ and 1.495%, $*Ar^{40} = 1.015 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 85\%$; (sphene) spontaneous fission tracks $\rho_s = 1.14 \times 10^6$ t/cm^2 (379 tracks), induced tracks $\frac{1}{2}\rho_i = 1.39 \times 10^6$ t/cm^2 (462 tracks), neutron flux $\phi = 2.02 \times 10^{15}$ n/cm^2. Collected by: C. T. Wrucke, U. S. Geological Survey; dated by: (K-Ar) R. F. Marvin and H. H. Mehnert, (fission track) C. W. Naeser, U. S. Geological Survey.

70. C. T. Wrucke (oral commun., 1973) K-Ar (biotite) 64.6±2.2 m.y.
No. B1379
Quartz latite dike (40°02′10″N, 105°19′16″W; Boulder Co., CO). Analytical data: (biotite) $K_2O = 9.24\%$ and 9.29%, $*Ar^{40} = 8.988 \times 10^{-10}$ moles/gm, $*Ar^{40}/\Sigma Ar^{40} = 89\%$. Collected by: C. T. Wrucke, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

71. C. T. Wrucke (oral commun., 1973) K-Ar (biotite) 65.4±2.2 m.y.
No. B204
Quartz latite dike (40°01′20″N, 105°18′13″W; Boulder Co., CO). Analytical data: (biotite) K_2O = 9.18% and 9.26%, $*Ar^{40}$ = 9.056 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 96%. Collected by: C. T. Wrucke, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

72. E. E. Larson (written commun., 1973) K-Ar (biotite) 64.6±2.4 m.y.
No. Flag 28-65
Latite sill (approx. 40°00′11″N, 105°17′50″W; Flagstaff Mtn., Boulder Co., CO). Analytical data: K_2O = 9.235% and 9.339%, $*Ar^{40}$ = 9.032 x 10^{-10} and 9.072 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 65% and 64%. Collected by: E. E. Larson and R. Hobbitt, Univ. of Colorado; dated by: Geochron Laboratories, Inc. Cambridge, Massachusetts.

73. E. E. Larson (written commun., 1973) K-Ar (whole rock) 61.9±2.5 m.y.
No. R-14
Mafic latite (shoshonite) of the Ralston sill (approx. 39°49′27″N, 105°14′23″ W; collected in a tunnel, at about 150 feet west of east entrance, Jefferson Co., CO). Analytical data: K_2O = 3.197% and 3.176%, $*Ar^{40}$ = 2.992 x 10^{-10} and 2.955 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 35% and 44%. Collected by: E. E. Larson, L. La Fountain, and K. Kellogg, Univ. of Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

74. Evernden and others (1964) K-Ar (whole rock) 58.7 m.y.
No. KA 978, Appendix
Basalt (approx. 39°45′10″N, 105°09′45″; South Table Mtn., Jefferson Co., CO). Collected by: M. McKenna; dated by: J. F. Evernden and G. H. Curtis, Univ. of California at Berkeley. Comment: This age appears to be too young according to G. R. Scott (1972)

75. Evernden and others (1964) K-Ar (plagioclase) 64.8 m.y.
No. KA 992, Appendix
Denver Formation. Dacitic pumice (approx. 39°45′10″N, 105°09′45″W; South Table Mtn., Jefferson Co., CO). Collected by: G. H. Curtis and D. E. Savage; dated by: J. F. Evernden and G. H. Curtis, Univ. of California at Berkeley.

76. Scott (1972) K-Ar (biotite) 64.3±0.7 m.y.
No. 70-0-10
Dacitic pumice (approx. 39°45′10″N, 105°09′45″W; Jefferson Co., CO). Analytical data: K_2O = 8.43%, * $*Ar^{40}$ = 8.14 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 97%. Collected by: G. R. Scott, G. A. Izett, and J. D. Obradovich, U. S. Geological Survey; dated by: J. D. Obradovich. Comment: This sample was collected 35 feet above sample that gave Evernden and others (1964) an age of 64.8 m.y.

77. Pinson and others (1961) Rb-Sr (glass) 71±23 m.y.
No. R4261, Tables 2 and 3
Obsidian (probably near 39°40′N, 105°43′W; Georgetown, Clear Creek Co., CO). Analytical data: Rb = 257 ppm, Sr = 50 ppm, Sr^{87}/Sr^{86} = 0.7235, $*Sr^{87}/Rb^{87}$ = 0.001074. Dated by: Geochronology Laboratory at Mass. Inst. of Tech. Comment: If this age is for the plutons examined by Taylor and King (1967), then the age is too old. Taylor and King correlated the plutons with Oligocene rocks on Red Mountain (Taylor and others, 1968) and Iron Mountain (Corbett, 1968).

78. U. S. Geological Survey Fission track (sphene) 67.8±4.5 m.y.
unpublished age
Empire stock. Monzonite (approx. 39°45′46″N, 105°43′09″W; Clear Creek Co., CO). Analytical data: Spontaneous fission tracks ρ_s = 9.71 x 10^6 t/cm^2 (2698 tracks), induced tracks $\frac{1}{2}\rho_i$ = 4.81 x 10^6 t/cm^2 (1336 tracks), neutron flux ϕ = 1.10 x 10^{15} n/cm^2. Collected by: G. A. Izett, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

79. Young (1972) K-Ar (hornblende) 53 m.y.
Monzonite stock (near 39°46′N, 105°43′W; Clear Creek Co., CO). Analytical data: not available; dated by: C. E. Hedge, U. S. Geological Survey.

80. Schassberger (1972) K-Ar (sericite) 26.0±0.9 m.y.
No. 3
Mineralized porphyry (approx. 39°45′20″N, 105°49′30″W; Urad mine, Red Mountain, Clear Creek Co., CO). Collected by: H. T. Schassberger, AMAX Exploration, Inc., Denver, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Material analyzed was 90% sericite, 5% quartz, and 5% plagioclase plus minor impurities.

81. Naeser and others (1973) Fission track (zircon) 27.6±2.9 m.y.
No. 72-123
Rhyolite (near 39°45′30″N, 105°49′40″W; Henderson mine, Red Mountain, Clear Creek Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 2.05 \times 10^6$ t/cm^2 (663 tracks), induced tracks $\frac{1}{2}\rho_i = 2.56 \times 10^6$ t/cm^2 (831 tracks), neutron flux $\phi = 1.13 \times 10^{15}$ n/cm^2. Collected by: W. H. White, Climax Molybdenum Co., Empire, Colorado; dated by: C. W. Naeser, U. S. Geological Survey.

82. Naeser and others (1973) Fission track (zircon) 27.6±2.1 m.y.
No. 72-125
Rhyolite (near 39°45′30″N, 105°50′W; Henderson mine, Red Mountain, Clear Creek Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 2.57 \times 10^6$ t/cm^2 (1273 tracks), induced tracks $\frac{1}{2}\rho_i = 3.22 \times 10^6$ t/cm^2 (1595 tracks), neutron flux $\phi = 1.13 \times 10^{15}$ n/cm^2. Collected by: W. H. White, Climax Molybdenum Co., Empire, Colorado; dated by: C. W. Naeser, U. S. Geological Survey.

83. Naeser and others (1973) Fission track (zircon) 26.9±2.7 m.y.
No. 72-126
Rhyolite (near 39°45′30″N, 105°50′W; Henderson mine, Red Mountain, Clear Creek Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 1.77 \times 10^6$ t/cm^2 (713 tracks), induced tracks $\frac{1}{2}\rho_i = 2.28 \times 10^6$ t/cm^2 (920 tracks), neutron flux $\phi = 1.13 \times 10^{15}$ n/cm^2. Collected by: W. H. White, Climax Molybdenum Co., Empire, Colorado; dated by: C. W. Naeser, U. S. Geological Survey.

84. Naeser and others (1973) Fission track (zircon) 25.1±2.5 m.y.
No. 72-143
Rhyolite (near 39°45′30″N, 105°50′W; Henderson mine, Red Mountain, Clear Creek Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 3.09 \times 10^6$ t/cm^2 (715 tracks), induced tracks $\frac{1}{2}\rho_i = 4.03 \times 10^6$ t/cm^2 (932 tracks), neutron flux $\phi = 1.07 \times 10^{15}$ n/cm^2. Collected by: W. H. White, Climax Molybdenum Co., Empire, Colorado; dated by: C. W. Naeser, U. S. Geological Survey. Comment: Recalculation of the 25.3 ± 2.5 m.y. age listed in the abstract (Naeser and others, 1973).

85. Naeser and others (1973) Fission track (zircon) 22.8±2.3 m.y.
No. 72-144
Rhyolite (near 39°45′30″N, 105°50′W; Henderson mine, Red Mountain, Clear Creek Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 2.73 \times 10^6$ t/cm^2 (695 tracks), induced tracks $\frac{1}{2}\rho_i = 3.91 \times 10^6$ t/cm^2 (995 tracks), neutron flux $\phi = 1.07 \times 10^{6}$n/cm^2. Collected by: W. H. White, Climax Molybdenum Co., Empire, Colorado; dated by: C. W. Naeser, U. S. Geological Survey. Comment: Recalculation of the 23.1 ± 2.3 m.y. age listed in the abstract (Naeser and others, 1973).

86. Naeser and others (1973) Fission track (zircon) 27.6±2.9 m.y.
No. 70-169
Rhyolite (near 39°45′30″N, 105°50′W; Henderson mine, Red Mountain, Clear Creek Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 3.00 \times 10^6$ t/cm^2 (666 tracks), induced tracks $\frac{1}{2}\rho_i = 3.56 \times 10^6$ t/cm^2 (792 tracks), neutron flux $\phi = 1.07 \times 10^{15}$ n/cm^2. Collected by: W. H. White, Climax Molybdenum Co., Empire, Colorado; dated by: C. W. Naeser, U. S. Geological Survey.

87. Taylor and others (1968) K-Ar (sanidine) 27±3 m.y.
No. 3, Table 1
Rhyolite plug (approx. 39°46'N, 105°50'30"W; Red Mountain, Clear Creek Co., CO). Collected by: R. B. Taylor, U. S. Geological Survey; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

88. Naeser and others (1973) Fission track (zircon) 29.9±2.4 m.y.
No. 72N2
Latite porphyry sill (approx. 39°52'43"N, 106°19'17"W; Summit Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 4.71 \times 10^6$ t/cm^2 (1155 tracks), induced tracks $\frac{1}{2}\rho_i = 5.34 \times 10^6$ t/cm^2 (1311 tracks), neutron flux $\phi = 1.11 \times 10^{15}$ n/cm^2. Collected by: G. A. Izett and C. W. Naeser, U. S. Geological Survey; dated by: C. W. Naeser.

89. McDowell (1971) K-Ar (biotite) 38.6±1.2 m.y.
No. L-1032
Montezuma stock. Quartz monzonite (approx. 39°36'N, 105°54'W; Summit Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

90. V. E. Surface (written commun., 1973) K-Ar (biotite) 42.8±2.0 m.y.
Climax Molybdenum Company
Tucker Mountain stock. Quartz monzonite porphyry (39°27'25"N, 106°10'30"W; Summit Co., CO). Analytical data: $K_2O = 7.95\%$, $^*Ar^{40} = 5.10 \times 10^{-10}$ moles/gm, $^*Ar^{40}/\Sigma Ar^{40} = 61.6\%$ and 75.4%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

91. Tweto and Case (1972) K-Ar (sanidine?) 35.2±1.4 m.y.
V. E. Surface (written commun., 1973)
Climax Molybdenum Company
Rhyolite porphyry plug (39°27'10"N, 106°10'15"W; No Name Peak, Summit Co., CO). Analytical data: $K_2O = 7.17\%$, $^*Ar^{40} = 3.80 \times 10^{-10}$ moles/gm, $^*Ar^{40}/\Sigma Ar^{40} = 77.5\%$ and 60%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

92. V. E. Surface (written commun., 1973) K-Ar (biotite) 43.6±2.1 m.y.
Climax Molybdenum Company
Quartz monzonite porphyry (39°26'40"N, 106°10'00"W; Portal of the Lower D and G mine, Summit Co., CO). Analytical data: $K_2O = 2.43\%$, $^*Ar^{40} = 1.59 \times 10^{-10}$ moles/gm, $^*Ar^{40}/\Sigma Ar^{40} = 73.6\%$, 73.4%, and 80.6%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Humbug stock area (Tweto and Case, 1972).

