



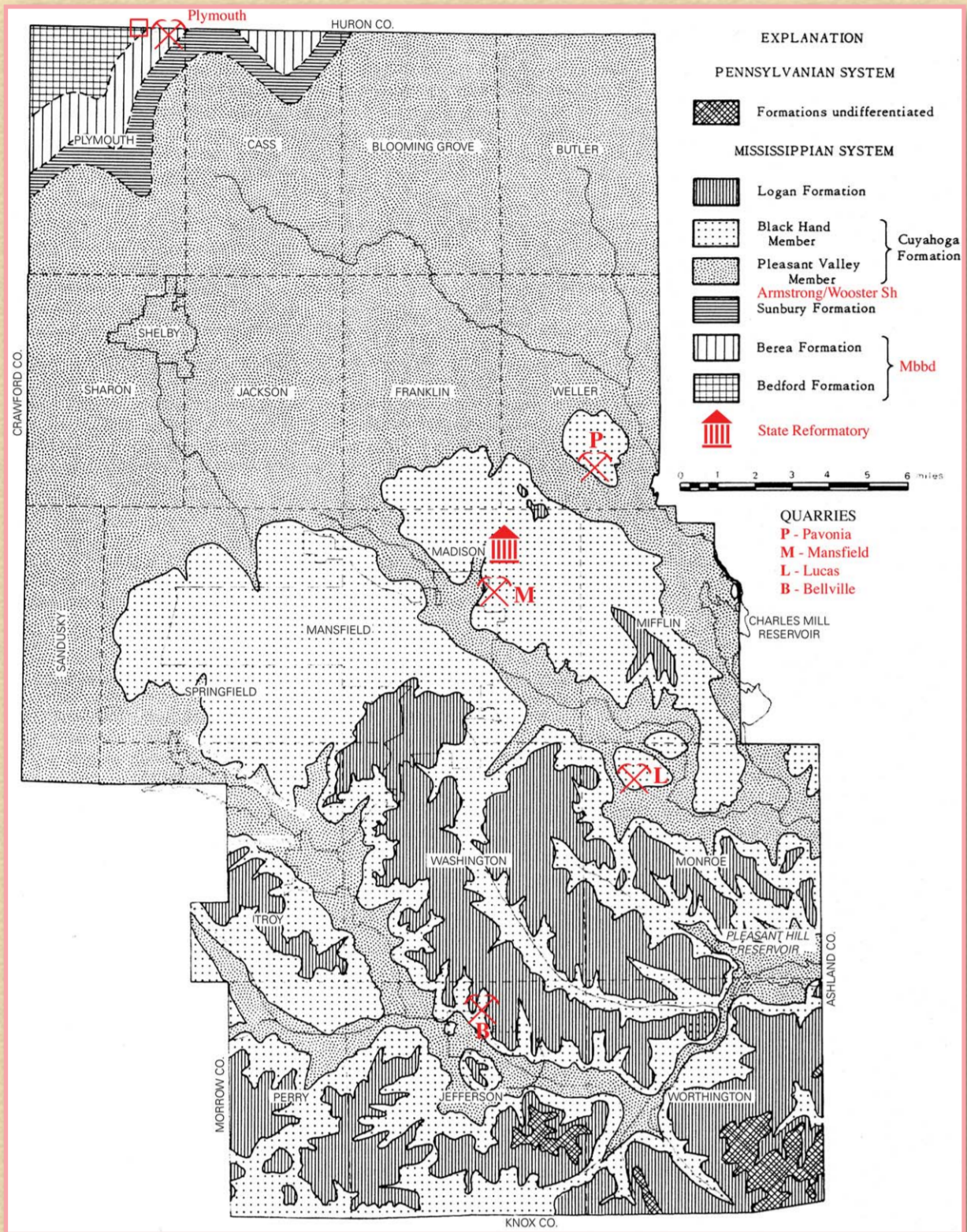
Black Hand Sandstone: A Building Stone of Unique Distinction from Richland County, Ohio

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The quarries have been silent for nearly a century, but the legacy of one of Ohio's most beautiful building stones lives on in the impressive churches, homes, and commercial structures of Mansfield and elsewhere. The Mississippian-age Black Hand Sandstone, commonly called the "Mansfield" stone, was well known in the latter half of the nineteenth century for its unique coloration of reds, browns, and grays that are often arrayed in stripes, swirls, and bands. In the hands of a skilled stone mason, the rich tapestry of the Black Hand Sandstone found in Richland County rivals marbles and granites.



Geologic map showing the locations of major historic building stone quarries in Richland County, Ohio. Modified from Totten (1973, fig. 5).

The most important quarries were located to the immediate northeast of Mansfield. Approximately 60 feet of medium- to coarse-grained Black Hand Sandstone is exposed. The sandstone is predominantly brown to tan in color, often with black, red, and gray laminations. The sandstone with Liesegang rings or banding occurs near the bottom of the quarry and varies from 10-inches to 4-feet thick. Rapid lateral variations in color are evident throughout the quarries. Prominent near-vertical joints trending northeast-southwest to southeast-northwest are exposed in the north wall of the west quarry. The original quarry (east) opened about 1840; the west quarry was opened in 1894 and closed about 1906. The quarries were worked intermittently into the 1930s.



