



The Vanport Limestone Outcrop at Jack Critchfield Park

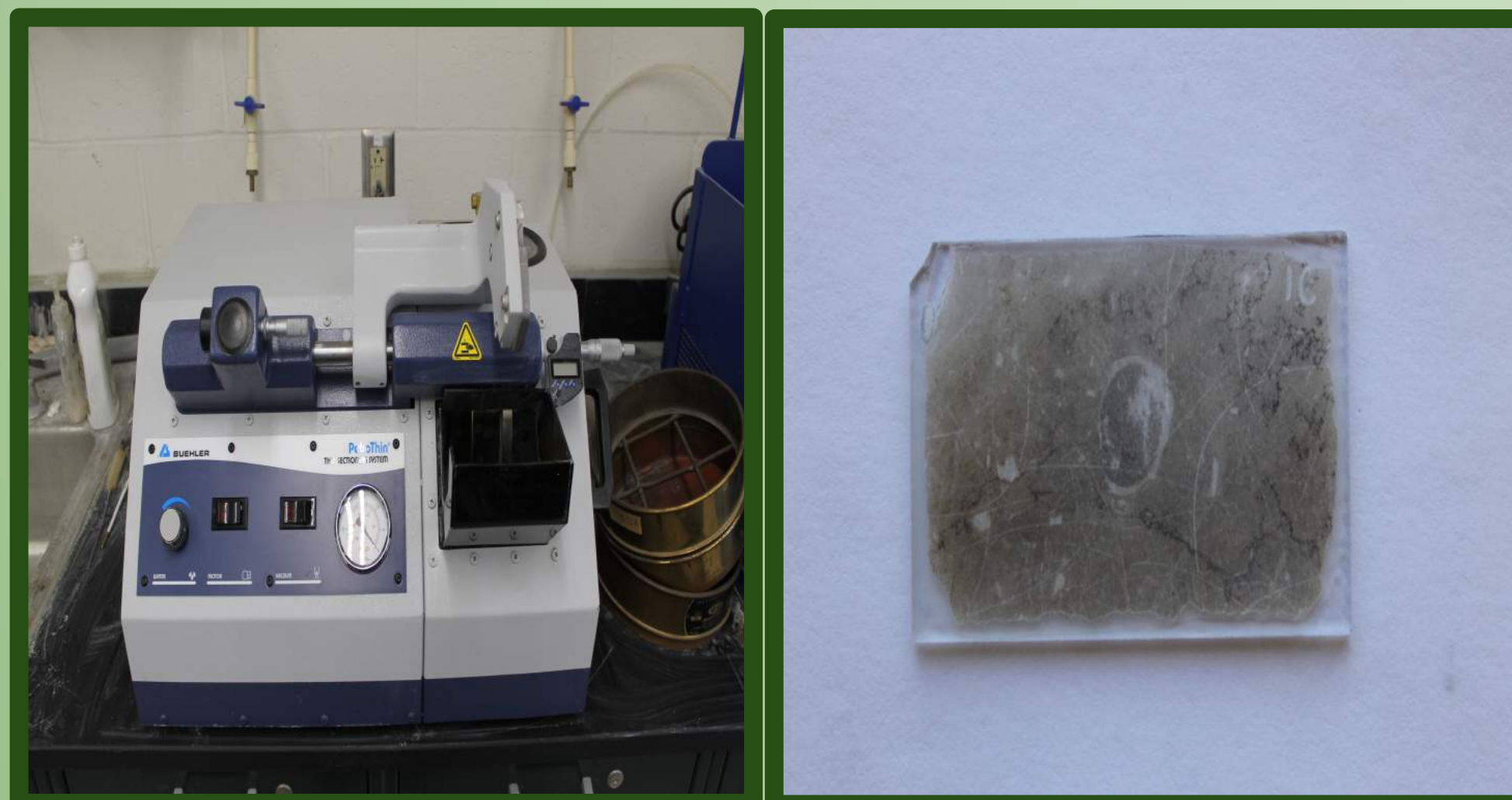
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Introduction

Only a meter beyond the left field foul pole at Jack Critchfield Park lies a late Paleozoic limestone outcrop. Limestones consist of CaCO_3 , which are formed by the sedimentation and compaction of marine organisms that died in a tropical, shallow ocean. Geologists use the combination of allochems and the mud they are entombed in to categorize limestones. This is important because of the economic uses of particular limestones as well as dating the rock to recreate the past environment it formed in.

