

EXTRA: Explore the New Trails at Hocking Hills during Earth Science Week

by Audrey Blakeman & Chuck Salmons

October 6, 2017—Ohio is abundant with great outdoor adventures to celebrate [Earth Science Week 2017](#). Perhaps no region in the state is more picturesque and more replete with opportunities for exploration than the Hocking Hills in southeastern Ohio. The region boasts hundreds of miles of trails for hiking and mountain biking, as well as sites for various other outdoor activities, such as canoeing, rock climbing, and ziplining. But a trip to the region wouldn't be complete without learning about the fascinating geology that shaped the land we see today.



Figure 1. Whispering Cave, an impressive shelter cave along the new trail at Hocking Hills State Park.

Hocking Hills State Park, the gem of the Ohio State Parks system, opened the new Hemlock Bridge and Whispering Cave Trails in May 2017. These trails provide access to Whispering Cave, a large shelter cave which spans 275 feet across its length and features an intermittent waterfall that spills over the rim of the cave into the stream below. Located just 0.2 miles from the parking lot of the former dining lodge, which burned in December 2016, the new trails offer unique opportunities to view many spectacular features of the Black Hand Sandstone without a large time commitment (fig. 1).

The Black Hand Sandstone is the major cliff-forming unit that is responsible for the stunning scenery within the Hocking Hills region. This sandstone was deposited during the Mississippian Period (360–320 million years ago) when a shallow sea covered Ohio. Rivers joined the sea over western Pennsylvania and eastern Ohio and brought with them a large volume of fine gravel, sand, and silt. The sediment load was deposited on a large delta not unlike that at the mouth of the modern Mississippi River at the Gulf of Mexico. Through the processes of burial, compaction, and cementation, the sediments were lithified into the Black Hand Sandstone.

Today, the Black Hand Sandstone is visible throughout Hocking Hills State Park and State Forest. Within the rock, primary sedimentary structures, such as crossbedding and ripple marks, are preserved and effectively provide a window into Earth’s distant past. These types of sedimentary structures can be used to determine the direction of current flow in the ancient rivers, estimate the velocity at which the water flowed, and in conjunction with the strata above and below, be used to make interpretations about ancient landscapes. Over the course of many millennia, the Black Hand Sandstone has been subjected to the forces of erosion, which is responsible for many of the scenic features within the park and along the Hemlock Bridge and Whispering Cave Trails. Interesting erosional features viewed along the trails include shelter caves, honeycomb weathering, and slump blocks. Shelter caves are one of the most prominent features throughout Hocking Hills State Park. In addition to Whispering Cave, three smaller shelter caves adorn the cliff face along the Hemlock Bridge and Whispering Cave Trails. Shelter caves are not true caves because they are not composed of winding underground passages, yet they are impressive sights. The Black Hand Sandstone is the most resistant rock unit in the Hocking Hills region, resulting in towering cliff faces, but it is in fact composed of three separate zones. The lowermost and uppermost of these zones are hard and well-cemented. However, the central zone is poorly cemented and easily disaggregates into individual sand grains (fig. 2). Because of this weakness, water and wind more readily weather the central zone, resulting in enormous shelters between the upper- and lowermost zones. Examples include Old Man’s Cave, Ash Cave, and Whispering Cave.

