Questions: Please answer the following questions in full and complete sentences.

1. What is your oldest fossil and how old is it?

2. What is the youngest fossil and during which period and epoch did it live?

3. Which fossil is most widespread geographically?

4. Which fossil is most spread out temporally (existed for the longest time)?

5. Which fossil(s) would be the best index fossil(s)? Why?

6. Which fossil(s) would be the least useful Index fossil(s)? Why?

7. Most of the very best index fossils are marine fossils. What is it about marine organisms that make their fossils good index fossils?

<u>Extension</u>: **Volcanic ash**

The teacher can now take some thick brightly colored yarn and run a line appropriately among all of the stratigraphic sections. The yarn represents a thin layer of ash deposited after a large volcanic eruption in the area. Observe the relationship of the "volcanic ash layer" to the rest of the layers that you have already correlated. Answer the following questions in full and complete sentences.

1. Describe how the volcanic ash layer looks compared to the rest of the correlated strata.

2. How good is the volcanic ash layer as a marker of time within the statigraphic section as compared to the index fossils? Support your answer with observations.

3. What is it about how a volcanic layer is produced that supports your answer to the above question?

<u>Teacher's Notes</u>:

Rationale:

This activity is designed to:

1. give the student a three-dimensional feel for correlating rock outcrops at different locations,
2. have the student utilize the *Earth Science Reference Tables* to find the age of different index fossils of New York State,
3. help the student understand the qualities that make a fossil a good index fossil, and
4. demonstrate to the student why volcanic ash layers are also good time indicators.

Set up and preparation:

1. Lab should be done during a double period.
2. Make enough copies of the fossils so that each group gets the appropriate ones. You can use the sample stratigraphic sections provided below, or come up with your own. Fossils would do best either copied onto card stock, or laminated for durability.
3. Using as much of the room as possible, run six lines of string (or the number of locations that you plan to be using) from the ceiling to the floor. These strings should be very firmly attached to both. Tying the string to the grid of the dropped ceiling or using dropped ceiling "clips," works well. On the floor, try several layers of masking or duct tape. Put on each layer perpendicular to the previous layer so it doesn't pull up.

During the activity:

1. Attaching the cards to the string can be done in many different ways. Loops can be made in the string every two feet (before putting up, of course), so that paperclips can be used to hook the fossils on the string. Two of the same cards can be used with Velcro pads on the backs so they can be stuck together on either side of the string. If doing this, make sure that the Velcro pads catch the string, as well. The cards could also be just taped to the string at the appropriate height.
2. Correlation using the string should be done with paperclip bent into an "S" shape. This will dramatically facilitate changes and clean up. Students should connect the top of one stratum to the top of the equivalent layer (based on fossils contained).

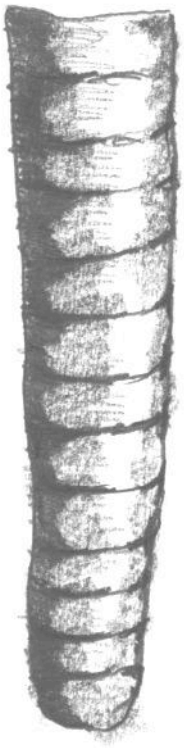
Volcanic ash layer

1. Use brightly colored heavy (the point is to make it visible) yarn and pick a particular stratum (or time equivalent) that occurs at all six locations and run the yarn along this line tying at each of the locations. You can twist the yarn around the string to prevent sagging between locations. The thickness of the yarn will represent the thickness of the ash layer.

Disclaimer: This is just a draft version that could probably use some changes and tweeking here and there. I've only done a rough edition of this particular lab once. If you do use this, please let me know how things worked out. What should be changed? What worked well? In what other directions could this go? I look forward to hearing from you with any constructive criticism. Contact me at gdolphin@uegw.stier.org.

