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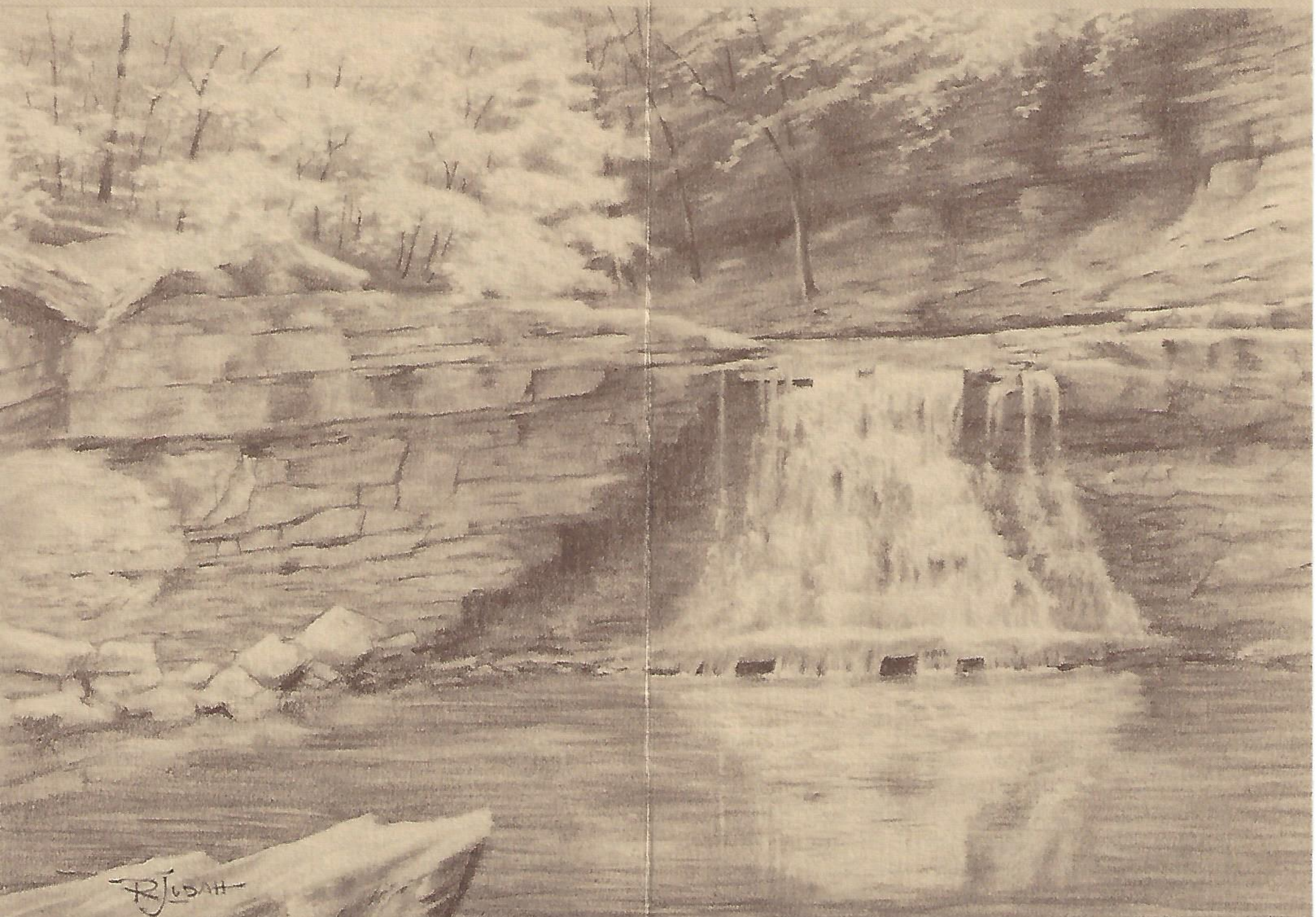
State Park Guide 3

GEOLOGIC STORY OF McCORMICKS CREEK STATE PARK



Take nothing but pictures.
Leave nothing but footprints.
Kill nothing but time.

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
GEOLOGICAL SURVEY
611 NORTH WALNUT GROVE AVENUE–BLOOMINGTON, INDIANA 47401

