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1. Which statement best explains why dinosaur fossils have *not* been found in the bedrock in the area around Syracuse, New York?

- A) Fossils are found only in sedimentary rock.
- B) In the Syracuse area, dinosaur bones are located deep below the Earth's surface.
- C) The dinosaurs were mobile and left no remains in the Syracuse area.

**D) No rock record exists in the Syracuse area for the time period when the dinosaurs lived.**

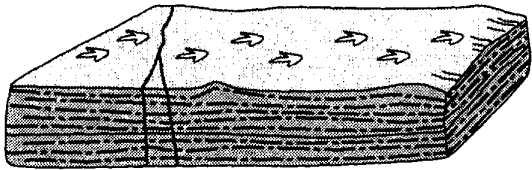
2. Most of the surface bedrock found in New York State was formed during which era?

- A) Precambrian            **B) Paleozoic**
- C) Mesozoic              D) Cenozoic

3. The most complete fossil record of past invertebrate life in New Jersey can be found in rocks of which era?

- A) Cenozoic              B) Mesozoic
- C) Precambrian        **D) Paleozoic**

4. Base your answer to the following question on the diagram below, which represents a rock sample containing fossilized *Coelophysis* footprints.

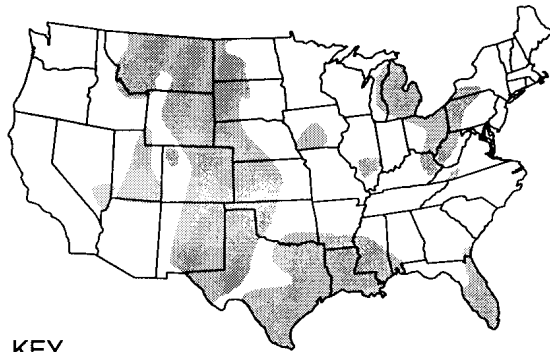


According to current knowledge of New York State fossils, during which geologic time period were these footprints most probably made?

- A) Cambrian              B) Devonian
- C) Cretaceous            **D) Triassic**

Base your answers to questions 5 and 6 on the map and cross section below. The shaded areas on the map represent regions of the United States that have evaporite rock layers (layers of rock formed from the evaporation of seawater) under the surface bedrock. The cross section shows the generalized structure of the area in which the evaporite layers are found in New York State.

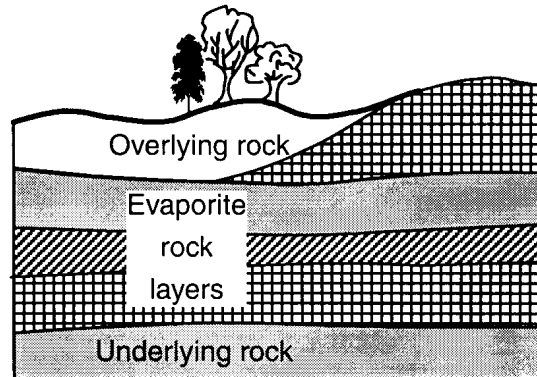
United States Map



KEY

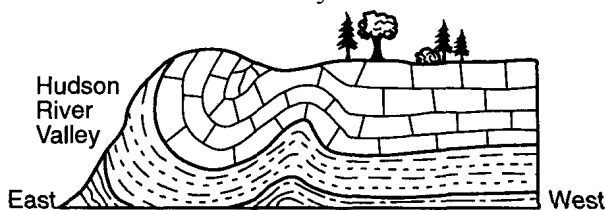
█ Evaporite rock regions

Cross Section



5. At which location in New York State are evaporite rocks found under the surface bedrock?
- A) Old Forge    **B) Jamestown**    C) Massena    D) Kingston
6. The presence of these evaporite rocks indicates that the shaded areas on the map at some time in the past were
- A) high mountain ranges    B) glacial ice sheets  
C) **shallow seas**    D) mid-ocean ridges

7. What is the age of most of the surface bedrock found in New York State at a latitude of 45°?
- A) Precambrian Middle Proterozoic  
B) Triassic and Jurassic  
C) Silurian and Devonian  
**D) Cambrian and Ordovician**
8. The diagram below shows a cross section of some Devonian-age rocks along the western side of the mid-Hudson River Valley.



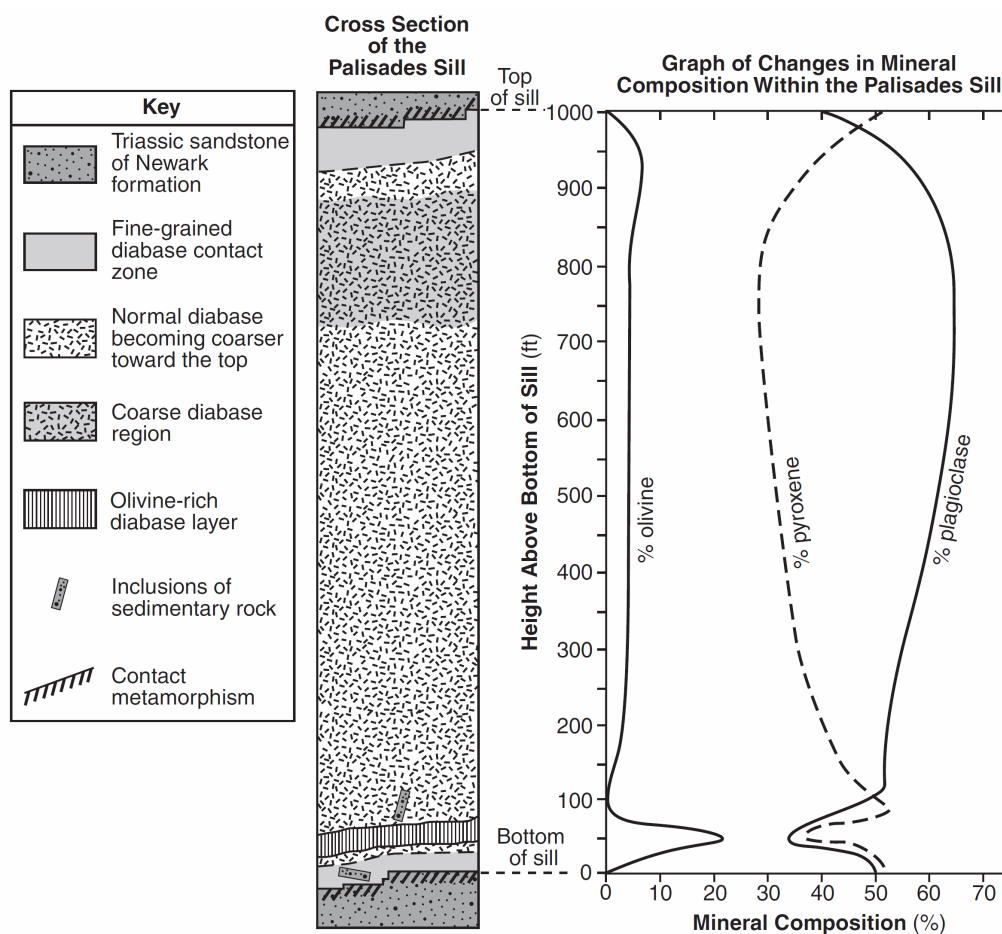
Which two mountain-building episodes could have been responsible for deforming these rock layers?

