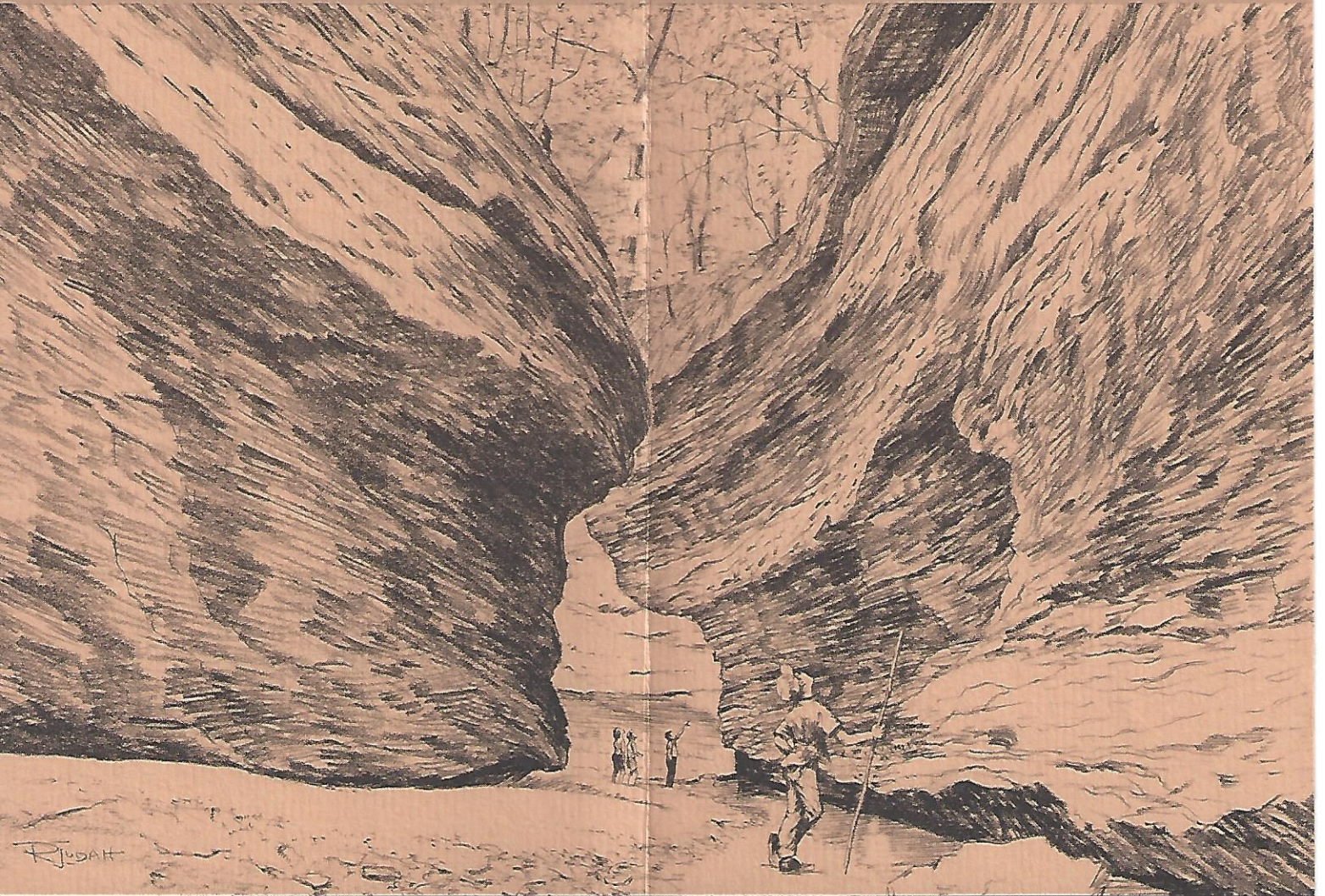


1977
State Park Guide 5

GEOLOGIC STORY OF TURKEY RUN 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

PRICE 10¢

Punch Bowl - a large *pothole* ground into sandstone bedrock by swirling currents and hard cobblestone grinders

