

“Almost Heaven”

Fossil Trip

Into West Virginia

**Renfrew Institute of Cultural and
Environmental Studies Annual
Geology Excursion**

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ABOUT YOUR LEADER

Jeri owns Jones Geological Services in Spring Grove, PA where he studies the geology of southeastern Pennsylvania. In his 38 years of research Jeri leads groups on field trips and acts as a consultant to several area quarries. He has traveled throughout the country conducting field trips and programs for all ages. He previously taught at HACC-Gettysburg, York College of Pennsylvania and Messiah College. He received the Digman Award for Geologic Excellence from the Eastern Chapter of the National Association of Geoscience Teachers. He has authored five books, narrated a geologic education video series and written numerous articles. Jeri also is a guest columnist for the York Daily Record where he writes about local earth science. Jeri is also teaching Earth Science at York College of Pennsylvania.

Jeri has brought several experienced fossil experts along with him today to assist you in collecting and identifying specimens. Dick Cooper of New Oxford and Ed Books of Hanover are here to assist you today.

Critters You Might See Today

Our four stops today will be in rocks that formed in an ancient ocean known as the Iapetus Ocean. Before the supercontinent Pangaea formed in the Permian Period, there was a previously supercontinent that played a role in today's trip. Rodinia was located in the southern hemisphere about 1 billion years ago and began to rift into continents from 750 – 560 million years ago (mya). This was the formation of the Iapetus Ocean and slowly our continent known as Laurentia moved northward across the Equator. During this time during the Cambrian, Ordovician, Silurian and Devonian periods, a continental shelf developed off of our East Coast in the Iapetus Ocean. The fossils you will find today lived either on the continental shelf or in the shallow, muddy, warm marine water of the Iapetus Ocean.

Animal classes that are expected to be found today include the following. All definitions are from dictionary.com with minor modifications.

Brachiopod

[any](#) mollusklike, marine animal of the phylum Brachiopoda, having a dorsal and ventral shell; a lamp shell. An bivalve that has equal sized shells. Not common today.



Pelecypod

any mollusk of the class Pelecypoda (Lamellibranchiata), characterized by a bivalve shell enclosing the headless body and lamellate gills, comprising the oysters, clams, mussels, and scallops. Shells are equal in size.



Crinoid

any **echinoderm** of the class Crinoidea, having a cup-shaped body to which are attached branched, radiating arms, comprising the sea lilies, feather stars and various fossil forms. Commonly found are the segmented stems.



Trilobite

any marine **arthropod** of the extinct class Trilobita, from the Paleozoic Era, having a flattened, oval body varying in length from 1 inch (2.5 cm) or less to 2 feet (61 cm).



Gastropod

any mollusk of the class Gastropoda, comprising the snails, whelks, slugs, etc.



Cephalopod

any mollusk of the class Cephalopoda, having tentacles attached to the head, including the cuttlefish, squid, and octopus.



Bryozoan

Also called moss

animal. any sessile marine or freshwater animal of the phylum **Bryozoa**, forming branching, encrusting, or gelatinous mosslike colonies of many small polyps, each having a circular or horseshoe-shaped ridge bearing ciliated tentacles, occurring on algae or on shaded objects.



Coral

the **hard**, variously colored, calcareous skeleton secreted by certain marine polyps. such skeletons collectively, forming reefs, islands, etc.



Ostracod

any **minute** crustacean of the mainly freshwater subclass *Ostracoda*, in which the body is enclosed in a transparent two-valved carapace. Very small impressions.



Cystoid

Are primitive stemmed echinoderms with a spherical or sac-like body outline. Skelton composed of irregularly arranged plates with arms for food gathering.



STOP 1. SOUTH BRANCH OF THE POTOMAC RIVER BRIDGE ROUTE 50 WEST OF ROMNEY, WV

Since we cannot go to the quarry from where fossilized rock has been removed, we are going to the rock was used for pier landscaping of the West Virginia Route 50 bridge. The property is privately owned and we are grateful for the help of Dean and Tim Williams for allowing us to visit this site.

The fossils found here are in a dark limestone from the Tonoloway Formation. This rock unit is Late Silurian in age (443.8 – 419.2 my) and represents a shallow marine environment. The rock was quarried at the Alleghany Aggregates quarry at Short Gap, WV, about 14 miles north of here.

Fossil types that could be found here: brachiopods, pelecypods, crinoids, ostracods, bryozoan gastropod, coral.

