A Guide to the Geology of Oxford Presbyterian Church's Memorial Building, Oxford, Ohio

A Very Brief History of the Church

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. In 2025, the church is celebrating its Bicentennial. The walls are imbued with history. 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.

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.



OPC's Memorial Building in 1925. Located at 101 N. Main St. Oxford, OH 45056. Photo: OPC



OPC's Memorial Building in 2017. Still located at 101 N. Main St. Oxford, OH 45056. Photo: OPC

Purpose of this Guide

The purpose of this guide is to enlighten the curious about the stones, the paleoenvironments and geologic processes in which they formed and the fossils of creatures that lived long ago which are preserved within. Intended as a self guided tour in and around the Memorial Building, an identification guide and details on where to find certain fossil specimens is included.

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Oxford Presbyterian Church U.S.A.

The Memorial Church Trivia

- In 1925, Mrs. Laura M. Kumler had agreed to finance the erection of a new church edifice as a memorial to her daughter, Miss Mary Kumler, and her late husband, Mr. Theophilus Kumler.
- The inspiration for the building is a Norman English parish church, though no precise church has been identified.
- Facing the courtyard at the corner of the cloister and the shorter wing is a bell tower. The bell was cast in 1854 and presumedly hung in the belfry of the old First Presbyterian Church on the NE corner of Church (Mulberry) and Campus (East) Streets. The bell tower of that church was destroyed in a windstorm in 1855 and never replaced. Most likely, the bell was placed in storage and reused in the reconstruction of Presbyterian Church (1875-1877) on this site, only to be used again in the Memorial Church.
- Carl Eugene Howell of Howell & Thomas Architects, in Cleveland, Ohio, to draw up preliminary plans for The Memorial Church, and the firm carried the project through to completion.

All of the details were collected from church documentation for pertaining to the Oxford Historical Plaque. However you may also enjoy the two books on the history of Oxford Presbyterian Church refenced at the end of this guide.

The Indiana Limestone or Salem Formation

The Indiana Limestone (the human perspective)

The same stone here is know by two names. To builders and architects, it's the Indiana Limestone, and geologists call it the Salem Formation.

Columns in the OPC's Memorial building's sanctuary are Indiana Limestone from a well known quarry in Bedford, Indiana.

The oolitic limestone in the Bedford quarry begun entering the stone industry's market in the 1830's. The demand and thereby, economy really took off in the 1850's with the arrival of railways.

Why is it so popular for buildings?

It's because it's chemically pure and consistent, making it durable and strong, can be cut into large blocks and hold fine details when carved.

Other buildings using Indiana Limestone

Too many to list, but to name a few: The Empire State Building, The Pentagon, National Cathedral, Yankee Stadium, and many churches, libraries, post offices, and private residences.

The Salem Formation (the geological perspective)

It's geologic age (Mississippian, which is part of the Carboniferous in the Paleozoic) and paleoenvironment is marine.

Oxford Area Limestone

The church's Memorial Building is constructed of blue limestone, quarried five miles north of Oxford, along Four Mile Creek, most likely in Preble county, by H. S. Coulter Company. This is clearly visible from the exterior of the building.