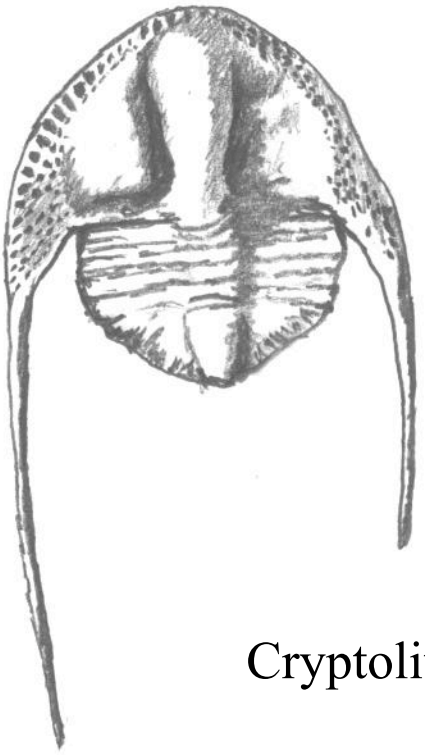
Very truly yours,

Flipper
Earth Science teacher
Union – Endicott High School
Endicott, New York
Earth Science Director at Large



1 cm

Nautiloid



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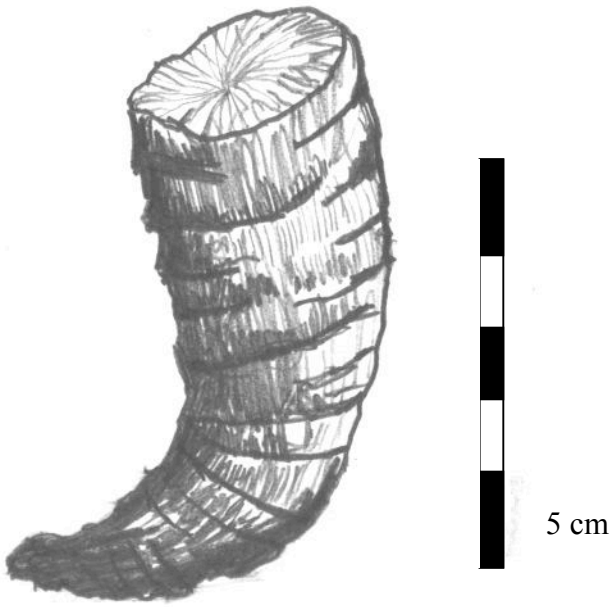
Cryptolithus