93. V. E. Surface (written commun., 1973) K-Ar (biotite) 35.0±1.4 m.y.
Climax Molybdenum Company
Quartz monzonite porphyry (39°26'40"N, 106°09'45"W; Summit Co., CO). Analytical data: $K_2O = 7.17\%$, $^*Ar^{40} = 3.75 \times 10^{-10}$ moles/gm, $^*Ar^{40}/\Sigma Ar^{40} = 43.5\%$ and 17.4%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Humbug stock area (Tweto and Case, 1972).

94. V. E. Surface (written commun., 1973) K-Ar (biotite) 46.8±2.2 m.y.
Climax Molybdenum Company
Quartz monzonite porphyry (39°26'40"N, 106°08'20"W; Bald Mountain, Summit Co., CO). Analytical data: $K_2O = 7.53\%$, $^*Ar^{40} = 5.28 \times 10^{-10}$ moles/gm, $^*Ar^{40}/\Sigma Ar^{40} = 65.1\%$ and 41.9%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Mass. Comment: Humbug stock area (Tweto and Case, 1972).

95. V. E. Surface (written commun., 1973) K-Ar (biotite) 34.9±2.0 m.y.
Climax Molybdenum Company
Quartz monzonite porphyry (39°26′40″N, 106°08′20″W; Bald Mountain, Summit Co., CO). Analytical data: K_2O = 6.77%, $*Ar^{40}$ = 3.53 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 67.2% and 44.4%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Humbug stock area (Tweto and Case, 1972).

96. Moorbath and others (1967) Rb-Sr (sericite) 73±8 m.y.
No. 4550, Table 3
Material from tailings dump of concentration mill at Climax mine (near 39°24′N, 106°12′W; Summit Co., CO). Collected by: S. Moorbath; dated by: S. Moorbath at Geochronology Laboratory, Mass. Inst. of Tech. Comment: Rb-Sr age appears to be too old in comparison to the K-Ar age of 29.5 m.y. from the Climax Mine (see item No. 97).

97. Schassberger (1972) K-Ar (muscovite) 29.5±1.0 m.y.
No. 1
Porphyritic granite (approx. 39°22′N, 106°10′W; Climax mine, Lake Co., CO). Dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

98. Tweto and Case (1972) K-Ar (biotite) 27.0±1.9 m.y.
V. E. Surface (written commun., 1973)
Climax Molybdenum Company
Chalk Mountain stock. Rhyolite porphyry (39°22′N, 106°12′40″W; Lake Co., CO). Analytical data: K_2O = 7.87%, $*Ar^{40}$ = 3.20 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 36.6% and 27%. Collected by: personnel of Climax Molybdenum Co., Climax, Colorado; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

99. Pearson and others (1962) K-Ar (biotite) 64 m.y.
No. C-10 Pb-α (zircon) 530±60 m.y.
Lincoln Porphyry (approx. 39°20′30″N, 106°13′30″W; Lake Co., CO). Collected by: Ogden Tweto and R. C. Pearson, U. S. Geological Survey; dated by: (biotite) R. C. Pearson and H. H. Thomas, and (zircon) T. W. Stern, U. S. Geological Survey. Comment: Pb-α age is too old for this porphyry; zircons may be xenocrystic.

100. McDowell (1971) K-Ar (biotite) 64.7±1.9 m.y.
No. L-1125
Lincoln Porphyry. Porphyritic granodiorite (39°18′51″N, 106°13′35″W; Lake Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

101. Pearson and others (1962) K-Ar (biotite) 70 m.y.
No. C-12
Pando Porphyry (approx. 39°18′N, 106°15′30″W; Lake Co., CO). Collected by: Ogden Tweto and R. C. Pearson, U. S. Geological Survey; dated by: R. C. Pearson and H. H. Thomas, U. S. Geological Survey.

102. Pearson and others (1962) K-Ar (biotite) 41 m.y.
No. C-21 Pb-α (zircon) 120±20 m.y.
Johnson Gulch Porphyry (approx. 39°15′40″N, 106°16′10″W; Price mine dump, Lake Co., CO). Collected by: Ogden Tweto and R. C. Pearson, U. S. Geological Survey; dated by: (biotite) R. C. Pearson and H. H. Thomas and (zircon) T. W. Stern, U. S. Geological Survey. Comment: Zircons may be xenocrystic. K-Ar age is not consistent with geologic relations.

103. Linn (1963) K-Ar (sericite) 60 m.y.
Core DDH-1
Moorbath and others (1967) Rb-Sr (whole rock, mainly sericite) 100±11 m.y.
No. 4233, Table 3

White Porphyry (lower part) (approx. 39°13'30"N, 106°13'40"W, Hellena mine area, Lake Co., CO). Analytical data: Not available for K-Ar analysis. See Moorbath and others (1967) for Rb-Sr analytical data. Collected by: K. O. Linn; dated by: S. Moorbath at Geochronology Laboratory, Mass. Inst. of Tech. Comment: The analyzed drill core was from 370 feet below drill hole collar. Sericite age probably is a mineralization age. The Rb-Sr age appears to be too old. The White Porphyry is equivalent to the Pando Porphyry (see Pearson and others, 1962, 1966).

104. U. S. Geological Survey unpublished ages No. T1-F-6-16 — Fission track — (zircon) 44.1±5.0 m.y. (sphene) 39.2±4.2 m.y. (apatite) 18.5±4 m.y.

Twin Lakes pluton. Mafic schlieren in granodiorite (39°04'14"N, 106°24'11"W; Lake Co., CO). Analytical data: (zircon) spontaneous fission tracks $\rho_s = 4.95 \times 10^6$ t/cm^2 (710 tracks), induced tracks $\frac{1}{2}\rho_i = 3.87 \times 10^6$ t/cm^2 (556 tracks), neutron flux $\phi = 1.13 \times 10^{15}$ n/cm^2, U = 200 ppm; (sphene) spontaneous fission tracks $\rho_s = 2.09 \times 10^6$ t/cm^2 (668 tracks), induced track $\frac{1}{2}\rho_i = 2.22 \times 10^6$ t/cm^2 (708 tracks), neutron flux $\phi = 1.36 \times 10^{15}$ n/cm^2; (apatite) spontaneous fission tracks $\rho_s = 1.08 \times 10^6$ t/cm^2 (225 tracks), induced tracks $\frac{1}{2}\rho_i = 3.75 \times 10^5$ t/cm^2 (782 tracks), neutron flux $\phi = 1.05 \times 10^{15}$ n/cm^2, U = 11 ppm. Collected by: H. G. Wilshire, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey. Comment: The apparent time of emplacement for the pluton is about 42 m.y. ago; the apatite age may represent the time of uplift and cooling.

105. Obradovich and others (1969) No. 3, Table 1 — K-Ar — (biotite) 41.7±1.2 m.y.
Tweto and Case (1972) — Rb-Sr — (biotite) 49.7±4.5 m.y.
Twin Lake stock. Quartz monzonite porphyry (39°04'12"N, 106°28'25"W; Lake Co., CO). Analytical data: K-Ar data published, see Obradovich and others (1969). (Rb-Sr) Rb = 432.7 ppm, Sr = 25.01 ppm, $Sr^{87}/Sr^{86} = 0.7411$, $*Sr^{87}/Rb^{87} = 0.000682$. Collected by: F. E. Mutschler and Bruce Bryant, U. S. Geological Survey; dated by: (K-Ar) J. D. Obradovich and H. H. Mehnert, (Rb-Sr) C. E. Hedge, U. S. Geological Survey.

106. Moorbath and others (1967) No. 4534, Table 3 — Rb-Sr — (biotite) 56±10 m.y.
Twin Lakes stock. Granite (?) (approx. 39°04'30"N, 106°30'W; Lake Co., CO). Collected by: S. Moorbath; dated by: S. Moorbath at Geochronology Laboratory, Mass. Inst. of Tech.

107. E. E. Larson (written commun., 1973) — K-Ar — (whole rock) 1.25±0.2 m.y.
Basalt (39°18'18"N, 106°54'53"W; Pitkin Co., CO). Analytical data: $K_2O = 3.05\%$, $*Ar^{40} = 0.0569 \times 10^{-10}$ mole/gm, $*Ar^{40}/\Sigma Ar^{40} = 16\%$. Collected by: E. E. Larson, Univ. of Colorado and F. E. Mutschler, Eastern Washington State College, Cheney; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from igneous unit which is called informally the Aspen flow No. 2 by E. E. Larson.

108. E. E. Larson (written commun., 1973) — K-Ar — (whole rock) 1.98±0.3 m.y.
Basalt (39°18'16"N, 106°54'53"W, Pitkin Co., CO). Analytical data: $K_2O = 2.60\%$, $*Ar^{40} = 0.0758 \times 10^{-10}$ mole/gm, $*Ar^{40}/\Sigma Ar^{40} = 9\%$. Collected by: E. E. Larson, Univ. of Colorado and F. E. Mutschler, Eastern Washington State College, Cheney; dated by: M. Ozima, Univ. of Tokyo, Japan. Comment: Sample is from igneous unit which is called informally the Aspen flow No. 1 by E. E. Larson.

109. Obradovich and others (1969) No. 7, Table 1 — K-Ar — (biotite) 31.2±1.1 m.y.
Snowmass Creek sill. Granodiorite porphyry (39°11'07"N, 107°01'08"W; Pitkin Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

110. Obradovich and others (1969) No. 4, Table 1 — K-Ar — (biotite) 34.1±1.4 m.y.

Snowmass pluton. Granodiorite (39°07′03″N, 107°02′26″W; Pitkin Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

111. Obradovich and others (1969) K-Ar (muscovite) 72.2±2.2 m.y.
No. 1, Table 1
Bryant (1970)
Little Annie sill (?). Quartz-muscovite porphyry (39°07′57″N, 106°49′30″W; Pitkin Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

112. Obradovich and others (1969) K-Ar (biotite) 70.0±2.3 m.y.
No. 2, Table 1 (biotite) 67.4±2.2 m.y.
Bryant (1970)
Aplite (39°06′20″N, 106°48′02″W; Pitkin Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

113. Obradovich and others (1969) K-Ar (biotite) 33.9±1.1 m.y.
No. 6, Table 1
Lincoln Creek stock. Granodiorite porphyry (39°05′20″N, 106°38′29″W; Pitkin Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

114. Obradovich and others (1969) K-Ar (biotite) 33.9±1.0 m.y.
No. 5, Table 1
Bryant (1970)
Whiterock pluton. Granodiorite (39°00′35″N, 106°50′16″W; Pitkin Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

115. Obradovich and others (1969) K-Ar (biotite) 12.5±0.6 m.y.
No. 10, Table 1
Crystal pluton. Soda granite porphyry (39°03′16″N, 107°07′08″W; Gunnison Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

116. Obradovich and others (1969) K-Ar (biotite) 12.3±0.6 m.y.
No. 11, Table 1
Crystal pluton. Soda granite porphyry (39°03′06″N, 107°07′17″W; Gunnison Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey: dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey. Comment: Latitude is incorrectly listed as 38°03′06″N in table 1 (Obradovich and others, 1969).