Wedge Rock - a *joint block* that has separated from the canyon wall

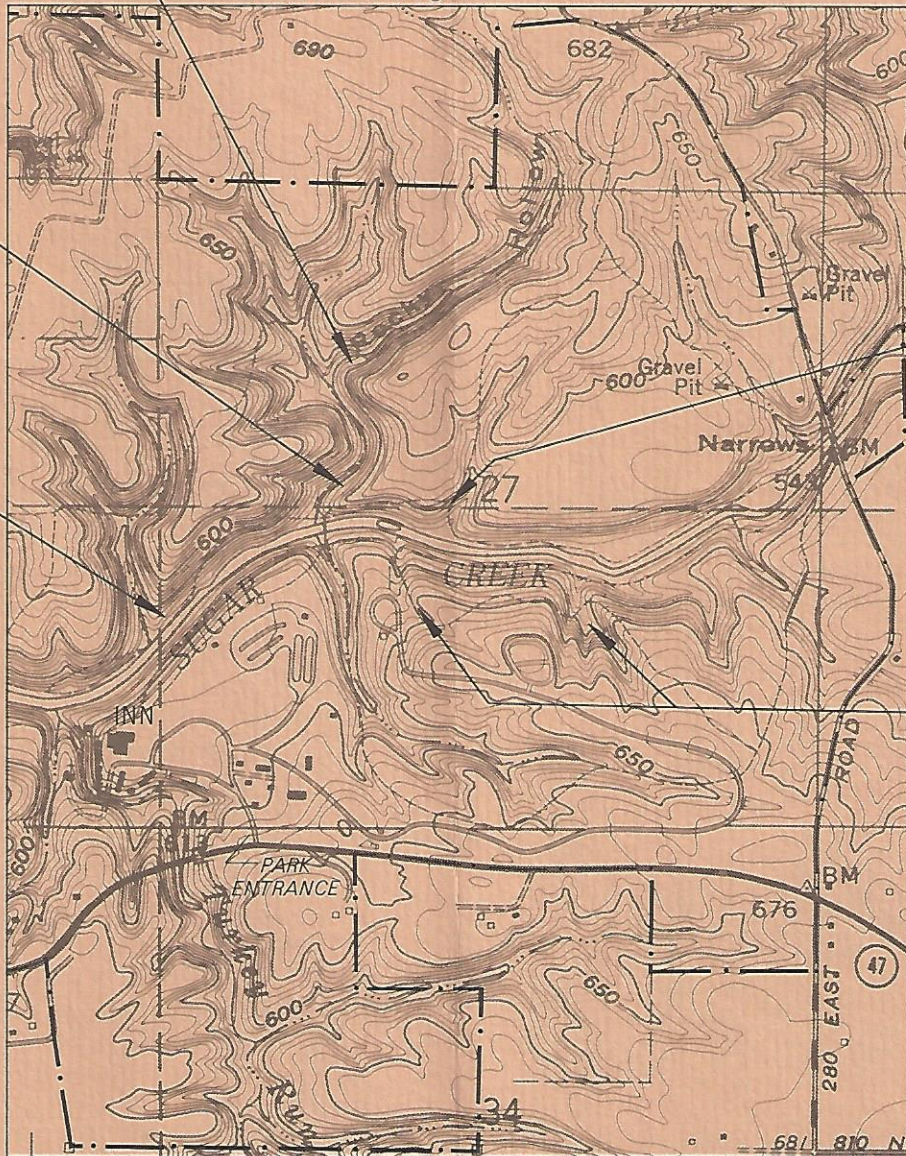
Crossbedding - inclined layers in sandstone indicate deposition by running water

EXPLANATION

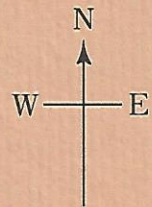
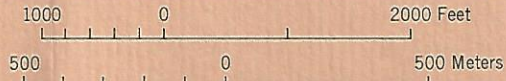
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Park boundary

Thin *coalbed* indicates an ancient swampy environment

Box Canyon and Gypsy Gulch - *Jointing* in the bedrock results in the formation of smooth vertical canyon walls



Base modified from U. S. Geological Survey 7½ Wallace topographic quadrangle map, 1961



TOPOGRAPHIC MAP OF PART OF TURKEY RUN STATE PARK,
PARKE COUNTY, INDIANA

INTRODUCTION

The steep bedrock cliffs and small streams in Turkey Run State Park tell of two chapters in its long geologic history. The first chapter records events that took place about 225 million years ago, during a time known as the Pennsylvanian Period. The second chapter, which concerns the Ice Age or Pleistocene Epoch, tells the story of the last million years.

