horse material. Neville, Opdyke, Lindsay, and Johnson (1979), investigating the magnetic stratigraphy, radiometric age relationships, and fossil mammals of the Glenns Ferry Formation in Idaho, determined an age of 3.75 m.y. for the lowest stratigraphic occurrence of Cosomys. According to C. A. Repenning (written commun., 1979) Cosomys primus from the Coso Formation is about 3.4 m.y. old. The pumice-bearing water-laid tuff appears to be no older than 3.0 m.y. Consequently, if the relation of the tuff to the fossiliferous strata is correct, a gap in the record may be present or an unusually low sedimentation rate may have pertained to the intervening period.

PLIOCENE RHYODACITE LAVA FLOWS

Several thick flows of porphyritic rhyodacite overlie both the rhyolite and rhyodacite pumice deposits of the Coso Formation in the vicinity of Haywee Ridge (Duffield and Bacon, 1981; Duffield and others, 1980). These flows were described as andesite by Stinson (1977a) and Chesterman (1956). All the flows are similar in appearance and composition; the weighted mean of two biotite age determinations is 2.52±0.05 m.y. (table 1, locs. 1 and 2; Duffield and others, 1980). This age is probably consistent with an age of 2.01 m.y. calculated from the original data of Evernden, Savage, Curtis, and James (1964, sample KA 1026) for low-potassium biotite from the northernmost flow. Duffield, Bacon, and Dalrymple (1980, loc. 51) were unable to obtain a meaningful age for either biotite or hornblende from the same locality studied by Evernden and coworkers (sample KA 1026). Some of the rhyodacite flows fill canyons in the underlying pyroclastic rocks of the Coso Formation (fig. 4; Duffield and others, 1980) and provide a minimum age of approximately 2.5 m.y. for the Coso Formation.

CONCLUSIONS

The potassium-argon ages of volcanic rocks that overlie, are interbedded with, and intrude the Coso Formation indicate that the formation includes strata that range in age from somewhat greater than 2.5 m.y. to at least 6.0 m.y. old and that the Coso Formation is Miocene and Pliocene in age. The oldest exposed part of the Coso Formation crops out from the north end of the Coso Range northeast to the Inyo Mountains. Sedimentary rocks of the Coso Formation northeast of the Coso Range contain a vertebrate fossil (Agriotherium) that is not younger than 4.8 m.y. old. The 3.0-m.y. age implied for the Blanchan fossil-bearing strata of the Coso in the Coso Range (fig. 1, loc F) described by Schultz (1937, locs. 131 and 284) is consistent with radiometric age determinations on rocks associated with Blanchan faunas from other areas (C. A. Repenning, oral commun., 1978; Repenning, 1980); the 2.3-m.y. age calculated from the data of Evernden, Savage, Curtis, and James (1964) is probably a minimum age.

The age of the Owens Valley, the westernmost basin of the Basin and Range province, is of considerable significance to the history of Basin and Range extension. Fluvial and lacustrine deposits exposed northeast of the Coso Range indicate that a basin, possibly the tectonic precursor to the Owens Valley, began collecting sediment at least 6 m.y. ago. Crustal instability in the region is documented by the presence of arkosic sedimentary rocks and by the contemporaneous eruption of mafic and silicic volcanic rocks. Sedimentary rocks slightly older than 2.5 m.y. occur in the northwestern Coso Range and coarse 3-m.y.-old clastic sedimentary deposits are cut by graben-forming faults in the interior of the range. Volcanism began within the Coso Range approximately 4 m.y. ago (Duffield and others, 1980). The ages of volcanic and sedimentary rocks in southern Owens Valley show a shift from early volcanism and sedimentation (5-6 m.y.) on the north flank and northeast of the Coso Range to later volcanism, block faulting, and sedimentation (2.5-4 m.y.) within the range.

REFERENCES CITED