

# FOSSIL COLLECTING IN ADAMS AND FRANKLIN COUNTIES, PENNSYLVANIA

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What is needed on Trip: Hard Hat, Larger hammer and chisel for breaking rock, collecting bag, lunch and beverage. Optional is a pry bar especially for Stop 3. Releases need to be signed for Valley Quarry – Fairfield and Guitner Road when signing in for the trip.

## INTRODUCTION AND ITINERARY

Welcome to what should be an exciting day touring the Gettysburg-Newark Section of the Piedmont and Great Valley Section of the Ridge and Valley provinces. Between Stops 1 and 2, we will pass over the South Mountain Section of the Ridge and Valley province. Our three stops today will give you a glimpse of some of the paleontology within the Ordovician and Triassic periods.

10:05 am	Depart Comfort Suites - Carlisle
11:00 am	Arrive at STOP 1 - Valley Quarry – Fairfield Plant – 3805 Bullfrog Road, Fairfield, PA
11:45 am	Depart
12:05 am	Arrive at Renfrew Park and Museum – Lunch Stop
12:45 pm	Depart
1:05 pm	Arrive at STOP 2 - 8948 Browns Mill Road, Greencastle, PA Fossil Site
1:45 pm	Depart
1:55 pm	Arrive at STOP 3 – 783 Guitner Road, Greencastle, PA Fossil Site
3:00 pm	Depart
4:00 pm	Arrive back to Comfort Suites

## ACKNOWLEDGEMENTS

The trip would not be possible without the fine cooperation of the landowners involved. Randy Van Scyoc of Valley Quarries for accommodating us at the Fairfield plant; Ray Miller, owner of the Browns Mill Road property, who is always looking for ways to reduce his outcrops in the meadows and Darrel Rosenberry for allowing us to explore the abandoned railroad cut.

### STOP 1. Valley Quarries Fairfield Plant

This quarry is a second generation excavation on the property. The older workings are found to the north of the scale house and are water-filled. What has made this operation special to geologists over the years is the age of the rock. Some researchers proposed a Lower Paleozoic age for the rocks and are associated with the carbonates of the Piedmont Lowland Section to the east or the carbonates that underlie the Great Valley to the west. This would mean that the Fairfield plant would be a window where the Triassic rocks were removed. For example see Kochanov and Faill, 2008. This discovery of the foot tracks put a stamp on the age controversy, placing the age into the Triassic.

The discovery of the tracks actually started in June, 2012 when several members of the Franklin County Rock and Mineral Club found what appeared to them as a single track in float. A photograph of the track was sent to the leader of today's trip who identified it as a Grallator. The club revisited the quarry in October, 2012 at which time today's leader accompanied them. Another single track was discovered in loose rock in the vicinity of the June, 2012 specimen on the lower level of the quarry.

Later work by the quarry in early 2013 exposed the trackway that you will see today. The abstract and program presented at the 2014 Geological Society of America Northeastern Section Meeting is found at this link (Weems and others, 2014):

<https://gsa.confex.com/gsa/2014NE/webprogram/Paper235415.html>

**No collecting will be allowed at the site and please be aware of your surrounding.**

### STOP 2. Browns Mill Road Fossil Site

This site was found by accident as in preparation of this trip I was attempting to find a good stromatolite site to examine. After examining two other sites on the east side of Interstate 81 as reported by Root (1968) and deemed not accessible due to ownership or wetlands, this field was examined. No stromatolites were found but interesting array of dolomitized networking burrows now filled in with carbonates material were found. According to Dr. Roger Cuffey, retired professor at Pennsylvania State University mentioned that the

carbonates vary slightly back and forth between dolomitic limestones and calcareous dolomites; on average they're 50% calcite and 50% dolomite, but where one is 45% versus the other 55%, you get this kind of differential weathering and production of a distinct color difference (personal commun.). Also, a view of a yet unknown coral or echionoderm can be observed. Any other ideas are also welcome here!

The rock exposed here is the middle part of the Rockdale Run Formation, a unit composed of limestone and dolomite. The age of the rock is Lower Ordovician and is estimated at about 2,500 feet thick (Root, 1968). Structural interruptions in the middle and upper part of the formation makes calculating the true thickness difficult. In the field, the rock is dipping steeply to the west.