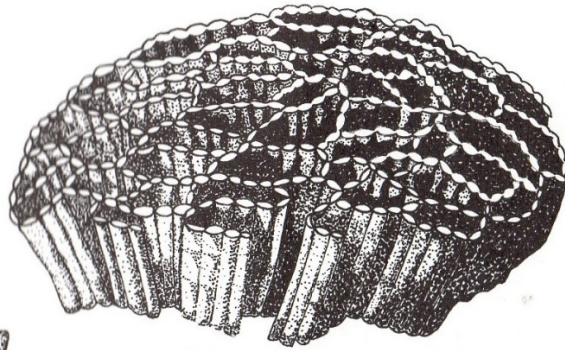
Here is an example of a crinoid column found here.



Pictured below are examples of what could be found in these rocks. **HAPPY HUNTING!!!!!!**



Coenites x0.8



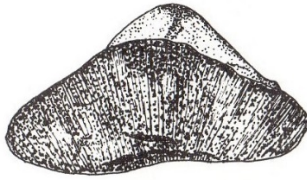
Halysites x1



Fistuliporella
x20



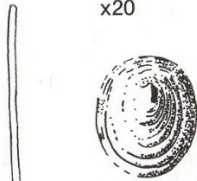
Rhombotrypa
x2.5



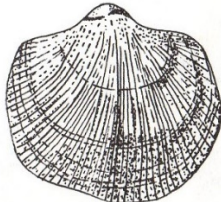
Monotrypa x0.8



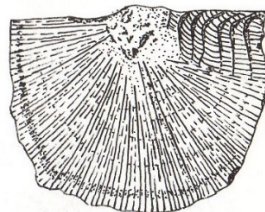
Orthopora x2



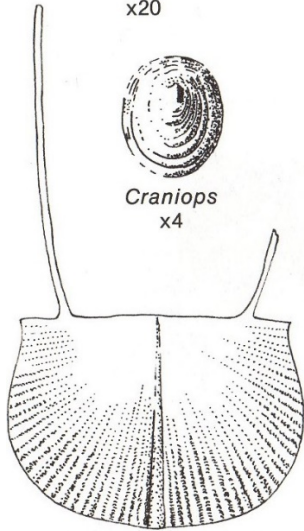
Craniops
x4



Isorthis
x1



Brachyprion x1



Strophochonetes x5



Stegerhynchus
x1



Uncinulus
x1



Rhynchospirina
x1.8



Whitfieldella
x0.8



Howellella
x1



Hormotoma
x1.6



Cornulites
x2



Spirorbis
x5

STOP 2. Route 50 Roadcut and Abandoned Quarry

This stop features a unique opportunity to collect fossils without seeing much of anything. In the roadcut within the Tonoloway Formation and the Helderberg Group, bryozoans, brachiopods, cystoid segments and coral can be collected. However, much of the remains is buried inside the limestone and requires some extra work to reveal your finds. If desired after getting home and wanting to do a rainy-day project, buy some muriatic acid from a neighborhood hardware store and place your sample into a bucket and dissolve the limestone away. You hopefully will find some great specimens.

As mentioned at Stop 1, the Tonoloway Formation is Late Silurian in age. The Helderberg Group which is composed of the Keyser Formation, Clifton Forge Sandstone and the Big Mountain Shale members. The unit comprises mostly limestone, some containing chert zones, sandstone and shale. Here, it is probably that the fossils are coming out of the Tonoloway Formation in the weathered rock.

Here are examples of what has been identified from here. Taken from Burns (1991).

While here we will do a brief discussion on Geology 101 principles. Looking at the 300-foot high wall in the quarry, you can see layering (or bedding) in the limestone units. Does the layering look consistent across the wall or do the beds go up or down on occasion? You will also detect some near vertical cracks going up the wall.

1. Where is the oldest layer of rock on this wall?
2. Are the rocks folded here since we are located within the Appalachian Mountains, a classic example of a folded mountain range.
3. What are the fractures going up the wall? Can you detect any offset of layers across the fractures?



Mold

Cast



Locality 10. 1, slab with bryozoans, brachiopods (including *Rhynchotretra* sp. just above and to the right of center), and cystoid segments and a plate from crown, or calyx, of *Pseudocrinites* sp. (just below center); 2, bryozoan and cystoid segments; 3, brachiopod *Cupularostrum litchfieldense*; 4, ostracodes *Leperditia* sp. (Tonoloway formation). (Fossils shown 1.7x actual size.)

