

RADIOMETRIC AGES OF DIABASE SILLS AND BASALTIC LAVA FLOWS IN THE UNKAR GROUP, GRAND CANYON

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Rb-Sr and K-Ar methods were used to date diabase sills at Shinimu Creek, Tapeats Creek, and Hance Rapids, and basalt of the Cardenas Lavas at Basalt Canyon. A Rb-Sr isochron using six whole-rock specimens from the Cardenas Lavas yields an age of about 1.1 b.y. A preliminary Rb-Sr isochron (3 points) using whole-rock specimens from the differentiated sill at Shinimu Creek yields a similar age but a lower initial $^{87}\text{Sr}/^{86}\text{Sr}$ value. K-Ar age determinations on basalts from the Cardenas Lavas yield ages of about 0.8 b.y. K-Ar age analyses by isotope dilution and by $\text{Ar}^{40}/\text{Ar}^{39}$ total fusion methods on mineral separates and by $\text{Ar}^{40}/\text{Ar}^{39}$ incremental fusion methods on whole-rock samples from the diabase sills yield ages clustering around 0.9 b.y. and 1.1+ b.y.

The age of emplacement of the diabase sills and the Cardenas Lavas is considered to be about 1.1 b.y., as determined by Rb-Sr and some of the K-Ar analyses. The younger K-Ar determinations of the sills and flows suggest a heating event at about 0.8 to 0.9 b.y.

PRELIMINARY GEOTHERMAL EXPLORATION SAN FRANCISCO VOLCANIC FIELD, NORTHERN ARIZONA *

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The first step in our evaluation of the San Francisco volcanic field for geothermal energy was to determine the location and age of silicic volcanic rocks in the region. This approach assumes that surface exposures of silicic rocks, especially rhyolite, are a guide to shallow intrusive bodies which may be young enough to have retained magmatic heat.

Six major centers in the volcanic field containing silicic rocks are: Bill Williams Mtn., Sitgraves Mtn., Kendrick Mtn., San Francisco Peak, Mt. Elden-Dry Lake Hills, and O'Leary Peak. In addition there are a number of smaller isolated silicic domes or plugs. A total of 21 bodies of rhyolitic to dacitic composition were dated by K-Ar methods and yielded ages ranging from about 4 m.y. to less than 1 m.y. Those less than 1 m.y. old are in the east central part of the field and include a number of bodies in the San Francisco Peaks center, O'Leary Peak center, Mt. Elden-Dry Lake Hills, and O'Neil Crater. Because of their young age these areas are judged as the most promising for detailed geothermal studies.

THE LATE CENOZOIC VOLCANIC HISTORY OF THE WHITE MOUNTAINS, APACHE COUNTY, ARIZONA

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Mount Baldy, in southern Apache County, central Arizona, is a middle Tertiary volcano which is the center of the White Mountain Volcanic Field. The volcano consists of latite and quartz latite lava

flows piled one upon the other forming

The earliest activity of the Mount Baldy eruption of latite flows (55% SiO_2) on the surface of moderate relief cut into volcaniclastic rocks of middle Tertiary granitoid and metamorphic cobbles in the area indicates that these rocks were deposited south. The latite volcanism was followed by extensive activity during which a local light latite (63% SiO_2), alkali trachyte (68% SiO_2) lavas were extruded, resulting in flows 700 meters thick. The rock suite has high alkali affinities. A date of 8.6 ± 0.4 m.y. for the late quartz latite lava flows. A date of 3.9 ± 0.9 m.y. overlies Mount Baldy cone. The Mount Baldy lavas have no

The latest period of volcanism is represented by olivine basalt eruptions. This activity is of Quaternary age has built up a plateau which comprise the bulk of the White

AN OCCURRENCE OF TYPE B PEARLETTE ASH

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A water-laid rhyolitic ash bed exposed about nine miles east of Snyder, Texas, and the Pearlette ash of Meade County, Kansas, in the Yellowstone National Park area are to be equivalent to deposits containing the Blancan vertebrate assemblage described by the correlation between type B Pearlette ash based on chemical and petrographic characteristics and fission track ages. Atomic absorption measurements of Fe, Ca, Ti, Mn and Rb in the ash correspond to those of the type B Pearlette ash. Significant differences from glass shards in the Bandelier Tuff (Jemez Mts., New Mexico) ash using the spindle stage reveals quartz, sanidine, oligoclase, pink quartz, of which occur in the type B Pearlette ash. The volcanic glass shards from the ash bed in the index of the glass of type B Pearlette ash track dating of four zircons from the ash bed in Kansas was reported to be 1.9 ± 0.1 m.y. The correlation of this ash bed with the number of occurrences of air fall tephra from an eruption in Yellowstone and provided a key for the upper Cenozoic deposits and tephra in Texas.