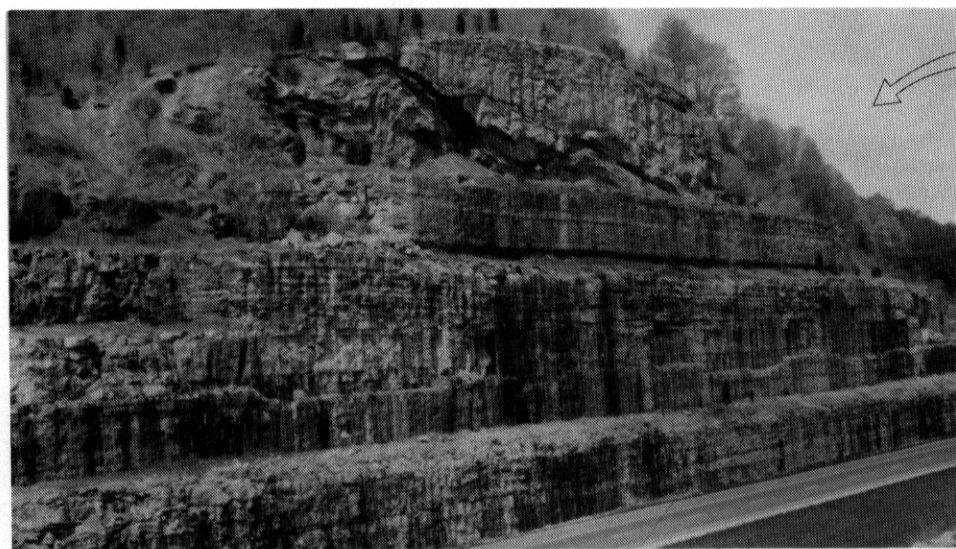


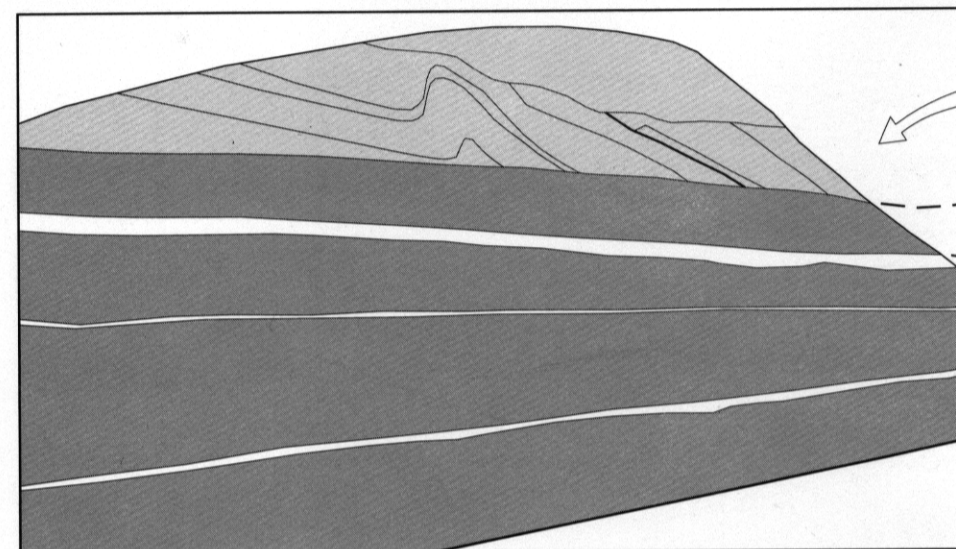
**GEOLOGIC HIGHWAY CROSS SECTIONS:
INTERSTATE HIGHWAY 75
CONWAY, KENTUCKY, TO JELICO, TENNESSEE**

Donald R. Chesnut, Jr.