- A) Grenville and Taconian orogenies  
B) Taconian and Acadian orogenies  
**C) Acadian and Appalachian orogenies**  
D) Appalachian and Grenville orogenies

9. In which New York State landscape region have fossilized footprints of *Coelophysis* dinosaurs been found in the surface bedrock?
- A) Allegheny Plateau  
B) Tug Hill Plateau  
C) Hudson-Mohawk Lowlands  
**D) Newark Lowlands**
10. Eurypterid fossils are abundant in the Bertie dolostone, a sedimentary rock layer found in western New York State. The presence of both the eurypterids and the dolostone indicates that, during the formation of this rock layer, this region of New York State was
- A) covered by evaporating shallow seas**  
B) uplifted and eroded  
C) buried beneath lava flows  
D) intensely metamorphosed

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11. Which New York landscape region is composed primarily of Cretaceous through Pleistocene unconsolidated sediments?
- A) Champlain Lowlands
  - B) Erie-Ontario Lowlands
  - C) Hudson-Mohawk Lowlands
  - D) Atlantic Coastal Lowlands**
12. A group hiking in the Catskill region of New York State finds several large boulders composed of metamorphic rock. These boulders most likely resulted from the weathering of bedrock formed in the
- A) Catskills, and were transported to their present location by mass movement
  - B) Catskills, and were transported to their present location by glaciers
  - C) Adirondack Mountains, and were transported to their present location by mass movement
  - D) Adirondack Mountains, and were transported to their present location by glaciers**
13. Which inference is best supported by the rock and fossil record in New York State?
- A) Eurypterids lived in shallow seas near present-day Syracuse.**
  - B) *Coelophysis* wandered through jungles near present-day Albany.
  - C) The first coral reefs formed off the shoreline of present-day Long Island.
  - D) The condor nested on the peaks of the ancestral Adirondack Mountains during the Grenville Orogeny.
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Base your answers to questions 14 through 18 on the geologic cross section and graph below, and on your knowledge of Earth science. The cross section represents the intrusive igneous rock of the Palisades sill and surrounding bedrock located on the west side of the Hudson River across from New York City. The graph indicates changes in the percentages of the major minerals found in the sill.

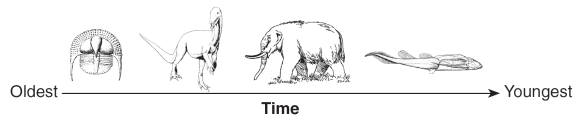
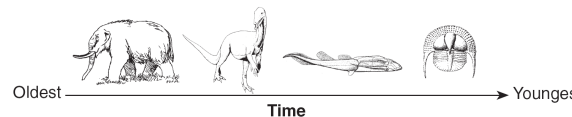
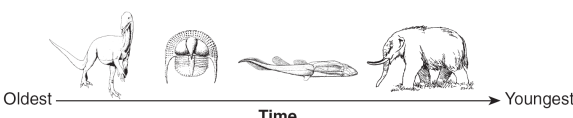
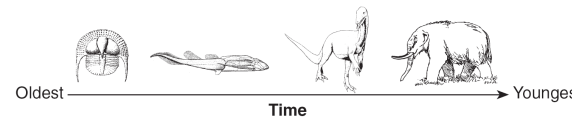


14. The inclusions shown near the bottom of the Palisades sill are pieces of the Triassic sandstone that
- formed from deposits of minerals within the sill
  - crystallized within the sill and were cemented together
  - were part of the olivine-rich layer that broke apart
  - D) broke off from the surrounding bedrock during the intrusion**
15. Which two minerals, *not* shown on the Graph of Changes in Mineral Composition Within the Palisades Sill, are also likely to be found in some other samples of diabase?
- amphibole and potassium feldspar
  - potassium feldspar and quartz
  - quartz and biotite
  - D) biotite and amphibole**
16. The Palisades sill intruded as North America began the process of separating from Africa and Europe as Pangaea was breaking apart. Approximately when did these events occur?
- 65 million years ago
  - B) 200 million years ago**
  - 299 million years ago
  - 400 million years ago
17. Approximately how far above the bottom of the Palisades sill is the coarse diabase region found?
- 50 ft
  - 400 ft
  - C) 800 ft**
  - 950 ft

18. The graph shows that, within the olivine-rich diabase layer near the bottom of the sill, as the percentage of olivine increases, the

- A) percentages of both plagioclase and pyroxene decrease
- B) percentages of both plagioclase and pyroxene increase
- C) percentage of plagioclase decreases and the percentage of pyroxene increases
- D) percentage of plagioclase increases and the percentage of pyroxene decreases

19. Which sequence of New York State index fossils shows the order in which the organisms appeared on Earth?

- A) 
- B) 
- C) 
- D) 

20. What great orogeny (mountain-building episode) occurred in New York State during the Devonian time period?

- A) Taconian Orogeny
- B) Grenvillian Orogeny
- C) Alleghenyan Orogeny
- D) **Acadian Orogeny**

21. Which New York State landscape region could have surface bedrock containing dinosaur fossils?

- A) Adirondack Highlands
- B) Erie-Ontario Lowlands
- C) St. Lawrence Lowlands
- D) **Newark Lowlands**

22. Dinosaur footprints may be preserved in Triassic and Jurassic rock. In which section of New York State would these footprints most likely be found?

- A) northeastern
- B) southwestern
- C) central
- D) **southeastern**

23. Surface bedrock of the Allegheny Plateau is most likely to contain fossils of the earliest

- A) grasses
- B) flowering plants
- C) dinosaurs
- D) **amphibians**

24. The rock record preserved in New York State indicates that

- A) Jurassic rock is very abundant
- B) **early Paleozoic rock is very abundant**
- C) dinosaurs existed at the time of the Taconian Orogeny
- D) the Palisades Sill formed before the extinction of the trilobites

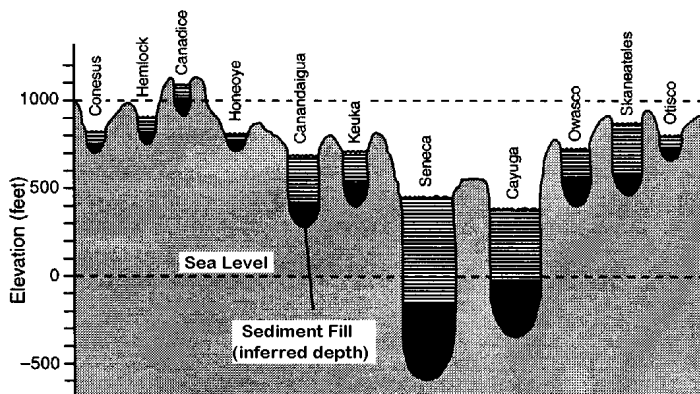
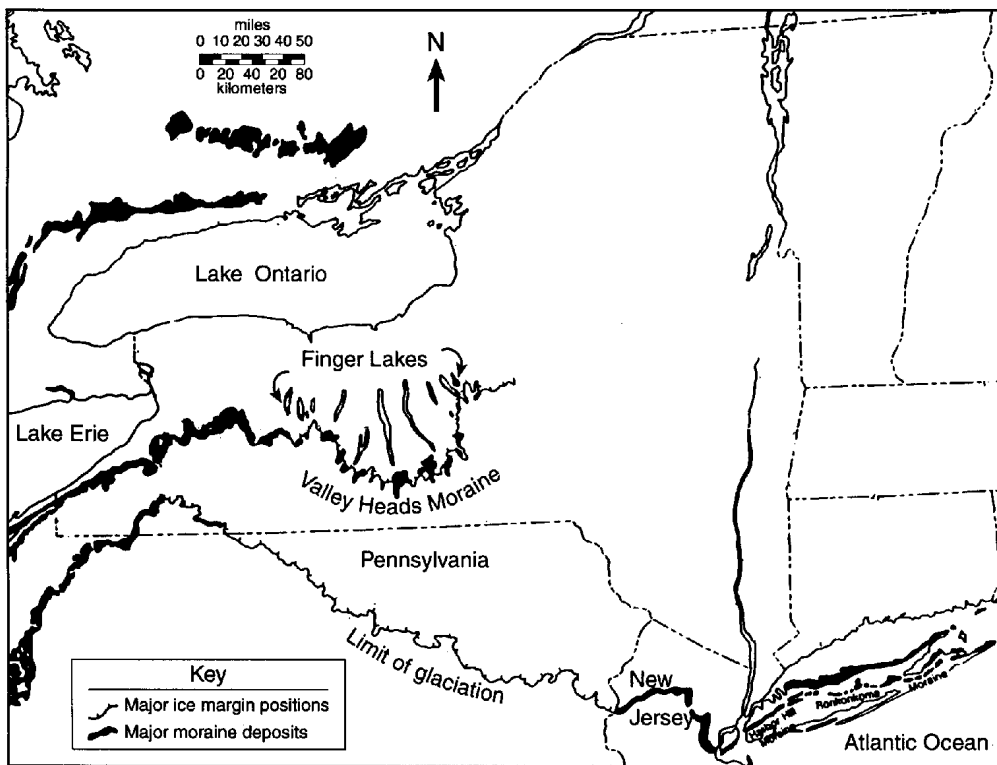
25. Which geologic event is associated with the Grenville Orogeny?