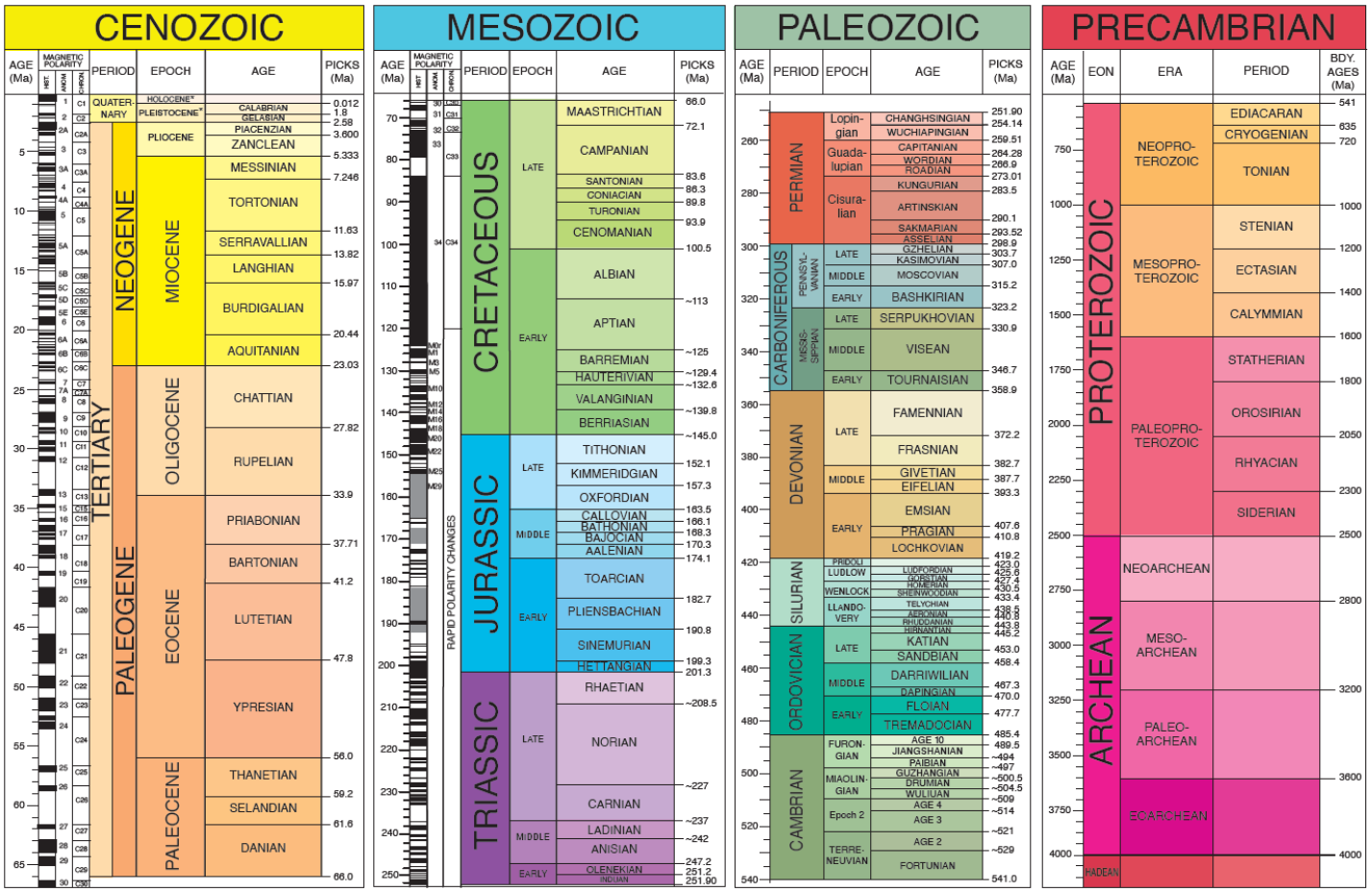
This limestone would have come from the Drakes, Whitewater. or Liberty Formation, which is Ordovician in age, so older than the Salem Formation (Indiana Limestone).

Measuring Geologic Time

When we talk about geologic time, we are talking about deep time. All of human history occurred in Holocene epoch, in the Quartey period, as seen on the time scale below. Geologic time is measured in millions of years ago, or Ma.

The NPS has a time scale with some added context for what was happening in earth's history and in North America specifically (https://www.nps.gov/subjects/geology/time-scale.htm)

Time Scale: A geologic time scale included for reference. Geological Society of America. Version 6.0



Fossil Identification Guide

Note that what's described below are broad groups, each with numerous different species, so there will be variations in sizes, shapes and ornamentation. Bear in mind these fossils are remains of animals so they follow the taxonomic system of kingdom, phylum, class, order, family, genesis and species. This guide doesn't seek to be species specific. Also keep in mind that when looking at fossils, the remains are products of their environment, so may not be complete, parts can be missing or broken.

For more information and photos, we recommend: Ohio Department of Natural Resources. (2025). Ohio Fossils. https://ohiodnr.gov/discover-and-learn/rock-minerals-fossils/fossils

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A Note on Rock Types

There are three main types of rock, all rocks will fall into one 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 and sandstone

Igneous—by cooling a melt

Eg. Granite and gabbro

Metamorphic—by heat and pressure

Eg. Slate and marble

Advise Before Exploring

This is not a rugged trip to the field, an urban exploration of just one building, so no need to over equip oneself. Still below are some tips.

- Bring a flashlight and magnifying glass
- Do not plan to collect any specimens. Do not plan to apply dilute hydrochloric acid or other acidic stand-ins to the rock
- Some of the stone blocks have been replaced over time, so they appear different than the surrounding blocks
- Rough patches or fresh surfaces give a better glimpse into the stone than the cut surfaces, a few of the columns have these patches where something has knocked into it and exposed the rock this way
- Most of the rocks on this tour are some variety of limestone, however the roof tiles are slate
- Keep in mind that the columns and blocks in the sanctuary and those on the exterior, will seem very different, but they are all limestone. This is due to the different paleoenvironments in which they formed. In building terms, it's the grade, and in geologic terms it's the facies.



