ISSUE ELEVEN 2021

Senior Hiker
MAGAZINE

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the *f*ossils of the *f*alls of the Ohio

Kenny Karem

Even after years of teaching, exploring and leading hikes at the Falls of the Ohio National Wildlife Conservation Area and State Park, I am still amazed when I walk across the world-famous Devonian fossil beds—the largest exposed "reef" in the world. With each step, I touch the remains of an ancient sea creature that lived over 390 million years ago.

Located in the river valley between Louisville, Kentucky, and Clarksville, Indiana, the Falls of the Ohio area encompasses a sea life cemetery embedded in limestone with over 600 species of fossils. As I gaze at the array of sea forms beneath my feet, I am humbled and perplexed as if I were in a time warp.

When you descend 75 feet down the steps from the river observation deck of the Falls of the Ohio

Interpretive Center toward the Ohio River, you are going back over 390 million years in geological time. When you walk on the limestone fossil beds, you are traversing an ancient inland sea. The fossilized sea creatures found here were some of the first forms of life on earth during the Devonian Period of the Paleozoic Era. Known as the Age of Fishes, this geological period featured thriving life in a sea that crossed the eastern half of the North American continent from New York through Kentucky south and west over Texas.

The sea creatures included fish, trilobites, brachiopods, bryozoans, sponges, corals and echinoderms, such as sea lilies. Their remains, mostly of calcium carbonate,

Previous (left): The original Falls of the Ohio extended 2-1/2 miles and dropped about 25 feet. Now only a small part of the rapids is visible due to raised water levels from dams. (Photo: Courtesy of the Falls of the Ohio State Park)

Right top: At the Falls, the great blue heron feeds in flocks of more than 70 birds. (Photo: David Black)

Right bottom: Fossils found in the limestone, including (left to right) brachiopods, kneecap coral and bits of horn coral. (This and following photos: Courtesy of the Falls of the Ohio State Park)

Above: Fossil of a trilobite tail (Phacops).

Middle: The rapids.

Bottom: Crossing the rapids on a fossil hunting field trip.

settled on the sea floor. Over time sedimentary rock limestone formed, preserving the fossils.

Following the Devonian Period, the Falls area was intermittently under water, wetlands and dry land. Millions of years later, the glaciers advanced, with the last, which melted about 10,000 years ago, forming the Ohio Valley. The falls themselves, a series of rapids on the Ohio River, were formed from the relatively recent erosion of the underlying limestone.

By far, the most common fossil in the park is the coral with 212 species identified. Found all over the park, from the Interpretative Center to the river, the coral has common descriptive names such as horn, colonial, branching, honeycomb, knee cap and wasp nest. The largest horn coral measures between 4 and 5 feet. The tabulate coral, composed of animals living in a colony, is a showcase in geometry. I frequently ask a visitor to lie down on top of one

Top: Visitors explore the vast ancient limestone reef alongside the Ohio River.

Above: In the lower limestone beds, the scouring river water has eroded "pot holes" often filled with fossils.

Top: Panorama of the reef with the McAlpine Lock Access Bridge on the Ohio River.

Above: River water falls through niches cut into the McAlpine Dam.

to measure its width, which often reaches 5 feet in diameter. Some rugose corals, another colonial coral, have measured 11 feet in diameter.

Mollusk fossils are also common to the area, usually in the form of gastropods (snails) and brachiopods (bi-valves). The snails can vary in shapes and sizes with some as small as a pea and others as large as an orange. They generally appear in groups scattered on the top of the upper cliff outcroppings. The brachiopod's distinctive shell form make it easy to spot in dense layers along with the snails. I often place a present-day Asiatic clam shell on top of an ancient brachiopod to show how little the design of this ancient sea creature has changed in millions of years.

Everyone enjoys touching the common crinoids. Once attached to the ancient sea floor, these animals extended upward like flowers on a segmented stem. Close examination of the small circular individual segments reveal varied inner shapes of circles, hexagons and star-like squares. I nicknamed them "Cheerios." Native Americans once made necklaces out of their delicate segments.

Fossils of bryozoans, a marine animal that once existed in colonies in the lime deposits, are also found in the flat-topped cliff layers. The fossil of this sponge-like creature resembles white lace, and, though common, its lack of a distinct symmetrical shape makes it hard to find.