- A) **the formation of the ancestral Adirondack Mountains**
- B) the advance and retreat of the last continental ice sheet
- C) the separation of South America from Africa
- D) the initial opening of the Atlantic Ocean

26. New York State bedrock of which age contains salt, gypsum, and hematite?

- A) Cambrian
- B) Devonian
- C) Mississippian
- D) **Silurian**

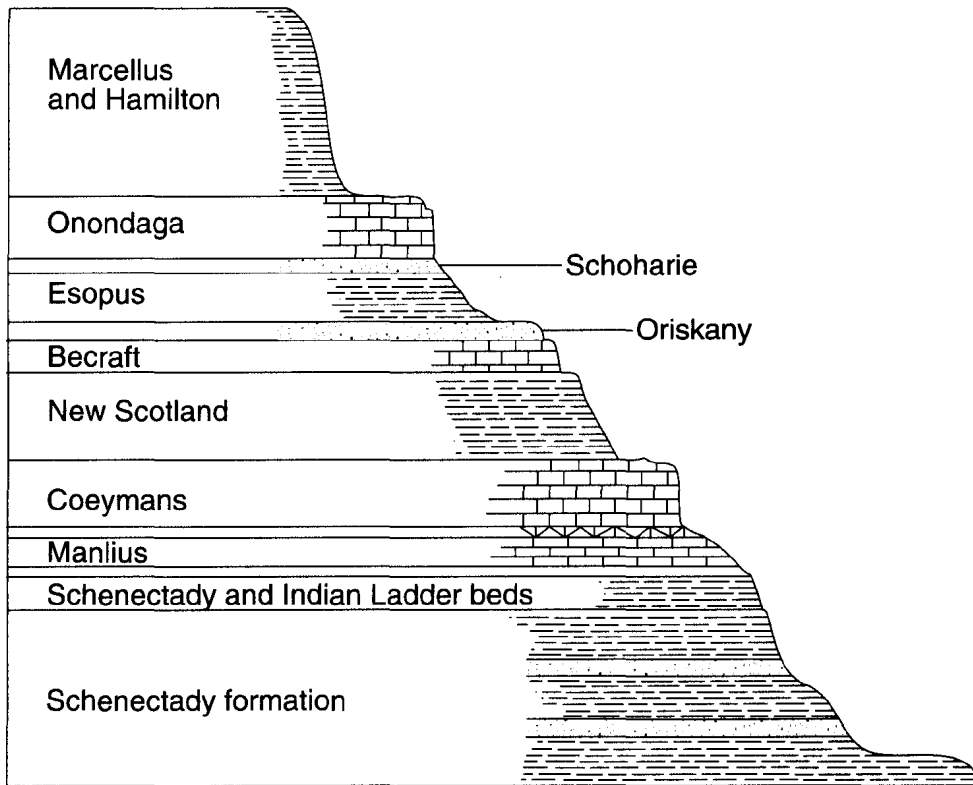
27. Base your answer to the following question on the map and cross section below. The map shows the shapes and locations of New York State's 11 Finger Lakes and the locations of some major glacial deposits (moraines) left behind by the last ice age. The cross section shows surface elevations, valley depths, and water depths of the Finger Lakes.



Layers of rock salt are found in bedrock hundreds of feet beneath some of the Finger Lakes. During which geologic time period did this bedrock form?

- A) Silurian      B) Carboniferous      C) Triassic      D) Cretaceous

28. Base your answer to the following question on the cross section below, which shows the bedrock of a portion of the Helderberg Escarpment, located in Thacher State Park near Albany, New York. The rock formations are identified by name.



The Manlius layer formed during the early Devonian Period. What type of fossils could possibly be found in the Manlius layer?

- A) earliest birds    B) earliest reptiles    C) *Tetragraptus*    **D) *Ctenocrinus***

29. Which geologic event occurred in New York State at the end of the Triassic Period?
- A) domelike uplift of the Adirondack region  
 B) formation of the Catskill delta  
 C) retreat of the last continental ice  
**D) intrusion of the Palisades sill**
30. Which geologic event occurred in New York State at approximately the same time as the extinction of dinosaurs and ammonoids?
- A) formation of the Queenston Delta  
**B) deposition of the sands and clays underlying Long Island**  
 C) initial opening of the Atlantic Ocean  
 D) advance and retreat of the last continental ice sheet
31. During which two geologic time periods did most of the surface bedrock of the Taconic Mountains form?
- A) Cambrian and Ordovician**  
 B) Silurian and Devonian  
 C) Pennsylvanian and Mississippian  
 D) Triassic and Jurassic

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32. Base your answer to the following question on the passage below.

### Fossils and the History of Earth's Rotation

Data from coral fossils support the hypothesis that Earth's rotation rate has been slowing down by about 2.5 seconds per 100,000 years. Scientists believe this is due to the frictional effects of ocean tides. This slowing rotation rate decreases the number of days in the year.

Scientists have discovered that corals produce a thin layer of shell every day, resulting in growth rings. These daily layers are separated by yearly ridges.

The Devonian coral fossil, *Pleurodictyum*, has approximately 400 growth rings between each yearly ridge, which suggests that there were about 400 days in a year during the Devonian Period.

Supporting this hypothesis, scientists have found coral from the Pennsylvanian Period that have about 390 growth rings per year, while present-day corals have about 365 growth rings per year.

The evidence of the fossil *Pleurodictyum* found in surface bedrock in the Finger Lakes region of New York State suggests that this region was once

- A) covered by a glacial ice sheet
- B) covered by a warm, shallow sea
- C) located in a desert area
- D) located in a tropical rain forest





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36. What is the geologic age sequence of the surface bedrock from Ithaca, New York, to Watertown, New York?