117. Obradovich and others (1969) K-Ar (biotite) 29.0±1.1 m.y.
No. 9, Table 1
Paradise stock. Granodiorite (38°59′30″N, 107°03′28″W; Gunnison Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

118. Obradovich and others (1969) K-Ar (biotite) 29.1±1.0 m.y.
No. 8, Table 1
Crested Butte laccolith. Granodiorite porphyry (38°53′20″N, 106°56′36″W, Gunnison Co., CO). Collected by: F. E. Mutschler and B. Bryant, U. S. Geological Survey; dated by: J. D. Obradovich and H. H. Mehnert, U. S. Geological Survey.

119. Steven and others (1967) K-Ar (biotite) 26.8±2.7 m.y.
No. BC5793, Table 2
Lipman and others (1970)
No. BC5793, Table 3
Fish Canyon Tuff (38°26′56″N, 107°16′19″W; Sapinero Mesa, Gunnison Co., CO). Collected by: W. R. Hansen, U. S. Geological Survey; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey.

120. Dickinson and others (1968) K-Ar (biotite) 72.7±2.2 m.y.
No. RD1538, Table 3 (sanidine) 71.5±2.1 m.y.
Mancos Shale (upper part). Bentonite (approx. 38°17′20″N, 107°31′15″W; Gunnison Co., CO). Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

120A. R. G. Dickinson (written commun., 1973) K-Ar (biotite) 31.8±1.1 m.y.
(hornblende) 40.3±2.5 m.y.
(plagioclase) 80.4±5.3 m.y.
(plagioclase) 80.0±5.3 m.y.

Rhyodacite boulder in San Juan Formation (38°12′38″N, 107°30′30″W; Gunnison Co., CO). Analytical data: (biotite) K_2O = 7.51% and 7.45%, $*Ar^{40}$ = 3.54 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 88%; (hornblende) K_2O = 0.86%, 0.85%, 0.82%, and 0.83%, $*Ar^{40}$ = 0.503 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 91%; (plagioclase) K_2O = 0.52% and 0.52%, $*Ar^{40}$ = 0.627 x 10^{-10} and 0.631 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 84% and 93%. Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey. Comment: The rhyodacite boulder was about 700-800 feet above the base and about 1500 feet from the top of the formation. The biotite age is in good agreement with the ages listed for sample RD-336-69 (see entry 125), which is also from the San Juan Formation. However, the hornblende and plagioclase ages are much older and are geologically unreasonable (Lipman and others, 1970). It appears that the hornblende and plagioclase contain excess argon. Similar hornblende ages are listed under entry 126.

120B. R. G. Dickinson (written commun., 1973) K-Ar (biotite) 26.7±2.7 m.y.
(hornblende) 27.2±1.2 m.y.
(plagioclase) 28.2±1.7 m.y.

Pumice (38°16′47″N, 107°37′19″W; Gunnison Co., CO). Analytical data: (biotite) K_2O = 7.46% and 7.45%, $*Ar^{40}$ = 2.96 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 20%; (hornblende) K_2O = 1.06% and 1.03%, $*Ar^{40}$ = 0.433 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 79%; (plagioclase) K_2O = 0.73% and 0.73%, $*Ar^{40}$ = 0.306 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 82%. Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey. Comment: The pumice is from a thick white ash flow tuff about 200 feet below the top of the beds mapped as San Juan Formation at this locality. The radiometric ages indicate a close temporal affinity with sample RD-1901-57 (see entry 121).

121. Lipman and others (1970) K-Ar (biotite) 29.3±1.2 m.y.
No. RD-1901-57, Table 3 (sanidine) 27.4±0.8 m.y.
Moderately welded devitrified tuff (38°17′37″N, 107°38′05″W; Storm King Mtn.; Cimarron Ridge, Gunnison Co., CO). Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey. Comment: This sample is approximately the same age as sample RD-1717 (see entry 120B). The sample locality listed above is a corrected location (see Lipman and others, 1970).

122. Dickinson and others (1968) K-Ar (sanidine) 75.0±2.2 m.y.
No. 1-RM-67, Table 3
Mancos Shale (upper part). Bentonite (approx. 38°18′30″N, 107°31′W; Montrose Co., CO). Collected by: R. G. Dickinson, R. F. Marvin, and H. H. Mehnert, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert.

123. Marvin (1968) K-Ar (biotite) 23±2 m.y.
(biotite) 25±2 m.y.

West Elk Breccia. Ash flow (38°29′N, 107°33′W; Montrose Co., CO). Analytical data: K_2O = 7.40%, $*Ar^{40}$ = 2.577 x 10^{-10} and 2.752 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 41% and 45%. Collected by: W. R. Hansen, U. S. Geological Survey; dated by: H. H. Thomas and R. F. Marvin, U. S. Geological Survey. Comment: Ages are apparently too young, as this ash flow is reported to be stratigraphically lower than the Fish Canyon Tuff on Sapinero Mesa, which gave a 26.8-m.y. age (see entry No. 119).

124. Dickinson and others (1968) — K-Ar — (biotite) 72.7±2.2 m.y.; (sanidine) 75.2±2.3 m.y.
No. 3-RM-67, Table 3
Mancos Shale (upper part), Exiteloceras jenneyi zone. Bentonite (38°25′21″N, 107°39′11″W; Montrose Co., CO). Collected by: R. G. Dickinson, R. F. Marvin, and H. H. Mehnert, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert.

125. Lipman and others (1970) — K-Ar — (biotite) 31.4±1.3 m.y.; (hornblende) 32.1±2.4 m.y.; (plagioclase) 32.9±4.3 m.y.
No. RD-336-68, Table 2
San Juan Formation. Rhyodacite (38°19′53″N, 107°38′08″W; Storm King Mountain, Montrose Co., CO). Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey. Comment: The rhyodacite was collected about 400 feet above the base and about 600 feet from the top of the formation. This sample is equivalent in age to sample RD-1877 (see entry No. 120A), but may be slightly younger as it is 200-400 feet higher in the stratigraphic section.

126. Dickinson and others (1968) — K-Ar — (biotite) 70.2±2.1 m.y.; (plagioclase) 61.5±6.2 m.y.; (hornblende) 86.5±4.3 m.y.; (hornblende) 87.3±4.4 m.y.
No. RD-845-64, Table 3
Rhyodacite tuff breccia (38°12′30″ N, 107°35′47″W; Ouray, Co., CO). Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: The biotite age is probably the correct age. The plagioclase age is probably too young and the hornblende ages are too old.

127. Dickinson and others (1968) — K-Ar — (biotite) 66.9±4.0 m.y.
No. RD-828-64, Table 3
Spruce Ridge dike. Rhyodacite (38°10′45″N, 107°36′43″W; Ouray Co., CO). Collected by: R. G. Dickinson, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

128. Armstrong (1969) — K-Ar — (altered mafic minerals) 49.3 m.y.; (plagioclase) 23.1 m.y.
No. 738, Table 1
Altered diorite porphyry (37°59′05″N, 107°42′30″W; Ouray Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

129. Armstrong (1969) — K-Ar — (whole rock) 25.5 m.y.
No. 739, Table 1
San Juan Formation. Altered andesite tuff (37°58′40″N, 107°43′00″W; Ouray Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

130. McDowell (1971) — K-Ar — (biotite-chlorite) 25.4±0.8 m.y.
No. L-1036
Lipman and others (1970)
No. L-1036, Table 4
Ophir pluton. Porphyritic monzonite (37°51′32″N, 107°52′05″W; San Miguel Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

131. W. P. Pratt (oral commun., 1973) K-Ar (biotite) 16.2±0.5 m.y.
No. PH-7
Trachyte (37°44′03″N, 107°56′26″W; Dolores Co., CO). Analytical data: K_2O = 8.015%, $*Ar^{40}$ = 1.93 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 61%. Collected by: W. P. Pratt, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

132. W. P. Pratt (oral commun., 1973) K-Ar (hornblende) 82.1±2.5 m.y.
No. MR-2 Fission track (zircon) 43.0±4.0 m.y.
Fission track (sphene) 48.7±5.1 m.y.
Rico dome. Monzonite (37°41′47″N, 108°02′21″W; Dolores Co., CO). Analytical data: (hornblende) K_2O = 0.258%, $*Ar^{40}$ = 0.463 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 58%; (zircon) spontaneous fission tracks ρ_s = 5.92 x 10^6 t/cm^2 (1075 tracks), induced tracks $\frac{1}{2}\rho_i$ = 5.31 x 10^6 t/cm^2 (964 tracks), neutron flux ϕ = 1.26 x 10^{15} n/cm^2; (sphene) spontaneous fission tracks ρ_s = 2.29 x 10^6 (836 tracks), induced tracks $\frac{1}{2}\rho_i$ = 1.80 x 10^6 t/cm^2 (660 tracks), neutron flux ϕ = 1.26 x 10^{15} n/cm^2. Collected by: E. T. McKnight; dated by: H. H. Mehnert (K-Ar) and C. W. Naeser (fission track), U. S. Geological Survey. Comment: The hornblende age appears questionable.

133. W. P. Pratt (oral commun., 1973) K-Ar (biotite) 64.0±1.8 m.y.
No. MR-1 Fission track (zircon) 58±7 m.y.
Fission track (sphene) 48±8 m.y.
Rico Dome. Monzonite (37°41′34″N, 108°02′42″W; Dolores Co., CO). Analytical data: (biotite) K_2O = 7.815%, $*Ar^{40}$ = 7.51 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 92%; (zircon) spontaneous fission tracks ρ_s = 2.46 x 10^6 t/cm^2 (740 tracks), induced tracks $\frac{1}{2}\rho_i$ = 1.62 x 10^6 t/cm^2 (488 tracks), neutron flux ϕ = 1.26 x 10^{15} n/cm^2; (sphene) spontaneous fission tracks ρ_s = 1.4 x 10^6 t/cm^2 (261 tracks), induced tracks $\frac{1}{2}\rho_i$ = 1.14 x 10^6 t/cm^2 (300 tracks), neutron flux ϕ = 1.26 x 10^{15} n/cm^2. Collected by: E. T. McKnight; dated by: H. H. Mehnert (K-Ar) and C. W. Naeser (fission track), U. S. Geological Survey.

134. Armstrong (1969) K-Ar (impure pyroxene-chlorite) 179 m.y.
No. 744, Table 1 (impure plagioclase) 61.3 m.y.
Diorite porphyry dike (37°38′20″N, 108°03′35″W; Dolores Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ. Comment: The 179-m.y. age appears spurious.

135. Armstrong (1969) K-Ar (impure hornblende-chlorite) 481 m.y.
No. 745, Table 1 (impure plagioclase) 83.7 m.y.
Laccolith. Diorite porphyry (37°14′22″N, 108°46′32″W; Montezuma Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ. Comment: These ages appear spurious.

136. Armstrong (1969) K-Ar (impure augite) 85.5 m.y.
No. 743, Table 1 (impure biotite) 65.0 m.y.
Augite monzonite (37°23′20″N, 108°04′40″W; La Plata Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ. Comment: The 85.5-m.y. age appears questionable.

137. W. P. Pratt (oral commun., 1973) K-Ar (hornblende) 80.1±2.4 m.y.
No. PH-39A Fission track (zircon) 57.2±6.9 m.y.
Fission track (sphene) 78±16 m.y.
Latite porphyry (37°42′28″N, 107°55′13″W; San Juan Co., CO). Analytical data: (hornblende) K_2O = 0.784%, $*Ar^{40}$ = 1.37 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 87%; (zircon) spontaneous fission tracks ρ_s = 8.74 x 10^6 t/cm^2 (688 tracks), induced tracks $\frac{1}{2}\rho_i$ = 5.87 x 10^6 t/cm^2 (462 tracks), neutron flux ϕ = 1.26 x 10^{15} n/cm^2; (sphene) spontaneous fission tracks ρ_s = 1.47 x 10^6 t/cm^2 (286 tracks), induced tracks $\frac{1}{2}\rho_i$ = 0.725 x 10^6 t/cm^2 (141 tracks), neutron flux ϕ = 1.26 x 10^{15} n/cm^2. Collected by: W. P. Pratt, U. S. Geological Survey; dated by: H. H. Mehnert (K-Ar) and C. W. Naeser (fission track), U. S. Geological Survey. Comment: The hornblende age is questionable and the sphene age is questionable because of the large number of crystal defects present in the sphene.

