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NEW K-AR AGES ON VOLCANIC ROCKS FROM CATRON AND GRANT COUNTIES, N. M.

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This paper reports eight new K-Ar dates on volcanic formations in southwestern New Mexico (see fig. 1), collected in the summer of 1970 and analyzed in the Laboratory of Isotope Geology at the University of Pittsburgh during the school year 1970-1971.

The argon laboratory at the University of Pittsburgh has been in operation since 1968. Calibration of the Ar^{38} spike from Zurich University has been against laboratory standard samples supplied by Paul E. Damon and Donald E. Livingston of the University of Arizona and by Bruno Gilletti of Brown University. Since getting on stream some tens of samples have been analyzed, both unknowns and standards, and the errors shown are based on the experience gained on these samples and the atmospheric correction on the individual runs. As more experience is gained on the system the error values can be expected to improve.

Potassium was determined by duplicate runs on a Perkin Elmer 303 atomic absorption spectrophotometer using a hollow cathode lamp. All duplicate runs agreed to within one percent of the amount reported, and the values shown are the average of the two runs.

Argon analysis was by conventional techniques using RF vacuum fusion, cleanup of gases evolved over hot CuO, zeolite, and hot Ti foil. Argon spike from a gas pipette system was introduced during the melting of the sample from an individual ampoule. After cleanup the spiked sample was ready for argon analysis on the A.E.I. MS-10 mass spectrometer. Runs on the MS-10 have been made satisfactorily in both the static and dynamic modes, with the static mode used predominantly because of the great improvement in sensitivity. All runs reported on here were done in the static mode with the exception of G-5.

In addition to the seven samples discussed, four others were collected, but proved unsuitable for age determination either because of extreme alteration of, or sparsity of, dateable minerals. A more complete geologic discussion awaits more data, and will eventually be published elsewhere.

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SAMPLE DESCRIPTIONS

A. Extrusive Rocks–New Mexico

1. UP-G2 K-Ar (plagioclase) 33±2 m.y.

Dacite (or "andesite") of Rain Creek (S/2 Sec. 11, T13S, R18W; Grant Co., NM). Tdl of Weber and Willard (1959a). Consists of oligoclase plagioclase in partially resorbed laths, quartz, altered orthoclase, biotite, and iron ore minerals in a microspherulitic glass matrix. Analytical data: K = 0.840%; $\mathring{A}r^{40} = 4.966 \times 10^{-11}$ mole/gm; $\mathring{A}r^{40}/\Sigma Ar^{40} = 79\%$. Collected by: R.C. Rhodes and E.I. Smith, Univ. N. Mex., and M. Bikerman, Univ. Pittsburgh.