- A) Ordovician, Taconic, Cambrian
- B) Ordovician, Tertiary, Pleistocene
- C) Devonian, Silurian, Cambrian
- D) Devonian, Silurian, Ordovician**

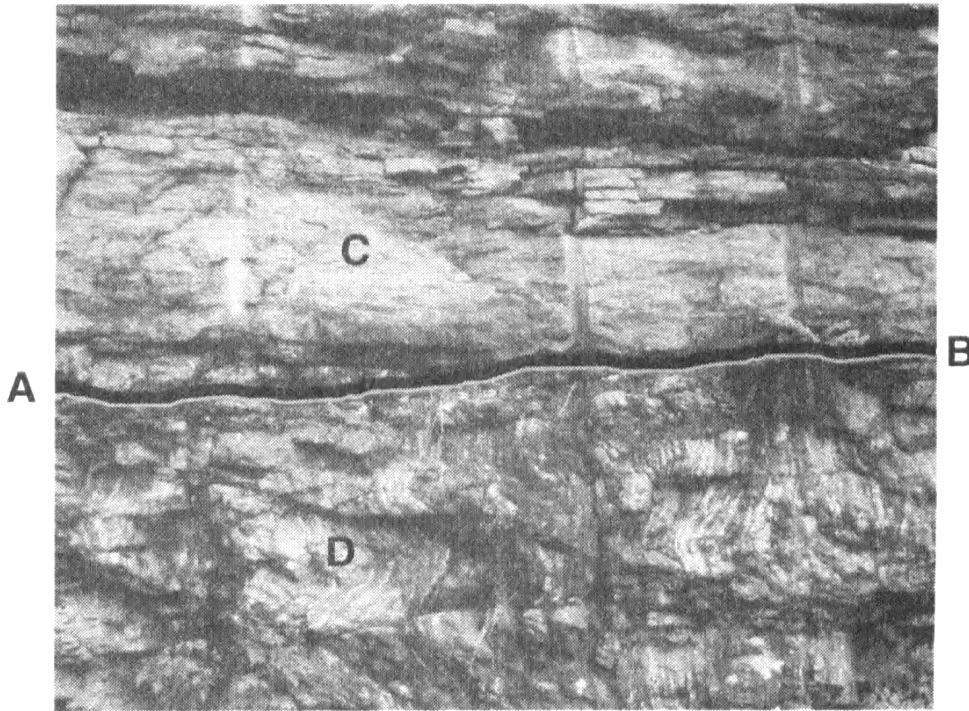
37. The surface bedrock of the Tug Hill Plateau landscape region is mostly composed of

- A) igneous rock of Silurian age
- B) sediments of Tertiary age
- C) metamorphic rock of Precambrian age
- D) sedimentary rock of Ordovician age**

38. Which geologic event occurred in New York State at about the same time as the extinction of dinosaurs and ammonoids?

- A) formation of the Queenston Delta
  - B) deposition of the sands and clays underlying Long Island**
  - C) initial opening of the Atlantic Ocean
  - D) advance and retreat of the last continental ice sheet
-

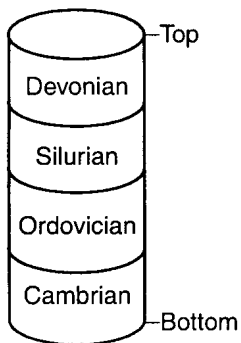
39. Base your answer to the following question on the photograph below, which shows a bedrock outcrop. Line *AB* is an unconformity between sandstone *C* and metamorphic rock *D*.



The lower layers of sediment found in sandstone *C* were deposited 520 million years ago. During which period of geologic time did this deposition occur?

- A) **Cambrian**    B) Ordovician    C) Silurian    D) Triassic

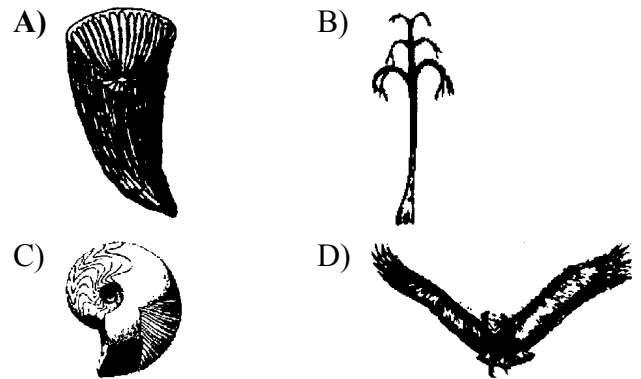
40. The diagram below represents bedrock of different ages beneath a location in New York State.



Assuming that the rock layers have not been overturned and that no unconformity exists, at which location is this bedrock found?

- A) Albany                      **B) Elmira**  
 C) Old Forge                 D) Oswego

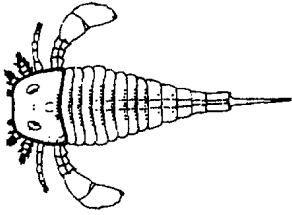
41. Which fossil would most likely be found in the late Ordovician surface bedrock in New York State?



42. Which geologic event occurred during the same geologic period as the first appearance of modern corals in Earth's oceans?

- A) Grenville Orogeny  
 B) Acadian Orogeny  
**C) intrusion of the Palisades Sill**  
 D) formation of the Catskill Delta

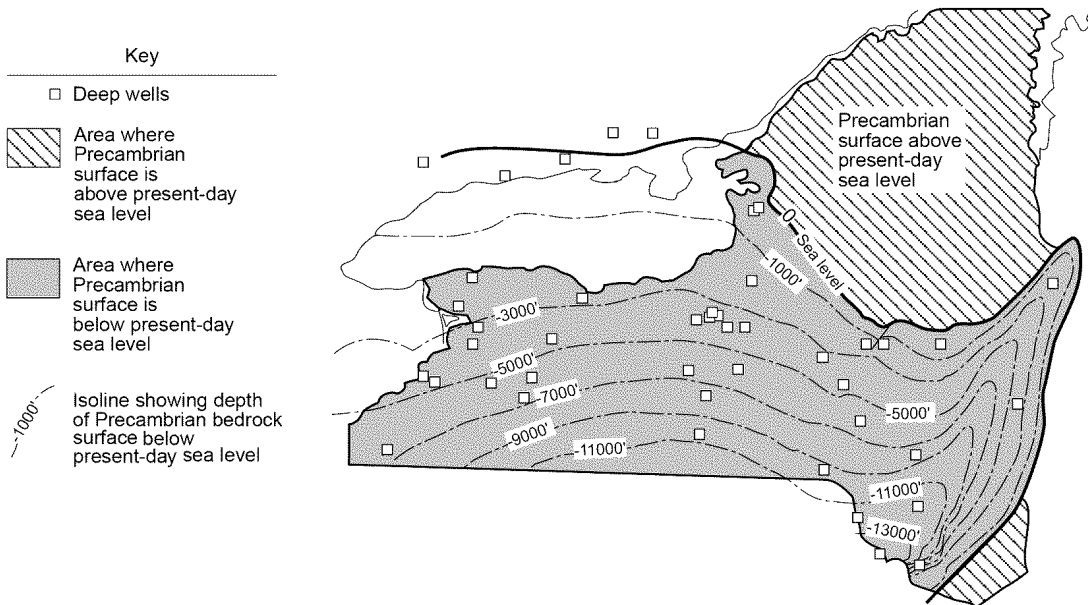
43. The fossil shown below was found in the surface bedrock in New York State.



In which landscape region was this fossil most likely found?