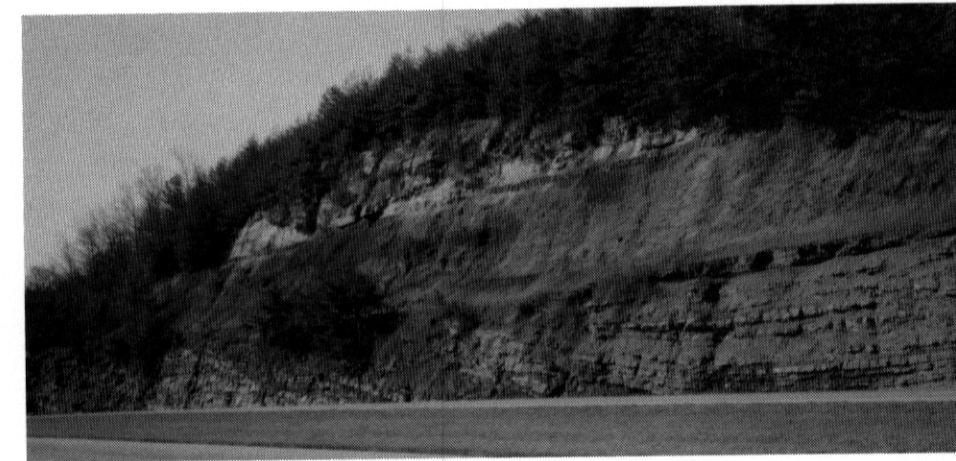
In cooperation with the Kentucky Department of Transportation



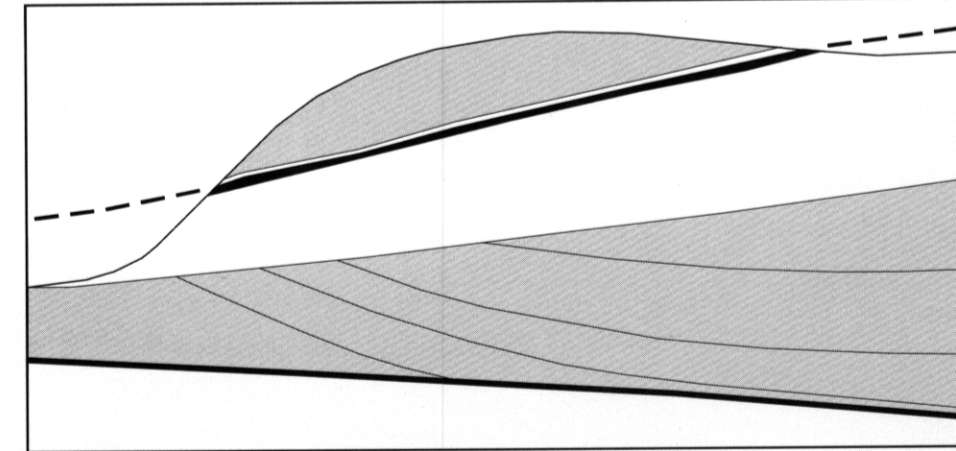
Photograph of roadcut at milepost 61.



Graphic representation of geologic relationships shown in photograph at milepost 61.



Photograph of roadcut at milepost 25.



Graphic representation of geologic relationships shown in photograph at milepost 25.

Highway roadcuts along Interstate Highway 75 from Conway, Kentucky, to Jellico, Tennessee, expose Mississippian and Pennsylvanian rocks in south-central Kentucky (Fig. 1). The roadcut exposures offer easy access and stratigraphic variety for educational purposes, and are ideal for high school, university, and professional geology field trips. Several national and international field trips, and many out-of-State university field trips have examined these exposures. In addition, scientific studies involving clastic and carbonate sedimentology, coal geology, paleontology, biostratigraphy, and karst (cave) development have been undertaken along this road.

These rocks, however, are highly variable and difficult to differentiate stratigraphically. The sandstones and shales of different stratigraphic levels are commonly quite similar, making correlation or identification of stratigraphic units very difficult. Moreover, these sedimentary rocks are highly variable laterally (for example, a sandstone may grade laterally into a shale in a short distance), further complicating stratigraphic identification. In order to aid scientific and educational studies of these coal-bearing rocks, this stratigraphic identification of the rocks exposed along Interstate Highway 75 was undertaken, resulting in the six cross sections on these sheets.