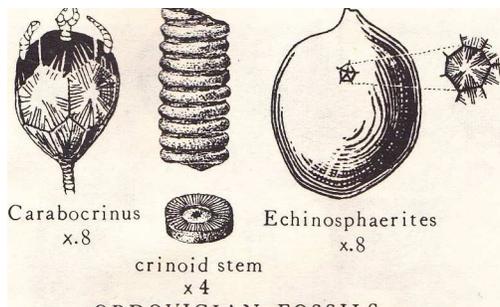
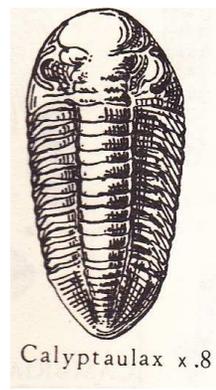
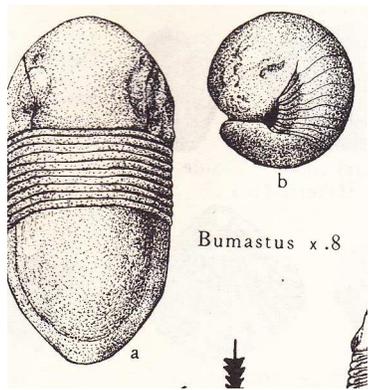
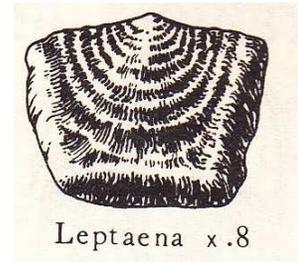
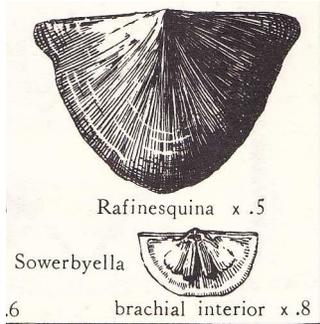
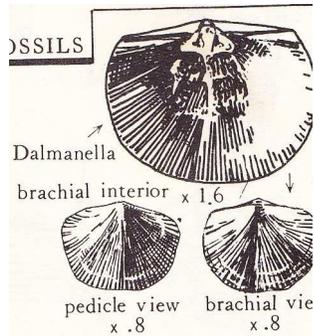
### STOP 3. Guitner Road Fossil Site

Fossil sites within the Great Valley Section are a rarity. Some of this is due to the lack of exposures in the region. Limestone and shale underlie most of the physiographic section and with these rocks being soft, they weather and erode easily. Many times, a geologist has to examine the float rock laying on the surface to determine what the bedrock is at that particular location. Jones Geological Services reviewed through many of the older geologic reports written in the Franklin County area hoping to uncover a fossil site that may be able to produce enough specimens. Sometimes, historical research is important in learning geological facts about an area. Luckily, the Kauffman site was mentioned in an older edition of "Fossil Collecting in Pennsylvania" publication (Hoskins, 1969). Also, the best exposure of the Chambersburg Formation is found in this abandoned Pennsylvania Railroad cut (Root, 1968).

As mentioned above, the rocks exposed here belong to the Middle Ordovician Chambersburg Formation. Dark-gray cobbly limestone dominates this unit. Upon weathering, the cobbles litter the surface which is very distinctive to this formation. As many limestone units are, outcrops are sparse. The Chambersburg Formation seems to peek through the soil and doesn't have any rocky ledges exposed on the ground. Some argillaceous (clay) layers are also present. The thickness of the Chambersburg Formation is 750 feet (Root, 1968). Several metabentonite layers have also been mapped with this formation (Root, 1968). The significance of this material is that some bentonite clay is a result of the weathering of volcanic ash. The word "meta" in front of the word implies that it has been changed by heat and/or pressure over time. Thin bentonite beds have been reported in several other Middle Ordovician formation, one known to the leader occurring in the old Bethlehem Steel quarry near Middletown, Dauphin County, Pennsylvania. Its presence does imply that some sort of volcanic activity did occur during this time span someplace in the region.

As for the fossils found here, the site is known for an unusual ball cystoid *Echinosphaerites*. Complete specimens of cystoids have been collected from this railroad cut, mostly to the south of Kauffman Road West. These fossils look like a small golf ball. The 800+ pentagonal and hexagonal plates that make up the body (theca) of the animal are covered by a very thin calcareous "skin". Some specimens have been found where the "skin" has been weathered off, exposing the plates. Rare separated calyx plates of the crinoid genus

*Carabocrinus* are also found here. Four species of brachiopods (shells with two unequal halves), two species of trilobites (arthropods) and crinoid stems have also been identified from here (Hoskins, 1969).



## References

- Hoskins, D.M., 1969. Fossil Collecting in Pennsylvania. Pa. Geol. Survey, 4<sup>th</sup> ser., Gen. Geol Rept. G 40.
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- Root, S. I., 1968. Geology and mineral resources of southeastern Franklin County, Pennsylvania. Pa. Geol. Survey, 4<sup>th</sup> ser., Atlas 119cd.
- Weems, R.E., Van Scyoc, R., Ganis, G. R., and Bender, B., 2014. Reptile Trackways provide a Triassic date for enigmatic rocks at Valley Quarries Fairfield operation, Pennsylvania. Geol. Soc. America, 49<sup>th</sup> Annual Northeastern Section Meeting, Lancaster, PA.