The Geology of Oxford Presbyterian Church's Memorial Building

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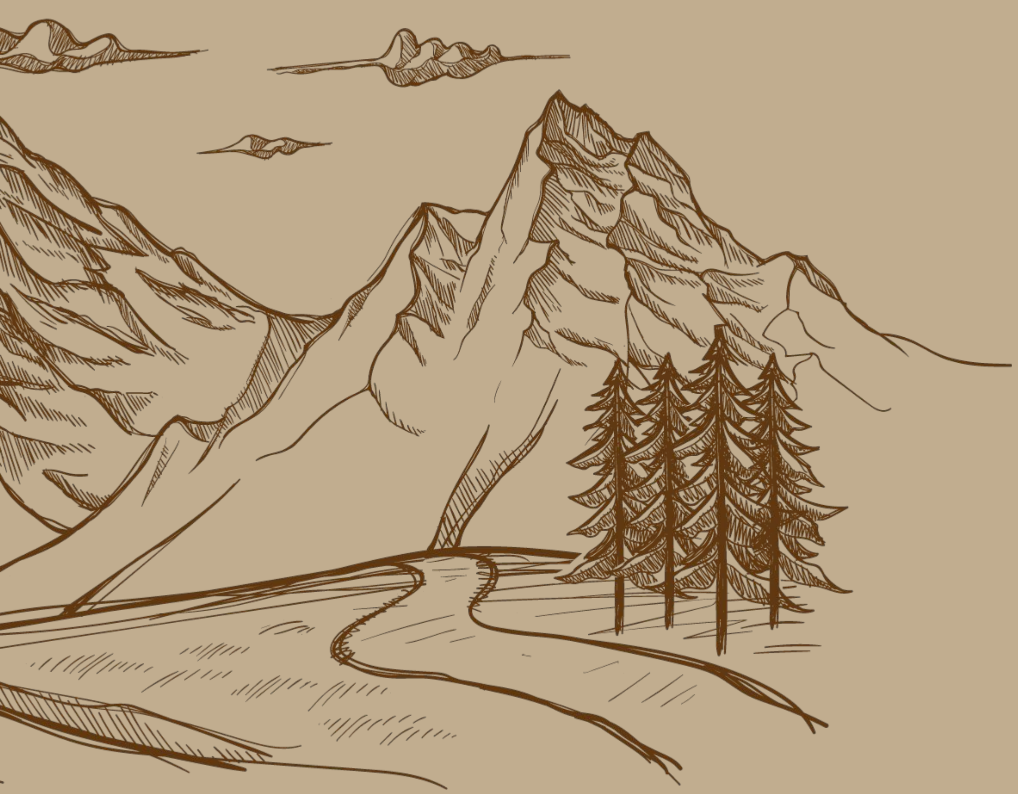


Presentation

About 30 minutes

Questions

About 15 minutes

Tour

About 15 minutes

Let's Begin

Churches and History

The Oxford Presbyterian Church's Memorial Building has been a place of worship for generations.

The present building was constructed between 1925-1927; its announcement took place in March 1925 as part of the Presbyterian Church's Centennial Celebration.

The history of the congregation, the church family, the city of Oxford and through the stone it's constructed with, the history of the natural world.

Looking Deeper

The Memorial Building is constructed of blue limestone, quarried five miles north of Oxford, along Four Mile Creek by H. S. Coulter Company.

The trim surrounding the doors and windows, along with the exterior decorations, is Bedford limestone.

The Bedford Limestone comes from a well known quarry in Bedford Indiana; builders and architects know this as Indiana Limestone, however geologists know this stone as the Salem Formation.