Locations of the cross sections along Interstate Highway 75 are shown on the reference map (Fig. 1). Letters (A, B, C, etc.) on the map indicate where the cross sections begin and end. The cross sections are a side-view representation of the rocks that are exposed in the roadcuts. Hills and valleys (topography) are represented by jagged up-and-down lines; the elevation of the highway is indicated by the smoothly curved, heavier line. Because of vertical exaggeration on the cross sections (the vertical component is drawn approximately 25 times greater than the horizontal), the topography appears to be much steeper than it actually is. Roadcut exposures, therefore, are shown as hills occurring above the level of the road. Mile markers (small green signs spaced 1 mile apart on the highway shoulder) are illustrated on the sections as small rectangles with numbers inside. Numbers on the left margins of cross sections refer to elevations above sea level. Creeks, rivers, bridges, intersections, and similar features are plotted on the sections to help the viewer locate the highway roadcuts.

The sedimentary rocks observed in the roadcut exposure are illustrated on the sections, and the major rock types present are identified in the Explanation. Thicknesses for many of the rock units were determined from cores drilled by the Kentucky Department of Transportation preceding construction of the highway. Actual shapes of the rock layers were determined by field examination.

The shales and sandstones of the Borden Formation were deposited as subaqueous (underwater) delta deposits during the Early Mississippian Period (350 to 360 million years ago). In some areas marine invertebrate fossils can be found in the shales. The Slade Formation, which was formerly divided into the Newman Limestone and the Penro Member (Ettensohn and others, 1984), was deposited as calcareous (limy) sands and muds in a shallow marine environment similar to the shallow seas around the Bahamas. Marine fossils are common in these limestones. The Paragon Formation, which was formerly referred to as the Pennington Formation (Ettensohn and others, 1984), was deposited as muds and sands in subtidal and intertidal environments. The Paragon Formation was truncated by erosion during the Early Pennsylvanian Period (about 320 million years ago), and this truncation is represented in the rock record as an unconformity.

The Breathitt Formation, which unconformably overlies the Mississippian rocks, consists of sandstone, siltstone, shale, and coal. The Breathitt Formation in the area of these exposures is Early and Middle Pennsylvanian in age (approximately 310 to 320 million years old). It contains several unnamed shale layers that were deposited as muds, silts, and sands in extensive, shallow marine or brackish seas. Traces of marine and brackish-water invertebrate fossils can be found in some of these strata. Many of the sandstones observed along the highway represent sands that were deposited in the channels of rivers flowing from the ancient Appalachian Mountains. These channel sandstones may appear as broad lenses of rock, or as a rock layer that cuts through underlying strata. Fossil tree limbs and logs can be found in the basal parts of some of these sandstone layers. These fossil tree limbs represent logjams that formed in the ancient rivers. Thin shale beds overlying these sandstones were commonly deposited as muds in abandoned channels or as flood sediments in levee or overbank deposits associated with the rivers. These shales may contain plant fossils such as ferns, seed ferns, and horsetails. Coal beds were deposited largely as peats in coastal peat swamps. Some locally occurring coal beds were deposited in abandoned (oxbow) channels or as transported peat mats and peat debris.

More detailed geologic descriptions and illustrations have been published for the roadcut exposures marked by an encircled letter. The publications containing these descriptions are listed under SOURCES FOR STOP DESCRIPTIONS.

REFERENCES CITED

- Cobb, J. C., Chesnut, D. R., Hester, N. C., and Hower, J. C., 1981, Coal and coal-bearing rocks of eastern Kentucky (Guidebook and roadlog for Coal Division of Geological Society of America Field Trip No. 14): Kentucky Geological Survey, ser. 11, 169 p.
- Dever, G. R., Jr., Hester, N. C., Ettensohn, F. R., and Moody, J. R., 1979, Stop 3: Newman Limestone (Mississippian) of east-central Kentucky and Lower Pennsylvanian slump structure, in Ettensohn, F. R., and Dever, G. R., eds., Carboniferous geology from the Appalachian Basin to the Illinois Basin through eastern Ohio and Kentucky (Ninth International Congress of Carboniferous Stratigraphy and Geology, Field Trip No. 4): Lexington, University of Kentucky, p. 175-181.