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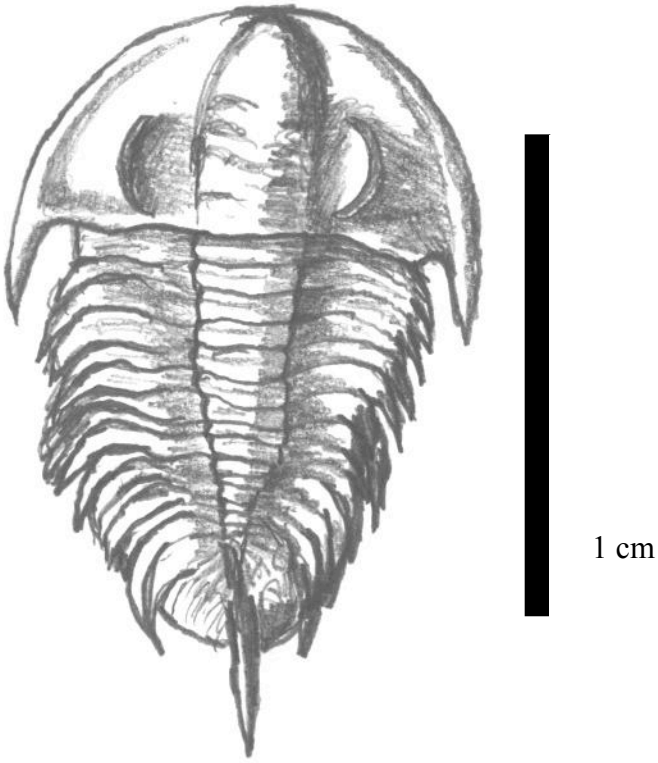
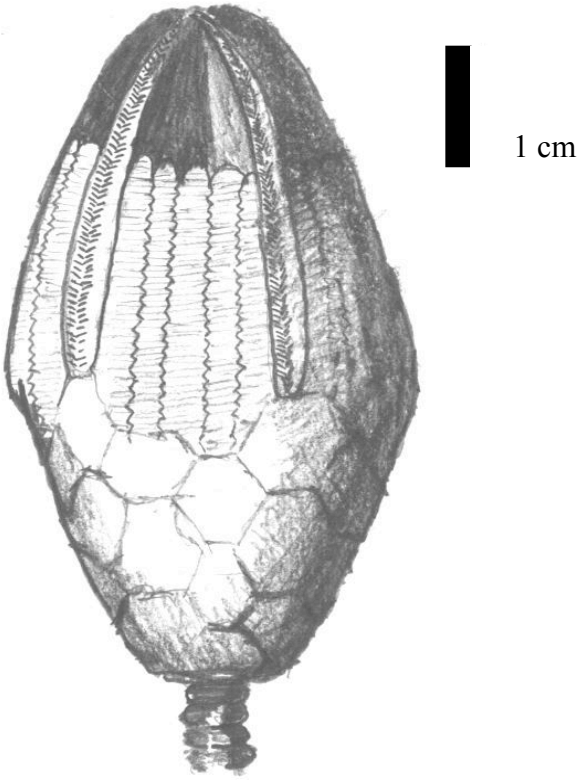
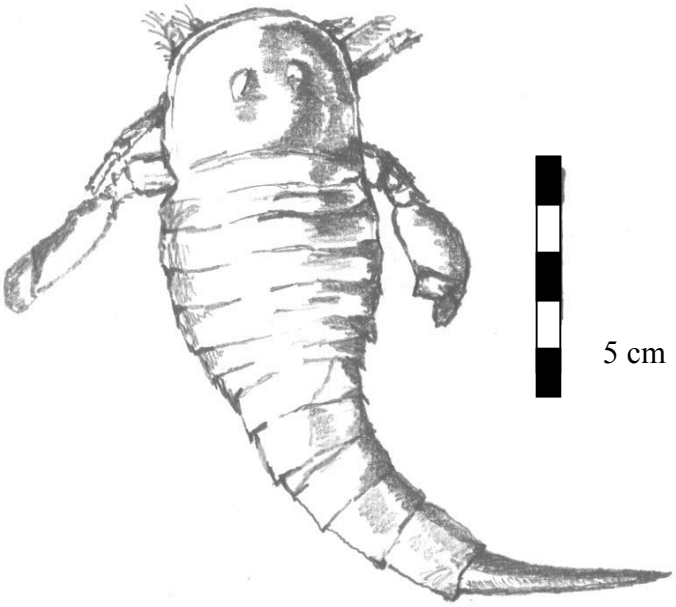