The Knapp Quarry in Ashland, Ohio, circa 1900. The sandstone being quarried is most likely from the Mississippian-age Logan Formation, but may include the upper most portion of the Black Hand Sandstone. Photo courtesy of the Ashland County Historical Society.



A fresh exposure at the historic Bushnell Quarry, located southeast of the intersection of U.S. 30 and State Route 545 in Richland County, Ohio. Note the color banding. Hat for scale.

The stone quarried at Mansfield was marketed in Ohio and surrounding states. The massive and forbidding State Reformatory, northeast of Mansfield, specified that the lightest-colored "Mansfield" sandstone be used. A remarkable example of the Black Hand building stone in the Mansfield area is the Martin Bushnell residence, built in 1892. The Universal Unitarian Church, built in 1894 in Bellville; commercial buildings scattered throughout the Carousel District of downtown Mansfield; the restored bathhouse at Liberty Park, Mansfield; and the First Presbyterian Church in Shelby are also handsome examples of the Black Hand sandstone dimension stone. Four additional Presbyterian churches in Ohio—located in Napoleon, Dayton, Barnesville, and Upper Sandusky, respectively—used the Black Hand Sandstone from the Mansfield area for construction.



Two views of the State Reformatory near Mansfield.



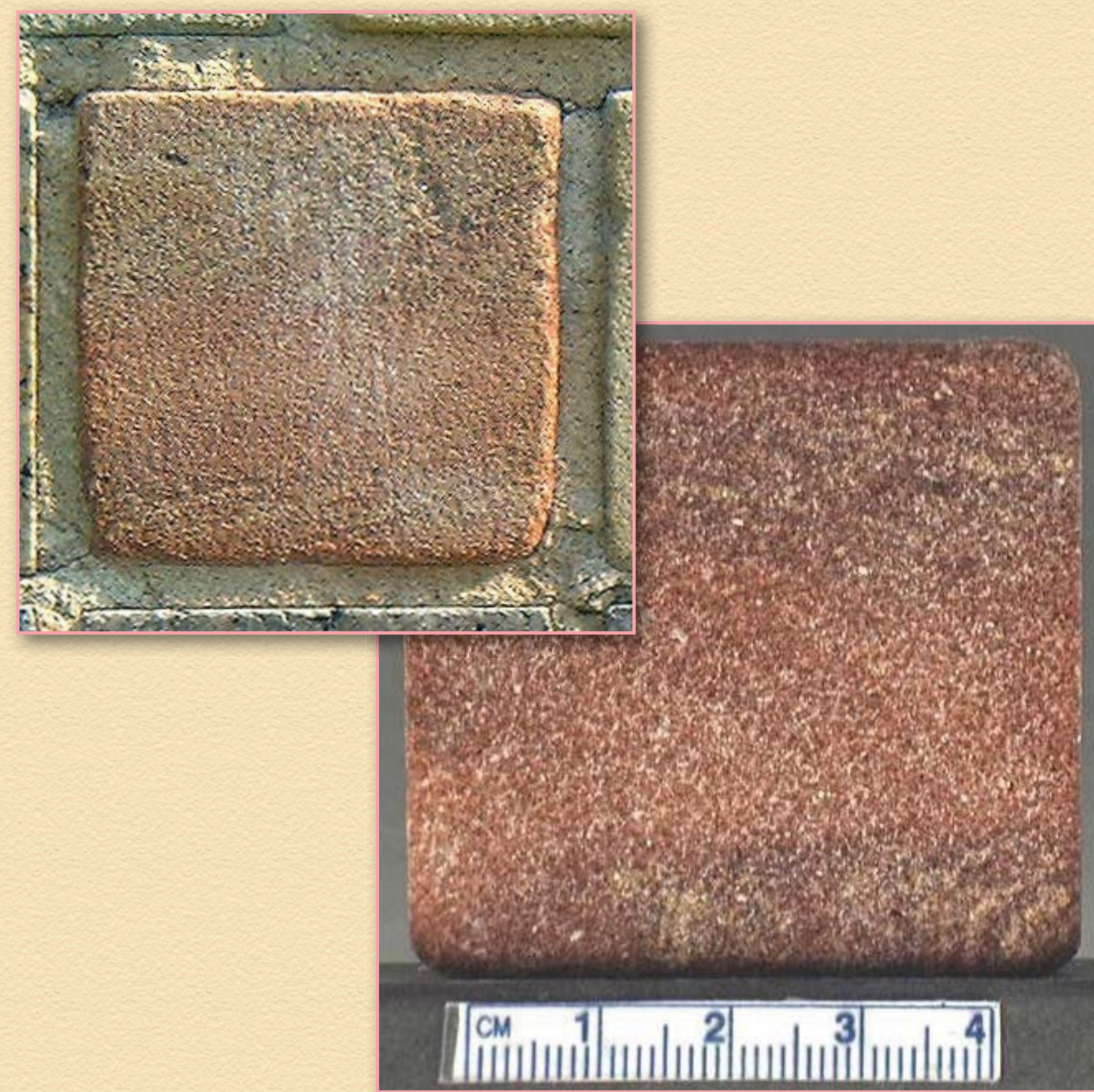
View (to west) of the Martin Bushnell residence, built in 1892 and located west of downtown Mansfield, Ohio.



