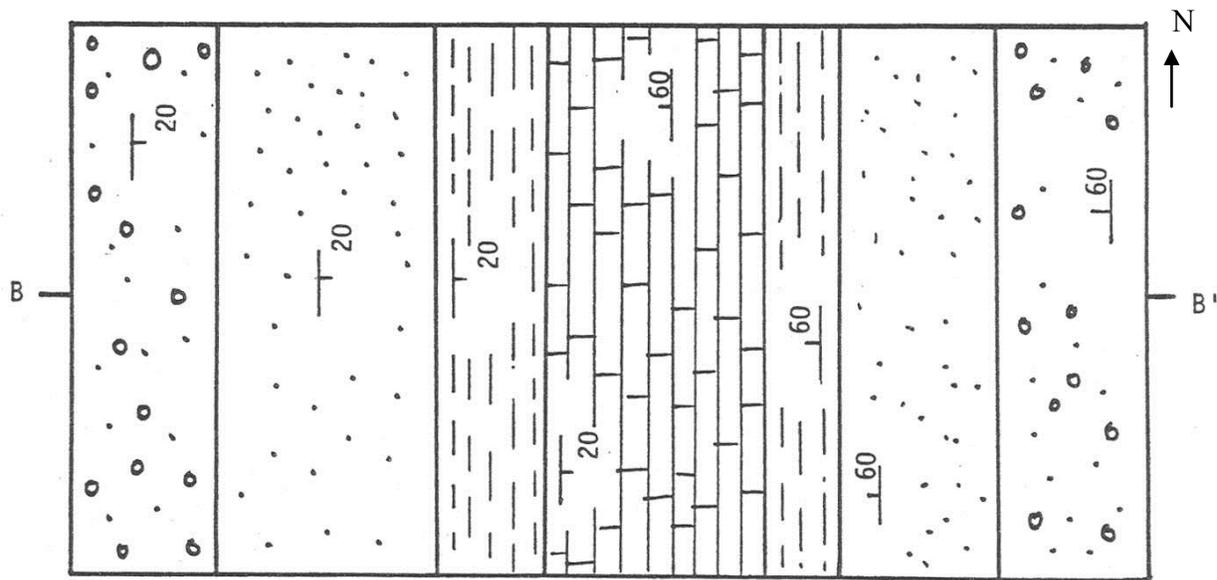


## 12.001 Exercise 4 – Geologic Mapping

11/02/2012

This laboratory exercise will consist of a set of hypothetical geologic examples to familiarize you with the thought process you'll need to use in interpreting simple problems. Next week, you will construct your own geologic map based on real rocks in a lifelike scenario, so you will need to be thinking in 3D and able to construct cross-sections.

1. Below is a small section from a hypothetical geologic map. Use the information given on the map itself to produce a geological structure section that shows what the rocks are doing along the line B-B'. Then answer the questions using the map and geologic cross-section.