- A) Adirondack Mountains
- B) Erie-Ontario Lowlands**
- C) Hudson Highlands
- D) Newark Lowlands

44. Base your answer to the following question on the map below, which shows most of New York State. Isolines indicate the depth of the Precambrian bedrock surface below present-day sea level. Depths are in feet.

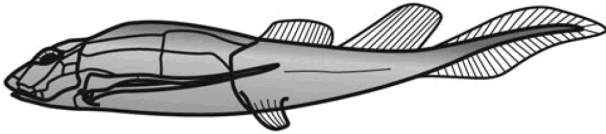


What is the geologic age of most of the bedrock covering the Precambrian rock in present-day New York State?

- A) Paleozoic**
- B) Cenozoic
- C) Mesozoic
- D) Mesozoic



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45. The diagram below represents the placoderm fish *Bothriolepis*, an index fossil found in New York State.



The surface bedrock at which location is most likely to contain this fossil?

- A) **Ithaca**                      B) Old Forge  
C) Albany                      D) New York City

Base your answers to questions **46** through **48** on the passage below and on your knowledge of Earth science.

### Ice Ages

Earth has undergone many ice ages, each lasting millions of years. Some scientists infer that most ice ages were caused by landmasses blocking the ocean currents between equatorial regions and the poles. Ice ages usually ended when the positions of continents allowed ocean currents to resume transporting equatorial heat to the poles.

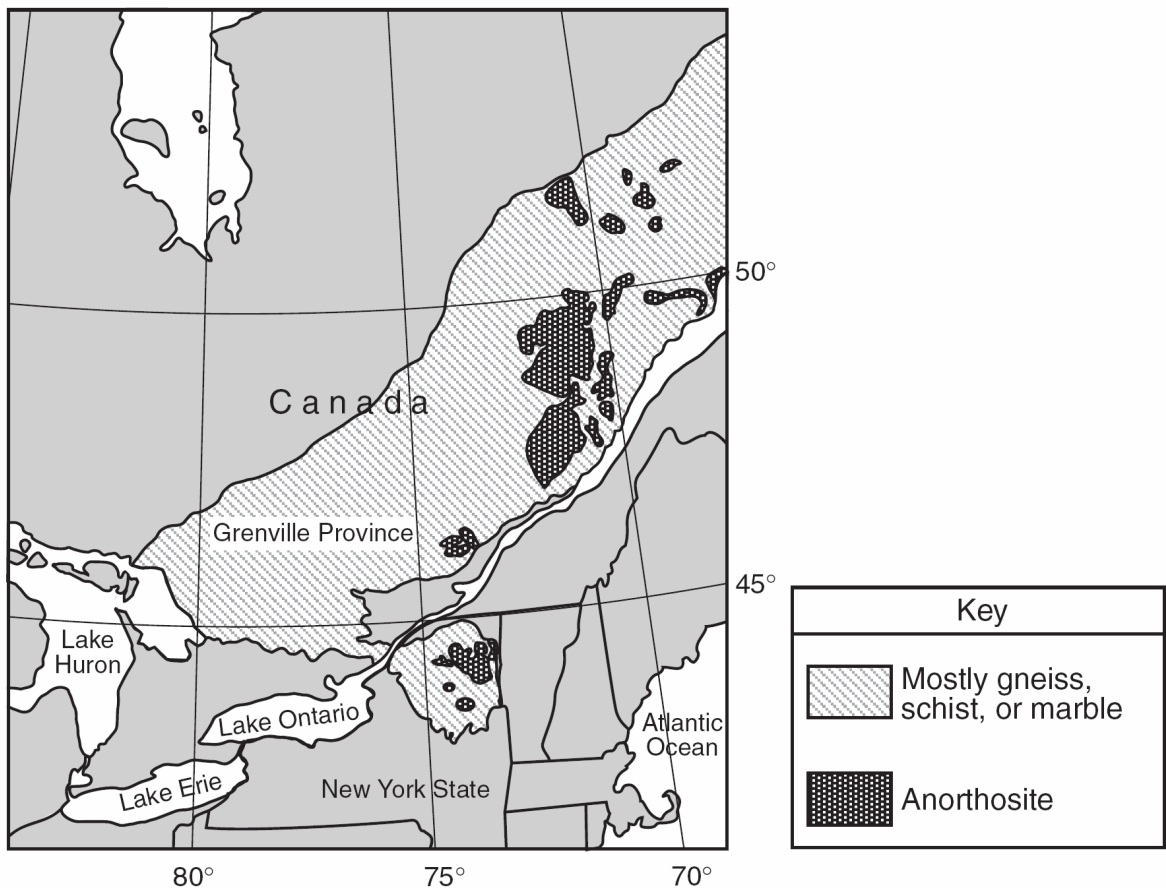
During each ice age there were advances and retreats of glaciers. These cool glacial and warm interglacial climate intervals were caused mostly by changes in Earth's orbit and tilt. Earth is presently in a warm interglacial interval.

46. Approximately 359 million years ago, the average intensity of insolation received in a year by the land area that is now eastern North America was likely
- A) **greater, because eastern North America was at a lower latitude**  
B) greater, because eastern North America was at a higher latitude  
C) less, because eastern North America was at a lower latitude  
D) less, because eastern North America was at a higher latitude
47. Earth's warm interglacial intervals are due primarily to
- A) changes in Earth's period of rotation      **B) changes in Earth's orbit and tilt**  
C) increases in elevation of North America    D) divergence at the Mid-Atlantic Ridge
48. Evidence that glaciers covered large areas of New York State is best provided by
- A) long-term temperature measurements      B) folded layers of bedrock  
**C) kettle lakes and drumlins**                      D) the presence of streams and rivers

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49. Which fossils could most likely be found in the bedrock within the Great Lakes area?
- A) **fish**                      B) birds  
C) reptiles                      D) mammals
-

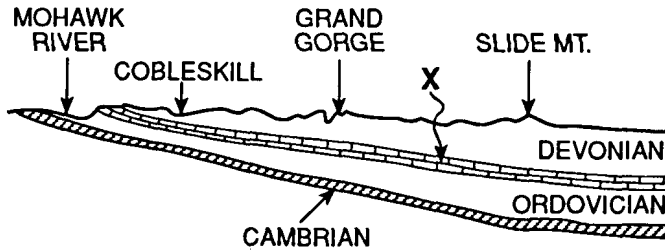
- 
50. Which statement best explains why no Permian-age bedrock is found in New York State?
- A) The extinction of many life-forms occurred at the end of the Permian Period.
  - B) Only rocks of igneous origin formed in New York State during the Permian Period.
  - C) Permian-age rocks have been metamorphosed and cannot be identified.
  - D) Permian-age rocks were either eroded away or never formed in New York State.**
51. The bedrock underlying the St. Lawrence Lowlands landscape region would most likely contain fossils of the earliest
- A) reptiles
  - B) flowering plants
  - C) mollusks**
  - D) dinosaurs
52. Which two landscape regions contain surface sedimentary bedrock of Ordovician age?
- A) Erie-Ontario Lowlands and Atlantic Coastal Plain
  - B) Erie-Ontario Lowlands and St. Lawrence Lowlands**
  - C) Hudson-Mohawk Lowlands and Newark Lowlands
  - D) Allegheny Plateau and Adirondack Mountains
53. What is the age of the most abundant surface bedrock in the Finger Lakes region of New York State?
- A) Cambrian
  - B) Devonian**
  - C) Pennsylvanian
  - D) Permian
54. A rock formation in New York State contains fossils of many trilobites but of no fish. In which general area is this rock formation probably located?
- A) Long Island
  - B) south of Lake Ontario
  - C) southwestern New York State
  - D) northeastern New York State**
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Base your answers to questions 55 and 56 on the map below. The map shows some regions where metamorphic bedrock of the Grenville Province in northeastern North America is exposed at Earth's surface.