Elliptocephala

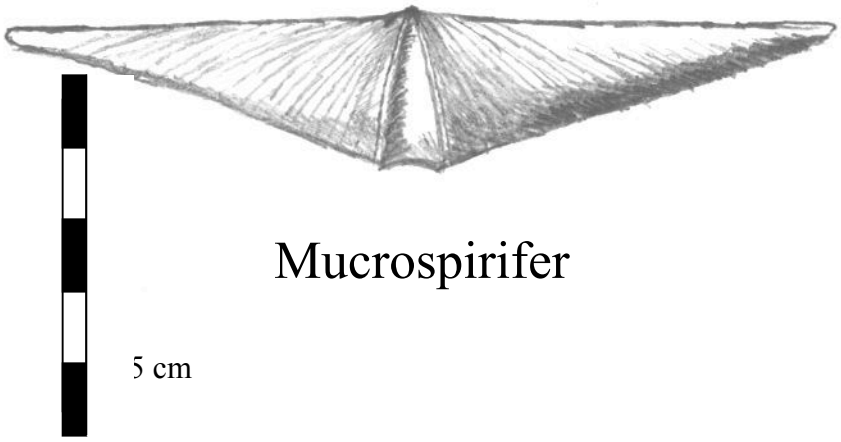
Eospirifer



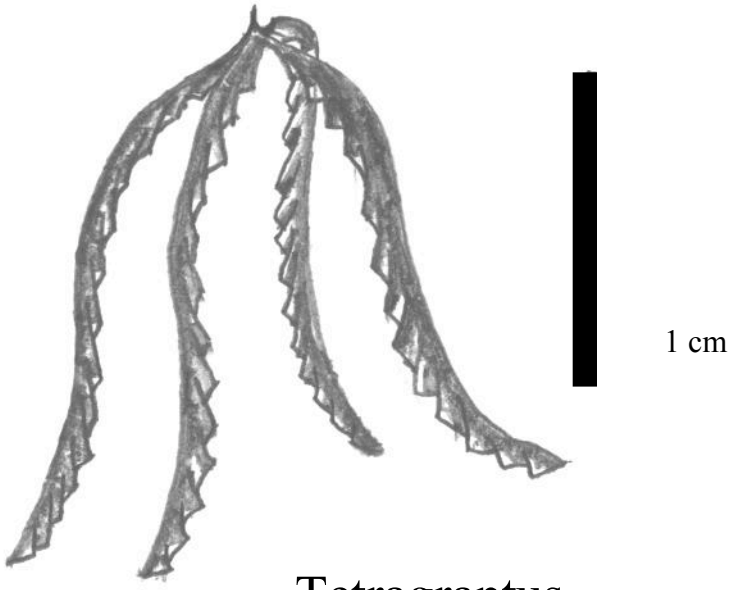
Eucalyptocrinus



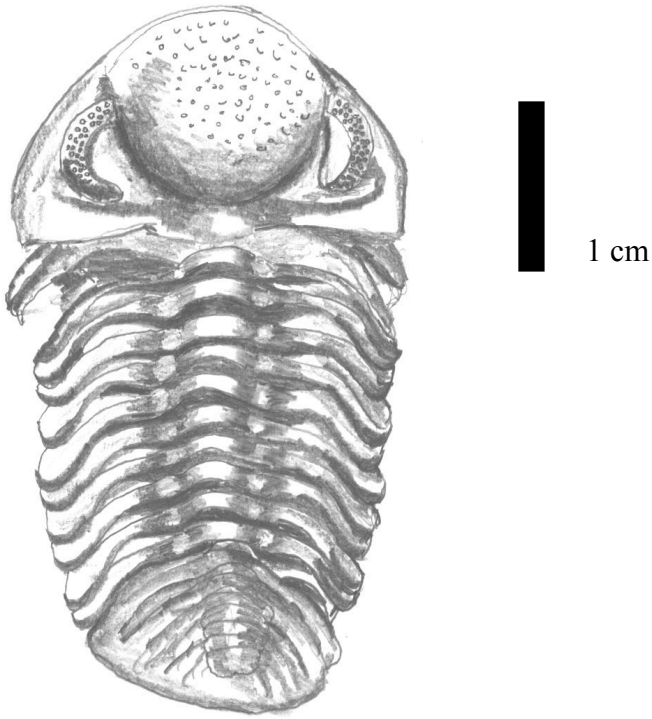
Eurypterid



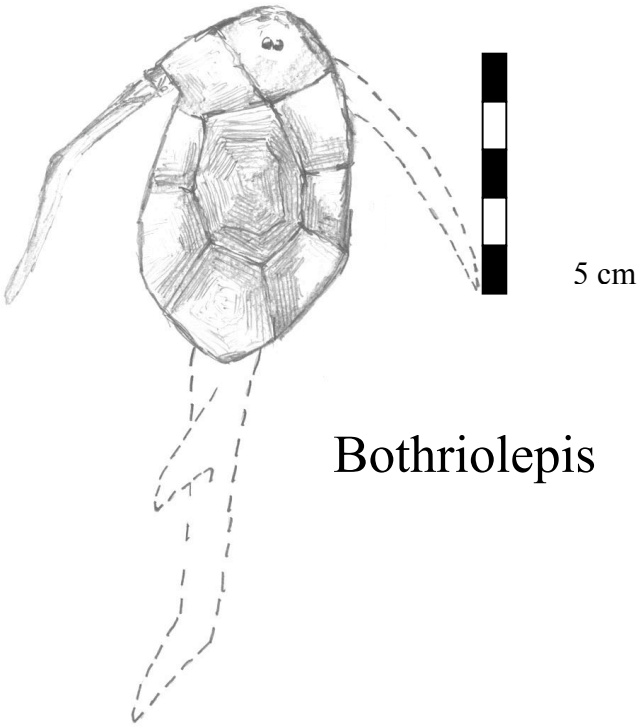
Mucrospirifer



Tetragraptus



Phacops



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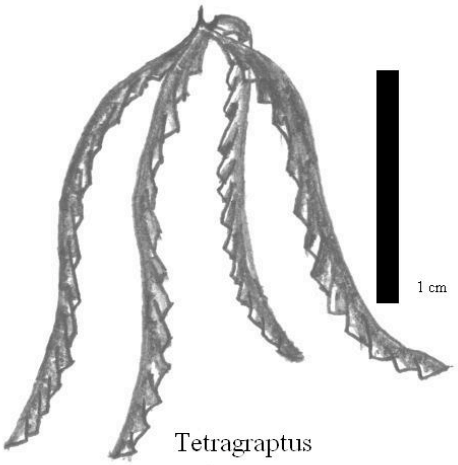

