

THE EOCENE-OLIGOCENE TRANSITION IN NORTHWEST ARIZONA

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The age of Paleogene fluvio-lacustrine sediments (“Rim gravel”) on the Colorado Plateau in northwestern Arizona has been narrowed to late Paleocene(?) or early Eocene time from recently made fossil collections. The fossils occur in thin lacustrine carbonate beds within an erosionally truncated sequence of arkosic sediments (Music Mountain Formation) that actually may range regionally from early Paleocene to late Eocene in age. The fossils within the carbonate beds include unidentified stromatolites, aquatic gastropods (*Viviparus* aff. *meeki*, *V.* cf. *calamodontis* or *V.* cf. *uniangulatus*, *Lioplacodes* aff. *mariana*, *Pleurolimnaea tenuicosta?*, and *Physa* sp.), charophytes (*Peckichara coronata* and *Nodosochara* sp.), and a single ostracode (*Bisulcocyridea aravadensis?*). Elsewhere, the top of the Laramide-derived, arkosic sequence is marked by a sharp disconformity with a thick red soil profile suggestive of subtropical weathering. A preferred early Eocene fossil age assignment for the top of the truncated, Laramide-age section at Long Point, AZ, is consistent with limited paleomagnetic data that place the base of one key section immediately above magnetic anomaly 25. Recent studies using U-Th/He apatite thermochronometry indicate that the southwestern Colorado Plateau was eroded down to a Kaibab-Moenkopi surface at ca. 50-53 Ma, followed by Rim gravel deposition derived from surrounding highlands. These diverse data suggest an age for the preserved Laramide fossiliferous sediments that is close to the Paleocene-Eocene boundary (ca. 55 Ma). An abrupt transition to carbonate-dominated conglomerates above the deeply weathered disconformity surface documents a markedly different tectonic, climatic, sedimentologic, and hydrologic setting that is most likely associated with the record of global cooling through the Eocene-Oligocene transition that has emerged from various studies. The markedly contrasting Laramide and Oligocene(?) sediments record a change from a predominantly chemically weathered landscape, developed primarily on carbonate strata under a thick soil and dense vegetation cover, to one in which markedly increased aridity resulted in soil removal and carbonate-clast-dominated fluvial deposits of the Scott type.

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