All of these fossilized sea creatures exist in some evolved form in today's tropical reefs. However, my favorite fossil, the trilobite, is now extinct. A marine arthropod related to insects and crustaceans, the trilobite was once the most common life form in the ancient seas nearly 245 million years ago. Today its closest distant relative is the horseshoe crab. Scientists now think that it could be the first creature to develop "eyes," enabling vision. How extraordinary! Using its compound eyes, a trilobite was able to "see" predators, swim away and even roll up into a ball like the common pill bug (roly-poly). Extremely small, scarce and difficult to see, its whitish exoskeleton is the search object that many visitors are determined to find.

Since the late 1800s, scientists from all over the world have come to the Falls area to explore and collect fossils, and many of those specimens are housed in museums. Today the Falls is an outdoor classroom, and visitors are not allowed to remove the fossils.

Professors, students, tourists and outdoor enthusiasts now flock to the area as there is something for everyone. It is truly a crossroads of nature and history, unique in America, with its diverse habitats, wildlife, landscapes, human history and, of course, the fossils.

We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.

–T. S. Eliot, *Four Quartets*

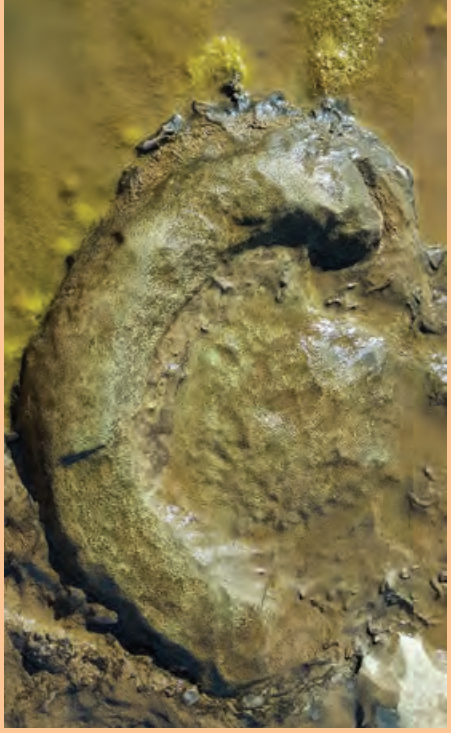
This column, top to bottom:

Horn coral.

Colonial coral.

Pipe organ colonial coral (Eridophyllum).

Wasp nest tabulate coral (Pleurodictyum).



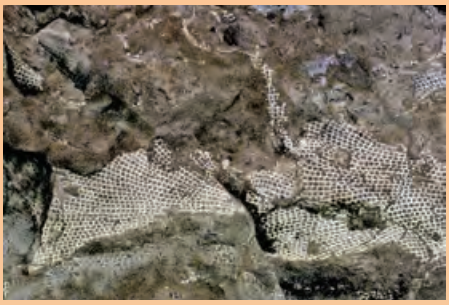
This column, top to bottom:

Honeycomb coral with algae (Favosites).

Branching coral (Thamnopora).

Gastropod, surrounded by brachiopods (Brevispirifer zone).

Brachiopods (Brevispirifer zone).



This column, top to bottom:

Crinoid fragments, stems.