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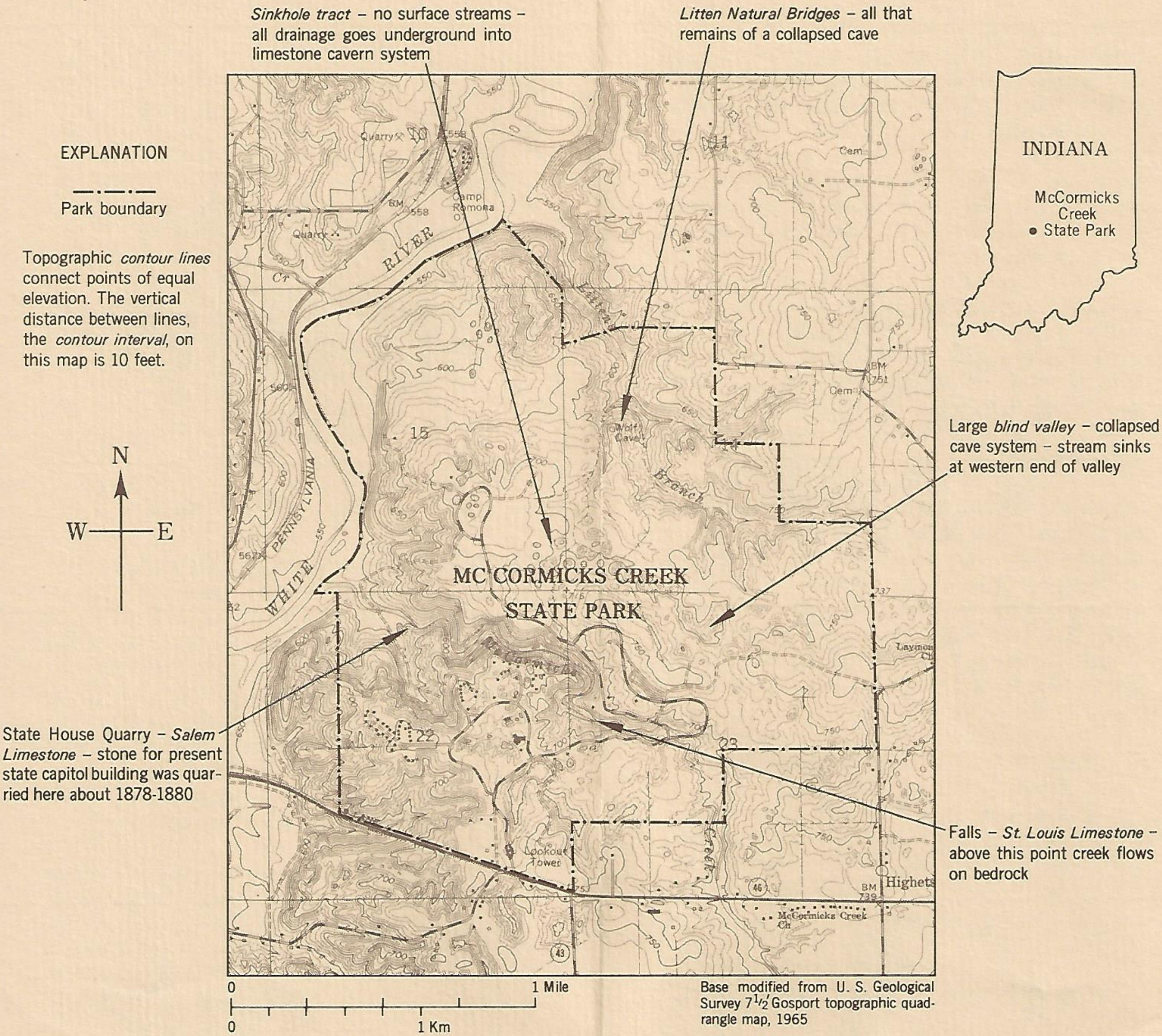


TOPOGRAPHIC MAP OF MC CORMICKS CREEK STATE PARK AREA, OWEN COUNTY, INDIANA

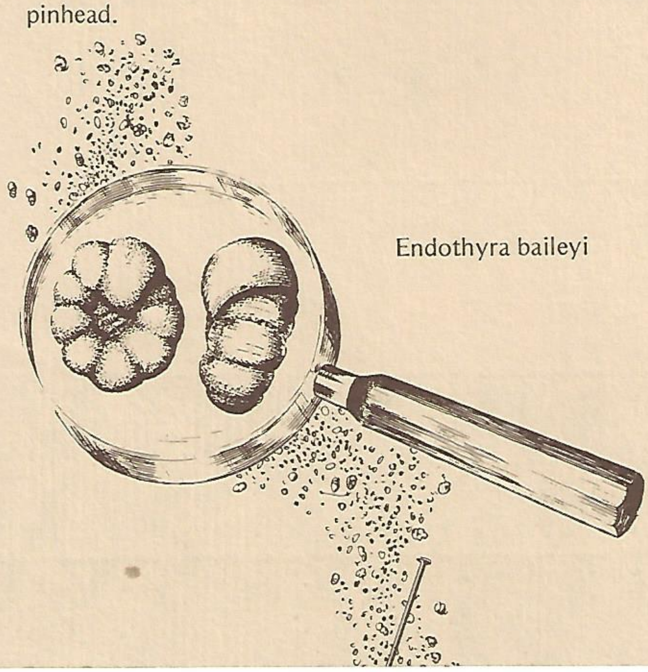
INTRODUCTION

The focal point of the geologic story of McCormicks Creek State Park is the canyon. A mile long, more than 100 feet deep, and with limestone outcrops along the walls, the canyon brings to mind many questions. This brief summary is intended to answer most of the geologic questions that visitors ask, but the entire story is a long one and many of the details are still unknown.

