OUTSTANDING GEOLOGIC FEATURE OF PENNSYLVANIA

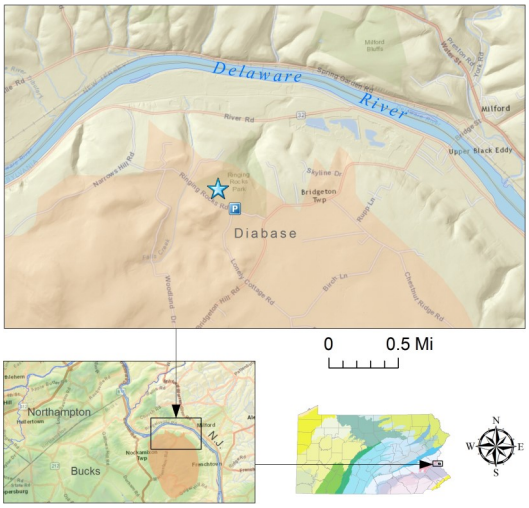
RINGING ROCKS, BUCKS COUNTY

Stuart O. Reese, 2016

Trail of Geology
16–097.0

Location

Ringing Rocks County Park, Bucks Co., Bridgeton Twp., lat: 40.56011, lon: -75.12878 (parking); lat: 40.56249, lon: -75.12946; Riegelsville 7.5-minute quadrangle



Recommended Reading

Inners, J. D., 1980, Nockamixon State Park, Bucks County—Rocks and joints: Pennsylvania Geological Survey, 4th ser., Trail of Geology 16–014.0, 5 p.

Sevon, W. D., and Fleeger, G. F., 1999, Stop 12, Ringing Rocks block field, *in* Sevon, W. D., and Fleeger, G. F., eds., Economic and environmental geology and topography in the Allentown-Bethlehem area: Annual Field Conference of Pennsylvania Geologists, 64th, Allentown, Pa., Guidebook, p. 112–121.

Nockamixon State Park web page of DCNR.

Ringing Rocks web page of the Bucks County website.

Geology

The Ringing Rocks site in Bucks County is one of the largest diabase boulder fields in the eastern United States. Many of the rocks have a characteristic “ring” when struck with a hammer. The origin of this field started about 230 million years ago as Africa split from North America and upland streams dumped sediment into the resulting Triassic Birdsboro basin, which stretched from New York to Virginia. At the beginning of the Jurassic, about 200 million years ago, a dark igneous rock called diabase intruded the basin rocks in the form of magma. Afterward, normal faulting and some folding developed as the entire basin tilted to the northwest. Long-term weathering of the rocks has since uncovered the diabase, which because of its tough, interlocking minerals has formed local topographic highs. Water scour marks on some boulders indicate erosion by flowing water while the diabase was still in place. Finally, periglacial conditions during the Ice Age formed the boulder field when repeated freeze-thaw cycles broke off large pieces of fractured bedrock, and cold summers allowed the boulders to slide slowly downhill on slippery permafrost turf.

Numerous legends have been advanced regarding the musical properties of these boulders. Much effort has gone into understanding why the rocks ring, because not every boulder will produce a tone when struck. Some visitors put the number at one in six, while others say one in three rocks that are struck will ring. A general explanation is that a delicate, complex balance of conditions, including mineralogy, weathering properties, and microclimate, combines to produce a distinctly musical rock. As the outer rim of a boulder weathers, pyroxene minerals expand into clays, creating tension in the rock. Projecting boulders that are exposed in the sunshine away from the shade of the woods are among those that have developed a capacity to ring when struck.

Ringing Rocks boulder field. Photograph by Kevin Tarbert, Pennsylvania Geological Survey intern.

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