

## ***K-Ar age of the La Jara Peak andesite and its possible significance to mineral exploration in the Magdalena mining district, New Mexico***

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SHORT NOTES

## K-AR AGE OF THE LA JARA PEAK ANDESITE AND ITS POSSIBLE SIGNIFICANCE TO MINERAL EXPLORATION IN THE MAGDALENA MINING DISTRICT, NEW MEXICO

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The K-Ar date reported herein was performed by Geochron Laboratories, Inc. during February 1971 for the New Mexico Bureau of Mines and Mineral Resources. The analytical methods used by Geochron Laboratories were described in Isochron/West, No. 1 (January 1971), p. 9. The constants used in the age calculations are:  $\lambda_c = 0.585 \times 10^{-10}/\text{yr}$ ;  $\lambda_p = 4.72 \times 10^{-10}/\text{yr}$ ;  $K^{40}/K$  total =  $1.22 \times 10^{-4}$  gm/gm. The discussion of the geologic significance of this date is based on detailed geologic mapping from Magdalena northward into the Bear Mountains by the author and David M. Brown, geological reconnaissance west of Magdalena, and on several K-Ar dates reported by R. H. Weber (Isochron/West, no. 1).

## GEOLOGIC DISCUSSION

Following the suggestions of Weber (1971, p. 35) the Datil Formation of Tonking (1957) is considered to have group status and the Spears, Hells Mesa, and La Jara Peak members are elevated to formational status. An erosional unconformity of regional extent (Willard, 1959, p. 95 and 98) separates the Hells Mesa tuffs (30.6 m.y., 32.1 m.y., 32.4 m.y.; Weber, 1971, p. 37-42) from the overlying basaltic andesites of the La Jara Peak Formation (23.8 m.y., this report). The La Jara Peak Andesite was therefore removed from the Datil Group and reassigned to a post-Datil sequence of basalts and basaltic-andesites by Willard (1959, p. 95); the date reported here substantiates this interpretation.

The La Jara Peak Andesite can be divided into a lower member of brecciated, slope-forming andesites with abundant amygdaloidal fillings of calcite and/or silica, and an upper member of cliff-forming, vesicular flows with only minor amygdaloids. Small pyroxene phenocrysts in both members are generally oxidized to hematite and/or iddingsite (?) which imparts the formation's distinctive appearance of fine-grained gray andesite with abundant small, reddish, relict phenocrysts.

During the pre-La Jara Peak interval of erosion, monzonitic to granitic stocks were intruded to within 2000 feet of the surface along a zone of intense faulting which trends N. 10°W. through the Kelly lead-zinc-silver district and into the southern Bear Mountains. Two of these stocks, the Nitt stock (28.0 m.y.) and the Anchor Canyon stock (28.3 m.y.), have previously been dated by the K-Ar method (Weber, 1971, p. 37, 38). Subsequent erosion cut very close to the tops of these stocks and may have exposed them before burial by andesitic flows of the La Jara Peak Formation. At least 1200 feet of basaltic andesites were deposited in the Bear Mountains (Tonking, 1957, p. 31, 57) and it seems probable that an appreciable thickness covered much of the Magdalena area.

Intense fracturing and moderate hydrothermal alteration, including introduction of disseminated pyrite, are visible in some areas beneath unaltered La Jara Peak andesites. Evidence of supergene alteration and one small oxide copper deposit are also present. Recognition of this unconformity raises the possibility of exploration for "blind" ore bodies which may have supergene enrichment zones.

A second period of mineralization, of probable Miocene age, is indicated by the existence of veins which cut the La Jara Peak Andesite. Rhyolitic flows south of Magdalena have been dated at 14.3 m.y. (Weber, 1971, p. 38) and appear to be younger than any mineralization.

### SAMPLE DESCRIPTIONS

G-R1786/NMBM-M/46-1

K-Ar

(whole rock) 23.8±1.2 m.y.

La Jara Peak Andesite. A pyroxene andesite flow (NE/4, NE/4, Sec. 31, T1N, R4W; 34°16'22"N, 107°17'22"W; at about 7,800 ft. elevation on the E escarpment of the Bear Mountains, 10.5 mi, NNW of Magdalena, immediately W of the Baca copper prospect at the head of Cedar Springs Canyon, Socorro Co., NM), consisting of 20% fresh clinopyroxene phenocrysts in a very fresh, fine-grained, holocrystalline groundmass of feldspar, magnetite, apatite, and small oxidized pyroxene(?) crystals. Analytical data: K = 3.565%;  $\text{Ar}^{40} = 0.00610$  ppm;  $\text{Ar}^{40}/\Sigma\text{Ar}^{40} = 53, 69\%$ . Collected by: C. E. Chapin, N. M. Bur. Mines. Comments: The La Jara Peak Andesite is very difficult to sample for dating because of its extreme susceptibility to deuteric alteration, amygdaloidal fillings, and weathering. The sample was taken from an unusually fresh talus block excavated from colluvium overlying the vein at the Baca prospect. The prospect is 200 to 300 feet above the base of the formation and only La Jara Peak Andesite crops out in the amphitheater. The sample matches the upper member lithologically. The 1200-foot sequence of andesitic rocks probably was deposited quite rapidly as there is little interbedded sediment and the flows are very similar lithologically.

### REFERENCES

- Tonking, W. H. (1957) *Geology of Puertecito Quadrangle, New Mexico*: N. Mex. Bur. Mines and Mineral Resources, Bull. 41.
- Weber, R. H. (1971) *K/Ar ages of Tertiary igneous rocks in central and western New Mexico*: Isochron/West, no. 1, p. 33-45.
- Willard, M. E. (1959) *Tertiary stratigraphy of northern Catron County, New Mexico*, in *Guidebook of west-central New Mexico*: N. Mex. Geol. Soc., 10th Field Conf., p. 92-99.