138. McDowell (1971) K-Ar (biotite-chlorite) 26.9±0.8 m.y.
No. L-1126
Lipman and others (1970)
No. L-1126, Table 4
Silverton stock. Quartz monzonite (37°47′43″N, 107°40′26″W; San Juan Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

139. McDowell (1971) K-Ar (impure hornblende) 24.1±0.8 m.y.
No. L-942
Lipman and others (1970)
No. L-942, Table 4
Silverton stock. Quartz monzonite (37°47′57″N, 107°40′29″W; San Juan Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

140. Armstrong (1969) K-Ar (whole rock) 14.8 m.y.
No. 741, Table 1
Burns Formation. Altered felsite porphyry (37°52′ 38″N, 107°43′27″W; San Juan Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

141. U. S. Geological Survey unpublished age K-Ar (whole rock) 18.4±0.6 m.y.
No. 72L-66H
Basalt (38°07′31″N, 107°14′W; Cannibal Mesa, Hinsdale Co., CO). Analytical data: K_2O = 3.28%, $*Ar^{40}$ = 0.893 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 85%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

142. U. S. Geological Survey unpublished age K-Ar (whole rock) 18.0±0.6 m.y.
No. 72L-66B
Basalt (38°07′29″N, 107°14′W; Cannibal Mesa, Hinsdale Co., CO). Analytical data: K_2O = 3.27%, $*Ar^{40}$ = 0.872 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 93%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

143. Jaffe and others (1959) Pb-α (zircon) 23±10 m.y.
No. 9
Granite dike (near 37°59′N, 107°23′W; Alpine Gulch, Hinsdale Co., CO). Collected by: E. S. Larsen, Jr., U.S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

144. Mehnert and others (1973a) K-Ar (sanidine) 22.4±0.6 m.y.
No. 1 (biotite) 22.7±0.6 m.y.
Intracaldera Sunshine Peak Tuff. Rhyolitic tuff (37°56′30″N, 107°22′25″W; Hinsdale Co., CO). Collected by: P. W. Lipman and T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

145. Mehnert and others (1973a) K-Ar (sanidine) 22.7±0.6 m.y.
No. 3 (biotite) 22.9±0.6 m.y.
Quartz latite flow of Grassy Mountain. Vitrophyre (37°56′15″N, 107°21′10″W; Hinsdale Co., CO). Collected by: H. R. Covington and T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

146. Steven and others (1967) K-Ar (sanidine) 22.9±0.6 m.y.
No. S342B, Table 2 (sanidine) 22.0±0.6 m.y.
Lipman and others (1970)
No. S342B, Table 5
Mehnert and others (1973a)
No. 2

Hinsdale Formation. Welded tuff (37°55′50″N, 107°11′15″W; Hinsdale Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert and J. D. Obradovich, U. S. Geological Survey. Comment: Mehnert and others (1973) called the welded tuff the Sunshine Peak Tuff.

147. Steven and others (1967) — K-Ar — (plagioclase) 12.4±1.3 m.y.; (plagioclase) 15.6±0.9 m.y.
No. S342A, Table 2
Lipman and others (1970)
No. S342, Table 5
Hinsdale Formation. Basalt (37°55′20″N, 107°12′W; Jarosa Mesa, Hinsdale Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert and J. D. Obradovich, U. S. Geological Survey.

148. Jaffe and others (1959) — Pb-α — (zircon) 15±10 m.y.
No. 1
Hinsdale Formation (Larson and Cross, 1956). Rhyolite (near 37°48′N, 107°09′W; Spring Creek, Hinsdale Co., CO). Collected by: E. S. Larsen, Jr., U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

149. Jaffe and others (1959) — Pb-α — (zircon) 22±10 m.y.
No. 6
Quartz latite (37°51′(?) N, 106°57′(?) W; near Sunnyside, Mineral Co., CO). Collected by: David Gottfried and George Phair, U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

150. Steven and others (1967) — K-Ar — (sanidine) 27.7±0.8 m.y.
No. S318, Table 2
Lipman and others (1970)
No. S318, Table 3
La Garita Member of Fish Canyon Tuff (37°57′06″N, 106°53′18″W; Mineral Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

151. Steven and others (1967) — K-Ar — (sanidine) 27.9±0.8 m.y.
No. S292, Table 2
Lipman and others (1970)
No. S292, Table 3
La Garita Member of Fish Canyon Tuff (37°54′46″N, 106°50′15″W; Mineral Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

152. Armstrong (1969) — K-Ar — (biotite-chlorite) 26.5 m.y.
No. 736, Table 1
Lipman and others (1970)
No. 736, Table 4
Fisher Quartz Latite. Andesite porphyry (37°46′15″N, 106°49′28″W; Mineral Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

153. Armstrong (1969) — K-Ar — (biotite) 26.7 m.y.
No. 737, Table 1
Lipman and others (1970)
No. 737, Table 3
Mammoth Mountain Tuff. Welded tuff (37°46′05″N, 106°47′12″W; Mineral Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

154. Steven and others (1967) — K-Ar — (sanidine) 26.8±1.4 m.y.
No. S333, Table 2

Lipman and others (1970)
No. S333, Table 4
Fisher Quartz Latite (37°42′N, 106°54′15″W; Copper Mountain, Mineral Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

155. Steven and others (1967) K-Ar (sanidine) 26.5±1.0 m.y.
No. S332, Table 2
Lipman and others (1970)
No. S332, Table 4
Fisher Quartz Latite. Basal vitrophyre (37°40′43″N, 106°57′W; Fisher Mountain, Mineral Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

156. Steven and others (1967) K-Ar (sanidine) 27.3±0.8 m.y.
No. Ds10, Table 2 (biotite) 26.3±0.8 m.y.
Lipman and others (1970) (hornblende) 25.9±1.8 m.y.
No. Ds10, Table 4 (plagioclase) 25.9±1.8 m.y.
(glass) 24.7±0.7 m.y.
Fisher Quartz Latite. Basal vitrophyre (37°41′05″N, 106°56′35″W; Fisher Mountain, Mineral Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

157. Lipman and others (1970) K-Ar (biotite) 29.6±1.2 m.y.
No. 65L-132, Table 3 (plagioclase) 30.0±2.2 m.y.
Treasure Mountain Tuff. Quartz latitic basal vitrophyre (37°28′N, 106°49′W; Treasure Mountain, Mineral Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

158. Jaffe and others (1959) Pb-α (zircon) 24±10 m.y.
No. 7
Potosi Volcanic Group (San Cristobal quad., San Juan Mountains, CO). Collected by: E. S. Larsen, Jr., U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey. Comment: Sample locality is not plotted on map, as exact geographic location is not known.

159. Jaffe and others (1959) Pb-α (zircon) 22±10 m.y.
No. 8
Treasure Mountain Tuff (San Juan Mountains, CO). Collected by: E. S. Larsen, Jr., U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey. Comment: Sample locality is not plotted on the map as the geographic location is not known.

160. Lipman and others (1970) K-Ar (plagioclase) 31.1±2.7 m.y.
No. Ds 141B, Table 2
Conejos Formation. Andesite (37°23′N, 106°59′W; Archuleta Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

161. Jaffe and others (1959) Pb-α (zircon) 14±10 m.y.
No. 4
Quartz latite porphyry (near 37°21′N, 106°58′W; Jackson Mountain, Archuleta Co., CO). Collected by: David Gottfried and George Phair, U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

162. Faul and others (1959) K-Ar (biotite) 27.0 m.y.
Marvin (1968) (biotite) 21.4 m.y.
Granite (near 37°16′N, 106°47′W; Square Top Mountain, Archuleta Co., CO). Analytical data: not available. Collected by: David Gottfried, U. S. Geological Survey; dated by: Henry Faul, U. S. Geological Survey.

163. Jaffe and others (1959) Pb-α (zircon) 10±10 m.y.
No. 2 (zircon) 11±10 m.y.
Quartz latite porphyry (near 37°15'N, 106°46'W; Archuleta Co., CO). Collected by: David Gottfried and George Phair, U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

164. Lipman and others (1970) K-Ar (biotite) 33.4±1.3 m.y.
No. 68L-91, Table 2 (hornblende) 31.4±1.8 m.y.
Conejos Formation. Rhyodacite (37°06'N, 106°43'W; Navajo Peak, Archuleta Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

165. U. S. Geological Survey K-Ar (whole rock) 4.4±0.22 m.y.
No. 68L-134I
Basalt (37°03'N, 106°10'W; Los Mogotes, Conejos Co., CO). Analytical data: K_2O = 1.73%, $*Ar^{40}$ = 0.111 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 42%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

166. Lipman and others (1970) K-Ar (plagioclase) 4.7±1.4 m.y.
No. 67L-16, Table 5
Hinsdale Formation. Basalt (37°04'N, 106°11'W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

167. Lipman and others (1970) K-Ar (plagioclase) 5.3±0.7 m.y.
No. 67L-17A, Table 5
Diabase dike (37°04'N, 106°11'W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

168. U. S. Geological Survey K-Ar (whole rock) 19.8±0.6 m.y.
No. 68L-16A
Basalt (37°09'N, 106°12'W; La Jara Creek, Conejos Co., CO). Analytical data: K_2O = 1.52%, $*Ar^{40}$ = 0.447 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 81%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

169. U. S. Geological Survey K-Ar (whole rock) 26.8±0.8 m.y.
No. 66L-26
Basalt (37°09'N, 106°13'W; Ra Jadero Canyon, Conejos Co., CO). Analytical data: K_2O = 1.36%, $*Ar^{40}$ = 0.542 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 73%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

170. U. S. Geological Survey K-Ar (whole rock) 24.3±0.8 m.y.
No. 66L-30
Basalt (37°09'N, 106°14'W; Ra Jadero Canyon, Conejos Co., CO). Analytical data: K_2O = 2.66%, $*Ar^{40}$ = 0.963 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 63%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

171. U. S. Geological Survey K-Ar (whole rock) 4.6±0.26 m.y.
No. 66L-36
Basalt (37°13'N, 106°12'W; Los Mogotes, Conejos Co., CO). Analytical data: K_2O = 1.24%, $*Ar^{40}$ = 0.085 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 38%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

172. Lipman and others (1970) K-Ar (whole rock) 17.7±1.4 m.y.
No. 68L-17, Table 5

Hinsdale Formation. Basalt (37°14′N, 106°12′W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

173. Lipman and others (1970) K-Ar (biotite) 27.6±1.1 m.y.
No. 65L-231, Table 3 (plagioclase) 27.0±1.2 m.y.
Treasure Mountain Tuff. Quartz latitic basalt vitrophyre (37°19′15″N, 106°35′30″W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

174. Lipman and others (1970) K-Ar (biotite) 28.5±1.4 m.y.
No. 67L-124, Table 3
Treasure Mountain Tuff. Quartz latitic ash flow (37°21′N, 106°31′W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

175. Jaffe and others (1959) Pb-α (zircon) 12±10 m.y.
No. 3
Quartz latite (near 37°22′N, 106°35′W; Klondike Mountain, Conejos Co., CO). Collected by: David Gottfried and George Phair, U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

176. Lipman and others (1970) K-Ar (biotite) 25.8±1.0 m.y.
No. 68L-107, Table 4
Rhyodacite (37°24′N, 106°39′W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

177. Lipman and others (1970) K-Ar (biotite) 29.1±1.2 m.y.
No. 67L-113, Table 4
Alamosa River stock. Monzonite (37°23′N, 106°33′W; Telluride Mountain, Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

178. Lipman and others (1970) K-Ar (biotite) 28.5±1.2 m.y.
No. 67L-109, Table 4 (biotite) 28.0±0.8 m.y.
(plagioclase) 27.0±2.3 m.y.
(hornblende) 31.8±2.3 m.y.
(hornblende) 31.6±2.3 m.y.
(hornblende) 32.1±1.6 m.y.
Rhyodacite (37°24′N, 106°15′W; Conejos Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey. Comment: The hornblende ages are too old (Lipman and others, 1970).

