Kentucky along the western margin of the Appalachian basin.

Trace fossils occur where dolomite overlies black shale in the lower part of the Huron Member (basal New Albany or Ohio Shale). *Cruziana, Zoophycos, Planolites, Phycodes, Chondrites* (Type A), *Trichichnus, Teichichnus, Laevicyclus,* and a newly described large burrow form are common. Up section, trace fossils are found where gray shale overlies black shale in the upper lower part of the Huron Member (*Teichichnus, Planolites, Chondrites*-Type B, *Rhizocorallium,* and *Zoophycos*) and the Three Lick Bed (*Chondrites*-Types C and D, *Planolites*-like burrows, *Zoophycos,* and pyritic burrows).

A combination of interpretations based on the stratigraphy, lithology sedimentary structures, and trace fossils suggests that the Devonian black shale was deposited in an upward-deepening sequence transgressive over the axis of the present Cincinnati arch in east-central Kentucky. The carbonate environment of the underlying Middle Devonian Boyle dolomite contains trace fossils and features suggestive of shallow water. At the beginning of the Upper Devonian, migration of black muds onto the platform rimming the Cincinnati arch allowed interbedding with the carbonates.

Up section, the carbonate-black shale environment was replaced by entirely black shale deposition. Periodic oxygenation allowed brief periods of burrowing.

Trace fossil correlation will be helpful in understanding the detailed stratigraphy within the mid-continent Upper Devonian black shale.

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Paleogeography and Structural Development of Late Pennsylvanian–Early Permian Oquirrh Basin, Northwest Utah

Deposition in the late Paleozoic Oquirrh basin of northwest Utah produced as much as 7.5 km of limestone and sandstone. Study of Upper Pennsylvanian and Lower Permian lithofacies, trace fossils, and body fossils relative to a time framework determined by fusulinid biostratigraphy reveals a spatial mosaic of depositional environments which shifted through time.

The Oquirrh basin changed in form from a broad, topographically subdued, shelf area in the Middle Pennsylvanian to a northwest-trending topographic basin in the Late Pennsylvanian. Water depths may have reached 300 to 400 m. Coarse conglomerates, commonly composed of older Oquirrh Group clasts, are common in latest Pennsylvanian and early Wolfcampian deep-water deposits. They record rapid lithification, uplift, and erosion of the margins of the trough, and imply that the Oquirrh basin was bounded by active northwest-trending high angle faults. The faults, with offset rates of about 25 cm/1,000 years, were apparently initiated in the Late Pennsylvanian, and became inactive by the late Wolfcampian. The upper Oquirrh Group records the passive filling of the remnant graben-like trough.

The histories of the Oquirrh basin and of basement uplifts and yoked basins throughout the region to the south and east are similar. The northwest trend, high angle fault margins, and rapid structural development in the latest Pennsylvanian and early Wolfcampian demonstrate the Oquirrh basin's tectonic association with the regional deformation responsible for the Ancestral Rocky Mountains.

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Whitney Canyon Field—Potential Gas Giant in Wyoming Thrust Belt

Recent drilling in the Absaroka plate of the Wyoming thrust belt has confirmed the presence of a major gas-condensate accumulation in the Whitney Canyon area of Uinta County, Wyoming. Reserves are primarily in porous and/or fractured Paleozoic carbonate formations. Triassic carbonate rocks also appear to be commercially productive.

The discovery well, which was scheduled as a 13,400-ft (4,084 m) test, was spudded in October 1976. Mechanical problems were encountered at 10,691 ft (3,259 m) in the Permian Phosphoria Formation and the well was subsequently completed in the Triassic Thaynes Formation. Paleozoic gas production was established in 1978 by the Amoco-Chevron-Gulf No. 2 well, which was drilled into a nearly normal stratigraphic section of Jurassic Twin Creek Limestone through Ordovician Bighorn Dolomite before crossing the Absaroka thrust at a true vertical depth (TVD) of 15,516 ft (4,729 m). Cretaceous sandstones and shales were drilled to a total depth of 16,224 ft (4,945 m) or 15,894 ft (4,845 m) TVD. A development well located approximately one mile north of the No. 2 well was drilled into a similar stratigraphic sequence.

The Whitney Canyon structure is a north-trending geophysical anomaly with little or no surface expression. Its general shape can be defined well with reflection seismic data. At the Phosphoria level, the structure is approximately 10 mi (16 km) long and 2 mi (3.2 km) wide with 2,500 ft (762 m) of closure.

Gas tested to date from the Triassic Thaynes Formation is sweet, whereas the Paleozoic gas is sour with a maximum H_2S content of 18%. Environmental considerations and gas treatment plant construction will delay Paleozoic gas production until late 1981.

Although reserve estimates for the Whitney Canyon structure are quite speculative at this time, it appears to be a giant field.

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Sedimentologic Description of Part of Coal-Bearing Carboniferous Sequence Exposed Near Joggins, Nova Scotia

A 300-m section of the upper Cumberland Group exposed south of M'Cairn's Brook near the village of Joggins, Nova Scotia, includes five lithologies, including sandstones, siltstones, claystones, carbonaceous shales, and coal. The sandstones and siltstones display one or