STOP 3. LOST RIVER FOSSIL PIT WEST OF WARDENSVILLE, WV

Probably the best collecting site for a large group in the Appalachian Mountains of West Virginia. The Fossil Guy (Fossilguy.com) has described this site. Collecting is being conducted here from the Needmore Shale of Middle Devonian age. The rock is described as a dark-to medium gray limy shale. There is some light greenish shale also present here. The Needmore Shale is mapped with the Marcellus Shale here in West Virginia and is believed to be only 150 feet thick.

The best collecting is found along the exposed bedrock shelf near the top of the pit. Much talus covers the ground below the shelf and does provide some traction to gaining access to the shelf. You may also access the shelf from either side. Be aware if you travel on the east side, briars are found within the wooded area.

I would ask to use team work here to collect. Some of our participants will not be able to or want to climb up to the shelf. It would be appreciated if ones collecting at the shelf could provide some specimens to those on the bottom.

Fossils that can be found here includes: brachiopods, pelecypods, trilobites, crinoids, gastropods, cephalopods, bryozoan and ostracods.



The State Fossil of Pennsylvania found here at Lost River.



COMMON FOSSILS FROM THE DEVONIAN OF WESTERN NEW YORK

PENN DIXIE CENTER - LAKE ERIE SHORES - CREEKS



TRILOBITE
ELDRIDGEOPS RANA (PHACOPS RANA)
PRONE AND ENROLLED EXAMPLES



TRILOBITE
GREENOPS BARBERI
GREENOPS GRABAUI LOOKS SIMILAR,
BUT HAS SHORTER PYGIDIUM SPINES



TRILOBITE
TRIMERUS DEKAYI
(DIPLEURA DEKAYI)
CEPHALON (1/2 SIZE)



BRACHIOPOD
ATHYRIS SPIRIFEROIDES



BRACHIOPOD
PSEUDOATRYPA DEVONIANA



BRACHIOPOD
SPINATRYPA SPINOSA



BRACHIOPOD
MUCROSPIRIFER MUCRONATUS



BRACHIOPOD
MEDIOSPIRIFER AUDACULUS
(SPIRIFER AUDALCULUS)



BRACHIOPOD
SPINOCYRTIA GRANULOSA
(SPIRIFER GRANULOSUS)



BRACHIOPOD
RHIPIDOMELLA PENELOPE



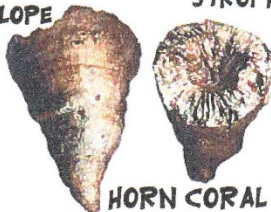
BRACHIOPOD
STROPHEODONTA DEMISSA



CEPHALOPOD
SPYROCERAS SP.
(STRAIGHT-SHELLED NAUTILOID)



CORAL
PLEURODICTYUM
AMERICANUM



HORN CORAL
STEREOLASMA RECTUM



CRINOID STEM FRAGMENTS

FOR MORE EXTENSIVE FOSSIL
IDENTIFICATION GO TO:

WWW.FOSSILGUY.COM/SITES/18MILE/

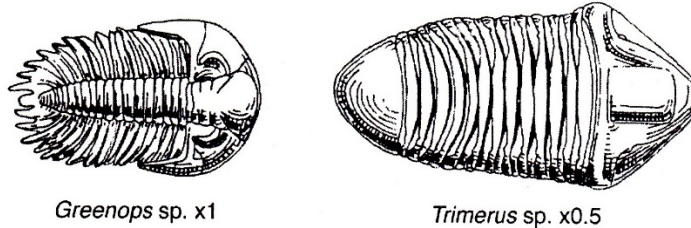
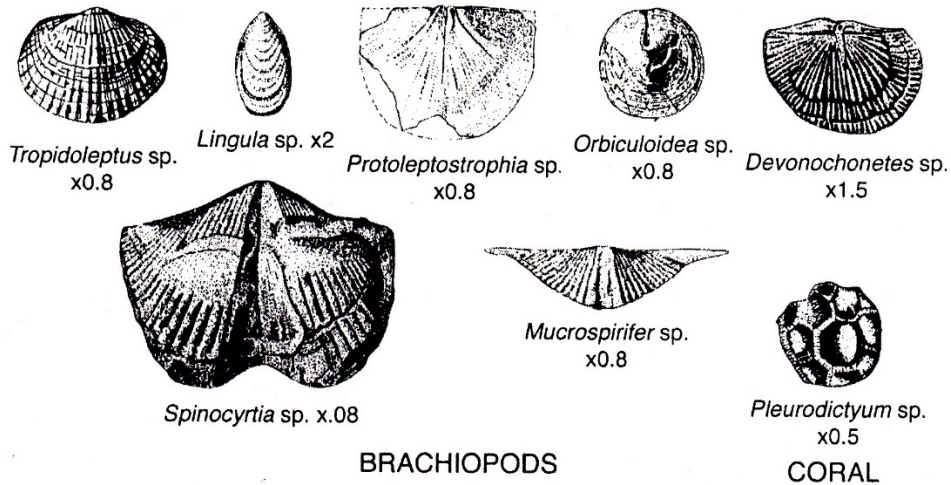