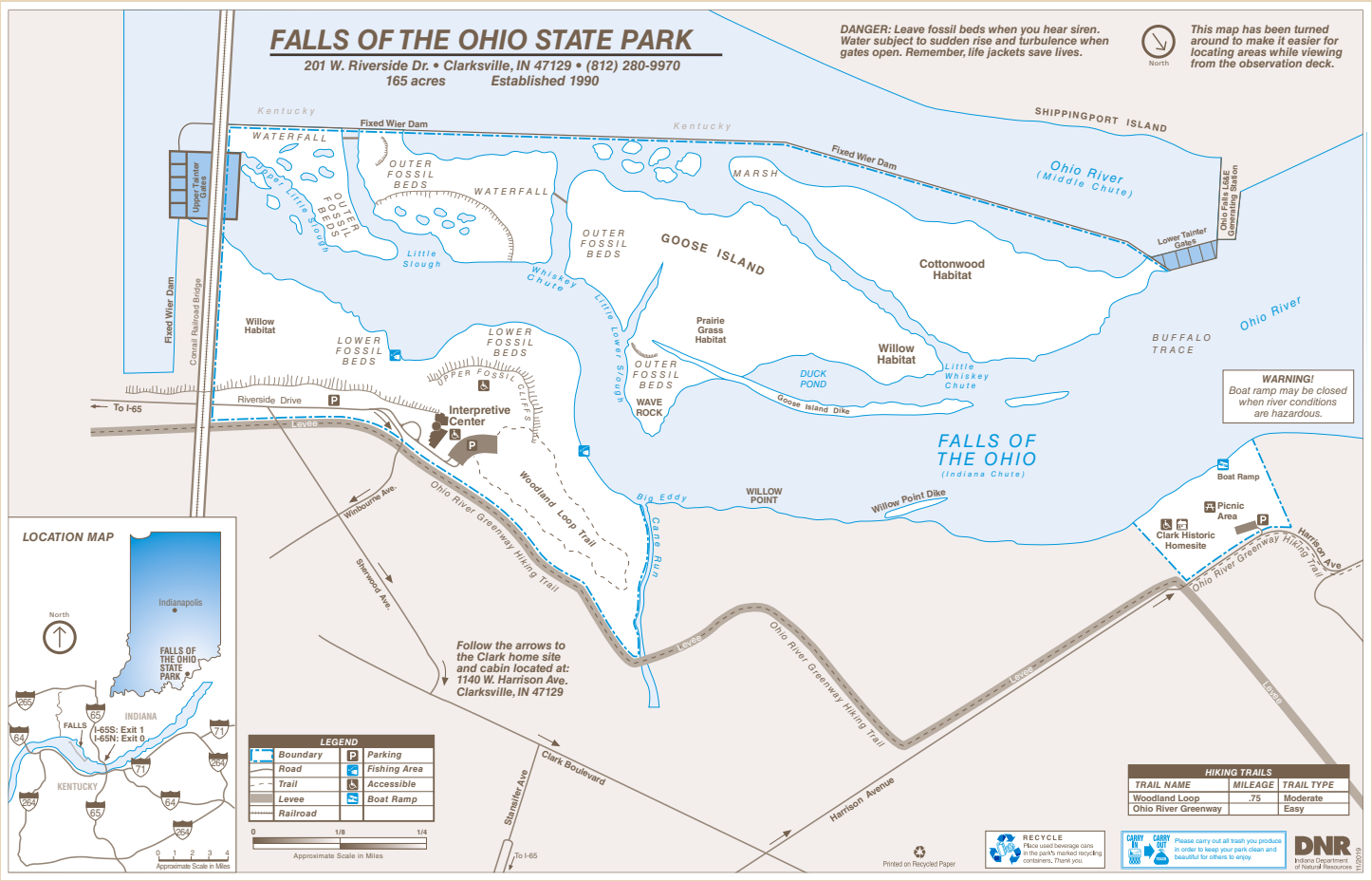
Crinoid fragments.

Fenestrate bryozoan.

Trilobite tail (Phacops).

Partially exposed, fragments or indistinct fossils are not assigned scientific names.

Opposite: Map of the Falls of the Ohio State Park, courtesy of the Indiana Department of the Natural Resources.



Falling for the Falls: A Crossroad of Nature and History

The Falls of the Ohio area is a spectacular place, where humans and nature have interacted for thousands of years, but notably in one small, unusual geographic setting. What makes the Falls area so special?

- The site of an ancient inland sea nearly 400 million years ago, a place shaped by glaciers 15,000 years ago, a shallow crossing for bison and now an area of many habitats—marshes, forests, river banks, mud flats, islands, sandy beaches, creeks and the only rapids on the 981-mile-long Ohio River.
- The largest exposed Devonian fossil beds in the world with over 600 species.
- A migratory shorebird stopping place with over 265 bird species, where famed painter John James Audubon lived and painted birds from 1808–1810.
- A thriving habitat for over 275 plant and 125 fish species.
- A natural stopping and living place for Native Americans for thousands of years, including the dominating tribe of the Shawnee, followed by European explorers and settlements that evolved into six riverport "Falls cities."
- The site from which in 1778, General George Rogers Clark set off on his victorious campaign to defeat the British in the American Revolution and thereby conquer the Northwest Territory for the colonies.
- The place where the Lewis and Clark Expedition Corps of Discovery was launched in 1803 to explore the West and then returned for a celebration of their historic journey. It was designated a Lewis and Clark National Historic Trail site in 2002.
- A past and present complex hub of transportation—a river highway used by canoes, flatboats, steamboats, barges, tow boats, fishing and recreational boats; with bridges, a dam, locks and canal, railroads, interstates and air travel.
- The first and only designated national wildlife conservation area in the US (1981), with adjacent land added as an Indiana State Park (1994).