

## ***K-Ar ages on post Early Jurassic granodiorite from the southern Pine Nut Range, western Nevada***

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## K-AR AGES ON POST EARLY JURASSIC GRANODIORITE FROM THE SOUTHERN PINE NUT RANGE, WESTERN NEVADA\*

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In the southern Pine Nut Range, Douglas County, western Nevada, a number of plutons ranging in composition from diorite to leucogranite intrude a thick sequence of volcanic and sedimentary rock ranging in age from Late Triassic to latest Early or early Middle Jurassic (Noble, 1972; D. C. Noble and N. J. Silberling, unpub. data). Here we report on K-Ar age determinations on coexisting biotite and hornblende from a granodiorite-quartz monzonite composite pluton named the Bullionville granodiorite-Longfellow quartz monzonite by Noble (1962), the oldest major plutonic body in the southern part of the range.

The hornblende K-Ar age of 107 m.y. (Early Cretaceous) is correlative with the Huntington Lake intrusive epoch of Evernden and Kistler (1970) in the Sierra Nevada. Intrusive rocks of the same age have also been reported from the Singatase Range east of the Pine Nut Range (Schilling, 1971), but appreciably older K-Ar ages (124 and 146 m.y.) have been obtained on intrusive rocks from the northern Pine Nut Range (Krueger and Schilling, 1971), leaving open the possibility that the pluton may be as old as Late Jurassic.

The 81.4-m.y. age (Late Cretaceous) obtained on biotite is reasonably interpreted as reflecting reheating during the Sierra Nevada Cathedral Range intrusive epoch of Evernden and Kistler (1970), during which time intrusive rocks were emplaced south of the Pine Nut Range west of Topaz Lake and to the southeast and east in the Pine Grove Hills (Krueger and Schilling, 1971) and northern Wassuk Range (Bingler, 1972). This interpretation is supported by petrographic features of the Lower Jurassic metavolcanic rocks west of Bullionville at the western margin of the pluton, which indicate that intrusion and contact metamorphism by the pluton occurred before Upper Triassic and Lower Jurassic rocks to the west (Noble, 1962) were metamorphosed, presumably during the Cathedral Range heating event.

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### SAMPLE DESCRIPTION

1. USGS(M) (hornblende) 106.7±4 m.y.  
(biotite) 81.4±3 m.y.

Unaltered hornblende-biotite granodiorite (SE¼SE¼SE¼NE¼, Sec. 8, T11N, R23E; 38°49'52"N, 110°25'13"W; Pine Nut Range, Douglas Co., NV) from the Bullionville granodiorite-Longfellow quartz monzonite composite pluton of Noble (1962). Analytical data: (Hornblende) K<sub>2</sub>O = 0.743%;  $\overset{*}{\text{Ar}}^{40} = 1.21 \times 10^{-10}$  mole/gm;  $\overset{*}{\text{Ar}}^{40}/\Sigma\text{Ar}^{40} = 80.1\%$ . (Biotite) K<sub>2</sub>O = 8.30%;  $\overset{*}{\text{Ar}}^{40} = 10.20 \times 10^{-10}$  mole/gm;  $\overset{*}{\text{Ar}}^{40}/\Sigma\text{Ar}^{40} = 88.3\%$ . Collected by: D. C. Noble, Stanford Univ.; dated by: E. H. McKee, U. S. Geological Survey. Comment: Both concentrates analyzed are better than 99% pure. No biotite whatsoever is present in the hornblende concentrate, and the age obtained thereon is thus the K/Ar age of the hornblende phase.

\*Publication authorized by the Director, U. S. Geological Survey, and by the Director, Nevada Bureau of Mines and Geology

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