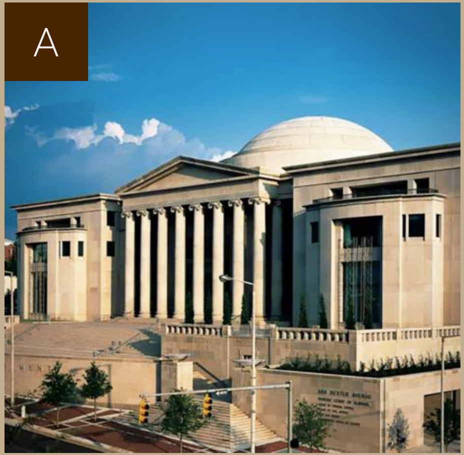
Quarrying in Bedford begun in the 1830's, really took off with arrival of railroads in 1850's

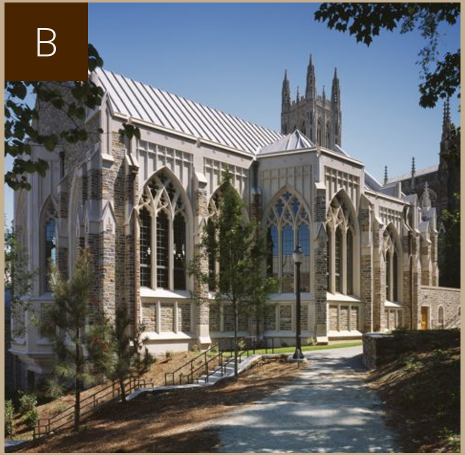
Other buildings using Indiana Limestone

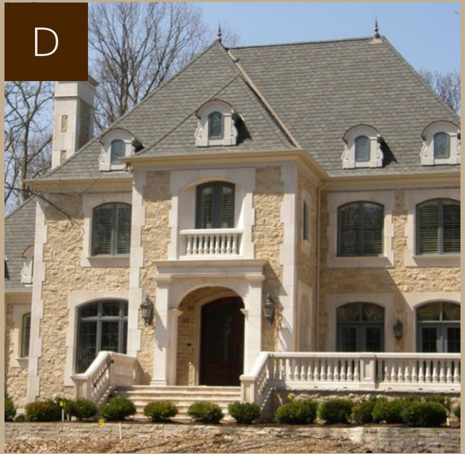
Why? Because it’s chemically pure and consistent, making it durable