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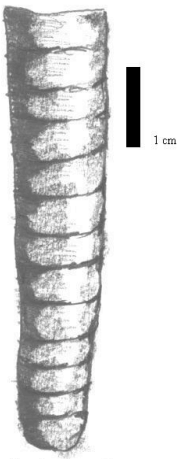
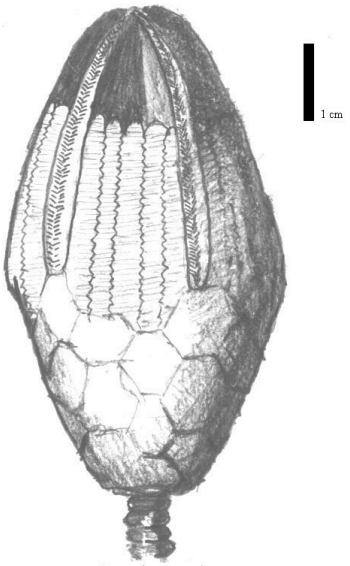


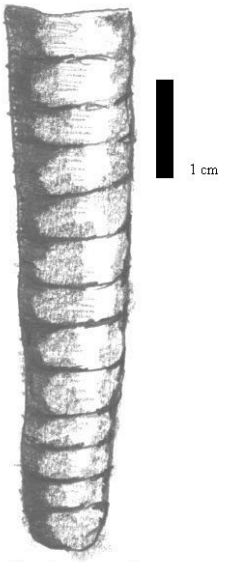
Cephalopod

Cystiphyllum

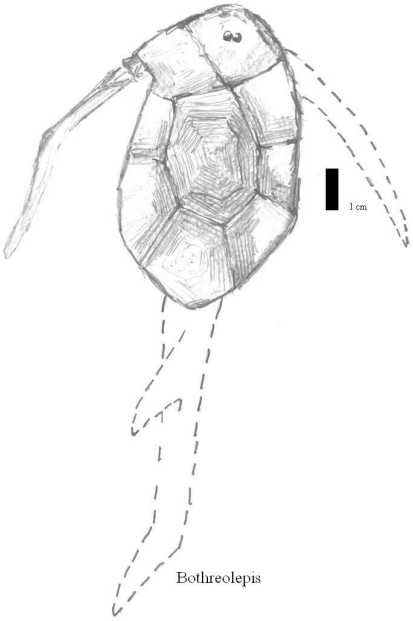
Eospirifer



Eucalyptocrinus



Cephalopod



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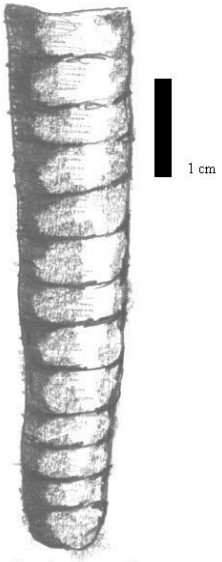

Cephalopod