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Isochron/West, Bulletin of Isotopic Geochronology, v. 48, pp. 21-22

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A NEW Rb/Sr ISOCHRON DATE FOR THE HELLS MESA TUFF, SOCORRO COUNTY, NEW MEXICO

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We report a new Rb/Sr date from the Hells Mesa Tuff, a regional ignimbrite erupted from the Socorro Cauldron, Socorro County, New Mexico (Osburn and Chapin, 1983). The Hells Mesa Tuff consists of phenocrysts of quartz (11%), sanidine (19%), plagioclase (10%), and biotite (1%) in a vitroclastic groundmass. Zircon, sphene, and opaque minerals are present in trace quantities. Outflow is as much as 240 m thick and covers much of the Socorro to Datil region (Osburn and Chapin, 1983). The samples were analyzed as part of a study of the chemical effects of alteration in the Luis Lopez Manganese District immediately southwest of Socorro, NM.

Samples used for the isochron were collected from a measured section in the Joyita Hills, about 15 km northeast of Socorro (fig. 1). The date (32.8 ± 0.4 m.y.) (fig. 2) is in good agreement with Osburn and Chapins' (1983) average date of 33.1 m.y. (conventional K-Ar on various minerals) and McIntosh and others' (1986) $^{40}Ar/^{39}Ar$ plateau date of 32.04 ± 0.15 m.y. on sanidine.

Rb and Sr analyses were performed by x-ray fluorescence spectrometry at the New Mexico Bureau of Mines and Mineral Resources. The isotopic analyses were performed in 1985 at the Mineralogisk-Geologisk Museum, Oslo, Norway on a Vacuum Generators Model 354 mass spectrometer (table 1). Errors in the Rb and Sr analyses are ± 2%. Twenty-three replicate analyses of NBS 987 performed before and during the analyses reported here yield $^{87}Sr/^{86}Sr$ = 0.71020' ± 13. $^{87}Sr/^{86}Sr$ values were normalized to $^{86}Sr/^{88}Sr$ = 0.1194. The decay constant was 1.42×10^{-11} yr^{-1} (Steiger and Jager, 1977). The isochron was calculated using the regression routine of York (1966).

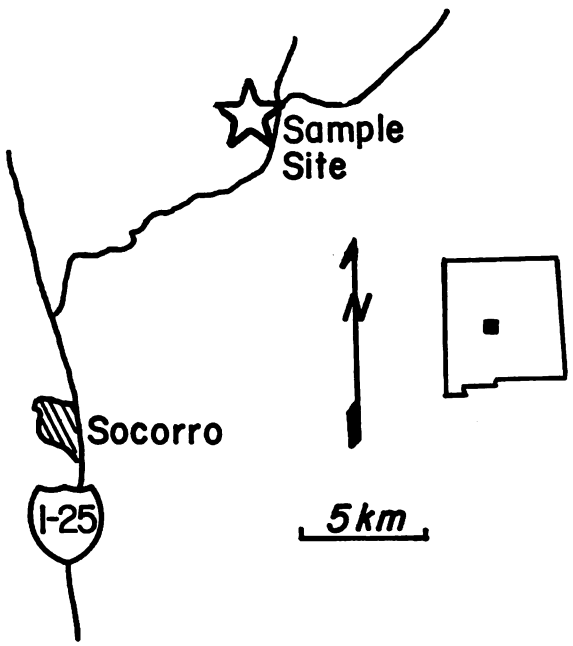

FIGURE 1. Location map for the measured section sampled for this work.

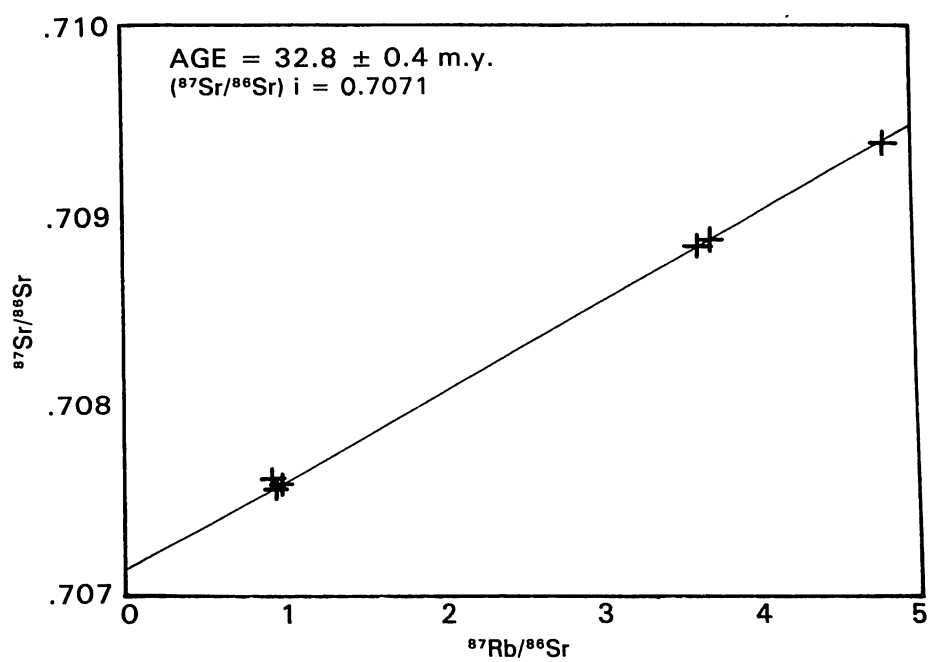

FIGURE 2. Isochron diagram for the Hells Mesa Tuff.

TABLE 1. Rb-Sr analyses for the Hells Mesa Tuff.

Sample	Rb	Sr	$^{87}Rb/^{86}Sr$	$^{87}Sr/^{86}Sr$	± sigma[1]
83-6-1	125	399	0.9087	0.70761	10
83-6-3	136	421	0.9345	0.70756	6
83-6-6	137	410	0.9667	0.70758	4
83-6-10	199	159	3.621	0.70883	7
83-6-11	198	119	4.812	0.70937	14
83-6-12	200	156	3.709	0.70886	5

[1]Precision of $^{87}Sr/^{86}Sr$ reported as 2 sigma.

This research was supported in part by grants from NSF (#EAR-8319913 to Norman) and the Norwegian Marshall Fund (to Norman) as well as a graduate research assistantship from the New Mexico Bureau of Mines and Mineral Resources to Eggleston.

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