

AN OVERVIEW OF EARLY TERTIARY TERRESTRIAL PALEOGEOGRAPHY OF THE NORTH AMERICAN SOUTHWEST AND GULF COAST

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ABSTRACT

Increasingly detailed stratigraphic work in intermontane basins from Montana to Texas has revealed significant differences between northern and southern early Tertiary terrestrial faunas of western North America. Early Tertiary fossil vertebrate sites are scarce east of the Big Bend region of Texas now, but within a decade, lignite strip mining in East Texas, Louisiana, and Arkansas will be producing outcrops. The best hope for finding extensive early Tertiary terrestrial faunas in eastern North America lies in the Gulf Coast.

Climatic differences are traceable from locality to locality using paleopedology. For example, Paleocene fluvial mudstones in West Texas and New Mexico show prominent red and black banding. Red layers are rich in soil-formed calcite nodules. Red color banding and nodules are not seen in northern localities until the early Eocene, indicating a northward spread of warm, variable climate. Migrations of animals, triggered by such climatic changes, may be responsible for abrupt faunal changes in the northern intermontane basins.

The early Tertiary Gulf Coast may have served as a source for new forms migrating to the west and north. The Paleocene and early Eocene of the southeastern U. S. can be expected to have strong European affinities, and the late Eocene to have close ties to western North America. The Paleocene faunas of West Texas show less resemblance to those of France, which were similar in latitude, than the high degree of similarity of early Eocene animals of Europe and western North America would have suggested. Evidently, neither the slow-to-open North Atlantic nor the long distance were insurmountable barriers to many mammals before the end of the early Eocene. The Cretaceous interior seaway split North America and served as a barrier to migration between West and East Texas. The effects of this separation may have lingered throughout the Paleocene.

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