

THE PATTERN OF TERRESTRIAL FAUNAL CHANGE IN THE MID-CRETACEOUS OF NORTH AMERICA

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The most fundamental data provided by fossils pertain to time and place of occurrence of species, and because of that fact, fossils have a pivotal role in the study of Earth and life history. All species of fossil organisms contribute information about Earth and life history because their first occurrence, last occurrence, co-occurrence with other species, and geographic distribution exhibits a time specific pattern correlated to a greater or lesser degree with physical conditions and events that vary through geologic time. The objective in studying patterns of life is to gain insight into the causal processes that effect the patterns. One of the most dramatic patterns in Earth history involves the extinction of many dinosaur species at the end of the Cretaceous Period. However, an investigation of almost any time interval recorded in fossiliferous continental sediments falling in the roughly 160 million years between Late Triassic (230 ma) and the end of the Cretaceous (66 Ma) would involve dinosaurs. The interval between approximately 113 Ma and 95 Ma, a portion in the middle of the Cretaceous, is significant because (among other factors) flowering plants were becoming dominant, major groups of modern mammals were originating, new dinosaurs were appearing, and others were going extinct. During the same interval sea level fluctuation and plate tectonics were modifying continental geography and stable carbon isotopes were varying through time. One place to examine mid-Cretaceous changes and patterns in a limited area is the Aptian through Cenomanian sections of the southern United States, specifically in north Texas.