Some 250 million years ago Indiana was covered by a broad, shallow sea. Limy mud and sand were deposited layer by layer on the sea bottom. As these soft sediments became deeply buried, they were compressed and cemented into layers of solid limestone. Geologists have divided these rocks into three formations, which lie one on top of the other like a stack of pancakes.

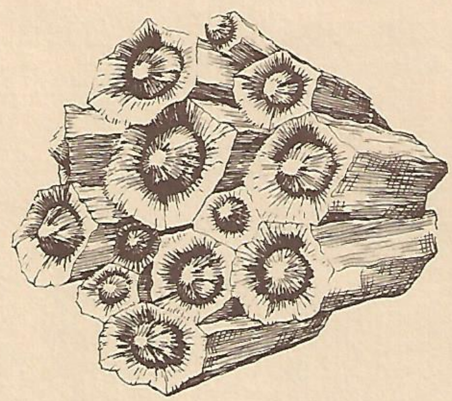
BEDROCK OF THE CANYON WALLS

The lowest, and therefore the oldest, of these formations is the Salem Limestone, which can be seen in the old quarry near the mouth of the canyon and in the lower canyon walls. The limestone is in thick beds, is uniformly sandy in texture, and weathers into huge rounded blocks, on some surfaces of which is a pitted effect known as honeycomb weathering. Only a few large fossils are present, but with a magnifying glass you may be able to see that most of the sand grains are small fossils or rounded fossil fragments. Many are the shells of *Endothyra baileyi,* a single-celled animal that lived in abundance in the ancient sea and was no bigger than a pinhead.



Endothyra baileyi

The next formation upward is the St. Louis Limestone. This formation is about 60 feet thick and makes up most of the canyon walls. It is more fine grained and more closely cemented than the Salem Limestone. Some of the beds are shaly and some contain nodules of chert, a hard flinty material. Among the fossils that are abundant in some beds are colonial corals, such as *Lithostrotionella.* Observe, but please don't collect specimens in the park!



Lithostrotionella

The top of the falls is about at the level of the top of the St. Louis Limestone, and upper parts of the canyon walls are made up of the third formation, the Ste. Genevieve Limestone. Rocks of this formation are even more fine grained, more smooth textured, and more compact than those below. The Ste. Genevieve Limestone is the youngest bedrock of the park. All three bedrock formations date from the Mississippian Period of geologic time, and together they represent about a million years of geologic history.

HOW THE CANYON WAS FORMED

Long after the rocks were formed, they were lifted above sea level and streams began their work of erosion. Valleys similar to those of today were formed. Then, about a million years ago, began a series of glaciations that powerfully shaped the topography of this part of Indiana.

The glacier that covered the park area is known as the Illinoian glacier. It left deposits of sand and clay that contain cobbles of granite and other stones from as far north as Ontario. These deposits show that the limit of this glacier's advance was just southeast of the park. The ice blocked many of the preglacial valleys, and drainage from these valleys, along with meltwater from the glacier, had to flow southwestward along the glacier margin for many miles before it could find an outlet to the Ohio River.

When the ice melted, glacial deposits still blocked some of the preglacial valleys. Some of the streams that drained these valleys did not find their former courses but eroded new ones. The area southeast of the park formerly drained westward, but glacial deposits diverted the drainage to the northwest across what is now the park, and in this way the course of McCormicks Creek was determined.

As the creek eroded downward, the rock-walled canyon was formed. Most of this erosion probably took place about 50,000 years ago, when ice of the last glaciation (which did not reach the park area) was advancing from the north. At that time the climate was wetter and colder, and erosion was more rapid than it is today. The falls, which are evidence of the canyon-forming process, still are eroding their way upstream, but now at a very slow rate.

Litten Natural Bridge

Entrance to Wolf Cave

SINKHOLES, CAVES, AND NATURAL BRIDGES

In the upland area of the park are numerous bowl-shaped depressions called sinkholes. Some are small; some are large; some are in groups or in rows. A few contain springs and small streams that sink into the ground. All these features were formed by the underground movement of water, which slowly dissolves the limestone bedrock and forms an underground network of passageways to carry the water. Sinkholes, which are formed as the limestone is slowly removed from beneath the soil, carry underground the runoff from rain and snow.

As the underground streams seek lower and lower levels, some of the passageways are left high and dry. Wolf Cave is an example of a fairly large dry passageway that has been opened to view by erosion. Still further erosion leaves small remnants of the passage as natural bridges. Litten Natural Bridges are an example. Features formed by subterranean drainage are known as *karst* features and are widespread in parts of southern Indiana that are underlain by limestone.

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