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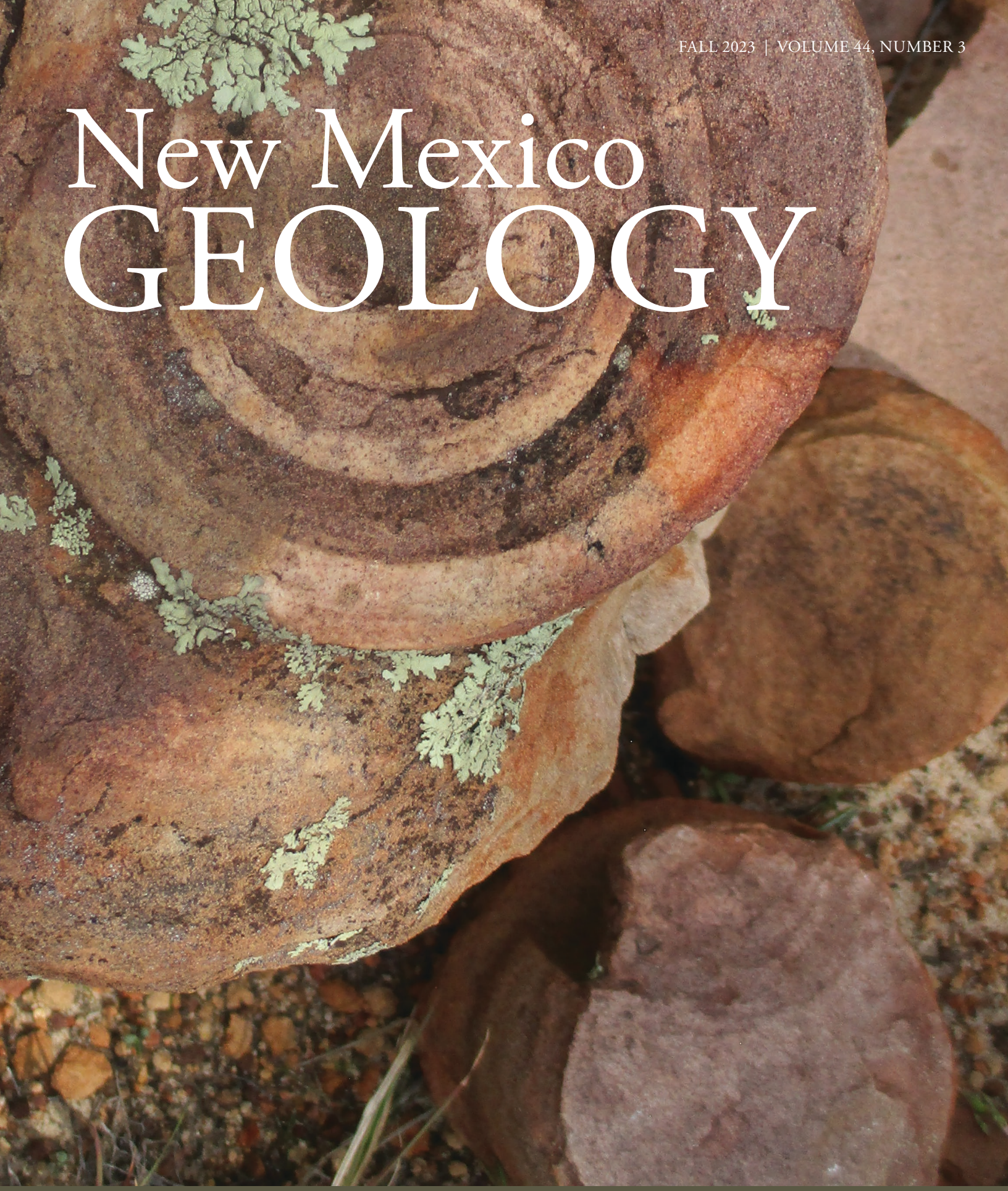

NEW MEXICO BUREAU OF GEOLOGY AND MINERAL RESOURCES

Contents

Unusual Sandstone Cylinders from the Lower Permian Glorieta Sandstone, Northern New Mexico

Spencer G. Lucas, William A. DiMichele, and Joseph M. Karnes

The early Permian Glorieta Sandstone is exposed across much of central and northern New Mexico and is part of the same lithosome termed Coconino Sandstone in northern Arizona. Glorieta and Coconino strata are primarily of eolian origin. In New Mexico, the only Glorieta Sandstone fossils that have been reported are reworked marine foraminiferans, but in Arizona, the Coconino Sandstone contains many vertebrate footprints and other trace fossils. On Sacatosa Mesa near Las Vegas in San Miguel County, New Mexico, the Glorieta Sandstone contains numerous upright sandstone cylinders in interdunal sedimentary deposits in the lower part of the formation. Most of these cylinders are perpendicular to bedding, have smooth exteriors, and, in cross section, have a structureless core surrounded by thin, concentric laminae. Some have one or more external grooves that demarcate a helical trajectory of flat to very slightly concave, slightly imbricated surfaces around the circumference of the exterior. The lack of deformation of the sediment in and around the cylinders and the external markings on some of the cylinders preclude their identification as inorganic dewatering structures or other forms of water conduits. The sandstone cylinders do not resemble any known cylindrical or plug-shaped trace fossils, and the lack of ornamentation (bioglyphs) on the cylinder walls precludes their identification as animal burrows. The most likely origin of these cylinders is as the fill of molds left by plant stems that were buried upright.

Photos of selected sandstone cylinders in the Glorieta Sandstone on Sacatosa Mesa in San Miguel County, New Mexico. In-place cylinders are seen in lateral/oblique views (top row) as well as cross-sectional views. The cross sections reveal the concentric rings present in some of the cylinders and also show the close spacing of some cylinders. Lack of sediment deformation structures and other features excludes dewatering pipes or burrows as the origin of the cylinders, which instead are most likely stem casts of Permian plants. Scales are in mm and cm.

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