Methodology

We started by measuring and analyzing the outcrop, which has a height of two meters, so we took hand samples from every quarter meter using a hammer to break off a piece of rock. We took these hand samples to the rock lab in ATS where we cut the rock into a thin rectangle (billet) and epoxied it to a slide. After a few hours of drying, we use the PetroThin machine then grind the billet to 30 μm . Next, we analyzed the percent of mud and each allochem and proceeded to name the rock based on Dunham's carbonate classification scheme.



To make a thin section (right), a billet is suctioned to a lever on the PetroThin (left) and set to 30 μm . The lever slowly swings into the machine against a grinder to thin the billet.

Pictures of the Outcrop, the fossils, a google earth map of the location or a geologic map of the VP

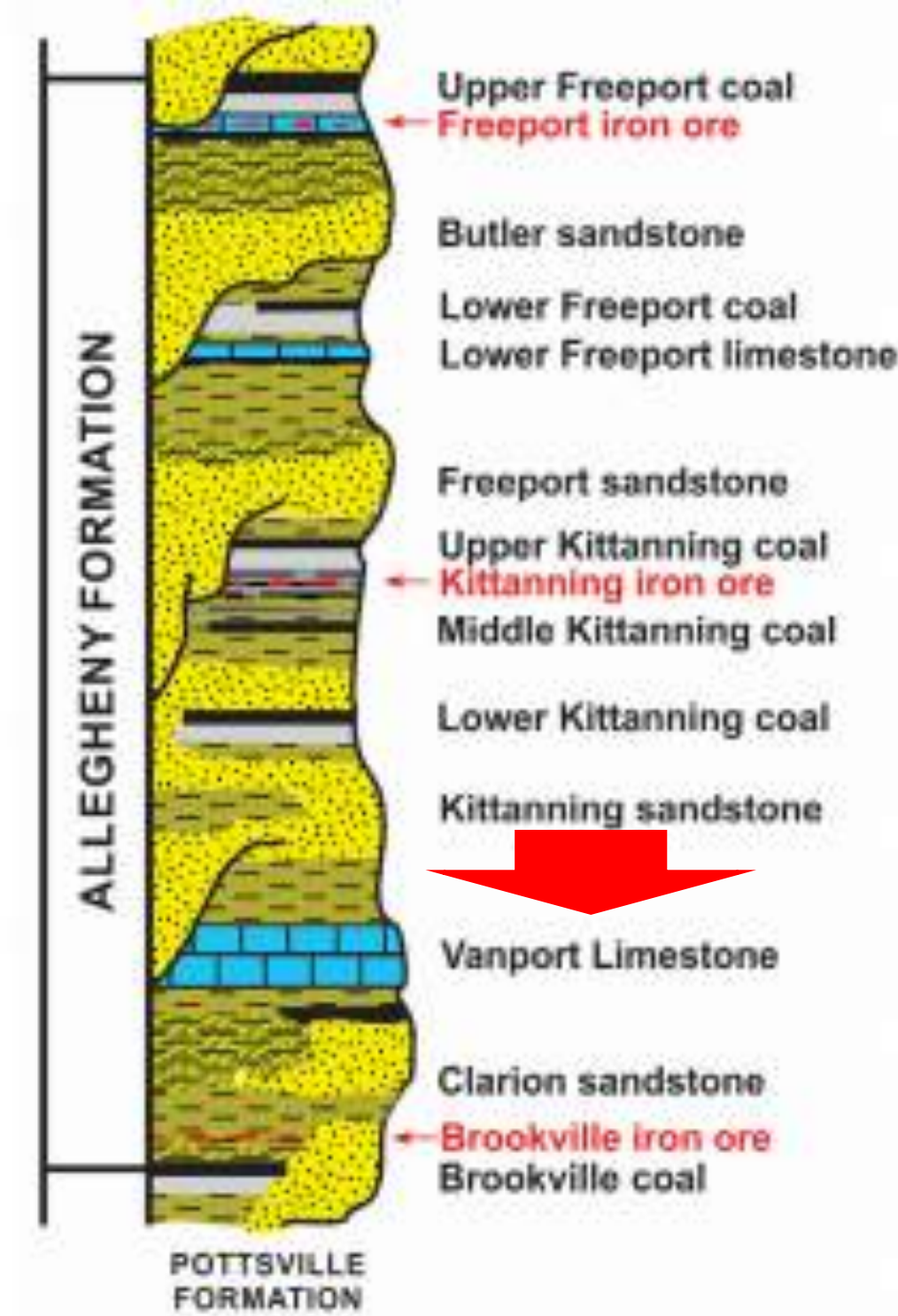


Photo of the Vanport Limestone outcrop located at Jack Critchfield Park



Area underlain by the generally flat lying Pennsylvanian Vanport Limestone, a high-calcium limestone. This limestone is generally overlain by less than 100 feet of sedimentary rocks, except in the southern part of the area.

