Cave-Fill Deposits in Pre-Atokan Paleocaves in the Mississippian (Osagean) Burlington-Keokuk Limestone in Southwestern Missouri

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Two siliciclastic-filled (sandstone and shale) paleocaves in the Mississippian (Osagean) Burlington- Keokuk Limestone are exposed in roadcuts in Dade County, Missouri. These caves formed in pre- Atokan time as suggested by their shale and/or sandstone fill, which contains Late Atokan spore and pollen fossil assemblages (principally Torispora securis, Triquitrites sculptilis, and Dictyotriletes bireticulatus).

These flora, and sedimentologic analysis, suggest that the cave-fill deposits were derived from Late Atokan terrestrial deposits (McLouth Formation) and not Desmoinesian age rocks (Krebs Group) that are exposed nearby. The McLouth Fm. Similarly fills subsurface paleocaves in Leavenworth and Jefferson counties in Kansas. One of the caves is filled with relatively thick units of coarse to fine-grained, large-scale cross-stratified sandstone that also have internal erosion surfaces, flaser bedded units, and local soft-sediment deformed beds, flame structures, and normal-graded layers. Sandstone beds commonly are separated by inferred slack-water black shales, and there is evidence of contemporaneous (and later) cave-roof collapse during sand deposition. The sediments filling this cave likely entered via surface sinking streams. The other cave is filled mainly by black mudrock, shale, and sandy siltstone, with abundant organic matter, pyrite and secondary sulfates, associated with abundant roof-collapse limestone breccia and “rauwacke”. This paleocave is interpreted to have been filled as colluvium entered through sinkhole collapses beneath marshes or swamps, and by some in-flowing, low-flow water currents.