179. U. S. Geological Survey K-Ar (whole rock) 18.8±0.4 m.y.
No. 66L-98
Basalt (37°23′N, 106°11′W; Green Ridge, Conejos Co., CO). Analytical data: K_2O = 2.49%, $*Ar^{40}$ = 0.694 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 83%. Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

180. Lipman and others (1970) K-Ar (biotite) 28.7±1.1 m.y.
No. 66L-101-B, Table 4 (plagioclase) 26.2±2.2 m.y.
Rhyodacite (37°28′N, 106°13′W; Rio Grande Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

181. Mehnert and others (1973 b) K-Ar (biotite) 22.9±0.6 m.y.
No. 1 (sanidine) 22.8±0.6 m.y.
Quartz latite of South Mountain (37°24′30″N, 106°36′W; Rio Grande Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

182. Steven and others (1967) — K-Ar — (sanidine) 19.2±0.8 m.y.
No. Ds29c, Table 2 — (biotite) 20.3±0.8 m.y.
Lipman and others (1970) — (hornblende) 20.3±0.8 m.y.
No. Ds29c, Table 4 — (plagioclase) 20.9±0.8 m.y.
Mehnert and others (1973 b)
No. 3
Quartz latite (37°24′45″N, 106°35′58″W; Rio Grande Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: Rock designated as rhyolite of Cropsy Mountain by Mehnert and others (1973)

183. Mehnert and others (1973 b) — K-Ar — (alunite) 22.3±0.5 m.y.
No. 2 — (alunite) 22.4±0.5 m.y.
Altered rock (37°25′30″N, 106°36′30″W; Science tunnel dump, Rio Grande Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

184. Lipman and others (1970) — K-Ar — (glass) 21.9±0.9 m.y.
No. 65L-161-A, Table 5
Hinsdale Formation. Rhyolite obsidian (37°31′N, 106°38′W; Rio Grande Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

185. Lipman and others (1970) — K-Ar — (whole rock) 23.4±1.0 m.y.
No. 67L-107-B, Table 5
Hinsdale Formation. Basalt (37°32′N, 106°37′W; Rio Grande Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

186. Armstrong (1969) — K-Ar — (biotite) 28.2 m.y.
No. 735, Table 1
Lipman and others (1970)
No. 735, Table 3
Mammoth Mountain Tuff. Quartz latitic ash flow (37°41′00″N, 106°39′30″W; Rio Grande Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

187. Steven and others (1967) — K-Ar — (sanidine) 27.8±0.8 m.y.
No. Ds28, Table 2 — (biotite) 27.7±0.8 m.y.
Lipman and others (1970) — (hornblende) 26.5±1.9 m.y.
No. Ds28, Table 3 — (plagioclase) 27.4±1.9 m.y.
Fish Canyon Tuff (37°48′38″N, 106°39′35″W; Rio Grande Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

188. Jaffe and others (1959) — Pb-α — (zircon) 17±10 m.y.
No. 5 — (zircon) 21±10 m.y.
Quartz latite porphyry (37°48′N (?), 106°32′W (?), Baughman Creek, Creede quad., Saguache Co., CO). Collected by: David Gottfried and George Phair, U. S. Geological Survey; dated by: H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing, U. S. Geological Survey.

189. Lipman and others (1970) — K-Ar — (biotite) 34.4±1.4 m.y.
No. 68L-20, Table 2 — (hornblende) 35.0±2.4 m.y.
Rhyodacite dike (37°46′N, 106°26′W; Saguache Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

190. Lipman and others (1970) — K-Ar — (biotite) 32.4±1.3 m.y.
No. 66L-120, Table 2
Rhyolite dike (37°49′N, 106° 20′W; Saguache Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

191. Lipman and others (1970) K-Ar (biotite) 34.1±1.4 m.y.
No. 68L-105, Table 2 (hornblende) 33.8±1.6 m.y.
Conejos Formation. Rhyodacite (37°50′N, 106°21′W; Saguache Co., CO). Collected by: P. W. Lipman, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

192. Lipman and others (1970) K-Ar (biotite) 34.2±1.4 m.y.
No. Ds196, Table 2 (hornblende) 33.4±2.2 m.y.
Conejos Formation. Rhyodacite (37°57′30″N, 106°16′W; Saguache Co., CO). Collected by: T. A. Steven, U. S. Geological Survey; dated by: H. H. Mehnert, U. S. Geological Survey.

193. R. E. Van Alstine (written commun., 1973) K-Ar (whole rock) 31.8±1.1 m.y.
No. V-567
Trachyandesite (38°25′15″N, 106°07′25″W; Saguache Co., CO). Analytical data: K_2O = 3.80% and 3.83%, $*Ar^{40}$ = 1.804 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 76%. Collected by: R. E. Van Alstine, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: The trachyandesite is stratigraphically above the andesite and basalt of entries No. 194 and No. 195.

194. Lipman and others (1970) K-Ar (plagioclase) 34.2±1.6 m.y.
No. V-999, Table 2
Rawley Andesite. Basalt (38°26′22″N, 106°07′06″W; Chaffee Co., CO). Collected by: R. E. Van Alstine, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: Recent study by R. E. Van Alstine has cast doubt on the Rawley Andesite designation for this sample; sample is probably from the Squirrel Gulch Latite (R. E. Van Alstine, written commun., 1973).

195. Lipman and others (1970) K-Ar (biotite) 33.2±1.3 m.y.
No. V-998, Table 2 (plagioclase) 33.7±2.1 m.y.
Rawley Andesite (38°27′19″N, 106°06′00″W; Chaffee Co., CO). Collected by: R. E. Van Alstine, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: Recent study by R. E. Van Alstine has cast doubt on the Rawley Andesite designation for this sample; sample is probably from the Squirrel Gulch Latite (R. E. Van Alstine, written commun., 1973).

196. McDowell (1971) K-Ar (biotite) 70.4±2.1 m.y.
No. L-1035 (hornblende) 69.4±2.1 m.y.
Salida stock. Granodiorite (approx. 38°38′N, 105°57′W; Chaffee Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

197. C. T. Wrucke (oral commun., 1973) K-Ar (biotite) 70.0±2.6 m.y.
No. CM-201
Granodiorite, Whitehorn stock (38°41′25″N, 105°56′02″W; Chaffee Co., CO). Analytical data: K_2O = 9.15% and 9.20%, $*Ar^{40}$ = 9.650 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 96%. Collected by: C. T. Wrucke, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

198. Van Alstine (1969) K-Ar (sanidine) 35.4±1.1 m.y.
Table 5 (biotite) 37.3±1.9 m.y.
Wall Mountain Tuff. Vitrophyric welded tuff (approx. 38°39′20″N, 106°04′W; Chaffee Co., CO). Collected by: R. E. Van Alstine, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey. Comment: These ages supersede the following ages – 34 ± 3 m.y. (biotite), 39 ± 3 m.y. (sanidine), and 34±3 m.y. (glass) – as given by Van Alstine (1965) and Marvin (1968) for the same mineral concentrates; the glass concentrate was not re-analyzed.

199. Van Alstine (1969) K-Ar (obsidian) 29.3±1.5 m.y.
Table 9
Nathrop Volcanics. Perlite (approx. 38°45′N, 106°04′W; Ruby Mountain, Chaffee Co., CO). Collected by: R. E. Van Alstine, U. S. Geological Survey; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

200. Van Alstine (1969) K-Ar (sanidine) 28.0±0.8 m.y.
Table 9
Nathrop Volcanics. Rhyolite (38°45′20″N, 106°04′40″W; quarry, Chaffee Co., CO). Collected by: R. F. Marvin; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

201. Van Alstine (1969) K-Ar (sanidine) 29.1±0.9 m.y.
Table 9
Nathrop Volcanics. Prophyritic rhyolite (38°45′50″N, 106°04′35″W; Chaffee Co., CO). Collected by: R. F. Marvin; dated by: R. F. Marvin and H. H. Mehnert, U. S. Geological Survey.

202. R. B. Taylor (oral commun., 1973) Fission track (zircon) 31.8±3.5 m.y.
No. SM-5-72
Badger Creek Tuff (near 38°49′06″N, 105°59′12″W; Chaffee Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 2.50 \times 10^6$ t/cm^2 (637 tracks), induced tracks $\frac{1}{2}\rho_i = 2.55 \times 10^6$ t/cm^2 (650 tracks), neutron flux $\phi = 1.06 \times 10^{15}$ n/cm^2. Collected by: G. R. Scott, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

203. Young (1972) K-Ar (biotite) 64 m.y.
(biotite) 64 m.y.
Upper Buckskin Gulch stock (near 39°19′N, 106°08′W; Park Co., CO). Analytical data: not available. Dated by: C. E. Hedge, U. S. Geological Survey.

204. Sawatzky (1967) (1968) K-Ar (whole rock) 56.8±2.6 m.y.
Epis and Chapin (1968)
Denver Formation. Andesite flow (approx. 39°15′15″N, 105°55′W; Park Co., CO). Analytical data: K_2O = 2.89% and 2.84%, $*Ar^{40} = 2.527 \times 10^{-10}$ and 2.352×10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 23% and 44%. Collected by: D. L. Sawatzky; dated by: Geochron Laboratories, Inc., Cambridge, Mass.

205. Epis and Chapin (1968) K-Ar (sanidine) 40.0±1.2 m.y.
Sawatzky (1968)
Wall Mountain Tuff (approx. 39°08′N, 105°43′45″W; Park Co., CO). Analytical data: K_2O = 9.38% and 9.43%, $*Ar^{40} = 5.705 \times 10^{-10}$ and 5.529×10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 89% and 81%. Dated by: Geochron Laboratories, Inc., Cambridge, Mass. Comment: Analyzed material is estimated to be 98% sanidine and 2% rock fragments and impurities. Additional K-Ar ages strongly suggest that this age is too old; quite likely the analyzed material was contaminated with Precambrian detritus. Wall Mountain Tuff is the same as ash flow 1 (Epis and Chapin, 1968).

206. Epis and Chapin (1968) K-Ar (whole rock) 34.1±1.1 m.y.
Upper member of the Thirtynine Mile Andesite (approx. 38°50′17″N, 105°32′18″W; Thirtynine Mile Mountain; Park Co., CO). Analytical data: K_2O = 3.36% and 3.34%, $*Ar^{40} = 1.714 \times 10^{-10}$ and 1.689×10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 68% and 64%. Dated by: Geochron Laboratories, Inc., Cambridge, Mass.

207. Izett and others (1969) K-Ar (biotite) 34.8±1.1 m.y.
(sanidine) 44.5±1.4 m.y.
Wall Mountain Tuff. Rhyolite tuff (approx. 39°19′45″N, 104°48′40″W; Douglas Co., CO). Collected by: G. A. Izett, U. S. Geological Survey; dated by: J. D. Obradovich, U. S. Geological Survey. Comment: Sanidine age is too old; concentrate contaminated with Precambrian feldspar.