Detail of the front entrance to the Bushnell residence in Mansfield, Ohio. Note the colorful swirls and banding ("Liesegang") of the Mississippian-age Black Hand Sandstone building stone quarried to the northeast of Mansfield.

In 1948, the National Institute of Standards and Technology in Gaithersburg, Maryland, constructed a stone test wall of building stones collected from working quarries in the United States during the 1870s. The wall provides an opportunity to study the effects of weathering on stone from throughout the United States, with the climatic conditions being the same for all stones. Two samples from Mansfield, one from Bellville, and one

from Richland County (Weller Township) are available for research. The weathering characteristics of the Black Hand Sandstone in Richland County, Ohio, compare favorably with other sandstones from across the country.



5RA19 Mansfield wallstone (left) and archive stone (right) from the National Institute of Standards and Technology Test Wall constructed in 1948 and currently residing in Gaithersburg, Maryland. The test wall was made from the 1876 Centennial Collection of U.S. Building Stones. Weathering effects appear to be minimal, even though the stone is described as porous.

Additional quarries that produced the Black Hand Sandstone include one at Pavonia in Weller Township, Richland County; one at Bellville in Jefferson Township of Richland County; Richland Stone Company north of Lucas in Monroe Township, Richland County; at least two quarries north of Mifflin in Ashland County; two in Ashland County to the east of Pavonia; and four in northeastern Troy Township, Richland County.



Three views of the abandoned Pavonia Quarry, circa 1910. Note the three figures in the right center of the far left photo for scale of the massive Black Hand Sandstone.

The surface bedrock of the area is composed primarily of siliciclastic rocks of Mississippian and Pennsylvanian ages. Underlying the Black Hand is a stratigraphically complex series of shales, siltstones, and silty sandstones—the Pleasant Valley Member of the Cuyahoga Formation. A similar stratigraphic section in Congress Township (Wayne County) consisting of 31 feet of interbedded siltstones and silty shales was named the Armstrong Member of the Cuyahoga Formation. To further complicate matters, the Black Hand in Richland, Ashland, and Wayne Counties has both sandstone and shale facies.

The Black Hand Sandstone member of the Cuyahoga Formation is a prominent ridge former in central and southern Richland County, as well as southern Ashland County. The Black Hand is a thick-bedded to massive sandstone composed primarily of quartz grains. A definite lobate geometry is conspicuous regionally. Low-angle and trough cross-bedding is common. Conglomeritic lenses and graded bedding are often found. Fossils are rare, particularly in the cross-bedded facies, but marine fossils are often found near the top of the Black Hand in thin-bedded and horizontally laminated units.



The First Presbyterian Church of Shelby, Ohio, circa 1900, probably not long after it was constructed using the Black Hand Sandstone quarried at Mansfield. The Shelby church is particularly striking due to its predominantly dark red color, field-stone style construction, and amazing variety of stripes, swirls, and banding.

Overlying the Black Hand is the Berne member of the Logan Formation. The Berne is commonly a sandstone conglomerate 1- to 2-feet thick elsewhere in Ohio. An erosional unconformity often exists at the contact of the Berne conglomerate and the Black Hand Sandstone.

The Byer Sandstone overlies the Berne Conglomerate. The Byer is a fine-grained to silty sandstone that is most often thin-bedded. Thick interbeds of fine-grained sandstone are commonly encountered. The Byer can be up to 75-feet thick.

The Vinton and Allensville members of the Logan Formation overlie the Byer. The Allensville is a thin-bedded, coarse-grained sandstone with occasional siltstone interbeds. Thickness is approximately 1 foot. The overlying Vinton is a silty sandstone 10–50-feet thick. Pennsylvanian-age sandstones, shales, and thin limestones of the Pottsville Group can be found at the highest elevations in southern Richland County.

The Black Hand Sandstone in Richland County was most likely deposited as marine bars or shoals and distributary mouth bars as part of a westward prograding delta. Strong longshore currents continuously reworked sand at the mouth of a distributary channel into bar deposits. Microscopic examination of the Black Hand shows a moderately well-sorted, subrounded, clean, quartz sandstone, which is further evidence of bar deposition.

Complex bands, rings, stripes and swirls are a distinctive feature in the Black Hand Sandstone of Richland County and are major reasons the Black Hand is such a striking and unique building stone. Liesegang bands in rocks are believed to form at the juncture of two distinct lithologies, such as the sandstone and shale at Mansfield, or when fluids are out of equilibrium with one or more minerals in the aquifer. Additional research into local stratigraphic relationships and the spatial distribution of the uncommon and colorful banding in the Black Hand Sandstone of Richland County could yield a more definitive answer.



Front entrance to the restored bathhouse at Liberty Park, Mansfield, Ohio, displays the variety of colors and banding that is common to the Mississippian-age Black Hand Sandstone quarried near Mansfield.