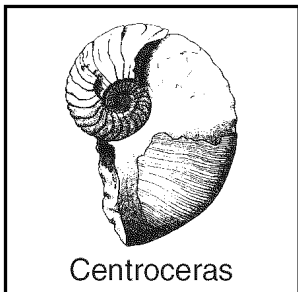
55. Which location has surface bedrock that consists mostly of gneiss, schist, or marble?
- A) 43° N 81° W    **B) 46° N 78° W**    C) 47° N 69° W    D) 49° N 71° W
56. Which New York State location has surface bedrock that consists mainly of anorthositic rock?
- A) Old Forge    B) Massena    **C) Mt. Marcy**    D) Utica
- 
57. The presence of eurypterid fossils in New York State bedrock indicates that
- A) eurypterids lived in land environments  
 B) eurypterids first appeared on Earth during the Devonian Period  
 C) most of New York State was once a mountainous region  
**D) areas of New York State were once covered with shallow seas**
58. Fossils of which type of animal would most likely be found in the surface bedrock of the Catskills?
- A) reptiles    **B) brachiopods**  
 C) mammals    D) birds
59. At which location in New York State would one least expect to find fossils in the surface bedrock?
- A) 42° N. 79° W.    B) 43° N. 76° W.  
**C) 44° N. 74° W.**    D) 42° N. 75° W.

60. The diagram below shows a geologic cross section of a portion of a landscape region.



What is the probable geologic age of sedimentary rock unit X?

- A) Cambrian                      B) Precambrian  
 C) Permian                        D) **Silurian**
61. Which event occurred most recently in Delaware?
- A) Taconian orogeny  
**B) extinction of dinosaurs**  
 C) formation of the ancestral Adirondacks  
 D) intrusion of the Palisades Sill
62. The diagram below shows a fossil found in the surface bedrock of New York State.



Which other fossil is most likely to be found in the same age bedrock?

- A) **Phacops**                      B) condor  
 C) *Coelophysis*                D) *Tetragraptus*
63. Trilobite fossil remains are most likely to be found in bedrock of
- A) Precambrian age near Mt. Marcy  
 B) Cretaceous age on Long Island  
 C) Triassic age northwest of New York City  
**D) Ordovician age near Plattsburgh**

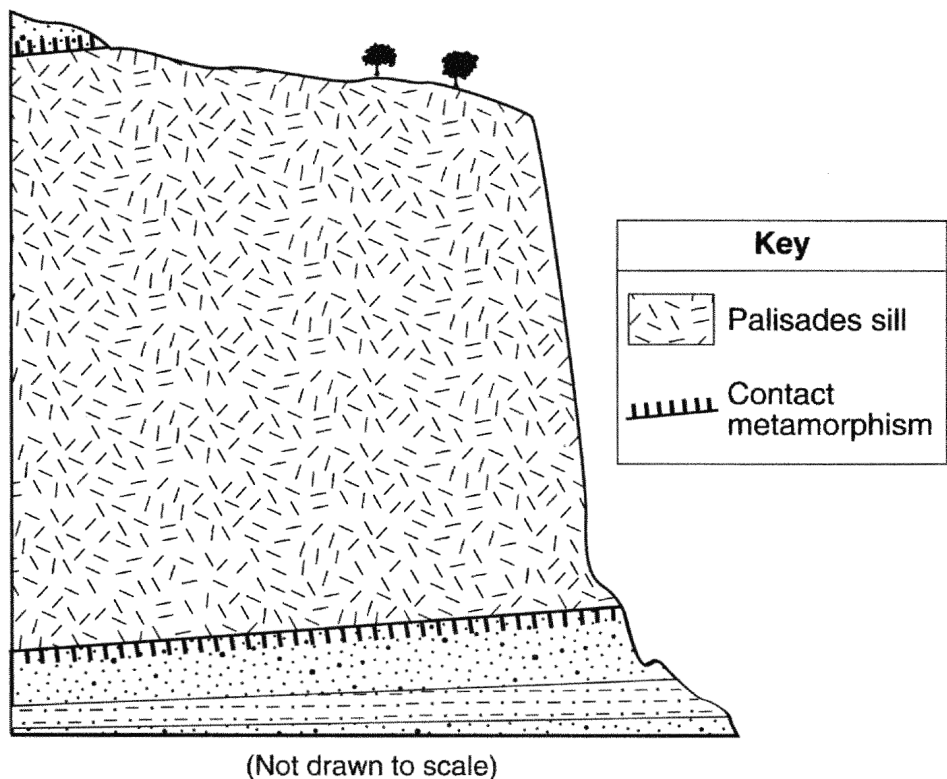
64. What elevation and bedrock structure are generally found in the Catskills?

- A) low elevation and horizontal sedimentary bedrock structure  
**B) high elevation and horizontal sedimentary bedrock structure**  
 C) low elevation and folded metamorphic bedrock structure  
 D) high elevation and folded metamorphic bedrock structure
65. *Valcouroceras* is a New York State index fossil. Which mountain-building event occurred in New York State during the time when *Valcouroceras* was living in oceans covering parts of New York State?
- A) Alleghenian orogeny  
 B) Acadian orogeny  
**C) Taconian orogeny**  
 D) Grenville orogen
66. When did the intrusion of the Palisades Sill occur?
- A) before the Appalachian Orogeny  
**B) during the late Triassic Period**  
 C) during the Paleozoic Era  
 D) after the extinction of dinosaurs and ammonites
67. Which type of fossil could be found in the bedrock near Dover, Delaware?
- A) early mammal                B) flowering plant  
 C) dinosaur                      D) **fish**

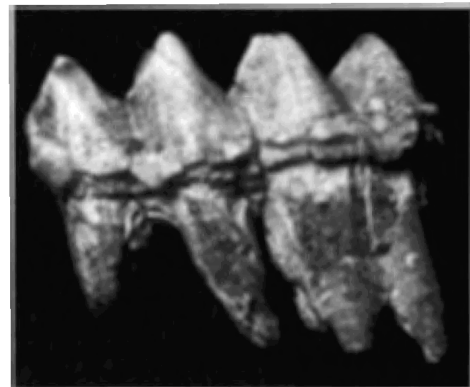


Base your answers to questions 68 through 70 on the geologic cross section and photograph below and on your knowledge of Earth Science. The cross section represents the Palisades sill in southern New York State and the surrounding bedrock. Potassium-40 analysis determined the sill to be approximately 200,000,000 years old. The photograph shows a mastodont tooth found in glacial sediments nearby. Carbon-14 analysis determined this tooth to be approximately 11,400 years old.

**Geologic Cross Section**



**Mastodont Tooth**



68. Potassium-40 is useful for radioactive dating of the Palisades sill because the half-life of potassium-40
- A) decreased as the amounts of  $^{40}\text{Ar}$  and  $^{40}\text{Ca}$  in the sill increased
  - B) remained constant during the radioactive decay process**
  - C) increased as pressure from the overlying sedimentary rock increased
  - D) was shortened by the high temperature of the magma that formed the sill
69. The mastodont tooth and the entire Palisade sill represented above are similar in that both
- A) can be found in deposits left by the last continental ice sheet in New York State
  - B) are fossils of animals that once lived in New York State
  - C) can be used as time markers to date nearby geologic events**
  - D) are Mesozoic in age
70. Which metamorphic rock was most likely produced in the contact zone between the Palisades sill and the sedimentary rock?
- A) schist
  - B) slate
  - C) gneiss
  - D) quartzite**

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71. Chemical evaporite bedrock is found approximately 20 kilometers south of Rochester, New York. This bedrock most likely formed during which geologic time interval?