208. R. B. Taylor (oral commun., 1973) Fission track (sphene) 43.3±3.9 m.y.
No. SB-1
Porphyry of Signal Butte (near 39°03′30″N, 105°13′20″W; Teller Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 1.80 \times 10^6$ t/cm^2 (825 tracks), induced tracks $\frac{1}{2}\rho_i = 2.63 \times 10^6$ t/cm^2 (1205 tracks), neutron flux $\phi = 2.07 \times 10^{15}$ n/cm^2. Collected by: R. B. Taylor, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

209. J. D. Obradovich (written commun., 1973) K-Ar (biotite) 35.7±0.8 m.y.
No. 68-0-39 (sanidine) 36.2±0.8 m.y.
Wall Mountain Tuff. Welded rhyolite (approx. 38°56'30"N, 105°18'15"W; Teller Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: J. D. Obradovich; dated by: J. D. Obradovich, U. S. Geological Survey.

210. J. D. Obradovich (written commun., 1973) K-Ar (sanidine) 34.1±0.8 m.y.
No. OHM-65-01
Florissant Lake Beds. Rhyolite tuff (approx. 38°55'N, 105°17'30"W; Teller Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: J. D. Obradovich; dated by: J. D. Obradovich, U. S. Geological Survey.

211. J. D. Obradovich (written commun., 1973) K-Ar (plagioclase) 29.5±1.5 m.y.
No. OHM-65-02
Andesite (approx. 38°53'25"N, 105°16'55"W; Teller Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: J. D. Obradovich; dated by: J. D. Obradovich, U. S. Geological Survey. Comment: This andesite overlies the Florissant Lake Beds (see item No. 210).

212. J. D. Obradovich (written commun., 1973) K-Ar (sanidine) 27.9±0.7 m.y.
(sanidine) 29.3±0.7 m.y.
Phonolite of Cripple Creek (approx. 38°45'30"N, 105°12'30"W; Mount Pisgah, Teller Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: R. C. Epis, Colorado School of Mines, Golden, Colorado; dated by: J. D. Obradovich, U. S. Geological Survey.

213. McDowell (1971) K-Ar (impure aegirine-augite) 33.4±1.0 m.y.
No. L-945 (impure aegirine-augite) 33.8±1.3 m.y.
Syenite of Cripple Creek (approx. 38°43'45"N, 105°07'40"W; Vindicator mine dump, near Victor, Teller Co., CO). Collected by: F. W. McDowell; dated by: F. W. McDowell at Lamont-Doherty Geological Observatory, Columbia Univ.

214. J. D. Obradovich (written commun., 1973) K-Ar (biotite) 33.6±0.7 m.y.
No. 68-0-40 (sanidine) 33.7±0.8 m.y.
Antero Formation of Stark and others (1949). Pumice tuff (approx. 38°38'30"N, 105°44'55"W; Fremont Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: J. D. Obradovich; dated by: J. D. Obradovich, U. S. Geological Survey.

215. J. D. Obradovich (written commun., 1973) K-Ar (sanidine) 34.7±0.7 m.y.
No. 5-70-1
Wall Mountain Tuff. Welded rhyolite (approx. 38°37'N, 105°34'45"W; Fremont Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: R. C. Epis, Colorado School of Mines, Golden, Colorado; dated by: J. D. Obradovich, U. S. Geological Survey.

216. Epis and Chapin (1968) K-Ar (sanidine) 34.8±1.4 m.y.
Gribbles Park Tuff (approx. 38°31'29"N, 105°34'44"W; Fremont Co., CO). Analytical data: K_2O = 7.66% and 7.52%, $*Ar^{40}$ = 4.028 x 10^{-10} and 3.878 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 71% and 81%. Dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Analyzed material is estimated to be 95% sanidine and 5% rock fragments and impurities. Additional K-Ar ages strongly suggest that this age is too old; quite likely the analyzed material was contaminated with Precambrian detritus. Gribbles Park Tuff is the same as ash flow 7 (Epis and Chapin, 1968).

217. Epis and Chapin (1968) K-Ar (whole rock) 18.9±1.2 m.y.
Andesite of Waugh Mountain (near 38°30'30"N, 105°36'30"W; Fremont Co., CO). Analytical data: K_2O = 2.75%, $*Ar^{40}$ = 0.7506 x 10^{-10} and 0.7956 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 17% and 10%. Dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

218. J. D. Obradovich (written commun., 1973) K-Ar (sanidine) 28.6±0.6 m.y.
No. 68-0-42 (sanidine) 29.5±0.7 m.y.
Gribbles Park Tuff. Welded ash flow (approx. 38°29′N, 105°33′W; Fremont Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: J. D. Obradovich; dated by: J. D. Obradovich, U. S. Geological Survey.

219. J. D. Obradovich (written commun., 1973) K-Ar (hornblende) 28.8±0.9 m.y.
No. 68-0-43 (biotite) 27.7±0.6 m.y.
(sanidine) 26.8±0.6 m.y.
(sanidine) 27.8±0.6 m.y.
Tuff in conglomerate of Fear Creek (approx. 38°29′N, 105°33′W; Fremont Co., CO). Analytical data: to be published in a forthcoming paper. Collected by: J. D. Obradovich; dated by: J. D. Obradovich, U. S. Geological Survey.

220. MacNish (1966) K-Ar (K-feldspar) 33.6±1.1 m.y.
Siems (1967)
Parker and Sharp (1970)
Gribbles Park Tuff. Welded tuff (approx. 38°15′52″N, 105°36′05″W; Custer Co., CO). Analytical data: K_2O = 7.40% and 7.35%, $*Ar^{40}$ = 3.69 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 76.4% and 81.9%. Collected by: R. D. MacNish, Univ. of Mich., Ann Arbor; dated by: Geochron Laboratories, Inc., Cambridge, Mass. Comment: Analytical data supplied by L. I. Briggs (written commun., 1973), Univ. of Mich.

221. R. B. Taylor, (oral commun., 1973) Fission track (sphene) 31.8±2.3 m.y.
No. RA-3-70 (zircon) 27.1±3.2 m.y.
Tonalite, Rito Alto stock (approx. 38°13′28″N, 105°44′38″W; Custer Co., CO). Analytical data: (sphene) spontaneous fission tracks ρ_s = 4.52 x 10^6 t/cm^2 (1130 tracks), induced tracks $\frac{1}{2}\rho_i$ = 8.51 x 10^6 t/cm^2 (2128 tracks), neutron flux ϕ = 1.96 x 10^{15} n/cm^2; (zircon) spontaneous fission tracks ρ_s = 2.01 x 10^6 t/cm^2 (521 tracks), induced tracks $\frac{1}{2}\rho_i$ = 2.34 x 10^6 t/cm^2 (606 tracks), neutron flux ϕ = 1.03 x 10^{15} n/cm^2. Collected by: R. B. Taylor and G. R. Scott, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

222. Pinson and others (1961) Rb-Sr (glass) 40±13 m.y.
No. R4226, Tables 2 and 3
Siems (1968)
Rhyolite lava flow. Obsidian (near 38°08′N, 105°27′W; Silver Cliff, Custer Co., CO). Analytical data: Rb = 174 ppm, Sr = 18.4 ppm, Sr^{87}/Sr^{86} = 0.7238, $*Sr^{87}/Rb^{87}$ = 0.0005999. Dated by: Geochronology Laboratory, Mass. Inst. of Tech.

223. MacNish (1966) K-Ar (biotite) 83.5±3.8 m.y.
Siems (1967)
Welded tuff (approx. 38°08′37.5″N, 105°25′38″W; Custer Co., CO). Analytical data: K_2O = 7.08% and 7.07%, $*Ar^{40}$ = 8.96 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 89.5% and 88.5%. Collected by: L. I. Briggs, Univ. of Michigan, Ann Arbor, Michigan; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Age is spurious; concentrate probably contaminated with older material. Analytical data supplied by L. I. Briggs, Univ. of Mich. (written commun., 1973).

224. G. R. Scott (oral commun., 1973) K-Ar (sanidine) 26.3±0.7 m.y.
No. SC-594
Rhyolite of Antrim Lode (approx. 38°09′10″N, 105°19′30″W; Custer Co., CO). Analytical data: K_2O = 8.951%, $*Ar^{40}$ = 4.210 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 90%. Collected by: W. N. Sharp and R. B. Taylor, U. S. Geological Survey; dated by: R. F. Marvin, H. H. Mehnert, and C. E. Hedge, U. S. Geological Survey.

225. MacNish (1966) K-Ar (whole rock) 33.2±0.9 m.y.
Siems (1968)

Trachyte lava (approx. 38°06′30″N, 105°19′15″W; Game Ridge, Custer Co., CO). Analytical data: K_2O = 7.16% and 7.16%, $*Ar^{40}$ = 3.565 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 83.0% and 78.0%. Collected by: R. D. MacNish, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Analytical data supplied by L. I. Briggs, Univ. of Mich. (written commun., 1973). G. R. Scott and R. B. Taylor believe that this radiometric age is probably too old (oral commun., 1973). Xenocrystic material may have been present in the rock.

226. G. R. Scott (oral commun., 1973) K-Ar (biotite) 32.1±0.9 m.y.
No. 71-S-2
Devils Hole Formation. Pumice (approx. 38°04′29″N, 105°18′15″W; Custer Co., CO). Analytical data: K_2O = 7.062%, $*Ar^{40}$ = 4.062 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 62%. Collected by: G. R. Scott, U. S. Geological Survey; dated by: R. F. Marvin, H. H. Mehnert, and C. E. Hedge, U. S. Geological Survey.

227. G. R. Scott (oral commun., 1973) K-Ar (sanidine) 27.3±0.8 m.y.
No. SC-595
Rhyolite of Antelope Butte (approx. 38°03′40″N, 105°17′55″W; Antelope Butte, Custer Co., CO). Analytical data: K_2O = 8.525%, $*Ar^{40}$ = 4.161 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 94%. Collected by: W. N. Sharp and R. B. Taylor, U. S. Geological Survey; dated by: R. F. Marvin, H. H. Mehnert, and C. E. Hedge, U. S. Geological Survey.

228. R. B. Taylor (oral commun., 1973) Fission track (zircon) 27.5±2.8 m.y.
No. TRT-1-72
Ash flow at Rosita (near 38°03′50″N, 105°20′42″W; Custer Co., CO). Analytical data: spontaneous fission tracks ρ_s = 2.58 x 10^6 t/cm^2 (740 tracks) induced tracks $\frac{1}{2}\rho_i$ = 2.95 x 10^6 t/cm^2 (848 tracks), neutron flux ϕ = 1.03 x 10^{15} n/cm^2. Collected by: R. B. Taylor, U. S. Geological Survey; dated by: C. W. Naeser, U. S. Geological Survey.

229. Volckmann (1965) K-Ar (feldspar-quartz) 41.2±1.2 m.y.
MacNish (1966)
Andesite (approx. 37°57′N, 105°27′15″W; Grape Creek, Custer Co., CO). Analytical data: K_2O = 0.991% and 0.987%, $*Ar^{40}$= 0.6105 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 35.2% and 29.8%. Collected by: R. D. MacNish, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Age is probably too old (Scott and Taylor, 1973). Analytical data supplied by L. I. Briggs, Univ. of Mich. (written commun., 1973).