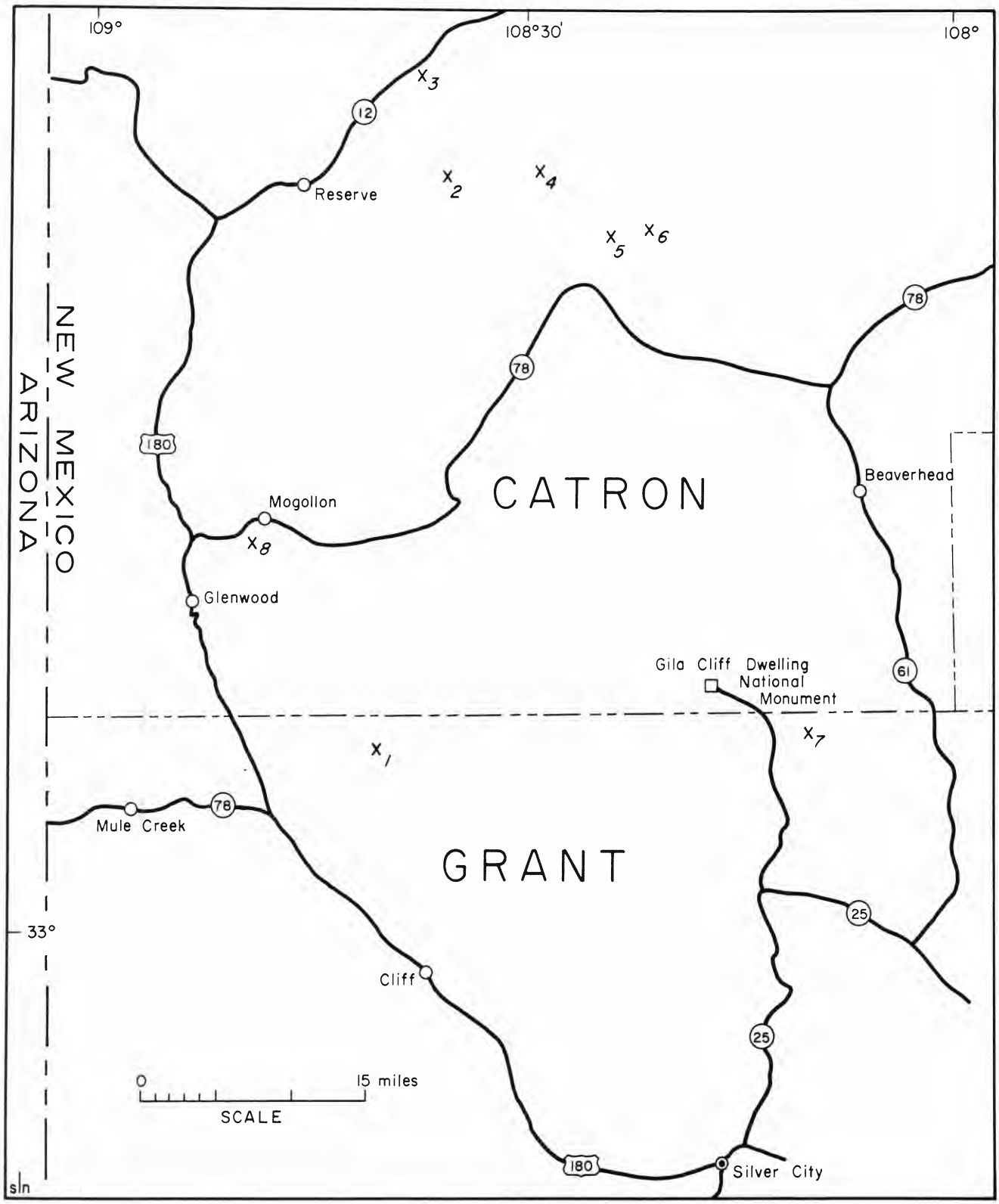

Figure 1. Map showing location of dated rock samples (numbers keyed to sample descriptions).

2. UP-G3 K-Ar (plagioclase) 24.5±1.5 m.y .

Andesite of Eagle Peak Quadrangle (SW/4 Sec. 34, T6S, R17W, along U.S. Forest Service road 233, Catron Co., NM). Tdt of Weber and Willard (1959b); oldest andesite in section. Glassy with abundant plagioclase of labradorite to andesine composition, some augite, some hypersthene, and rare biotite. Analytical data: K = 0.435%; $\overset{*}{A}r^{40}$ = 1.8487 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 84%. Collected by: R.C. Rhodes and E.I. Smith, Univ. N. Mex., and M. Bikerman, Univ. Pittsburgh.

3. UP-G4 K-Ar (whole rock) 0.9±0.2 m.y.

Basalt flow of Apache Creek (SW/4 Sec. 33, T5S, R17W; capping mesa just S of N.M. 12 at Apache Creek; Catron Co., NM). Qb of Weber and Willard (1959b). Augite and olivine bearing basalt. Whole rock showed 6.21% Ca and 2.43% Na by atomic absorption analysis. Analytical data: K = 0.91%; $\overset{*}{A}r^{40}$ = 0.1485 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 39%. Collected by: R.C. Rhodes and E.I. Smith, Univ. N. Mex., and M. Bikerman, Univ. Pittsburgh.

4. UP-G5 K-Ar (whole rock) 20±1.5 m.y.

Bearwallow Mountain basalt (NE/4 Sec. 3, T7S, R16W; along Forest Service road 94, Cox Canyon Road, about ¼ mi below the Tularosa divide; Catron Co., NM). Basaltic andesite with 60-70% laths of intermediate plagioclase, some prismatic amphibole, and iron oxides. Whole rock powder contained 4.37% Ca and 2.76% Na. Analytical data: K = 2.27%; $\overset{*}{A}r^{40}$ = 8.082 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 80%. Collected by: R.C. Rhodes and E.I. Smith, Univ. N. Mex., and M. Bikerman, Univ. Pittsburgh.

5. UP-G6 K-Ar (sanidine) 25.3±1.8 m.y.

Jerky Mountain flow banded rhyolite (NW/4 Sec. 33, T7S, R15W; in Y Canyon along Forest Service road 28; Catron Co., NM. Quartz, sanidine, rare plagioclase and magnetite in a spherulitic glass matrix. Analytical data: K = 5.58%; $\overset{*}{A}r^{40}$ = 25.237 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 98%. Collected by: R.C. Rhodes and E.I. Smith, Univ. N. Mex., and M. Bikerman, Univ. Pittsburgh. Comment: Date is average of three runs.

6. UP-G7 K-Ar (biotite) 26.3±1.5 m.y.
(sanidine) 25.7±1.5 m.y.

"Moonstone tuff" (NE/4 Sec. 26, T7S, R15W; along Forest Service road 28; Catron Co., NM). Unit is discussed in Elston et al. (1970). Sanidine (moonstone)-bearing rhyolite with abundant quartz, some biotite and iron oxides, in vitrophyric groundmass. Analytical data: (Biotite) K = 6.34%; $\overset{*}{A}r^{40}$ = 30.204 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 83%. (Sanidine) K = 4.49%; $\overset{*}{A}r^{40}$ = 20.702 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 96%. Collected by: R.C. Rhodes and E.I. Smith, Univ. N. Mex., and M. Bikerman, Univ. Pittsburgh, Comment: Compare with]

7. UP-M675 K-Ar (biotite) 26.2±1.5 m.y.
(sanidine) 25.3±1.5 m.y.

"Moonstone tuff" (Sec. 3, T13S, R13W; from Lyons Lodge; Grant Co., NM) from the type Bloodgood Canyon Rhyolite (Elston, et al., 1970). Analytical data: (Biotite) K = 6.42%; $\overset{*}{A}r^{40}$ = 30.134 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 83%. (Sanidine) K = 5.16%; $\overset{*}{A}r^{40}$ = 23.429 x 10^{-11} mole/gm; $\overset{*}{A}r^{40}/\Sigma Ar^{40}$ = 96%. Collected by: W.E. Elston, Univ. N. Mex. Comment: Compare with No. 6 (above).

8. UP-G9 K-Ar (biotite) 32±1.5 m.y.

Cooney Quartz Latite of Ferguson (1927) (center Sec. 4, T11S, R19W; along old Power Plant Road; Catron Co., NM). Tdru of Weber and Willard (1959a). Abundant biotite, some plagioclase, altered orthoclase, in a vitrophyric microlite-bearing matrix. Analytical data: K = 7.14%; $\overset{*}{Ar}^{40}$ = 41.403 x 10^{-11} mole/gm; $\overset{*}{Ar}^{40}/\Sigma Ar^{40}$ = 87%. Collected by: M. Bikerman, Univ. Pittsburgh.

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