**A) Silurian Period**

B) Devonian Period

C) Pleistocene Epoch

D) Pennsylvanian Epoch

72. At which location could a geologist find shale containing eurypterid fossils?

A) Old Forge                    **B) Syracuse**

C) New York City        D) Long Island

73. Which geologic event most likely caused the Appalachian Mountains to form?

A) the melting of a subducted oceanic plate

**B) the collision of North America and Africa**

C) the eruption of an ancient volcanic mountain chain

D) the massive erosion and deposition of Mesozoic rocks

74. During which geologic period would fossils in the exposed bedrock of New York State at 43° N, 77° W most likely have been deposited?

A) Cambrian                    B) Ordovician

**C) Silurian**                    D) Devonian

75. Near which location in New York State would a geologist have the greatest chance of finding dinosaur footprints in the surface bedrock?

**A) 41°10' N latitude, 74° W longitude**

B) 42°10' N latitude, 74°30' W longitude

C) 43°30' N latitude, 76° W longitude

D) 44°30' N latitude, 75°30' W longitude

76. Fossilized footprints of *Coelophysis* dinosaurs have been found in bedrock closest to which New York State location?

**A) New York City**        B) Old Forge

C) Watertown                D) Niagara Falls

77. At which latitude and longitude in New York State would a salt mine in Silurian-age bedrock most likely be located?

A) 41° N 72° W                **B) 43° N 77° W**

C) 44° N 74° W                D) 44° N 76° W

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78. Base your answer to the following question on the passage below.

## Frozen Mammoth

A woolly mammoth was found in 1999 buried in the frozen soil of the Siberian tundra. Carbon-14 dating indicated that it had died about 20,000 years ago. Many fossils represent only the partial remains of organisms. However, a complete mammoth with bones, skin, hair, and internal organs intact represented a unique opportunity for scientists to investigate the lifestyle of this animal and the environment in which it lived.

Identify *one* New York State index fossil of an organism that lived during the same time as the woolly mammoth.

- 
79. Dinosaur footprints have been discovered in New York State surface bedrock. These footprints were most probably found in rocks formed during the
- A) Devonian Period
  - B) Triassic Period**
  - C) Precambrian Period
  - D) Jurassic Period
80. Which geologic event occurred most recently in New York State?
- A) A continental glacier covered most of the State.**
  - B) The entire State was uplifted from below sea level.
  - C) The Palisades Sill intruded.
  - D) The Taconic Mountains formed.
81. Which geologic event occurred in New York State at approximately the same time that eurypterids were becoming extinct?
- A) the opening of the Atlantic Ocean
  - B) the uplift of the Appalachian Mountains
  - C) the formation of the Catskill Delta**
  - D) the intrusion of the Palisades Sill
82. During which geologic time period did the salt and gypsum deposits near Syracuse form?
- A) Cambrian
  - B) Ordovician
  - C) Silurian**
  - D) Devonian
83. A student finds a marine brachiopod fossil in the Catskill region of New York State. Which statement best explains the fossil's presence at this location?
- A) Brachiopods normally are deposited at high elevations.
  - B) The Catskill region was at a lower elevation when the brachiopod died.**
  - C) Ocean levels are higher now than they were when the brachiopod died.
  - D) The brachiopod fossil was carried into the Catskills by the retreat of continental glaciers.
84. Approximately how many years ago did the last continental ice sheet retreat from New York State?
- A) less than 1 million years**
  - B) 2.5 million years
  - C) 1 billion years
  - D) 10 billion years
85. Fossils of trilobites, graptolites, and eurypterids are found in the same bedrock layer in New York State. During which geologic time interval could this bedrock layer have formed?
- A) Late Ordovician to Early Devonian**
  - B) Late Silurian to Early Cretaceous
  - C) Early Permian to Late Jurassic
  - D) Early Cambrian to Middle Ordovician
86. The climate that existed in central Virginia during the Silurian Period can best be determined by studying
- A) the present climate
  - B) the present stream drainage patterns
  - C) faults found in the bedrock
  - D) fossils found in the bedrock**
-

87. The drawing below shows a fish that existed during the late Devonian period.

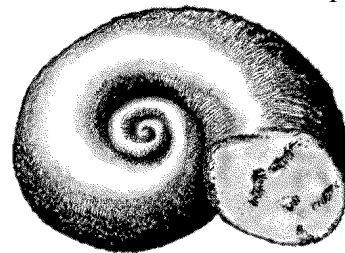


A fossil of this fish might be found in Florida bedrock that is how many million years old?

- A) 160    B) 225    C) **360**    D) 445
88. During which period did the Acadian Orogeny occur?
- A) Cambrian                      B) Ordovician  
C) Silurian                        D) **Devonian**
89. Which two locations are found in the same major geographic landscape province?
- A) Albany and Old Forge  
B) Elmira and Riverhead  
C) **Jamestown and Slide Mountain**  
D) Massena and Mount Marcy
90. During which period of geologic history was the surface bedrock of the Catskills deposited?
- A) Cambrian                      B) Pleistocene  
C) **Devonian**                      D) Triassic
91. During which period in geologic history did the uplifting of the Adirondack Mountains begin?
- A) Quaternary                    B) **Cretaceous**  
C) Triassic                        D) Cambrian
92. The glaciers that shaped the landscape of the Atlantic coast occurred at approximately the same time as the
- A) formation of the Taconic Mountains  
B) **development of humans**  
C) appearance of the first sharks  
D) extinction of the trilobites
93. Which two landscape regions in New York State have the oldest surface bedrock?
- A) Allegheny Plateau and Newark Lowlands  
B) Tug Hill Plateau and Erie-Ontario Lowlands  
C) Taconic Mountains and the Catskills  
D) **Adirondack Mountains and Hudson Highlands**

94. How many million years ago did the surface bedrock under Watertown, New York, form?

- A) 345 to 395                      B) 395 to 435  
C) **435 to 500**                      D) 500 to 570
95. Which event accounted for the vast surface changes that occurred in New York State during the Pleistocene Epoch?
- A) the uplift of the Adirondack Mountains  
B) the shifting of the North American continent toward the Equator  
C) the intrusion of the Palisades sill  
D) **the advance and retreat of the last continental ice sheet**
96. Which river in New York State flows for several miles over surface bedrock that is more than 542 million years old?
- A) Mohawk                        B) Susquehanna  
C) Genesee                        D) **Hudson**
97. Which area of New York State has the youngest bedrock?
- A) **the area south of the Finger Lakes**  
B) the area around Mt. Marcy  
C) the area between Syracuse and Rochester  
D) the area east of Albany
98. The diagram below shows an index fossil found in surface bedrock in some parts of New York State.



