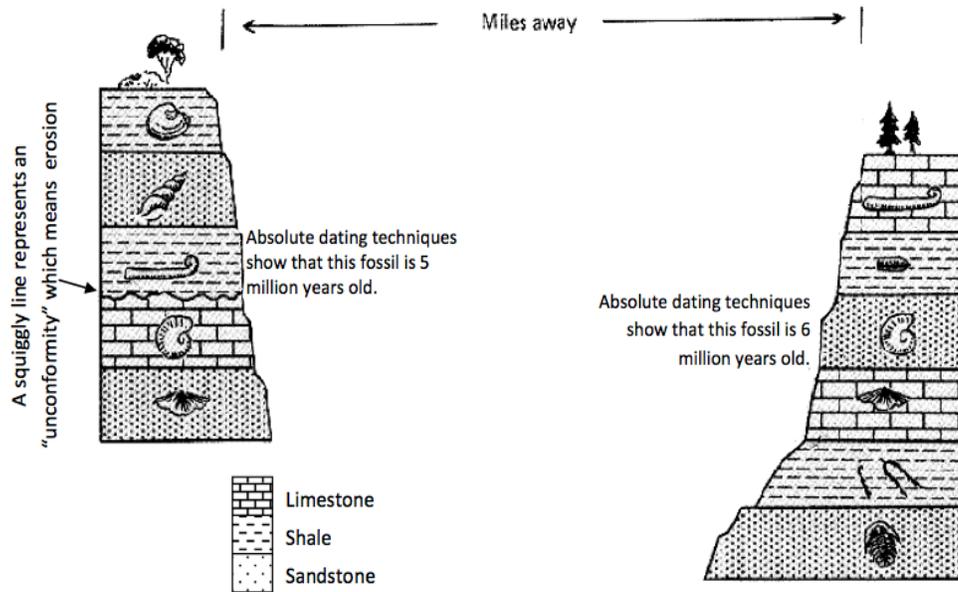


### CORRELATING ROCK LAYERS USING INDEX FOSSILS

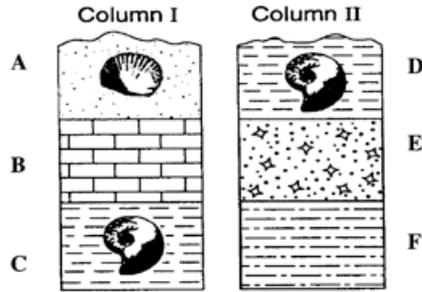
Most rock layers (strata) are buried underground. However, some parts can be seen on Earth's surface. These exposed layers are called **outcrops**. Geologists use various exposed outcrops to try to match similar rock layers in different locations to see if they formed at the same time or under the same conditions. This process is called rock "correlation" or **stratigraphic matching**. Below is a diagram of two outcrops in different locations that are miles apart. **Match the rock layers in one section with the layers in the other section by drawing arrows to the layers that match up by fossil type.** Sometimes the rock type will match but not always. Remember that sometimes erosion can remove layers that used to be there and then more layers can be deposited on top of the eroded layer.



1. Draw arrows to connect the matching rock layers by their **fossils**.
2. Label the layer in each section that is the **oldest**. Which layer between the two of them is older? (left outcrop or right outcrop) Explain your answer. \_\_\_\_\_  
\_\_\_\_\_
3. An "unconformity" exists between two layers in the first section. What is one possible reason that the unconformity appears only in the first section and not the second section? \_\_\_\_\_  
\_\_\_\_\_
4. How old do you think the fossil that is shaped like this: in the 2<sup>nd</sup> layer of the 2<sup>nd</sup> section is based on the age of the rocks around it? Explain your answer. \_\_\_\_\_  
\_\_\_\_\_
5. The fossil that is a wing-shaped clam (on the bottom layer of the first section) is found in sandstone in the first layer and limestone in the second layer. What is one possible explanation for why they are not found in the same type of rock? \_\_\_\_\_  
\_\_\_\_\_

## FOSSILS AND RELATIVE DATING

Examine the following diagrams. Columns I and II contain rock layers A, B, C and D, E, F. Both columns were taken from the same geological location.



6. Which two layers are approximately the same age? How do you know?

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7. Which layer is the **OLDEST**? How do you know?

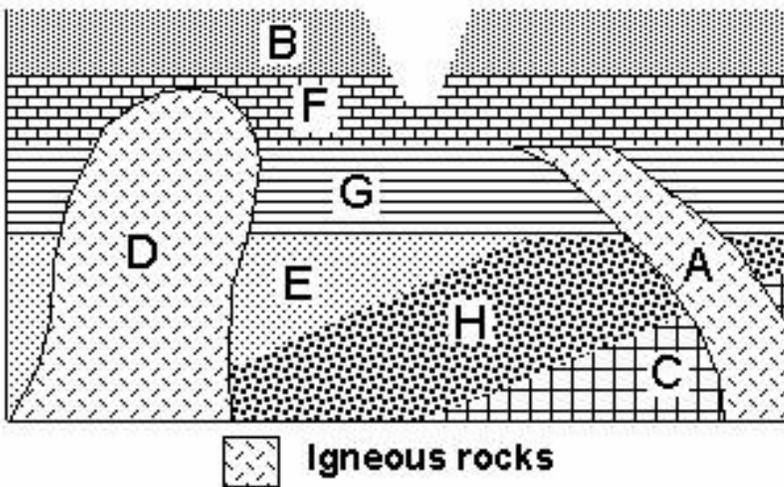
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8. Which layer is the **YOUNGEST**? How do you know?

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## HISTORICAL ABSOLUTE DATING TECHNIQUES

Before the emergence of Radiometric Dating, absolute time was calculated by estimating rates of erosion and sedimentation, counting tree rings, and counting varves. **Varves** are sediments that are deposited in a yearly cycle in any body of water. One common location that is likely to form varves is in a glacial lake. Spring melt causes coarse (large) sediment first which settles on the bottom, then fine (small) sediment lands on top. This cycle causes the sediment to deposit in layers.



9. Use the diagram above to relatively date the features from oldest to youngest.

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10. Layer G is a glacial lake deposit. Each line represents a varve. If the bottom of layer G was deposited 257,603 years ago, how old is the top layer?

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