and strong, can be cut into large blocks and hold fine details when carved.

Too many to list. Not shown: Empire State Building, Pentagon, National Cathedral

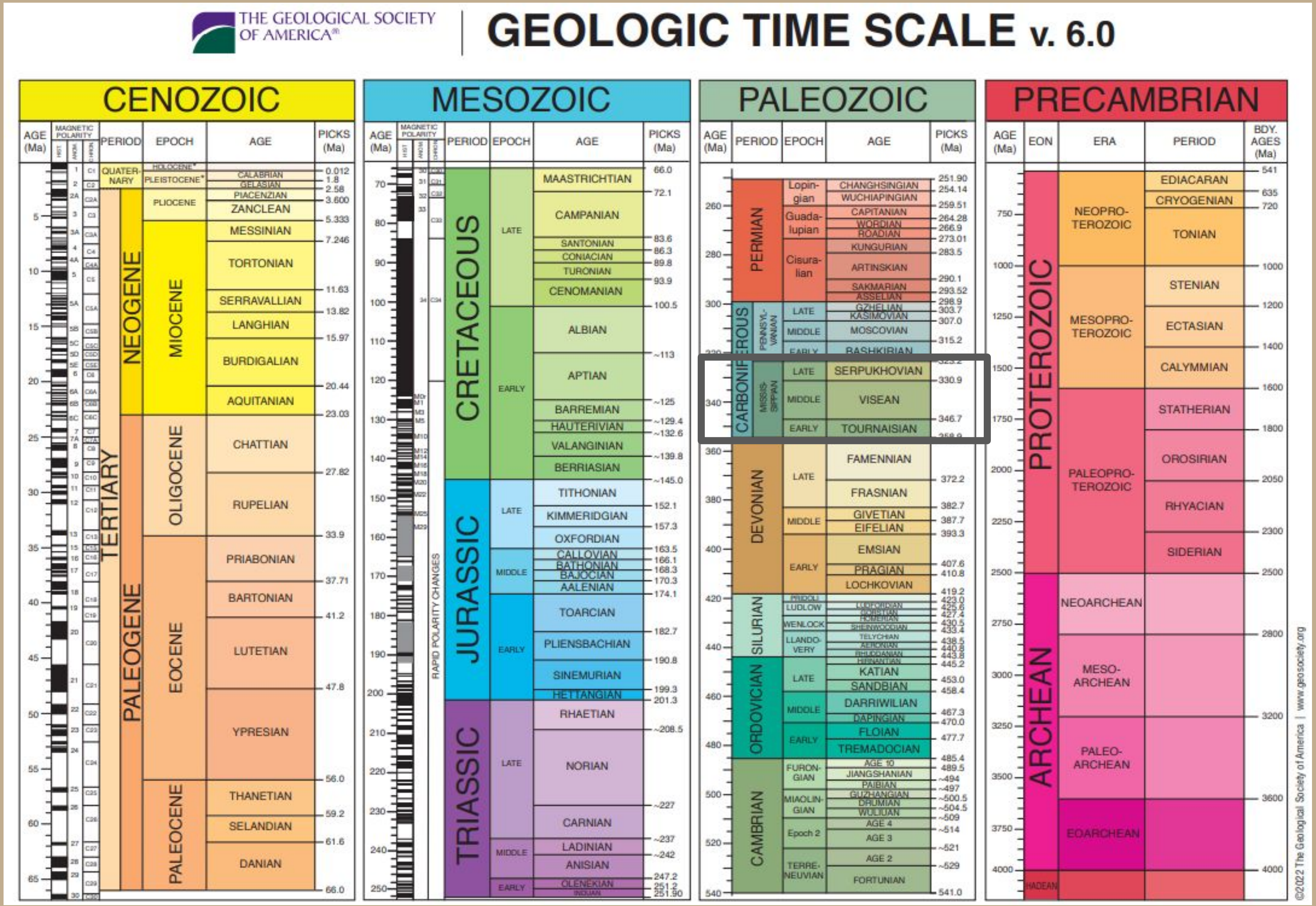
A. Alabama Judicial Center, AL
B. Duke University Divinity School, NC
C. Yankee Stadium, NY
D. Private Residence, MO