230. L. I. Briggs (written commun., 1973) K-Ar (biotite) 64.1±2.3 m.y.
Granite (37°38′30″N, 105°31′30″W; Raspberry Canyon, Alamosa Co., CO). Analytical data: K_2O = 5.24%, 4.93%, and 5.07%, $*Ar^{40}$ = 4.92 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 59.7% and 20.4%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

231. L. I. Briggs (written commun., 1973) K-Ar (biotite) 55.2±2.6 m.y.
Granite (approx. 37°37′35″N, 105°30′45″W; Alamosa Co., CO). Analytical data: K_2O = 3.25%, 3.10%, and 3.22%, $*Ar^{40}$ = 2.65 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 47.7% and 35.8%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

232. L. I. Briggs (written commun., 1973) K-Ar (biotite-amphibole) 50.1±4.2 m.y.
Latite dike (37°37′00″N, 105°32′30″W; South Zapata Creek, Alamosa Co., CO). Analytical data: K_2O = 3.59% and 3.67%, $*Ar^{40}$ = 2.75 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 52.3% and 74.5%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

233. Goddard and others (1965) K-Ar (biotite) 32.2±0.8 m.y.
Volckmann (1965)

Blanca Peak pluton. Granite (approx. 37°33′07″N, 105°33′07″W; Chimney Gulch, Alamosa Co., CO). Analytical data: K_2O = 5.16% and 5.23%, $*Ar^{40}$ = 2.50 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 57.9% and 55.5%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Analytical data supplied by L. I. Briggs, Univ. of Mich. (written commun., 1973).

234. L. I. Briggs (written commun., 1973) K-Ar (biotite) 37.4±2.0 m.y.
Quartz monzonite (approx. 37°41′00″N, 105°14′00″W; Huerfano Co., CO). Analytical data: K_2O = 8.61% and 8.63%, $*Ar^{40}$ = 0.483 x 10^{-10} mole/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 60.5% and 71.2%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts.

235. L. I. Briggs (written commun., 1973) K-Ar (non-magnetic fraction of whole rock) 113±8 m.y.
Vitric tuff (approx. 37°57′30″N, 105°14′00″W; Huerfano Co., CO). Analytical data: K_2O = 4.82% and 4.71%, $*Ar^{40}$ = 8.28 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 51.2% and 60.5%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: Age is questionable; analyzed material may be contaminated with older material.

236. McCulloch (1963) K-Ar (impure biotite) 38.2±1.5 m.y.
MacNish (1966)
Siems (1968)
Andesite boulder in volcanic breccia (approx. 37°58′00″N, 105°13′30″W; Huerfano Co., CO). Analytical data: K_2O = 3.45% and 3.47%, $*Ar^{40}$ = 1.98 x 10^{-10} moles/gm, $*Ar^{40}/\Sigma Ar^{40}$ = 28.7% and 25.6%. Collected by: L. I. Briggs, Univ. of Mich.; dated by: Geochron Laboratories, Inc., Cambridge, Massachusetts. Comment: McCulloch (1963) calls these rocks the Devils Hole Volcanics and Siems (1968) calls them the Rosita Formation. Analytical data supplied by L. I. Briggs, Univ. of Mich. (written commun., 1973). Analyzed material was magnetic fraction containing biotite (approx. 10%), other mafic minerals and some feldspar. G. R. Scott and R. B. Taylor believe that this radiometric age is probably too old (oral commun., 1973).

237. Stormer (1972) K-Ar (biotite) 24.7±0.8 m.y.
No. 2, Table 2
Gabbro (37°46′05″N, 104°48′50″W; Huerfano Butte, Huerfano Co., CO). Collected by: J. C. Stormer, Jr.; dated by: J. C. Stormer, Jr., Univ. of California at Berkeley.

238. Armstrong (1969) K-Ar (whole rock) 39.5 m.y.
No. 730, Table 1
Adamellite porphyry (37°25′20″N, 104°58′29″W; East Spanish Peak, Huerfano Co., CO). Collected by: R. L. Armstrong; dated by: R. L. Armstrong at Yale Univ.

239. Smith (1973) Fission track (zircon) 19.8±1.6 m.y.
No. EPS-1
Granite sill (37°25′17″N, 104°58′30″W; Huerfano Co., CO). Analytical data: spontaneous fission tracks ρ_s = 6.11 x 10^6 t/cm^2 (1033 tracks), induced tracks $\frac{1}{2}\rho_i$ = 9.89 x 10^6 t/cm^2 (1654 tracks), neutron flux ϕ = 1.035 x 10^{15} n/cm^2. Collected by: R. P. Smith; dated by: R. P. Smith, Univ. of Colorado.

240. Stormer (1972) K-Ar (biotite) 21.7±1.0 m.y.
No. 4, Table 2
East Peak Granite (37°23′50″N, 104°55′25″W; Huerfano Co., CO). Collected by: J. C. Stormer, Jr.; dated by: J. C. Stormer, Jr., Univ. of California at Berkeley.

241. Smith (1973) Fission track (zircon) 22.9±2.0 m.y.
No. WSP-1
West Spanish Peak stock. Syenodiorite (37°22′15″N, 104°59′50″W; Huerfano Co., CO). Analytical data: spontaneous fission tracks ρ_s = 6.53 x 10^6 t/cm^2 (910 tracks), induced tracks $\frac{1}{2}\rho_i$ = 9.02 x 10^6 t/cm^2 (1256 tracks), neutron flux ϕ = 1.035 x 10^{15} n/cm^2. Collected by: R. P. Smith; dated by: R. P. Smith, Univ. of Colorado.

242. Stormer (1972) K-Ar (plagioclase) 25.7±0.8 m.y.
No. 1, Table 2
Syenodiorite lamprophyre dike (37°21′05″N, 105°03′30″W; Huerfano Co., CO). Collected by: J. C. Stormer, Jr.; dated by: J. C. Stormer, Jr., Univ. of California at Berkeley.

243. Smith (1973) Fission track (apatite) 22.5±3.4 m.y.
No. 657-c
Diorite dike (37°20′00″N, 104°59′15″W; Las Animas Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 8.04 \times 10^4$ t/cm^2 (201 tracks), induced tracks $\frac{1}{2}\rho_i = 17.6 \times 10^4$ t/cm^2 (439 tracks), neutron flux $\phi = 0.805 \times 10^{15}$ n/cm^2. Collected by: R. P. Smith, Univ. of Colorado; dated by: C. W. Naeser, U. S. Geological Survey. Comment: Recalculation of the 22.4 ± 3.1-m.y. age listed in the abstract (Smith, 1973).

244. Smith (1973) Fission track (apatite) 23.3±2.6 m.y.
No. 609-c
Syenodiorite dike (37°20′05″N, 104°53′49″W; Las Animas Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 1.38 \times 10^5$ t/cm^2 (346 tracks), induced tracks $\rho_i = 2.92 \times 10^5$ t/cm^2 (732 tracks), neutron flux $\phi = 0.805 \times 10^{15}$ n/cm^2. Collected by: R. P. Smith, Univ. of Colorado; dated by: C. W. Naeser, U. S. Geological Survey. Comment: Recalculation of the 23.5 ± 4.0-m.y. age listed in the abstract (Smith, 1973).

245. Smith (1973) Fission track (apatite) 27.3±4.6 m.y.
No. 45
Diorite dike (37°19′30″N, 104°57′00″W; Las Animas Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 1.23 \times 10^5$ t/cm^2 (307 tracks), induced tracks $\rho_i = 2.20 \times 10^5$ t/cm^2 (549 tracks), neutron flux $\phi = 0.805 \times 10^{15}$ n/cm^2. Collected by: R. P. Smith, Univ. of Colorado; dated by: C. W. Naeser, U. S. Geological Survey. Comment: Recalculation of the 28.5 ± 5.0-m.y. age listed in the abstract (Smith, 1973). The 27.3-m.y. age listed above may be in error because of the large number of crystal defects present within the apatite crystals.

246. Smith (1973) Fission track (apatite) 21.5±3.0 m.y.
No. 641-c
Syenodiorite dike (37°19′20″N, 105°00′00″W; Las Animas Co., CO). Analytical data: spontaneous fission tracks $\rho_s = 0.74 \times 10^5$ t/cm^2 (185 tracks), induced tracks $\rho_i = 1.70 \times 10^5$ t/cm^2 (424 tracks), neutron flux $\phi = 0.805 \times 10^{15}$ n/cm^2. Collected by: R. P. Smith, Univ. of Colorado; dated by: C. W. Naeser, U. S. Geological Survey. Comment: Recalculation of the 24.3 ± 2.6-m.y. age listed in the abstract (Smith, 1973).

247. Stormer (1972) K-Ar (biotite) 23.4±1.0 m.y.
No. 3, Table 2
Gabbro sill (37°14′00″N, 105°01′03″W; Las Animas Co., CO). Collected by: J. C. Stormer, Jr.; dated by: J. C. Stormer, Jr., Univ. of California at Berkeley.

In considering the following list of U-Pb ages, one will quickly note that there is often a great difference in the Pb^{206}/U^{238} or Pb^{207}/U^{235} ages and the Pb^{207}/Pb^{206} age. One would naturally wonder as to which is the most reliable U-Pb age. For young uranium-rich minerals, the Pb^{206}/U^{238} age is usually the most reliable. The other U-Pb ages are subject to greater uncertainty because of analytical difficulties in accurately measuring the small amount of U^{235} present and because of the unknowns involved in making corrections for the presence of common lead (Hamilton, 1965).

250. Faul (1954) Pb^{206}/U^{238} (pitchblende) 55±2 m.y.
Table 9
Eckelmann and Kulp (1957) Pb^{207}/U^{235} (pitchblende) 56±2 m.y.
Table 9
Sims and others (1958) Pb^{207}/Pb^{206} (pitchblende) 170±100 m.y.
Vein material (approx. 40°51′20″N, 105°29′30″W; Copper King Mine, Larimer Co., CO). Comment: Ages quoted above are from Eckelmann and Kulp (1957)

251. Faul (1954) — Pb^{206}/U^{238} — (pitchblende) 71±4 m.y.
Table 9
Eckelmann and Kulp (1957) — Pb^{207}/U^{235} — (pitchblende) 75±5 m.y.
Table 9
Sims and others (1958) — Pb^{207}/Pb^{206} — (pitchblende) 280±200 m.y.
Vein material (approx. 40°51′20″N, 105°29′30″W; Copper King Mine, Larimer Co., CO). Comment: Ages quoted above are from Eckelmann and Kulp (1957)

252. Banks and Silver (1964) No. P445, Table 2
Pb^{206}/U^{238} — (pitchblende) 41±1 m.y.
Pb^{207}/U^{235} — (pitchblende) 47±1 m.y.
Pb^{207}/Pb^{206} — (pitchblende) 297±25 m.y.
Vein material (approx. 40°51′20″N, 105°29′30″W; Copper King Mine, Larimer Co., CO). Collected by: George Phair, U. S. Geological Survey; dated by: P. O. Banks and L. T. Silver, Calif. Inst. of Tech.

253. Banks and Silver (1964) No. P324, Table 2
Pb^{206}/U^{238} — (pitchblende P324-I) 45±1 m.y.
Pb^{207}/U^{235} — (pitchblende P324-I) 50±1 m.y.
Pb^{207}/Pb^{206} — (pitchblende P324-I) 306±25 m.y.
Pb^{206}/U^{238} — (pitchblende P324-II) 42±1 m.y.
Pb^{207}/U^{235} — (pitchblende P324-II) 47±1 m.y.
Pb^{207}/Pb^{206} — (pitchblende P324-II) 339±25 m.y.
Pb^{207}/Pb^{206} — (pitchblende P324-III) 120±60 m.y.
Vein material (approx. 40°51′20″N, 105°29′30″W; Copper King Mine, Larimer Co., CO). Collected by: George Phair, U. S. Geological Survey; dated by: P. O. Banks and L. T. Silver, Calif. Inst. of Tech.

254. Sheridan and others (1967)
Pb^{206}/U^{238} — (uraninite) 73±0.2 m.y.
Pb^{207}/U^{235} — (uraninite) 73±1.7 m.y.
Pb^{207}/Pb^{206} — (uraninite) 66±57 m.y.
Vein material (approx. 39°51′13″N, 105°18′06″W; Mena Mine, Jefferson Co., CO). Collected by: D. M. Sheridan, U. S. Geological Survey; dated by: T. W. Stern, L. R. Stieff, and M. H. Delevaux, U. S. Geological Survey.

