THE PALEONTOLOGICAL AGE OF THE ERIN SLATE, NORTHEAST ALABAMA

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Abstract
The ability to identify fossils that are preserved in rock can aid in determining not only the environment of said rock, but the conditions in which they were preserved, factors that may have altered them, and perhaps most importantly, the age in which they were deposited. Fossil organisms evolve over time and so occur in certain sequences found in rocks of different ages. The Erin Slate is a member of the Talladega Group which is a major interbedded sequence of hard gray slate, hard gray phyllite, and soft shale found in the southwestern extension of the Blue Ridge Belt of the eastern United States. When the Talladega Group is thrust over the Cincinnati Arch, it is a part of the Appalachian Mountains. The Erin Slate has been studied extensively over the past decades, but questions about the age and origin of the Erin Slate, and its relationship to other rocks in this area, have yet to be fully answered. This study addresses these questions by examining fossils from the Erin Slate and comparing them to other rocks in the area, as well as determining their stratigraphic position and age. Fossils that have been found in this area include brachiopods, brachiozoans, and crinoids. The Erin Slate is known from the Early Mississippian age; however, it has yet to be determined if it belongs to the early Mississippian age or to the late Silurian age. Therefore, it is important to determine the age of the Erin Slate in order to understand the geologic history of this portion of North America.

Methods
A number of slate specimens from various locations in the Erin Slate were collected, brought back to Columbus State University, and processed for fossil inclusions. One method for examining the rocks involved an angled light source. After an initial examination was completed, select samples were mounted in epoxy, allowed to harden, and systematically polished, revealing new layers of the slate and more fossil inclusions. The fossils were then examined under a microscope. The data samples were analyzed with a digital protractor and placed under a vertically angled light source. After all of the techniques were completed, select samples were analyzed using a petrography stage, allowing for further analysis of the fossils. The Erin Slate is an extinct species of brachiopod that dwelled in warm, shallow water environments. By collecting samples from the original fossil localities, we hope to resolve the most stratigraphically and age of the Erin Slate and providing a better understanding of the history of the northern Appalachian Mountains.

Results
After initial examination of the collected slate samples under reflected light using a petrographic stage, samples were measured and two-part epoxy propped and polished for further analysis. No definitive fossils were discovered using either technique. The samples collected from the Erin Slate were subjected to macroscopic examination, producing results that showed a significant lack of fossil content. The Erin Slate is known from the Early Mississippian age; however, it has yet to be determined if it belongs to the early Mississippian age or to the late Silurian age. Therefore, it is important to determine the age of the Erin Slate in order to understand the geologic history of this portion of North America.

Further Research
Samples collected from the New Albany Shale in central Kentucky need to be further analyzed for fossil indicators. Positive identification of recovered fossils needs to be carried out. Samples collected from the Erin Slate need to be processed further using the petrographic methods for fossil inclusions. However, a working hypothesis needs to be established, including a fossil-pollution study, which might help establish a more consistent and age range of the New Albany Shales and its stratigraphic position. Samples collected from the Erin Slate need to be analyzed for fossils using a more detailed study of the area. Analysis of the phosphate nodules recovered from the Falling Run bed will be used to understand the history of the area. Chemical analysis of the phosphate nodules recovered from the Erin Slate may provide evidence of the age and history of the area. This study is a part of an ongoing study of the geologic history of the southern Appalachian Mountains.

References

Further Reading
Charles Beck, a noted paleontologist from the University of Michigan, discovered the first reptile remains within the New Albany Shale in central Kentucky. By collecting samples from the original fossil localities, we hope to resolve the most stratigraphically and age of the Erin Slate and providing a better understanding of the history of the northern Appalachian Mountains.

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