Images: https://iliai.com/



The geologic age of the Indiana Limestone is:

Mississippian Epoch

Carboniferous Period

Paleozoic Era

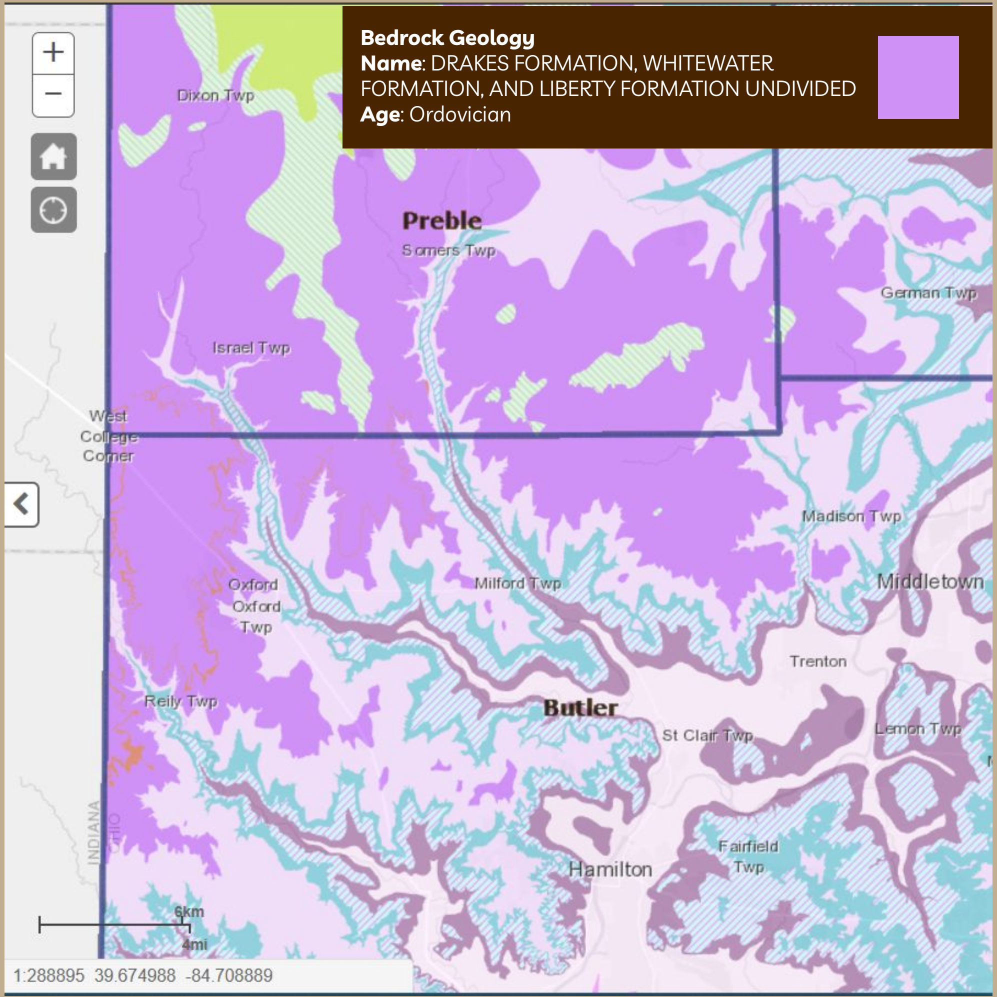
Between 358.9 - 323.2 Ma

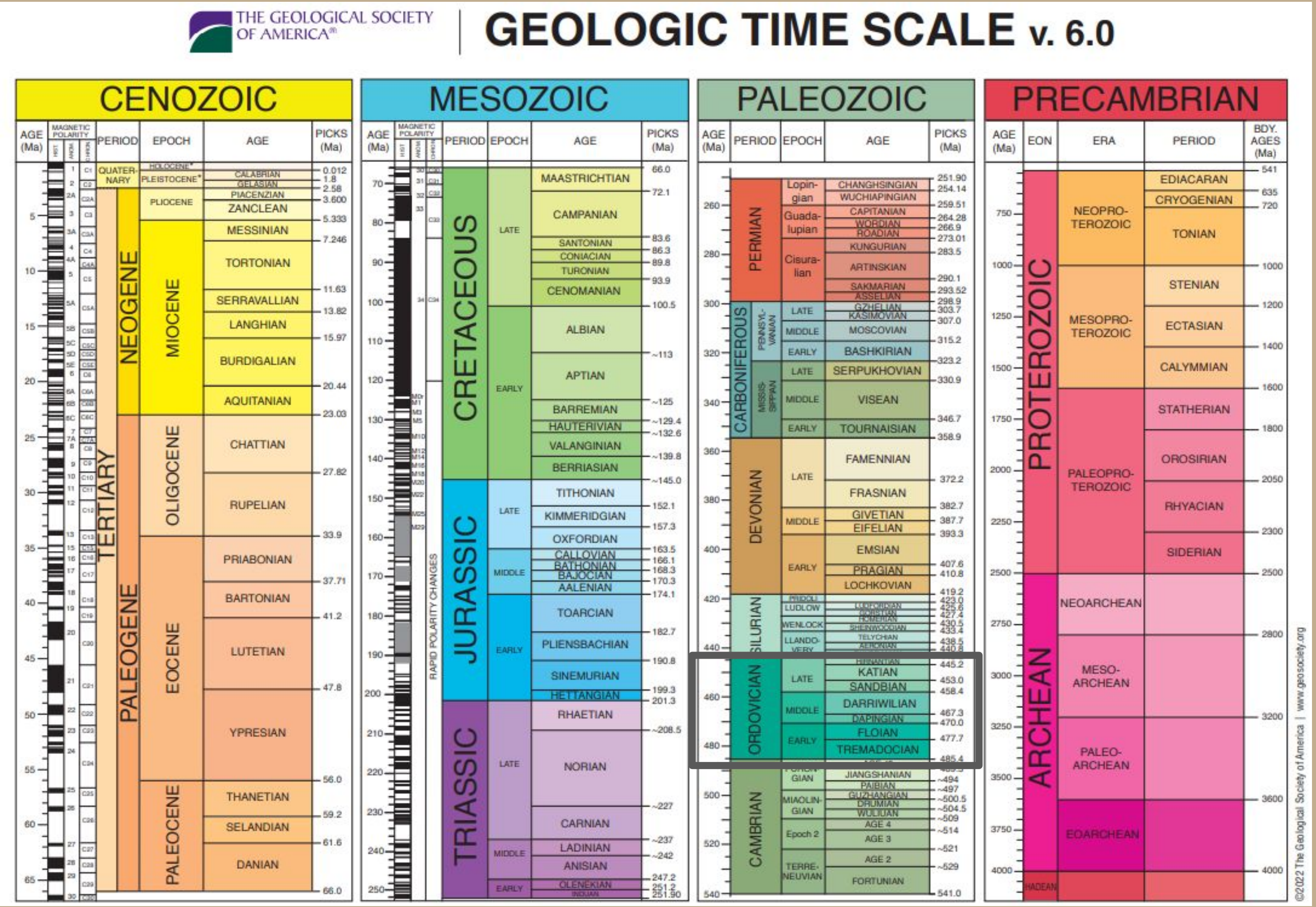
Oxford Area Limestone

The Memorial Building is constructed of blue limestone, quarried five miles north of Oxford, along Four Mile Creek by H. S. Coulter Company

This would have been likely in Preble County

The Drakes, Whitewater, or Liberty Formation





The geologic age of the Drakes Fm, Whitewater Fm. and Liberty Fm.:

Ordovician Period

Paleozoic Era

Between x - x Ma

Older than the Indiana Limestone

A Note About Rock Types

- There are three major rock types, all rocks will fall into of of these groups
  - They are distinguished from each other by their features which are reflective of how they formed
- Sedimentary
  - By sediment accumulation
  - **Eg. limestone** or sandstone
- Igneous
  - By cooling a melt
  - Eg. granite or gabbro
- Metamorphic
  - By heat and pressure
  - Eg. slate or marble

A Note About Limestone

- The type of rock and it's features can tell us about its formation environment
  - The paleoenvironment of limestone is marine, so the fossils are of marine creatures
- However limestone comes in varieties due to differing environmental factors, changes can happen over time even in the same physical location
  - Therefore not all limestone will appear the same, although they share some characteristics
- The geological term for this is facies, and the building term (used by architects, builders, quarriers and salespeople) is grade

Limestone Samples & Fossil Identification

Image from: https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils/

Gastropods

Fossil gastropods typically represent only the shells of ancient snails, as their soft parts are not readily preserved.

Most shells are spirally coiled.