THE PENNSYLVANIAN STRATA

The cliffs at Turkey Run consist mainly of coarse-textured sandstone belonging to the Mansfield Formation. The sandstone seen in the cliffs today was originally an unconsolidated body of sand which was deposited when large rivers flowed through this area enroute to a vast inland sea farther to the west, much as the Mississippi River flows into the Gulf of Mexico today. Slight variations in the river's course, water volume, or sediment load are evidenced by crossbedding,



Crossbedding in sandstone along one of the trails

in which the layers of sediment are inclined. Compaction and cementation through geologic time have changed the original sediments into sedimentary rock. Sandstone from the Mansfield Formation was once quaried in Indiana for manufacturing glass. Used mostly for bottles, the glass was tinted green because of the iron content in the sandstone. The iron causes the rust color seen in the cliffs at Turkey Run.

Few well-preserved fossils are found in the sandstone because organisms that fell into the rivers were washed away or were tumbled and broken before they finally

came to rest. Occasionally a portion of *Lepidodendron* or *Calamites* can be seen in the sandstone. These are the remains of extinct scale trees and giant rushes that lived by the rivers during Pennsylvanian time. Thin coalbeds that crop out in a few places in the park were formed when the lush vegetation that grew here was buried by other sediments and transformed, partly by compaction, to form coal. A thin coalbed can be seen at creek level along Trail 4. Please do not collect samples in the park.



Plant fossils from Pennsylvanian age rocks

THE ICE AGE

For many millions of years, weathering and erosion helped to mold the landscape before the final reshaping began with the onset of the Ice Age. Beginning about 2 million years ago, snow in Canada accumulated and compacted to form an ice sheet thousands of feet thick. Flowing plastically, the ice spread into portions of the northern United States. Several times the climate warmed and the ice melted. When the climate again cooled and the rate of snow accumulation exceeded the rate of melting, the vast continental glacier again expanded southward. The most recent glacial advance, the Wisconsinan, reached as far south as central Indiana before it began to melt and retreat northward, only about 20,000 years ago.

As ice flowed over land north of Turkey Run it picked up rock and soil material that was then carried along by the glacier. Later, as the glacial ice melted, the unsorted debris was deposited wherever the glacier had been. This material, called till, blankets the northern part of the park. Stones of many sizes found in the

ravines throughout Turkey Run have been washed from the till. Many of these are granite, gneiss, basalt, and other material from the bedrock in Canada. These stones are called erratics because they differ from the bedrock



Rounded glacial erratics from distant places

of this area. Tremendous volumes of glacial meltwater used some of these erratics as abrasive tools to wear away the bedrock. Erratics may be caught in a current and churned to grind a bowl-shaped pothole into the streambed. Potholes can be seen in the streambed and along the canyon walls by the ladders on Trail 3.



Pothole that has been partly destroyed by erosion

Deposits left by the glaciers obscured most of the preglacial drainage network. Glacial meltwater eroded new channels and helped to carve the course that Sugar Creek follows, as well as the spectacular canyons in Turkey Run.



Joints at Devil's Ice Box

JOINTS

A prominent feature along the trails in the park is the smooth, nearly vertical character of the bedrock walls. This phenomenon is due to smooth fractures in the bedrock, called joints, which probably resulted from regional stresses in the rock. Streams in the park follow the nearly rectangular joint pattern in numerous places because this is the least resistant path for erosion by running water. Excellent examples of joints are found along Trails 2 and 3 in Turkey Run. Water moving through the joints helps to dissolve the cementing agent in the sandstone. When the water freezes, it expands, exerting pressure on the already weakened areas. Weather conditions that prevailed during glacial times were more severe than they are today, thus causing an acceleration of weathering. Large blocks of bedrock have fractured and fallen from the long vertical cliffs, as seen in the Devil's Ice Box and Box Canyon. Huge blocks that have thus tumbled into the gorges are seen throughout the park. A good example is Wedge Rock on Trail 3.

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