Sandstone



Shale



Limestone



Conglomerate

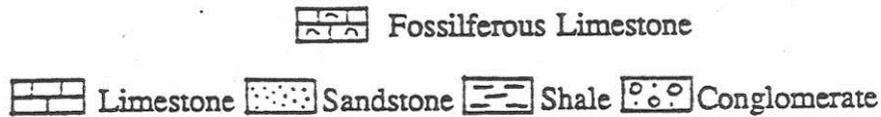
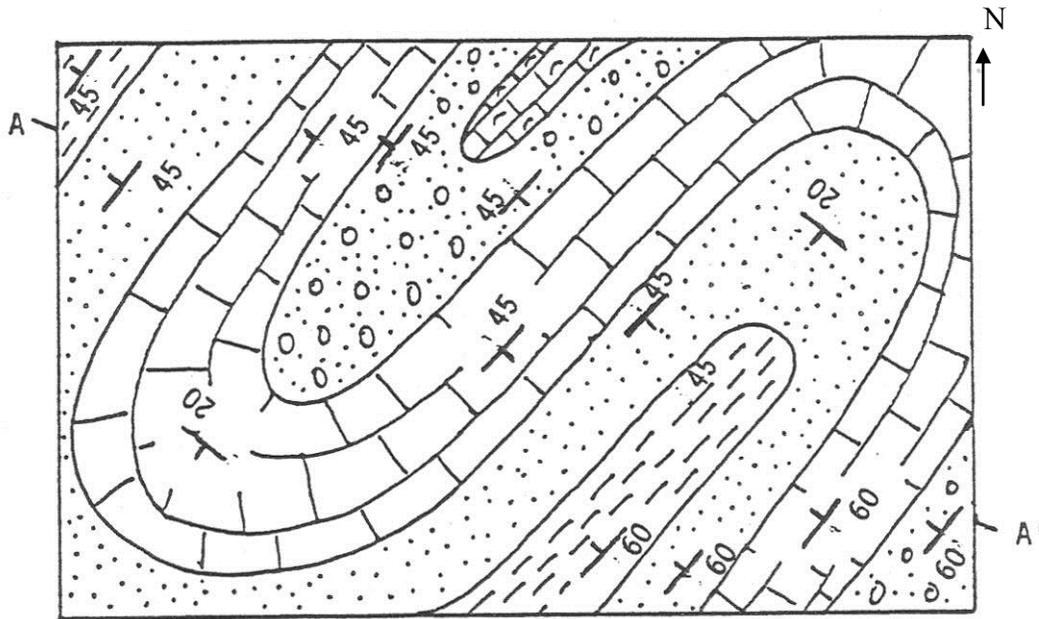
B

B'

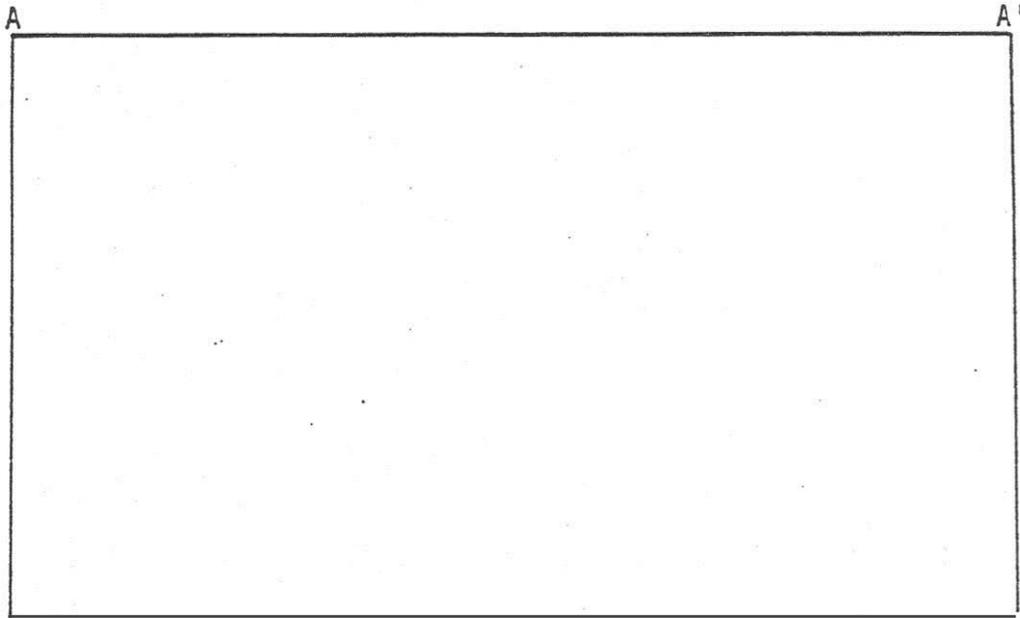


- Obviously, this is a fold. What kind is it? \_\_\_\_\_
- Draw the axial plane on your cross-section.
- Is this fold plunging or non-plunging? \_\_\_\_\_
- Is this a symmetric or asymmetric fold? \_\_\_\_\_
- Is the shale exposed in this area older or younger than the conglomerate?  
\_\_\_\_\_

2. The map below is slightly more complicated situation in an area of different rock types, but still similar to those you've just seen in the previous example. Construct a structure section across line A-A' and then answer the questions.