255. Heyse (1971)
Pb^{207}/U^{238} — (uraninite 489) 61±2 m.y.
Pb^{207}/U^{235} — (uraninite 489) 71±2 m.y.
Pb^{207}/Pb^{206} — (uraninite 489) 420±30 m.y.
Pb^{206}/U^{238} — (uraninite 507A) 52±2 m.y.
Pb^{207}/U^{235} — (uraninite 507A) 76±2 m.y.
Pb^{207}/Pb^{206} — (uraninite 507A) 1010±50 m.y.
Pb^{206}/U^{238} — (uraninite 524) 68±2 m.y.
Pb^{207}/U^{235} — (uraninite 524) 18±2 m.y.
Pb^{207}/Pb^{206} — (uraninite 524) 2300±100 m.y.
Vein material (approx. 39°50′38″N, 105°16′50″W; Schwartzwalder Mine, Jefferson Co., CO). Analytical data:

Sample No.	U (mg/gm)	Pb (mg/gm)	Lead Atomic Abundances (percent) Pb^{204}	Pb^{206}	Pb^{207}	Pb^{208}
489	389.53	10.97	0.822	52.684	14.594	31.900
507A	77.6	3.64	0.993	43.378	16.748	38.880
524	173.0	31.2	1.094	36.467	17.975	44.464
511 (galena)	----	----	1.163	33.443	18.413	46.982

Collected by: J. V. Heyse, Lucius Pitkin, Inc.; dated by: Teledyne Isotopes, Westwood, New Jersey. Comment: Sample 489 is from the Upper Ryder vein near the Sixth level; sample 507 is from the Illinois vein on the Third level; sample 524 is from the Nebraska vein on the Charley level; and sample 511 is from the Fourth level. Uranium decay constants used in the age calculations are $U^{238}\lambda = 0.154 \times 10^{-9} yr^{-1}$, $U^{235}\lambda = 0.972 \times 10^{-9} yr^{-1}$.

256. Banks and Silver (1964) No. 1, Table 2

Pb^{206}/U^{238}	(pitchblende) 110±2 m.y.
Pb^{207}/U^{235}	(pitchblende) 113±3 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 190±60 m.y.

Vein material (approx. 39°47′15″N, 105°32′W; Wood Mine, Gilpin Co., CO). Dated by: P. O. Banks and L. T. Silver, California Inst. of Tech. Comment: Material analyzed was a portion of the specimen originally analyzed by Nier and others (1941).

257. Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 56±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 62±6 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 320±230 m.y.

Vein material (Richards Mine, Gilpin Co., CO). Comment: Geographic location of the mine was not given but it is probably close to 39°47′N, 105°32′W.

258. Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 35±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 42±2 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 430±130 m.y.

Vein material (approx. 39°47′15″N, 105°32′W; Wood Mine, Gilpin Co., CO). Dated by: W. R. Eckelmann and J. L. Kulp, Columbia Univ.

259. Faul (1954) Table 9
Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 63±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 64±2 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 114±40 m.y.

Vein material (approx. 39°47′15″N, 105°32′W; Wood Mine, Gilpin Co., CO). Comment: Ages quoted above are from Eckelmann and Kulp (1957).

260. Nier and others (1941) Faul (1954) Table 9 Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 55±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 56±2 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 150±110 m.y.

Vein material (approx. 39°47′15″N, 105°32′W; Wood Mine, Gilpin Co., CO). Comment: Ages quoted above are from Eckelmann and Kulp (1957).

261. Nier and others (1941) F aul (1954) Table 9 Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 59±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 61±2 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 170±100 m.y.

Vein material (approx. 39°47′N, 105°32′W; Russell Gulch, Gilpin Co., CO). Comment: Ages quoted above are from Eckelmann and Kulp (1957).

262. Faul (1954) Table 9 Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 65±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 70±3 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 280±100 m.y.

Vein material (approx. 39°46′40″N, 105°31′50″W; Iron Mine, Gilpin Co., CO). Comment: Ages quoted above are from Eckelmann and Kulp (1957).

263. Eckelmann and Kulp (1957) Table 9

Pb^{206}/U^{238}	(pitchblende) 51±1 m.y.
Pb^{207}/U^{235}	(pitchblende) 54±2 m.y.
Pb^{207}/Pb^{206}	(pitchblende) 315±100 m.y.

Vein material (approx. 39°47′25″N, 105°32′W; German Mine, Gilpin Co., CO). Dated by: W. R. Eckelmann and J. L. Kulp, Columbia Univ.

264. Stieff and others (1953) Pb^{206}/U (carnotite) 75 m.y.
No. GS-21, -31, -33, -34, -42, (carnotite) 75 m.y.
-43, -10, and LRS-28, (carnotite) 85 m.y.
Table 7 (carnotite) 75 m.y.
(carnotite) 105 m.y.
(carnotite) 100 m.y.
(carnotite) 140 m.y.
(carnotite) 70 m.y.
(carnotite) 75 m.y.

Uranium deposit in the Morrison Formation (approx. 38°36'57"N, 108°50'30"W; Calamity No. 13 Mine, Mesa Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744).

265. Stieff and others (1953) Pb^{206}/U (carnotite) 90 m.y.
No. GS-41, Table 7
Uranium deposit in the Morrison Formation (approx. 38°36'35"N, 108°50'43"W; Calamity No. 21 Mine, Mesa Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744).

266. Stieff and others (1953) Pb^{206}/U (carnotite) 95 m.y.
No. GS-40, Table 7
Uranium deposit in the Morrison Formation (approx. 38°36'45"N, 108°50'46"W; Calamity No. 27 Mine, Mesa Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744).

267. Stieff and others (1953) Pb^{206}/U (uranium-vanadium mineral) 90 m.y.
No. GS-65, Table 7
Uranium deposit in the Morrison Formation (approx. 38°39'N, 109°02'W; La Sal No. 2 Mine, Mesa Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744).

268. Stieff and others (1953) Pb^{206}/U (carnotite) 60 m.y.
No. GS-20, Table 7
Uranium deposit in the Morrison Formation (approx. 38°26'17"N, 108°54'23"W; Rock Creek (Rajah) Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744).

269. Stieff and others (1953) Pb^{206}/U (carnotite) 75 m.y.
No. GS-49, Table 7
Uranium deposit in the Morrison Formation (approx. 38°18'30"N, 108°57'05"W; Red Bird Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

270. Stieff and others (1953) Pb^{206}/U (carnotite) 75 m.y.
No. LRS-63-2, GS-11, GS-12, Table 7 (carnotite) 60 m.y.
(carnotite) 70 m.y.

Uranium deposit in the Morrison Formation (approx. 38°22'N, 108°45'W; Club Mine, Montrose Co., CO).

Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

271. Stieff and others (1953) Pb^{206}/U (carnotite) 15 m.y.
No. GS-30, Table 7
Uranium deposit in the Morrison Formation (approx. 38°21'52"N, 108°42'53"W; Rock Raven No. 3 Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

272. Stieff and others (1953) Pb^{206}/U (carnotite) 75 m.y.
No. GS-47, Table 7
Uranium deposit in the Morrison Formation (approx. 38°18'23"N, 108°45'20"W; Coloradium Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

273. Stieff and others (1953) Pb^{206}/U (carnotite) 110 m.y.
No. GS-39-3, Table 7
Uranium deposit in the Morrison Formation (approx. 38°17'30"N, 108°44'30"W; Long Park No. 10 Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

274. Stieff and others (1953) Pb^{206}/U (carnotite) 70 m.y.
No. GS-18, Table 7
Uranium deposit in the Morrison Formation (approx. 38°15'55"N, 108°41'57"W; Bitter Creek Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

275. Stieff and others (1953) Pb^{206}/U (carnotite) 40 m.y.
No. GS-19-1, GS-19-2, Table 7 (carnotite) 20 m.y.
Uranium deposit in the Morrison Formation (approx. 38°14'30"N, 108°48'50"W; Wild Steer Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

276. Stieff and others (1953) Pb^{206}/U (carnotite) 30 m.y.
No. LRS 64-1, Table 7
Uranium deposit in the Morrison Formation (approx. 38°14'30"N, 108°47'W; Bob Tail Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

277. Stieff and others (1953) Pb^{206}/U (carnotite) 20 m.y.
No. GS-15-1, GS-15-2, Table 7 (carnotite) 60 m.y.
Uranium deposit in the Morrison Formation (approx. 38°13'17"N, 108°45'17"W; Jo Dandy Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

278. Stieff and others (1953) Pb^{206}/U (carnotite) 70 m.y.
No. GS-23, Table 7
Uranium deposit in the Morrison Formation (approx. 38°10′41″N, 108°57′47″W; Raven Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

279. Stieff and others (1953) Pb^{206}/U (carnotite) 35 m.y.
No. GS-17, Table 7
Uranium deposit in the Morrison Formation (Butterfly Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages. The geographic location of this mine is not known and the sample locality is therefore not plotted on Figure 1.

280. Stieff and others (1953) Pb^{206}/U (carnotite) 85 m.y.
No. GS-48, Table 7
Uranium deposit in the Morrison Formation (Mill No. 1 Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages. The geographic location of this mine is not known and therefore the sample locality is not plotted on Figure 1.

281. Stieff and others (1953) Pb^{206}/U (carnotite) 100 m.y.
No. GS-14, Table 7
Uranium deposit in the Morrison Formation ("Mine D" Mine, Montrose Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages. The geographic location of this mine is not known and therefore the sample locality is not plotted on Figure 1.

282. Stieff and others (1953) Pb^{206}/U (carnotite) 60 m.y.
No. GS-16, LRS-20-2, Table 7 (carnotite) 30 m.y.
Uranium deposit in the Morrison Formation (approx. 38°00′30″N, 108°58′25″W; Radium No. 6 Mine, San Miguel Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

283. Stieff and others (1953) Pb^{206}/U (carnotite) 100 m.y.
No. GS-51, Table 7
Uranium deposit in the Morrison Formation (approx. 38°00′15″N, 108°58′55″W; Radium No. 8 Mine, San Miguel Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

284. Stieff and others (1953) Pb^{206}/U (carnotite) 120 m.y.
No. GS-50, Table 7
Uranium deposit in the Morrison Formation (approx. 38°00′10″N, 108°57′W; Charles T No. 2 Mine, San Miguel Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion by Miller and Kulp (1963) and by Fischer (1968, pp. 743-744) of Colorado Plateau radiometric ages.

285. Stieff and others (1953) Pb^{206}/U (vanadiferous hydromica) 20 m.y.
No. GS-22, Table 7
Vanadium deposit in the Entrada Sandstone (approx. 37°56′N, 107°58′30″W; Bear Creek Mine, San Miguel Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (p. 743-744, 1968).

286. Stieff and others (1953) Pb^{206}/U (vanadiferous hydromica) 40 m.y.
No. GS-28, Table 7
Vanadium deposit in the Entrada Sandstone (Vanadous No. 1 Mine, San Miguel Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (pp. 743-744, 1968). The geographic location of this mine is not known and therefore the sample locality is not plotted on Figure 1.

287. Stieff and others (1953) Pb^{206}/U (vanadiferous hydromica) 90 m.y.
No. GS-24, Table 7
Vanadium deposit in the Entrada Sandstone (Primus claim, San Miguel Co., CO). Collected by: L. R. Stieff and T. W. Stern; dated by: L. R. Stieff, T. W. Stern, and R. G. Milkey, U. S. Geological Survey. Comment: Read discussion of Colorado Plateau radiometric ages by Miller and Kulp (1963) and by Fischer (pp. 743-744, 1968). The geographic location of this mine is not known and therefore the sample locality is not plotted on Figure 1.

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