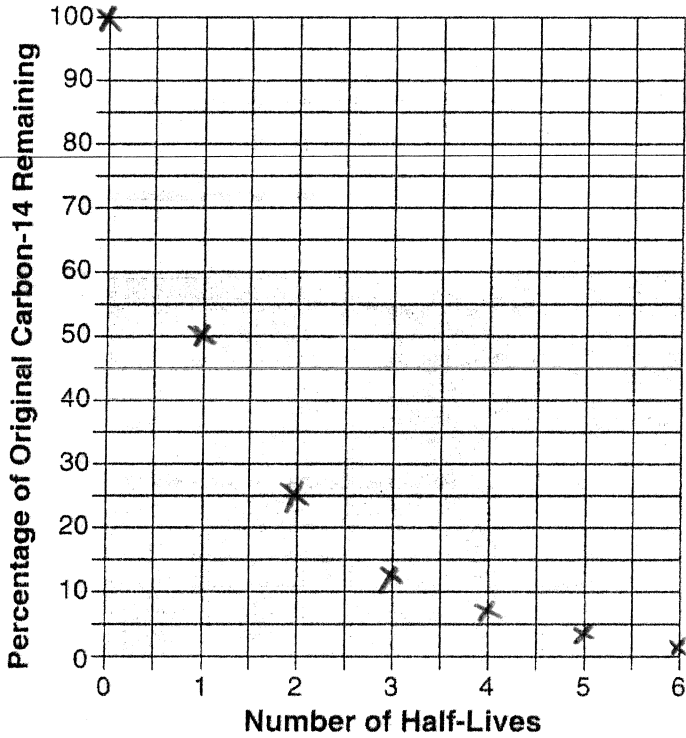


Key

Base your answers to questions 1 through 3 on the data table below, which shows the radioactive decay of carbon-14. The number of years required to complete four half-lives has been left blank.

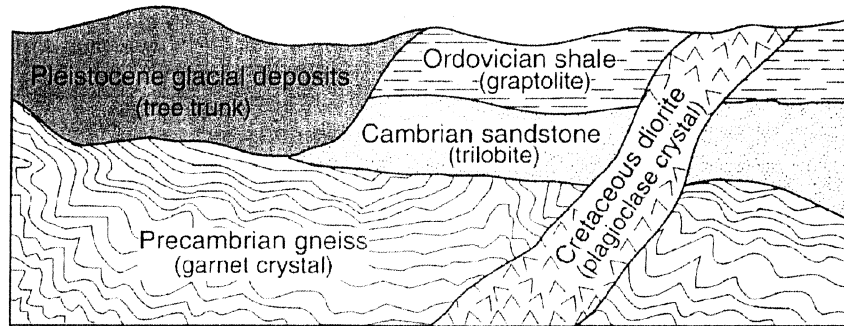
Radioactive Decay of Carbon-14



Radioactive Decay of Carbon-14

Number of Half-Lives	Percentage of Original Carbon-14 Remaining	Time (years)
0	100	0
1	50	5700
2	25	11,400
3	12.5	17,100
4	6.3	22,800
5	3.1	28,500
6	1.6	34,200

The cross section below shows part of Earth's crust. The objects in parentheses indicate materials found within each rock unit or deposit.



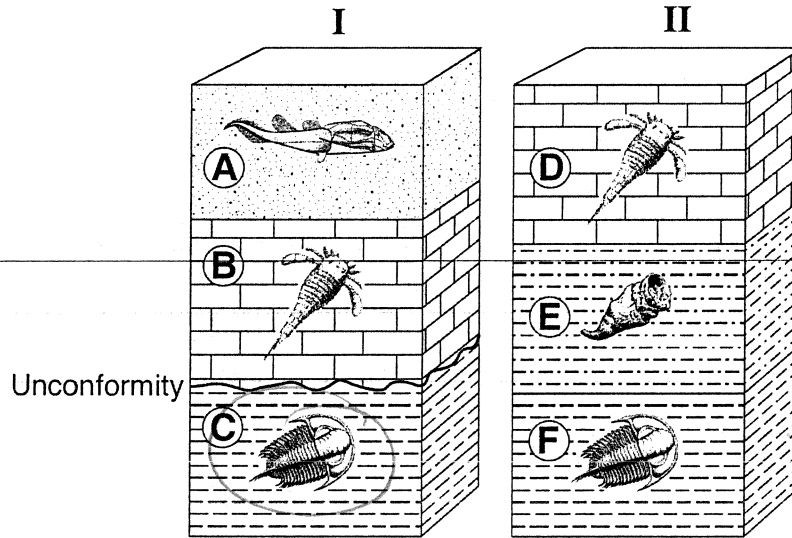
Which object in parentheses could be accurately dated using carbon-14? Explain your answer. *Tree Trunk, Pleistocene = less than 40,000 years old*

- How long does it take for radioactive carbon-14 to complete four half-lives?
- On the grid above, construct a graph that shows the radioactive decay of carbon-14 by plotting and X to show the percentage of original carbon-14 remaining after each half-life. Connect the Xs with a smooth, curved line.