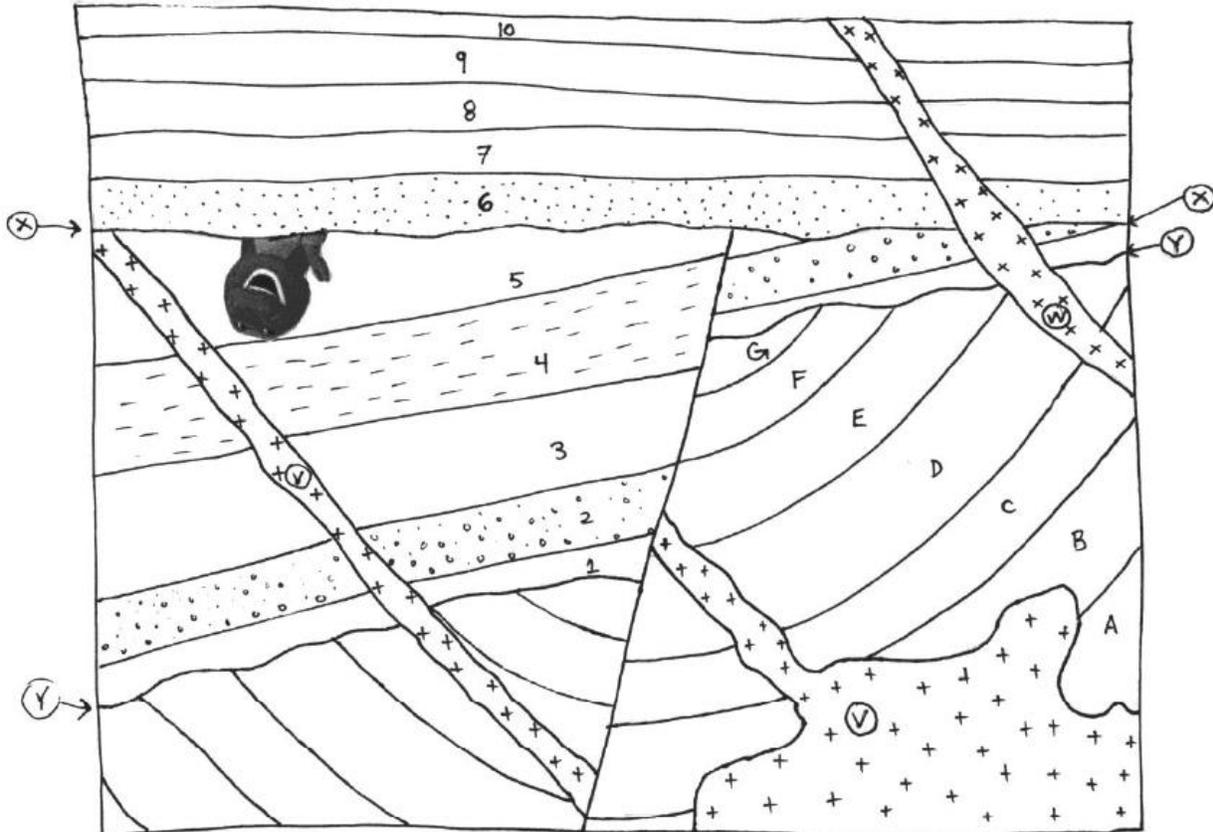


Structure Section:



- a. What is the oldest rock unit here? \_\_\_\_\_
- b. What is the youngest rock unit here? \_\_\_\_\_
- c. What two types of folds can you identify in the section?
  - i \_\_\_\_\_
  - ii \_\_\_\_\_

3. I have lifted the following **cross-section** out of a lab from 12.102, where they use it to think about geochronology. However, we're going to use it for a slightly different purpose.



- Which units are sedimentary and which units are igneous? How can you tell?
- Remember that this is a cross-section. Assume that all of the units extend straight into the page (so that if you took the cross-section 100m further into the page, it would look exactly the same). Now imagine that this whole area is tilted and eroded so that the line Y-Y represents the flat land surface. In the box below, draw a map of what the land surface would look like. Indicate unconformities and include approximate dips for the beds where appropriate.



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