

On entering Stebbins Gulch and experiencing its magnitude, one cannot help but be impressed by the powerful process of nature. What shaped these cliffs, creating a setting for the unusual plant and animal life found here? The bedrocks exposed in these valley walls tell the story of the formation of ancient sedimentary bedrocks and of the subsequent process of erosion that gouged out the ravine.

The bedrocks are formed

The bedrocks, about 200 feet thick, were all deposited in marine conditions beginning some 370 million years ago. An ancient mountain range east of today's Appalachians supplied the muds, silts, and sands; rivers carried them to a shallow sea basin. These materials, after long burial, became our local bedrock:

Late Devonian Period (oldest):

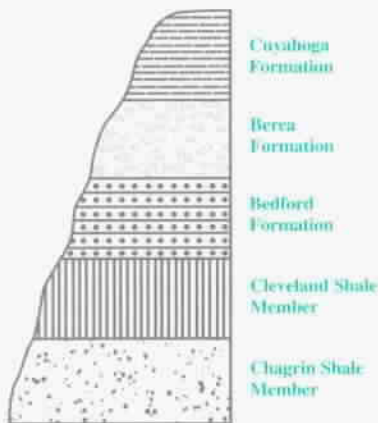
- Chagrin Shale, an offshore gray shale

Devonian-Mississippian Period:

- Cleveland Member of Ohio Shale, a black shale deposited offshore in deep water;
- Bedford Shale, an offshore shale with some siltstone or sandstone layers;
- Berea Sandstone, deposited near-shore

Early Mississippian Period:

- Orangeville Member of the Cuyahoga Formation, deposited offshore



Variations in the bedrocks influence many aspects of the Gulch. Waterfalls vary with each rock type depending on its relative resistance to erosion. The cliffs are most dramatic where the harder sandstone forms overhang. The sandstone deposits, being porous, allow water to pass through the rocks.

Erosion begins

Ever since the bedrocks formed, the rock has undergone continuous erosion. Prior to the most recent ice age, a river-and-stream system drained the

Geological forces created a rugged ravine with unique flora and diverse biotic communities.

land much as the East Branch of the Chagrin River does today. Outwash material from the advancing glacier, mostly sands and gravels, filled up this preglacial river system.

Later, when the ice retreated, Stebbins was almost level. A new river system began to downcut again. In Stebbins the creek cut through glacial debris and soon reached bedrock. Soft shales beneath the resistant sandstone eroded quickly, and the sandstone waterfall tracked gradually upstream.

The cover

Hikers in Stebbins Gulch encounter the first of two groups of Berea Sandstone falls before climbing out of the ravine.

By Tom Yates.

Printed on recycled paper. 06005m



Ice formations create this curtain hanging from undercut cliff of Berea Sandstone.