*1 = 5700 (+5700)
 2 = 11,400 (+5700)
 3 = 17,100 (+5700)
 4 = 22,800*

USE Table above

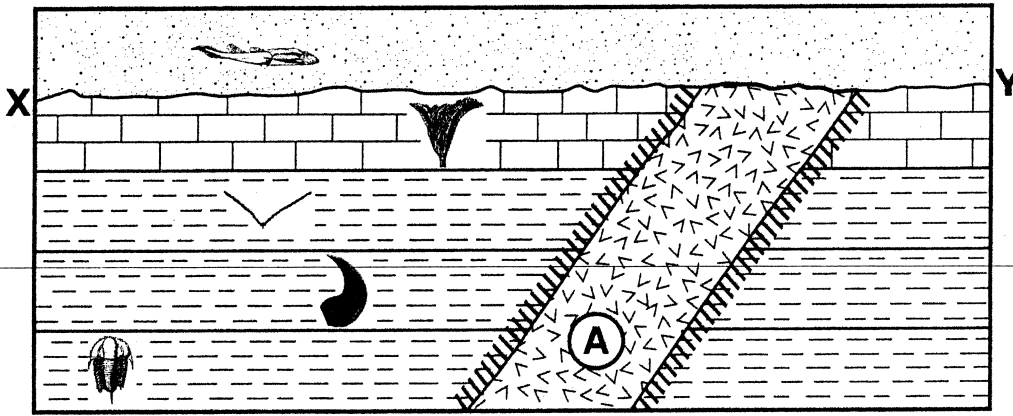
Base your answers to questions 4 through 7 on the diagrams below, which represent two bedrock outcrops, I and II, found several kilometers apart in New York State. Rock layers are lettered *A* through *F*. Drawings represent specific index fossils.



4. Explain why carbon-14 can not be used to find the geologic age of these index fossils. Fossils are older than 40,000 years.
5. Describe one characteristic a fossil must have in order to be considered a good index fossil. Wide distribution. Short lived.
6. Identify two processes that produced the unconformity in outcrop I. Uplift - Erosion - Deposition
7. During which geologic time period was rock layer C deposited?

ESRT p8-9
 Elliptocephala (A) = Cambrian

Base your answers to questions 8 through 12 on the geologic cross section below. The cross section shows Vermont index fossils in rock layers that have not been overturned. Rock unit *A* is an igneous intrusion and line *XY* represents an unconformity.






Key	
Index Fossils	
	<i>Bothriolepis</i>
	<i>Ctenocrinus</i> ^{I + V} <i>Devonian</i>
	<i>Dicellograptus</i>
	<i>Valcourceras</i>
	<i>Elliptocephala</i>

Key	
Rock Units	
	Sedimentary rocks
	Igneous rock
	Contact metamorphic rock

- Identify one piece of evidence shown in this cross section that indicates that the igneous intrusion, *A*, is older than the sandstone layer.
A did not cause contact metamorphism in the sandstone.
- Describe the type of depositional environment in which the fossilized organisms lived.
Marine - Aquatic - Water - Ocean
- Each index fossil existed for a relatively short geologic time interval. State one other characteristic that each fossil must have to be considered an index fossil.
widely distributed. Lived all over the world.
- Identify the coral index fossil that would most likely be found in the same layer as the index fossil *Ctenocrinus*.
V = Pleurodictyum
- Based on fossil evidence, determine the geologic period during which the unconformity formed.
Between top layers. Devonian

Bothriolepis = R = Devonian
Ctenocrinus = I = Devonian

Base your answers to questions 13 and 14 on the table of index fossils shown below and on your knowledge of Earth science.

Table of Index Fossils		
		
Eospirifer	Manticoceras	Phacops

Fossil Classification

Index Fossil	<i>Eospirifer</i> Y	<i>Manticoceras</i> G	<i>Phacops</i> C
General Fossil Group	Brachiopods	Ammonoids	Trilobites

ESRT p 9

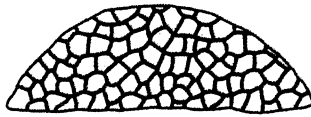
13. Complete the classification table above by filling in the general fossil group name for each index fossil.

ESRT p 9 match letters up with the shaded bar.

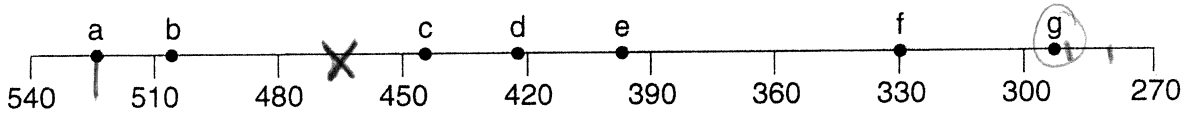
14. During what geologic time period did the oldest index fossil shown in this table exist?

Y = Silurian

Base your answers to questions 15 through 18 on the geologic time line shown in your answer booklet. Letters *a* through *g* on the time line indicate specific reference points in geologic time.



Geologic Time Line (millions of years ago)



15. Identify one letter that indicates a time for which there is no rock record in New York State.

G ~ 290

16. Identify the mountain building event (orogeny) that was occurring in eastern North America at the time represented by letter g.

Alloghenian

17. Letter *a* indicates a specific time during which geologic period?

525 Cambrian

18. Place an X on the geologic time line above, so that the center of the X shows the time that the coral index fossil Lichenaria shown above existed on Earth.

T = Ordovician
~ 470