Results

After examination of thin sections, hand samples, and the outcrop, we have determined it is nearly homogenous throughout with only slight variations in allochem to mud ratio. Based on the near 50/50 mud/allochem ratio we used Dunham's classification to name the rock a packstone. Many fossils exist throughout the outcrop including, ostracods, brachiopods, echinoderms, gastropods, and foraminifera. The finding of a foraminifera is significant because it allows us to date the formation of the rock to 323-252 million years ago.

Conclusion

The fossils present in the outcrop tell us that the rock was formed in a tropical shallow ocean during the carboniferous and Permian periods. This outcrop is part of the Vanport limestone group which extends through much of western Pennsylvania. The rock is a valuable resource, as it is used for cosmetics, fertilizer, interior décor, and most importantly as an aggregate in cement and other building materials.



A large crinoid on the surface of the outcrop. A pen lies underneath for scale.

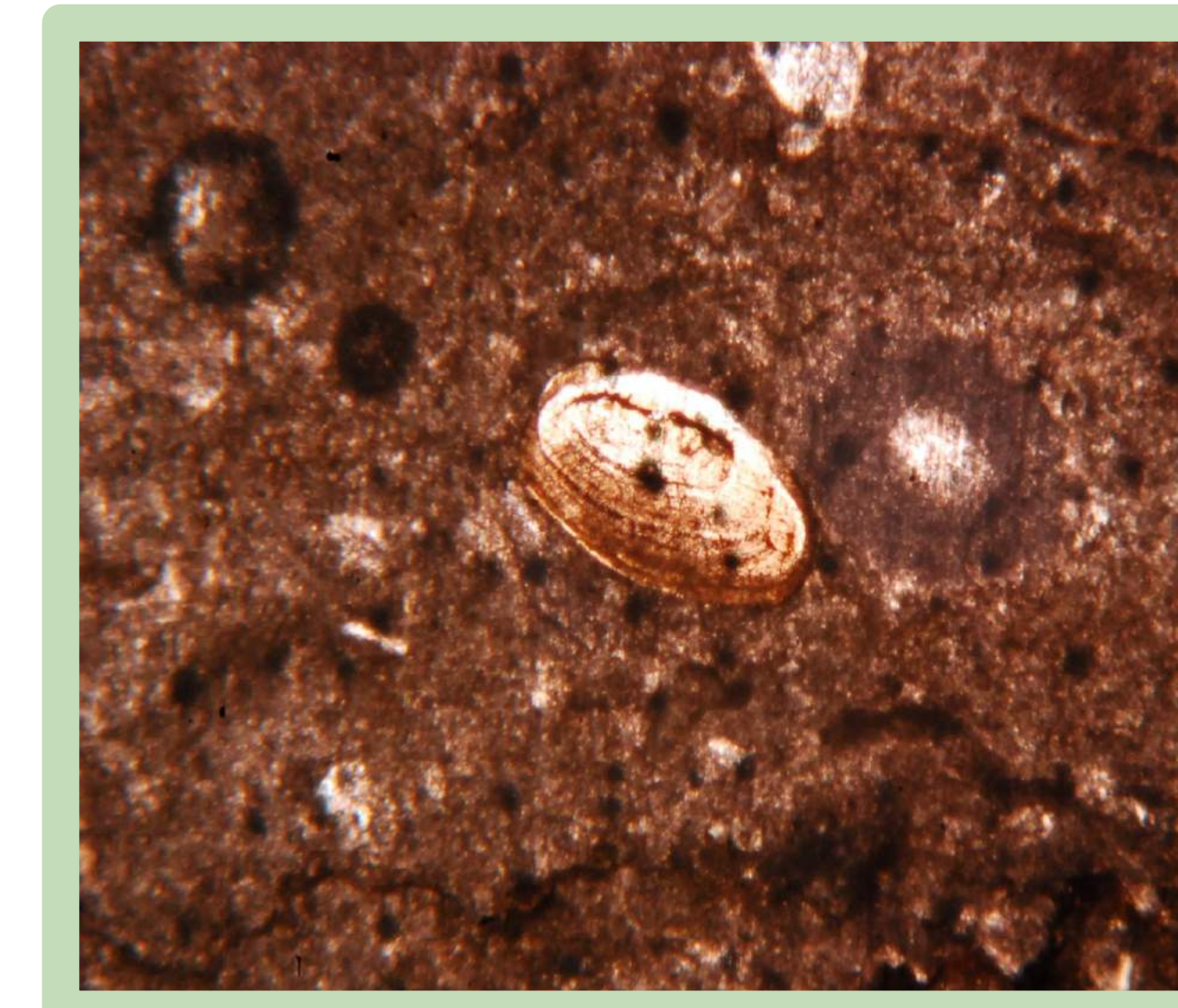
Microscopic Organisms Responsible for the Formation of The Vanport Limestone