Image from: https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils/

Brachiopods

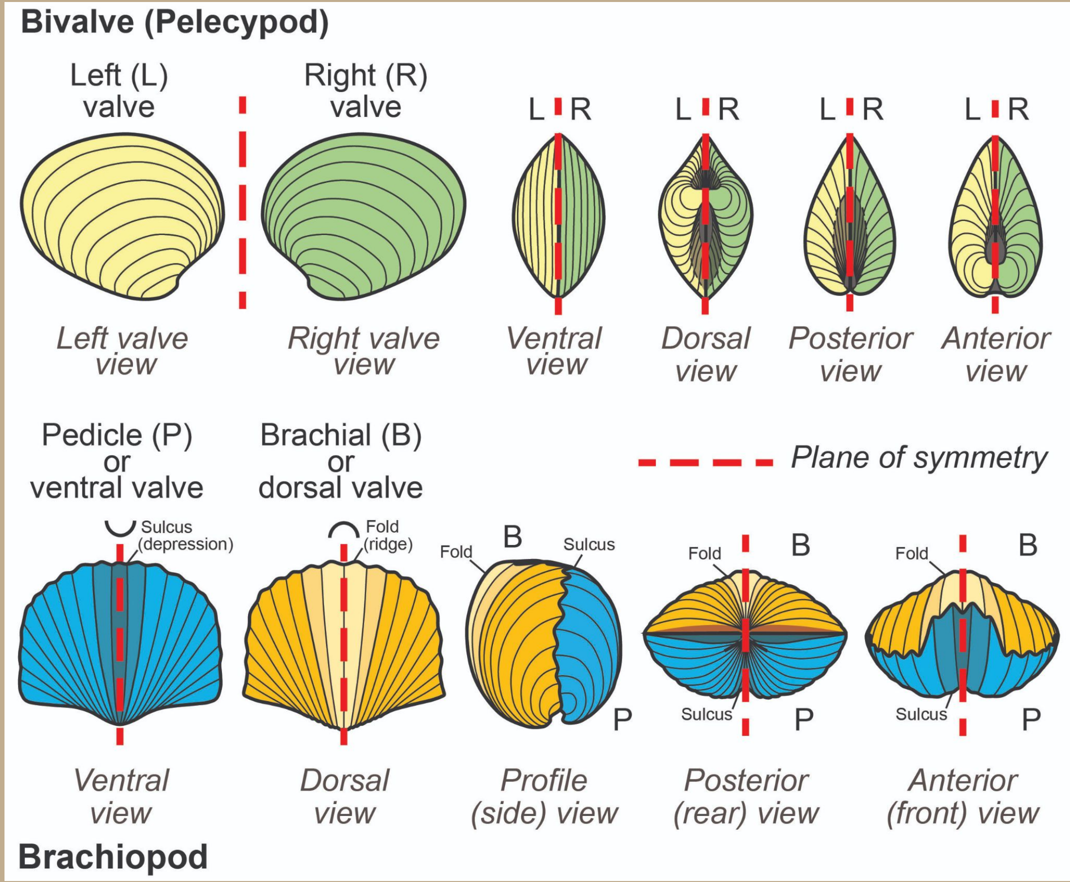
Many brachiopod species, so you'll see a wide variety.

Have a hard shell consisting of two valves.

See the symmetry slide to distinguish between brachiopods and bivalves.

Brachiopod at OPC

This photo was taken outside under the portico, on one of the columns.



https://www.uky.edu/KGS/fossils/fossil-pelecypoda-Bivalves-vs-brachiopods.php

Symmetry

How to tell the difference between a bivalve and a brachiopod

Image from: https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils/

Bivalves

Bivalves can be distinguished from brachiopods by their shell symmetry. The two valves (shell halves) of a bivalve mirror one another, whereas the tw valves of a brachiopod do not. Likewise, the left and right halves of a single brachiopod valve are symmetric, whereas individual valves of bivalves are asymmetric.

Bivalve at OPC

This photo was taken inside the sanctuary.

Image from: https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils/

Bryozoans

Bryozoan colonies appear in twig-shaped branching forms, fans, mounds, encrusting sheets, and others.

Bryozoans can be readily distinguished from corals because the individual tubes housing the zooids are much smaller than the individual tubes (corallites) of colonial corals.

Bryozoan at OPC

This photo was taken outside, near the side entrance on N. Main Street. The bryozoan is the y shaped fossil, the shell to the left is a brachiopod.

Image from: https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils/

Rugose Coral or Horn Coral

Horn corals name comes from the fact they look like horns

Ranged in size from a less than an inch to about a yard long.

The wrinkles represent growth intervals

This photo was taken outside in the playground area, on the wall near the windows into the nursery.

Rugose or horn coral at OPC

Image from: https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils/

Crinoids

The most commonly recognized crinoid fossils are individual pieces of the column, or stalk, called columnals.

These resemble small washers.

Crinoid skeletons disarticulate (fall apart) soon after the animal dies.

Crinoid at OPC

This was taken inside the sanctuary on a column near the pulpit. Keep in mind that sometimes you'll see these from different angles, so they may appear like a tube or simply a circle.

Questions?

Let's Go on the Tour

Tour Locations

Inside

- Sanctuary
  - Columns
  - Window surrounds
  - Choir loft
  - Door surrounds
- Narthex
  - Stone floors, but not much else to see

Outside

- Portico
  - Columns
  - Walls
- Play area
- Exterior doors going into the narthex
- Exterior side door on N. Main Street

Resources

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