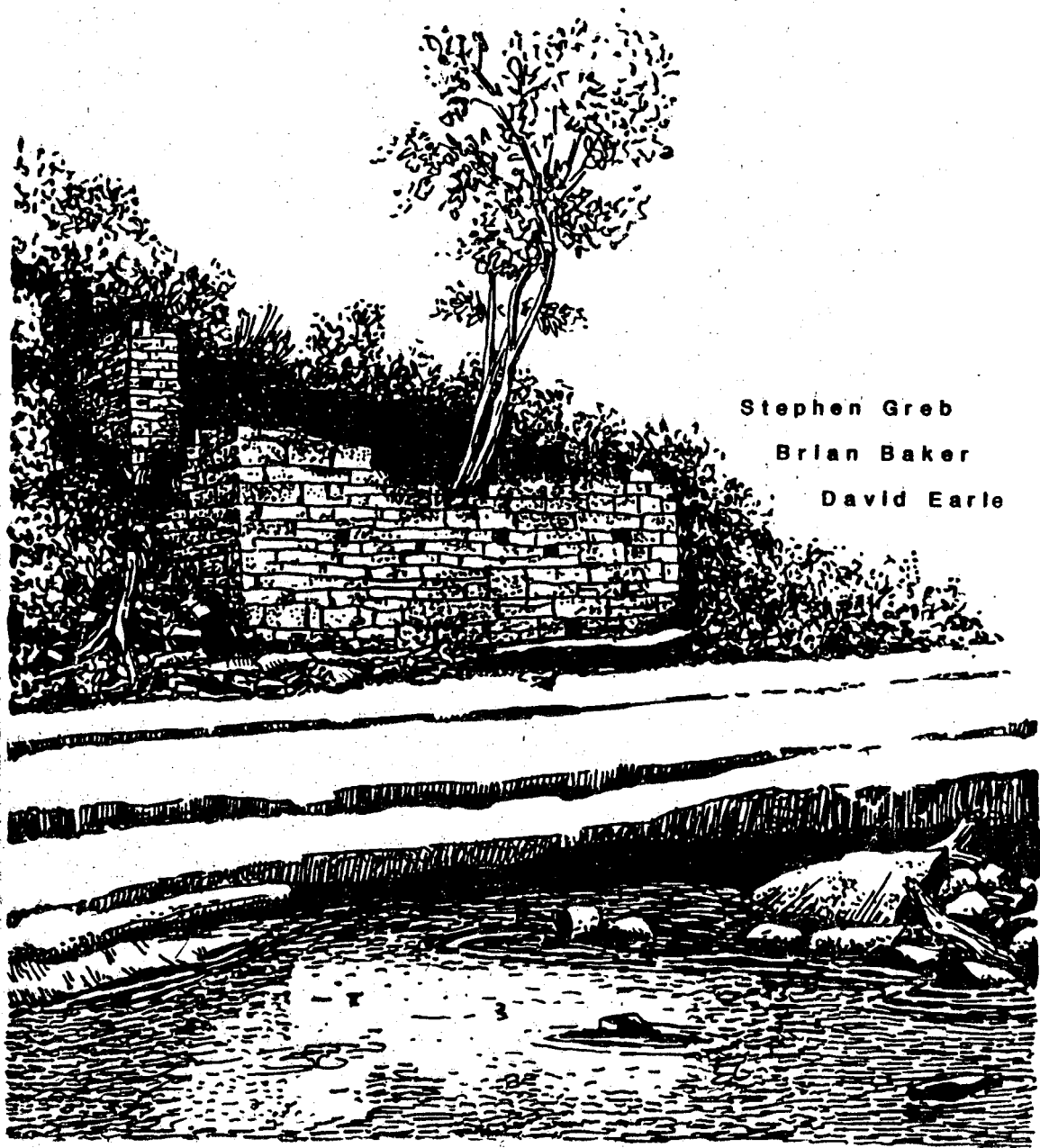


GEOLOGY OF THE RAVEN RUN NATURE SANCTUARY

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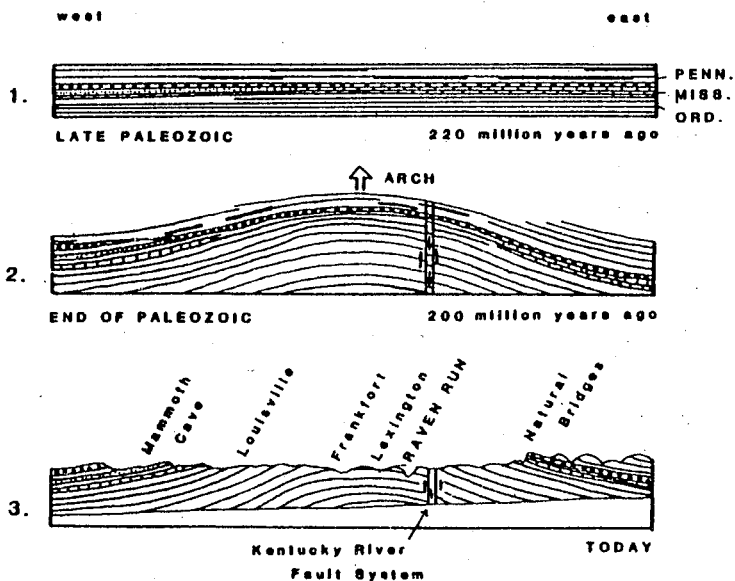
Cover Picture; The stone foundation of Evans' mill.

GEOLOGY OF RAVEN RUN NATURE SANCTUARY

Introduction to the trail guide

Geology is the science of the earth and those who study geology are called geologists. Part of a geologist's job is to determine how the rocks we see today in quarries, roadcuts, parks, and other areas, were originally formed.

Raven Run Nature Sanctuary is located on the eastern edge of the Bluegrass region in central Kentucky. This region is a broad, oval platform that geologists call the Jessamine Dome. The Jessamine Dome is part of an even larger feature called the Cincinnati Arch. Figure 1 shows how millions of years ago the sediments in central Kentucky were raised relative to eastern and western Kentucky. The area that was relatively uplifted is called an arch. The areas that



REGIONAL EVOLUTION of the CINCINNATI ARCH

CENTRAL KENTUCKY

were relatively downdropped on either side of the arch are called basins. After the arch was formed erosion removed great quantities of rocks and sediments from the arch. This left older rocks exposed on top the arch and younger rocks exposed in the basins. Since Raven Run is located near the top of the arch, some of the oldest exposed rocks in the state are found here.

Most of the rocks you can see in the park are called carbonates. These types of rocks are predominantly made-up of the mineral calcite. Carbonates are formed in warm, shallow seas, often or in part from the remains of small sea creatures. When these remains are preserved they are called fossils.

Figure 2 shows how geologists subdivide the carbonate rocks in the park. The lower and therefore older carbonates are called the High Bridge Group. The group is divided into three formations. Formations are used to classify rocks that are similar and can be mapped over large areas. At Raven Run, the High Bridge Group consists of the Camp Nelson Limestone Formation, the Oregon Formation and the Tyrone Limestone Formation. The upper and therefore younger carbonates are part of the Lexington Limestone Formation. The Lexington Limestone Formation can be further subdivided into specific members. Members are simply a more detailed classification. Three of the lower members of the Lexington Limestone are present in the park. These are the Curdsville Member, the Grier Member and the Tanglewood Member. The members of the Lexington Limestone Formation are generally buried beneath the soil on the upper slopes and ridgetops of the park. However, the formations of the High Bridge Group are spectacularly exposed in the gorges and along the trails of Raven Run.

The carbonate rocks that make up these formations were formed in a shallow sea that covered much of the eastern United States over 460 million years ago. This time was part of what geologists call the Ordovician period. During the Ordovician period the Raven Run area probably looked like the tidal flats and shallow seas of the Bahama Islands today. However, many of the creatures that lived in this Ordovician sea were very different