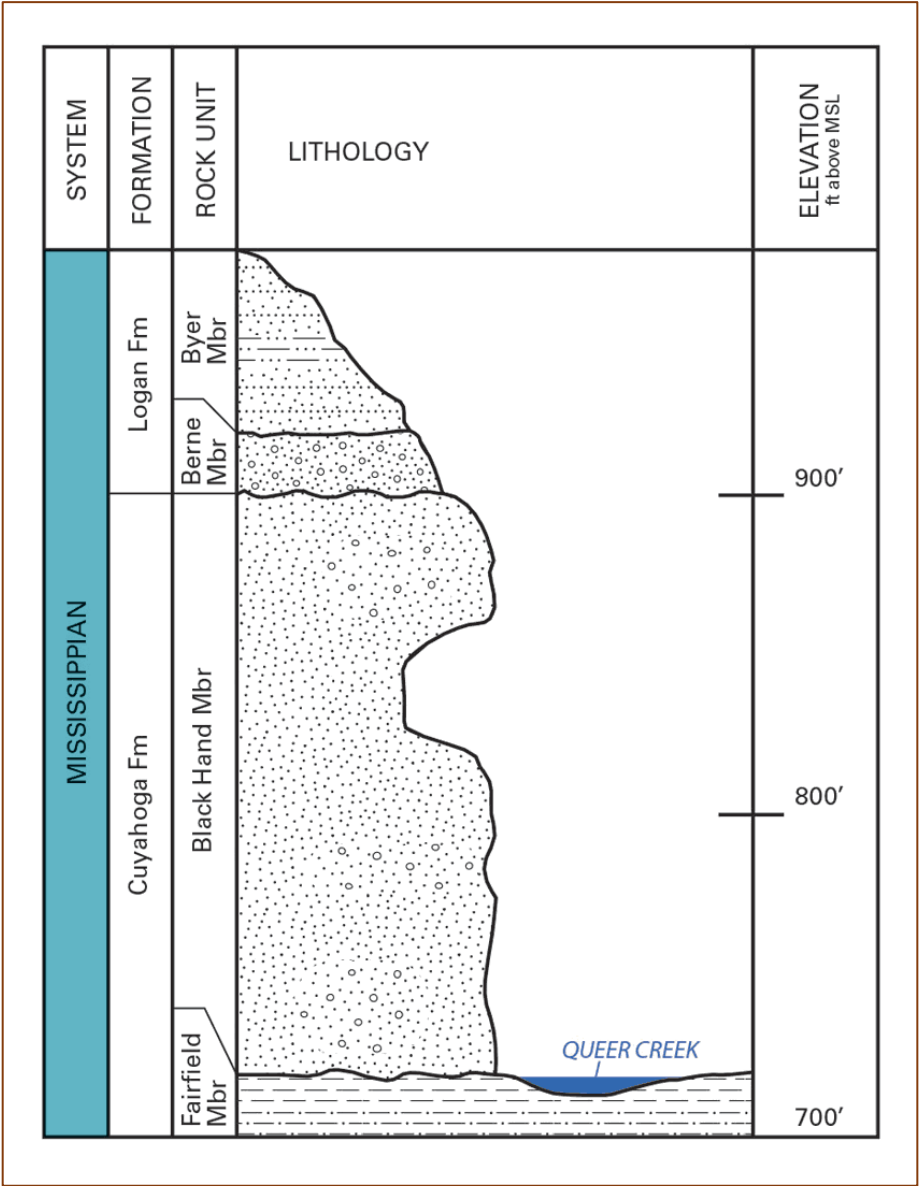


Figure 2. Generalized stratigraphic column of rocks exposed along the new Hemlock Bridge Trail at Hocking Hills State Park.

Many of the rocks exposed in the Hocking Hills region exhibit honeycomb weathering, one of the most striking features. The “honeycombs” are holes that have weathered into rock faces, resembling the cells within a beehive. These holes form through differential weathering—a process by which small, loosely consolidated pockets of sediments are removed by erosion while the surrounding, better-cemented sediments remain intact (fig. 3).

Slump blocks are large blocks of rock that litter the hillsides and valley floors within the gorges of the Hocking Hills region. Several examples can be viewed along the Hemlock Bridge Trail as it descends into



Figure 3. Honeycomb weathering in the Black Hand Sandstone.

the gorge below Whispering Cave. Slump blocks develop through a process called frost-wedging, in which water enters crevices in the rocks and freezes. As water freezes and expands, it widens the crevice. This process continues during innumerable cycles of freezing and thawing until eventually the crevice becomes a large crack and the rock separates from the cliff.

In addition to connecting visitors to the Whispering Cave Trail, the Hemlock Bridge Trail also descends into the gorge, known as The Gulf, where it connects to the Grandma Gatewood Trail via a newly constructed swinging bridge across Queer Creek. The Grandma Gatewood Trail, which is part of the statewide Buckeye Trail, leads hikers to Cedar Falls to the south and to Old Man's Cave to the north.

For explorers seeking a new hike or a close look at fascinating Ohio geology, a trek down the new Hemlock Bridge and Whispering Cave Trails is a worthwhile endeavor.

Further Reading



[Guidebook 4: Geology of Hocking Hills State Park](#), by Michael C. Hansen. [17 MB PDF]



[Report of Investigations 63: Bedrock geology of the South Bloomingville quadrangle, Hocking and Vinton Counties, Ohio \(Hocking Hills State Park\)](#), by Richard M. DeLong. [Ordering info here](#).



[The Geologic Interpretation of Scenic Features in Ohio](#), by J. Ernest Carman. [14 MB PDF]



[Hocking Hills State Park](#), web page hosted by Ohio State Parks & Watercraft.



[Earth Science Week](#), event info and more from the Ohio Geological Survey.