

Most of the water for the crystalline rocks is -- you guessed it -- in the fractures and faults. There are some minor areas of limestone on the eastern side of the mountains.

NEW ENGLAND

The New England province is also made up of crystalline rocks, and like the rocks of the Blue Ridge, is positioned right between the Ridge and Valley and the Piedmont Provinces. The rocks of this province generally stand as rounded hills or ridges above the surrounding areas. These rocks were pushed from the east during one of the several mountain-building events that affected eastern Pennsylvania.



Caves

One of the things rainwater does when it begins trickling down through ground is to dissolve carbon dioxide from dead plants in the soil. The water and the carbon dioxide team up to produce carbonic acid (H_2CO_3). Result: the rainwater - now groundwater - becomes weakly acidic.

Acidic groundwater has quite an effect on a rock called limestone: it dissolves it.

Little by little, the water carries away traces of the limestone, a rock which is based on the mineral calcite ($CaCO_3$; calcium carbonate).

The dissolving process begins in the limestone's cracks and fractures. As the water carries away more and more of the limestone's calcite, the cracks get bigger. In several hundred thousand years, enough limestone may have dissolved away so that great gaping caverns are left hidden under the ground.

Scientists think that most of the dissolving-away process takes place at whatever level the water table is at that time. But cave formations like stalactites and stalagmites (stalactites hang from the cave ceiling; stalagmites project upward from the floor) can't form until the cave passage is above the water table and no longer in the saturated zone.

They must wait until the cavern itself has formed and the water table has dropped.

The fantasy-like formations begin as single drops of water on the ceiling or wall of a cave room. Just like the water that dissolved and carried away limestone to create the cave in the first place, the water droplet clinging to the cave ceiling has dissolved calcite in it, too.

When the calcite-laden water drop enters the cave air, some of the CO_2 from the calcite and acidic water ($CaCO_3$ and H_2CO_3) diffuses back into the air. With its chemical balance changed, the water droplet gives up some of its calcite. It deposits the calcite in a tiny ring on the cave ceiling.

Each water droplet deposits a trace more calcite at the tip of the one before it. Eventually a delicate, hollow tube is formed. The young formation is called a "sodastraw."

Over the years, the calcite layers build up, sometimes to astonishing thicknesses. Sometimes they form the familiar stalactites and stalagmites we've all seen pictures of. Sometimes they form more fantastical shapes: delicate miniature dams holding tiny pools of water, or cobble-shaped "flowstones" that look like they're still in motion.