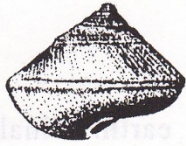
STOP 4. GANNAT BROTHERS SHALE PIT HEDGESVILLE, WV

We kept the best for last, at least in our opinion. This shale pit is active and much rock has been removed since Renfrew Institute last visited this site in 2015. Additional excavating into the hillside in the upper part of the burrow pit has exposed some nice fossils belonging to the Middle Devonian Mahantango Formation. This is probably the most fossiliferous rock unit within the Appalachian Mountains in Pennsylvania, Maryland and West Virginia. For those of you that have traveled with us before, we visited the New Ringgold, Schuylkill County, PA pit that also belonged to the Mahantango Formation.

The Mahantango represents a terrestrial to marine transition zone that went through many transgressive-regression sequences. The fine-grained rocks represent a shallow sea environment and accounts for many of the fossils. Coarser grained sediments represent near-shore environments, beaches, or possibly delta lobes. The age of the rock is 388.4 – 382.7 my and at that time our part of the continent was located north of the Equator in the tropics. It was during this time that marine life was nearing its peak in diversity of species. All the fossil types listed at the beginning of this guide can be found in the Mahantango unit.

The Fossil Guy (fossilguy.com) has an extensive interactive index page on specimen pictures that you can use as a reference.

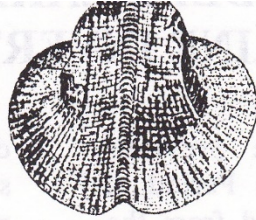




Bembexia sp. x0.8



Tropidodiscus sp. x0.8



Bucanopsis sp. x0.8



Cyclonema sp. x0.6

GASTROPODS



Nuculoidea sp. x1.2



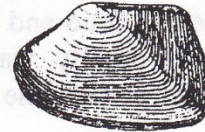
Nuculites sp. x1



Phestia sp. x0.8



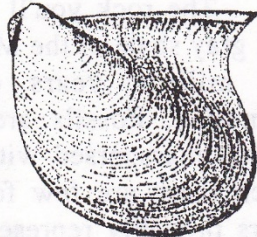
Orthonota sp. x0.5



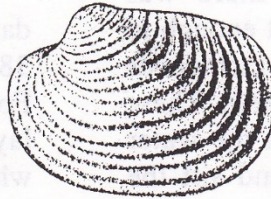
Cypricardella sp. x1



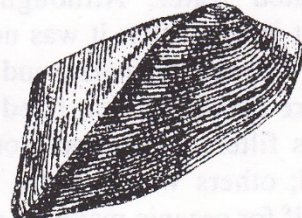
Modiomorpha sp. x0.9



Leiopteria sp. x1



Grammysiodea sp. x0.8



Goniophora sp. x0.8

PELECYPODS (BIVALVES)



