

MINER'S ROCK TRAIL - LAKE LEATHERWOOD CITY PARK - EUREKA SPRINGS - ARKANSAS



Miner's Rock, highlight of the Miner's Rock Trail at Lake Leatherwood City Park, Eureka Springs, Arkansas.

THE GEOLOGIC STORY OF MINER'S ROCK

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To a geologist, every rock tells a story - and Miner's Rock is no exception. In fact, the story of Miner's Rock is particularly intriguing because it is a story that comes to us over the great expanse of geologic time. It is a tale of the ebb and flow of ancient seas, of Earth, water, and weather; a tale that provides us with insights into the processes which have shaped the geologic history of northwest Arkansas and the Ozarks.

HOW OLD IS MINER'S ROCK?

When a geologist examines a rock, one of the goals is to determine how old the rock is. One way to do this is to identify the rock and compare it to other rocks in the region for which the age is known (a task called "correlation"). Miner's Rock is actually composed of two different types of rock formed at different times in Earth's history by rather different processes.

Geologists refer to rocks formed at different times as "Formations" and give them names to help distinguish them when seen in outcrops throughout a region. Near the base of Miner's Rock, fragments of rocks recognized as components of the Powell Formation can be seen. Geologists studying the rocks of northern Arkansas in the early 1900's determined that the Powell Formation was formed from sediments deposited in a shallow, tropical sea during the Ordovician Period of Earth's history (505 - 438 million years ago). Overlying the rocks of the Powell Formation (and forming the bulk of Miner's Rock) is another rock type which geologists have named the Clifty Formation. The Clifty Formation is a sandstone which was deposited across northern Arkansas during the Devonian Period of Earth's history (408-360 million years ago). So, the rocks forming Miner's Rock are very ancient indeed! Are you surprised to discover this fact?

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HOW DID MINER'S ROCK FORM?

If you look carefully near the base of Miner's Rock, you can see that the rock is composed of many chunks and fragments of rocks from the Powell Formation. A rock composed of pieces (or clasts) of other rocks is a rock type geologists call "breccia" (pronounced breh' chee uh).



The Powell Formation crops out throughout much of northern Arkansas - as you walked up the hill, you were walking on the Powell Formation. The Powell Formation contains shale, limestone, and a rock called dolostone. Clasts of each of these rock types can be seen among the fragments of the Powell Formation forming the breccia at the base of Miner's Rock. This breccia formed after deposition of the Powell Formation, during a time when the seas retreated from the Ozarks, and Powell Formation rocks were exposed to wind, water, and weather.

After the Powell Formation was formed, the shallow seas retreated for a prolonged interval of time - no one really knows for certain how long, but it was at least several millions of years. During this time, the Powell Formation lay exposed at Earth's surface, and was partially eroded by the combined effects of wind, water, and weather. In some places, the limestone and dolomite of the Powell Formation were dissolved by water to form sinkholes and caves (not unlike those that can be observed forming further along this trail today!).

When the seas finally returned to northern Arkansas, they brought with them great quantities of sand which spread over the former land surface as a layer covering everything beneath it - at this time, northern Arkansas and the Ozarks were situated near the southern edge of the North American continent, and it would have been possible to see beautiful white sand beaches throughout our region.

It was during this time that the white sand surrounding clasts of the Powell Formation at Miner's Rock was deposited. Geologists refer to this white sand as the Clifty Formation, and it was deposited throughout northern Arkansas during the Devonian Period of Earth's history (about 408-360 million years ago).

The great over-arching mass of rock forming the bulk of Miner's Rock is sandstone of the Clifty Formation, which, during the Devonian Period, filled a sinkhole that had developed in the Powell Formation at this site. The sandstone is more resistant to erosion than shale, limestone, or dolostone. Thus, over the many millennia of its exposure, the rocks of the Powell Formation slowly eroded, leaving behind this wonderful outcrop of the more resistant Clifty Formation that we call Miner's Rock - and a special tale of Ozark geology!



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