

Middle Ordovician Carbonates of Central Kentucky, Patrick J. Gooding and Robert R. Daniel, Kentucky Geological Survey, University of Kentucky, Lexington, KY 40511, gooding@uky.edu, rdaniel@uky.edu

The predominantly carbonate sediments of the Middle Ordovician High Bridge Group and Wells Creek Dolomite are composed mainly of dolostone and limestone with minor amounts of shale and siltstone. These formations are of important economic significance because of their composition and association with hydrocarbon entrapment and localization of mineral deposits. Sedimentary structures, fauna, lack of fauna and the abundance of carbonate sediments, mainly mudstones, suggest regressive carbonate cycles deposited on tidal flats within the intertidal, supratidal, and shallow marine environments.

The core was drilled along the axis of the Cincinnati Arch, on the Jessamine Dome in central Kentucky. The area is associated with the Kentucky River and Lexington Fault Systems, and is underlain by basement structures, mainly the Rome Trough. An unconformity of regional extent is present at the base of the Middle Ordovician.

Polished core slabs show great detail and variety in sedimentary structures, colors, textures, contacts, and repetition of particular rock types and structures with increasing depth and influence from hydrothermal activity. Detailed examination re-emphasizes the important role that invertebrate organisms played. They generated fecal and skeletal material, which produced carbonate sediment of both mud and coarser particles. Algae also played an important role in producing carbonate mud.

Many interesting sedimentary structures and geologic features resulting from burrowing activity are observed. Bird's-eye structures; tubular and cylindrical holes; vertical, inclined, horizontal and dolomite-filled burrows; unusual color-mottled structures; fossil packstones; laminations; mudcracks; extensive deformed, disturbed and destroyed bedding; and stylolites are common.