GEOLOGIC TIME CHART

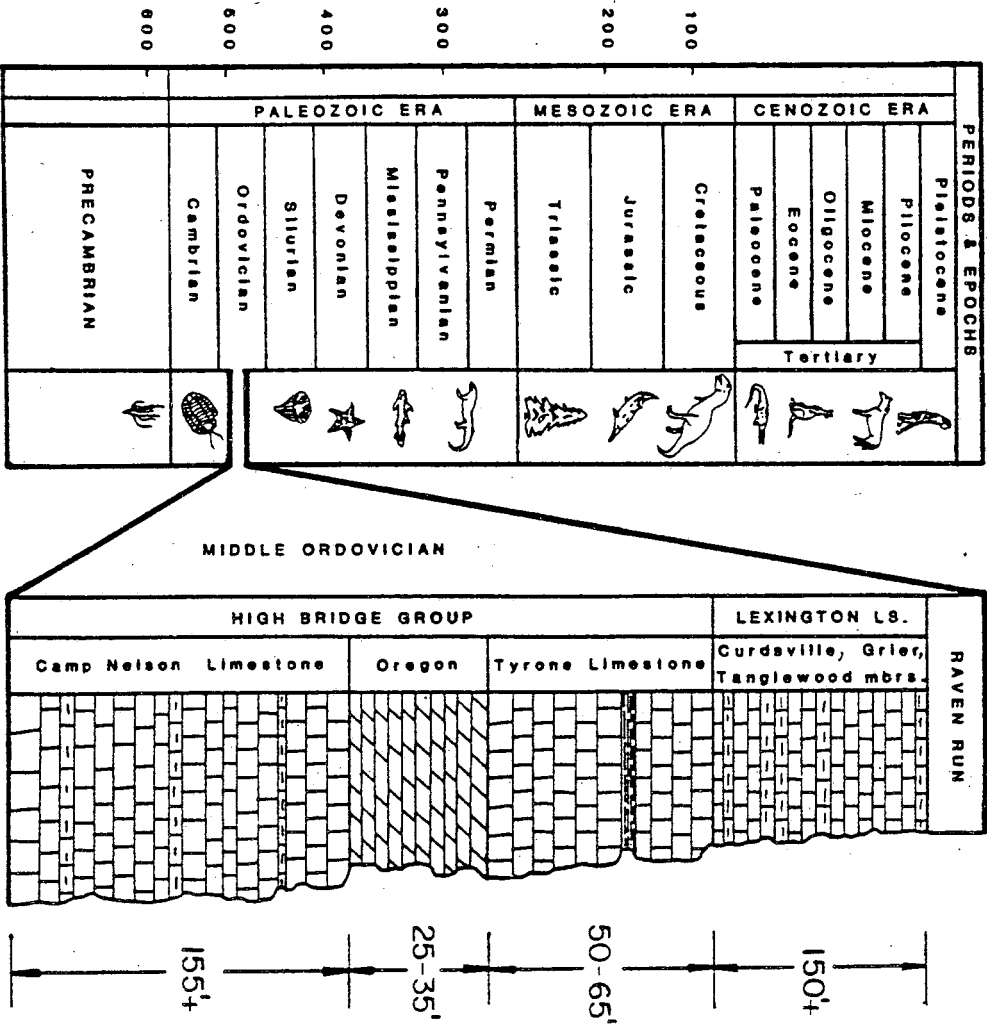


fig. 2

from the creatures we see today. Figure 3 is a illustration of what the Ordovician seas of the Raven Run area might have looked like 460 million years ago. In those seas were squid-like creatures with shells called cephalopods, strange cousins of the horseshoe crab called trilobites, creatures that resembled underwater flowers called crinoids, primitive snails called gastropods, primitive clam-like organisms called brachiopods, small coral-like creatures called bryozoans, as well as many relatives of the modern corals and marine worms.

Figure 4 is a geological map of the park. It is on page 6 of this pamphlet. Geological maps are used to show the rock formations occurring at the earth's surface. When you start out at the barn, the map indicates that the rocks right below your feet are part of the Lexington Limestone Formation. When you get down to the waterfalls at stop 4 the map indicates that you are standing on rocks which are part of the Camp Nelson Formation.

This pamphlet is a trail guide to the Raven Run Nature Sanctuary. Points of geological interest along the Red Trail are marked on the map (page 6). Brief descriptions of the points are listed in the following pages as geological stops. These stops can be seen from the designated trails as shown on the map. Walking off the trail can be very dangerous and is discouraged. Please do not remove or vandalize the rocks or fossils in the park. This park is meant to be enjoyed by everyone. Leave only footprints, take only memories.

LIFE IN THE ORDOVICIAN SEAS

460,000,000 years ago



fig. 3

1) horn coral

3) brachiopods

5) algae

7) marine worm

9) trilobite

2) colonial coral

4) crinoids

6) cephalopod

8) gastropod

10) bryozoan