Michelinoceras sp. x1



Agoniatites sp. x0.5



Agoniatites vanuxemi
Deer Lake, PA

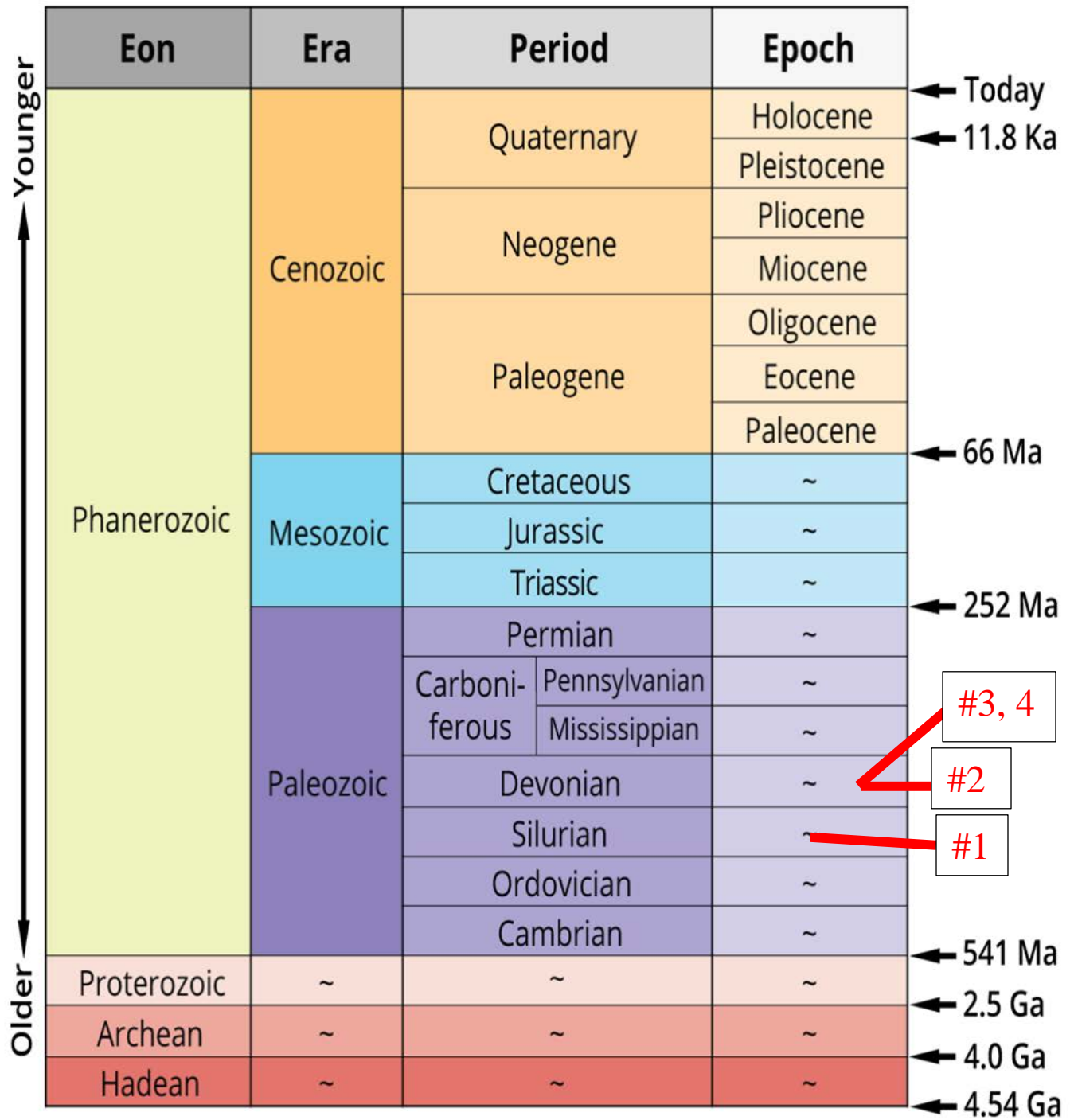
CEPHALOPODS



Eldredgeops rana trilobite. Pennsylvania's State Fossil.



Greenops trilobite



Geologic Time Scale with Stops Included

Road Log

Depart Renfrew parking lot and take PA Route 16 west to Interstate 81.

	Acc. Mileage
Beginning at Pennsylvania Exit 5 – Greencastle – Interstate 81	0.0
Virginia Exit 17 – Winchester – Route 50	48.2
Follow Rt. 50/37 west	48.8
Follow Route 50 west exit	52.3
Enter Gore Virginia	62.2
Bear Game Mountain - 1,000 feet in elevation	68.3
Schaffernaker Mountain – elevation ?	74.1
Copper Mountain – elevation 1607 feet	76.6
Stop 1 – at bridge on Route 50 west of Romney, VA	95.5
Stop 2 – Quarry Stop	97.4
Continue west of Route 50	
Turn left onto Route 220/28 south	101.6
Turn left onto Route 48 east at Moorefield VA	119.7
Turn right onto Route 55/48	120.5
Folding and Faulting in Roadcut on left	126.8
Limestone Anticline in left roadcut	136.7
Exit onto Pinnacle Drive and turn right onto Old Route 55	140.1
Stop 3 – Lost River Fossil Pit	140.4
Return to Route 48/55 East	140.9
Enter Wardensville, VA Straight on Route 259 North	145.0
Turn right onto Route 50 East in Gore, VA	164.2

Turn left onto Route 37/50 east	175.3
Turn left onto Interstate 81 North	179.4
Exit West Virginia exit 16 – Route 9 west toward Berkeley Springs	201.4
Hedgesville square – straight on Route 9 west	206.3
Go past post office and turn left into stone driveway – Stop 4	207.1
Return to Interstate 81 and go north (right exit)	212.1
Pennsylvania Exit 5 (Greencastle). Exit and take PA Route 61 back to Renfrew	238.7

References and Further Reading

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