Order: Fusulinida



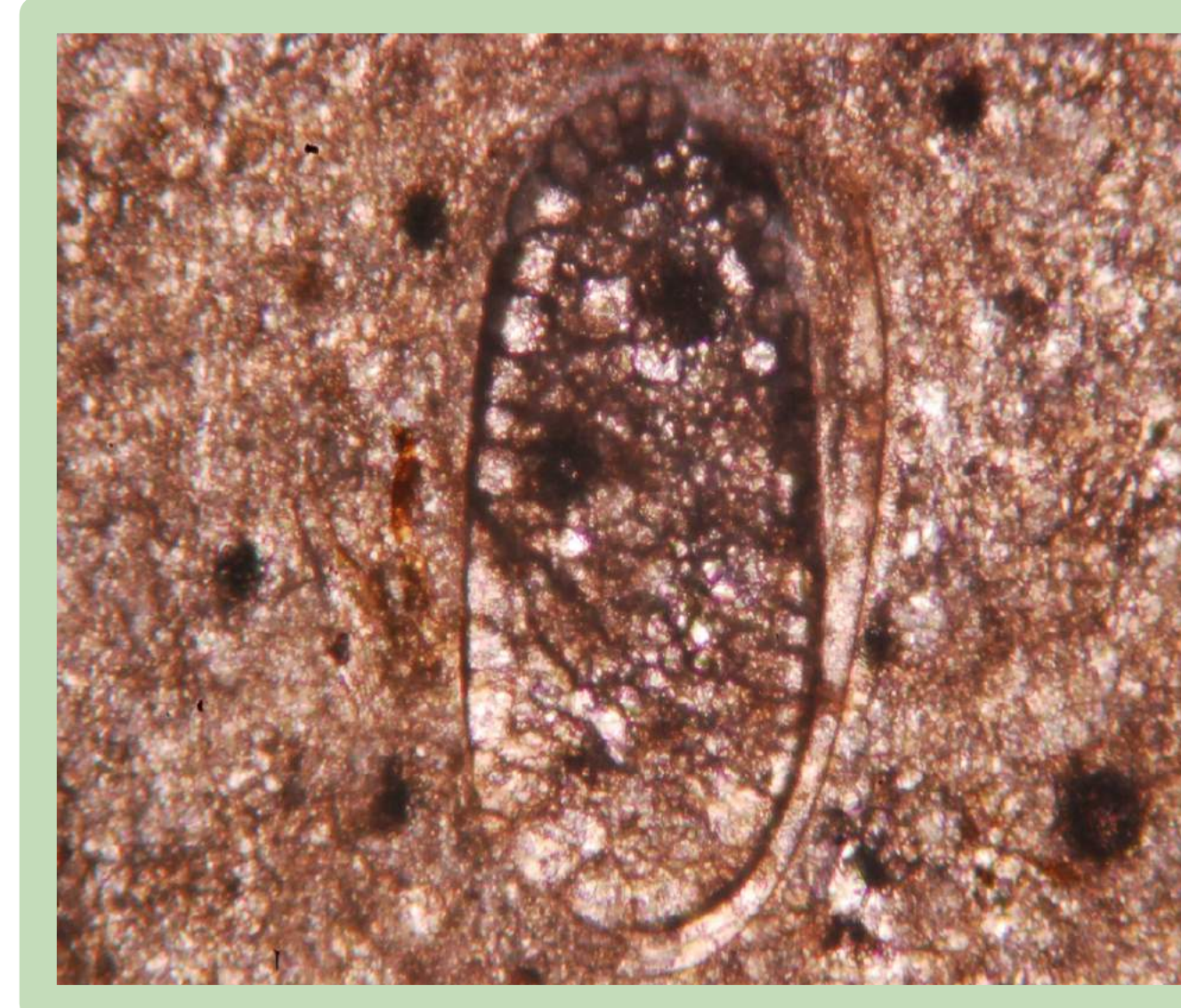
Phylum: Foraminifera



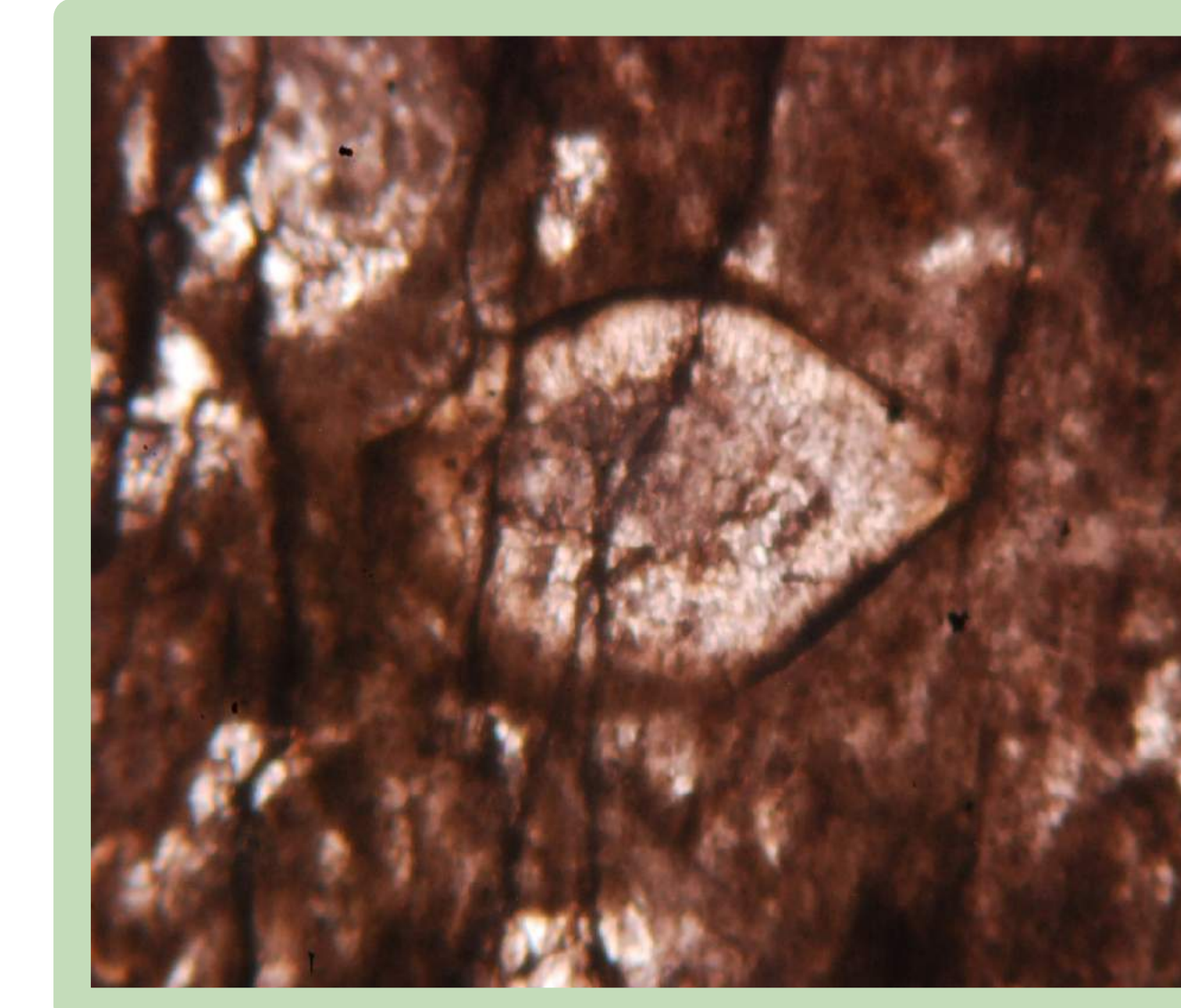
Phylum: Brachiopoda



Class: gastropoda



Paleozoic Algae



Order: Fusilinda

References

Harper, A. John. Suter, B. Simeon. Pennsylvania Geology, DCNR.
Mackenzie, W.S., Adams, A.E. A Colour Atlas of Rocks and Minerals in Thin Section. Schiappa, Tamra.