Gastropods

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



Ideal specimen. Photo: ODNR

No very identifiable gastropods found to photograph. However, that doesn't mean none are present somewhere in the building.

Brachiopods

Many brachiopod species, so you'll see a wide variety. They have a hard shell consisting of two valves. See note below on bivalves about distinguishing between them.



Ideal specimen. Photo: ODNR



OPC specimen. Photo: G. Adams

Bivalves

Bivalves can be distinguished from brachiopods by their shell symmetry. The two valves (shell halves) of a bivalve mirror one another, whereas the two valves of a brachiopod do not.



Ideal specimen. Photo ODNR



OPC specimen. Photo: G. Adams

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 of colonial corals.



Ideal specimen. Photo: ODNR

C.



OPC specimen. Photo: G. Adams

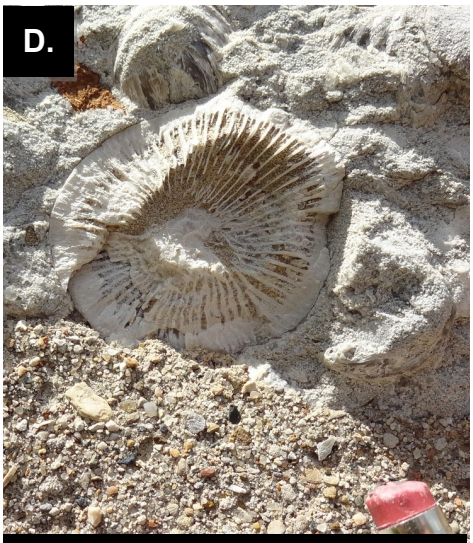
Rugose or Horn Coral

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



Ideal specimen. Photo: ODNR

D.



OPC specimen. Photo: G. Adams

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.



Ideal specimen. Photo: ODNR

E.



OPC specimen. Photo: G. Adams

Guided Tour of the Sanctuary

Columns

Massive limestone with some mica (a mineral with a shiny appearance). (see F and G)

Some occasional rough patches where something's hit it, and exposed a fresh surface, which make seeing inside easier.

Window surrounds

On the window sills are cut marks, that's not a natural part of the stone.

Choir loft

Column by the podium, has a gastropod (very challenging to see) and bryozoans, this is next to the flag and steps to the choir loft (see I).

By the organ on either side are columns and there are good brachiopods and crinoids here (see E).

Near the organ by the lift on the chancel, very near the floor are three great brachiopods (see B).

There are also rugose corals (see H) in this area.

Door surrounds

The doorway on the left, when facing the choir loft, nearest the pulpit, is surrounded with stone (see J). On the upper left is a very visible fossil, the end of a rugose coral (see K).

All of the photos to follow taken by G. Adams

Guided Tour of the Exterior

Portico

Near the mailbox are some darker gray to black fossils, these are very carbon rich (see T.)

Not a lot to see in the columns but there is a great brachiopod midway up the second column (see A), if you stand facing out to the street (see L).

Play Area

Good layers, indicating a change in depositional environment (see P)

Iron inclusions, which look like rusty spots (see S)

Great top part of a rugose coral (see D).

See M for general view of the exterior wall.

Exterior doors entering the Narthex

Good array of fossils, similar to those described elsewhere on the exterior, such as bivalves (see V).

Exterior doors on N. Main St.

Nice big clearly visible shells, brachiopods, bivalves and bryozoans (see C and Q).

Iron inclusions, which look like rusty spots (see S)

Good layers, indicating a change in depositional environment (see R)

To the upper left of the door is a good side on rugose coral

See N for general view of this doorway.

F.



G.



H.



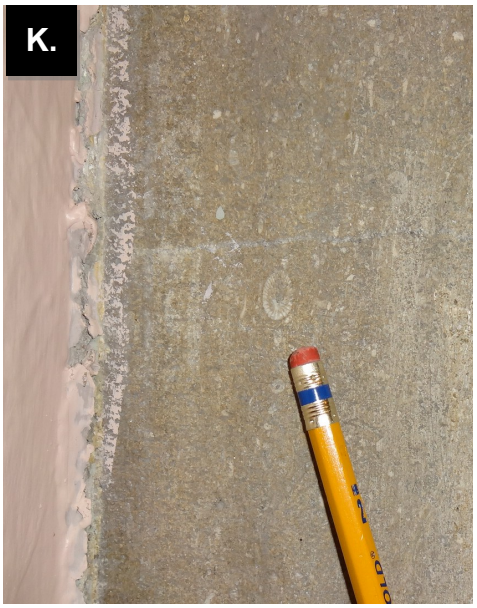
I.



J.



K.



L.



M.



N.

















Notes documenting your finds

Further Resources to Continue the Learning Journey

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