

## **LATE CRETACEOUS TO MODERN GENESIS OF KARST IN THE APPALACHIAN GREAT VALLEY**

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The century old paradigm for the genesis of landforms and karst of the Appalachian Great Valley (AGV) has regarded regional down-cutting and lowering of base level since the early Miocene ( ~23 Ma ) as the primary mechanism of speleogenesis. The majority of vertebrate faunas found in AGV cave systems are no older than the Irvingtonian North American Land Mammal Age (Early to Middle Pleistocene). However, recent palynological analyses of basal sediment from the Gray Fossil Site in Tennessee have revealed a Paleocene to Eocene age of the karst features that contain an early Pliocene (~5 Ma) fauna. Late Cretaceous to early Neogene ages have been suggested for lignite deposits in surficial sediments overlying karst at Brandon, Vermont, and at Pond Bank, Pennsylvania. Fossil pollen from the non-marine Pond Bank deposit is perhaps as old as early Turonian to middle Campanian (~75-90 Ma), indicating a minimum late Cretaceous age for subjacent karst.

Studies of manganese deposits in the AGV beneath and within alluvium of the west pediment of the Blue Ridge have demonstrated an association with deposits of kaolin, lignite, and/or bauxite in at least four locations extending from Virginia to Alabama. In each case the associated deposits are superjacent to karst. A newly discovered in-situ bauxite precursor deposit found by the authors within a cave exposed in a Virginia quarry provides additional circumstantial evidence of a pre-Pleistocene age of the karst, as its occurrence requires genesis by intense climatic weathering that post-dates the formation of the cave. Thus, the epikarst and caverns of the AGV may be the exposed remnants of an ancient phreatic system that has accumulated and discharged sediment repeatedly since the Late Cretaceous. Such deposits may be more widespread than previously thought, and may provide important insight into the antiquity of caves, surficial deposits, and landforms preserved in the Appalachians.