OUTSTANDING GEOLOGIC FEATURE OF PENNSYLVANIA

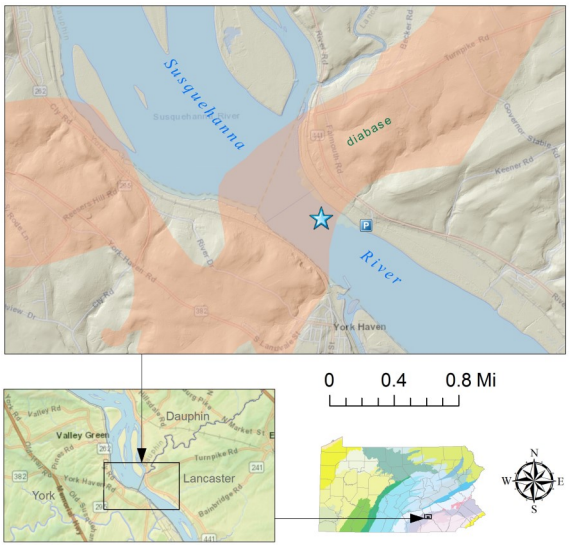
POTHOLES AT CONEWAGO FALLS, LANCASTER COUNTY

Stuart O. Reese, 2016

Trail of Geology
16–092.0

Location

Falmouth, Lancaster Co., Conoy Twp., lat: 40.11921, lon: -76.70916 (Pa. Fish and Boat Commission parking and boat launch); York Haven 7.5-minute quadrangle



Recommended Reading

Sevon, W. D., 1989, Exotically sculptured diabase: Pennsylvania Geology, v. 20, no. 1, p. 2–7.

_____ 1993, River on a rampage: Pennsylvania Geology, v. 24, no. 2, p. 2–7.

Geology

Numerous examples of potholes, carved ripple marks, and smoothly sculptured rock can be seen at Conewago Falls of the Susquehanna River when the river's gage height at Harrisburg is below 3.5 feet (see USGS Stream Gage 01570500). The rock is a tough, dark igneous rock called diabase, which intruded into the area as magma about 200 million years ago as continental rifting stretched the earth's crust thin. The hard diabase and adjacent rocks that were baked by the hot magma constrict the flow of the Susquehanna River. The intricate sculpted forms in the hard rock demonstrate the erosional power of water. Potholes are thought to originate from fast-flowing, sand-laden water that forms a vortex at a point of weakness in the rock. Swirling water with quartz sand acts as a sand-blasting drill. Some of the potholes are quite large, several feet in diameter and depth, while most are on the order of 1 to 2 feet across. The diabase is massive and durable enough to stand against the pressures of fast-flowing water, while persistent, swirling, abrasive sand grinds at the rock.

The features at Conewago were thought to have formed when the Susquehanna River was full of sediment and water from melting glaciers to the north. Evidence of the extraordinary flow velocities of these meltwaters is the presence of obviously moved large blocks of diabase. Some are truck size, weighing more than 100 tons. Extreme flows may have had their origin in ice-dam breaks of glacial lakes, and the constriction of the valley at Conewago would have enhanced the higher flow rates.

Top left: Transported diabase boulder with pothole. Bottom left: Ripple scour marks. Above: Sculpted diabase. Note 4-foot-long walking staff for scale.

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