SOURCES FOR STOP DESCRIPTIONS

Detailed descriptions of individual roadcut exposures (those indicated by an encircled letter on the cross sections) can be found in the following stop descriptions. Bibliographic references are given in REFERENCES CITED.

Locality	Reference
(A)	Cobb and others (1981), Stop 1, p. 6-10.
(B)	Dever and others (1979), Stop 3, p. 175-181.

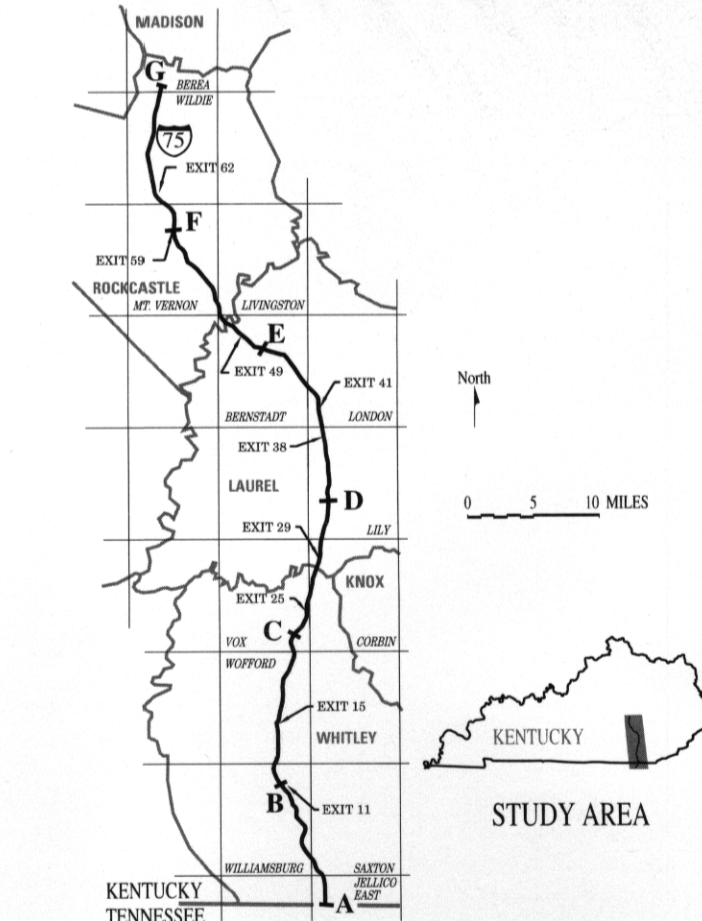


Figure 1. Reference map showing Interstate Highway 75 and locations of cross sections.

Age	Lithology	Stratigraphic Units
PENNSYLVANIAN	Shale	Jellico coal
	Shale	Blue Gem coal
	Shale	Little Blue Gem coal
	Shale	Lily-River Gem coal zone
	Sandstone	Corbin Sandstone
	Shale	Grayhawk coal
	Sandstone	Hazel Patch Sandstone
	Sandstone	Melley Rough coal
	Sandstone	Rockcastle and Bee Rock Sandstones
	Sandstone	New Livingston coal
MISSISSIPPIAN	Sandstone	Paragon Formation
	Sandstone	Pippin Rock Mbr.
	Shale	various members
	Shale	Wide Mbr.
	Shale	Nancy Shale
	Shale	Crowell Mbr.
	Shale	Nancy Shale
	Shale	Nancy Shale
	Shale	Chattanooga Shale
	Shale	Boyle Dolomite
DEVONIAN	Sandstone	Crab Orchard Formation
	Sandstone	Brassfield Dolomite
ORDOVICIAN	Sandstone	Drakes Formation

Figure 2. Stratigraphic column.