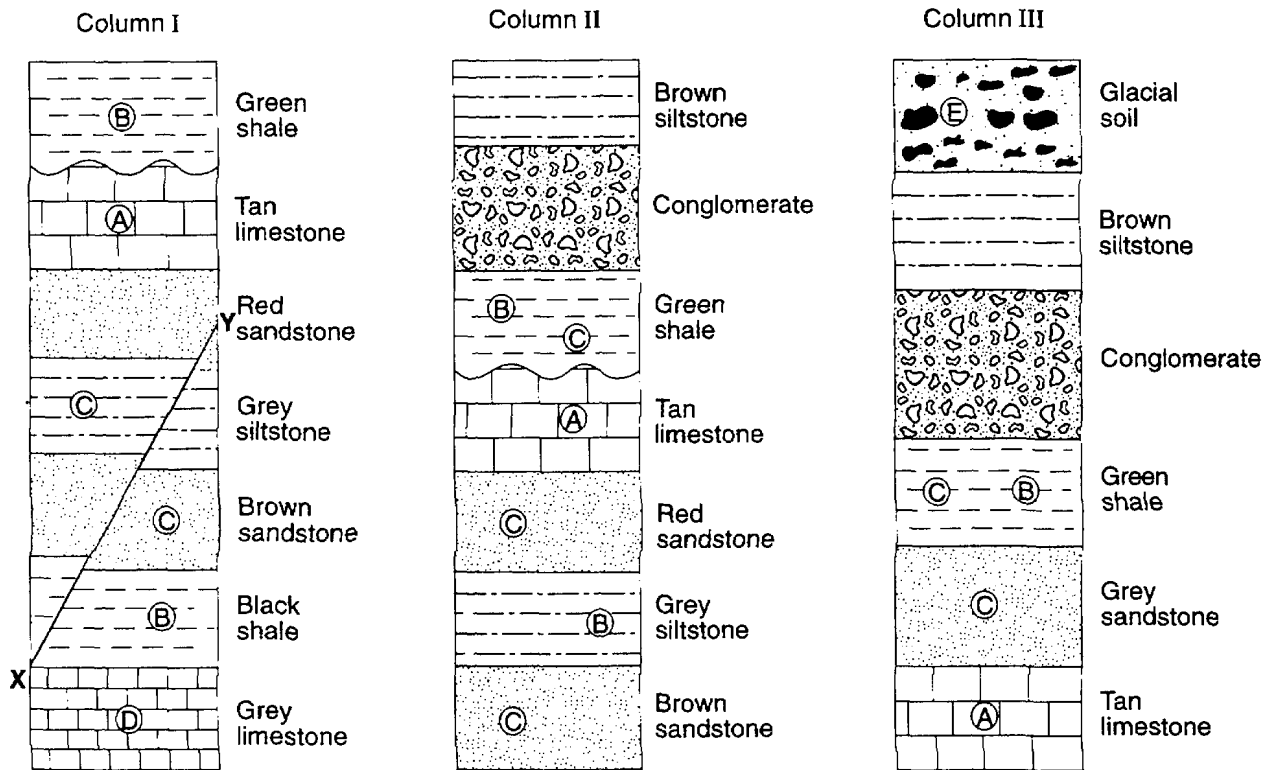
*Maclurites*

In which New York State landscape region is this gastropod fossil most likely found in the surface bedrock?

- A) **Tug Hill Plateau**  
B) Allegheny Plateau  
C) Adirondack Mountains  
D) Newark Lowlands

99. Base your answer to the following question on the diagram below which shows three geologic columns representing widely separated rock outcrops. Letters *A* through *E* represent fossils found in the outcrops. Line *XY* represents a fault in column I. The layers have not been overturned.

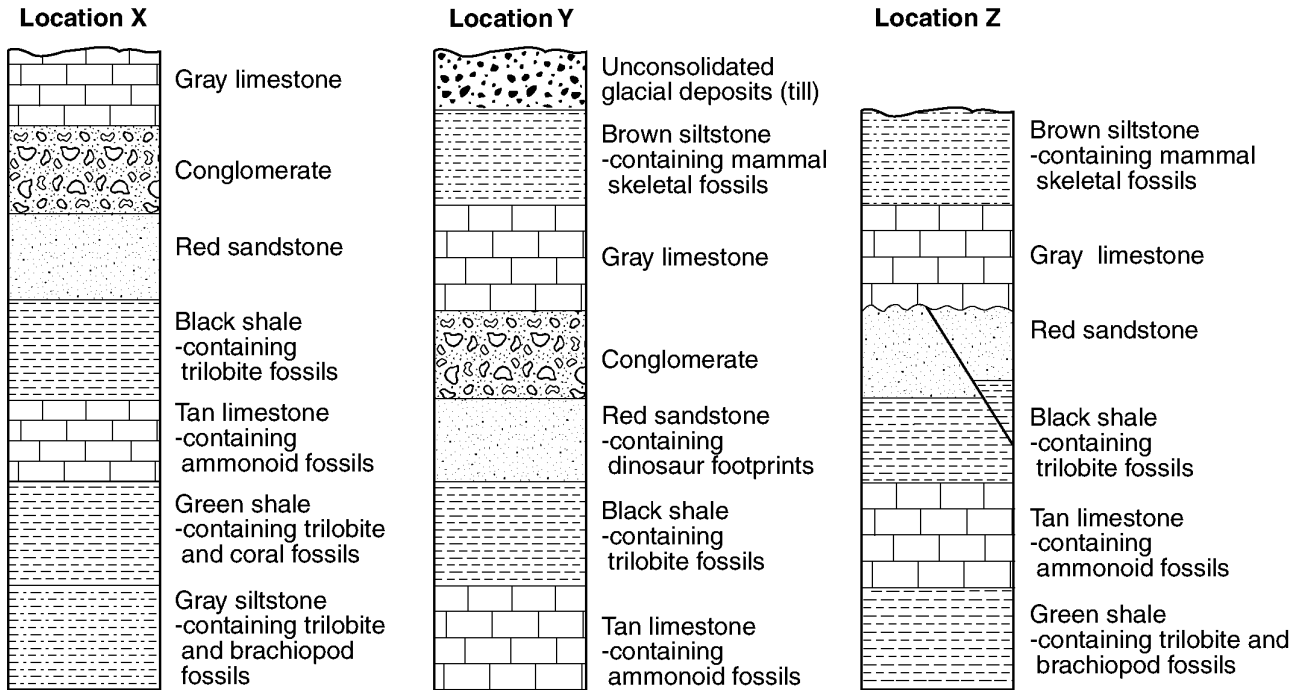
Rock Outcrops



Fossil *A*, in the tan limestone layer, is a fossil of the first known coral. This tan limestone layer was most likely deposited during which geologic time interval?

- A) Precambrian    **B) Paleozoic**    C) Mesozoic    D) Cenozoic

100. Base your answer to the following question on the cross sections below, which show widely separated outcrops at locations X, Y, and Z.



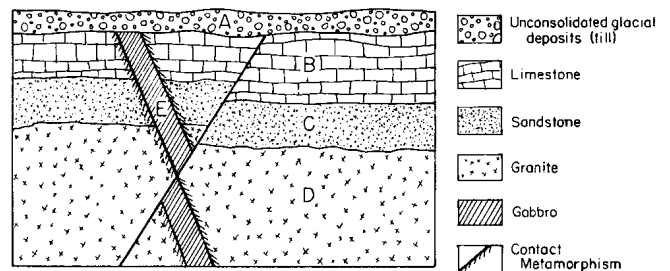
The fossils in the rock formations at location X indicate that this area was often covered by

- A) tropical rain forests
- B) glacial ice
- C) desert sand
- D) seawater

101. Which event was taking place during the Triassic Period?

- A) The Grenvillian Orogeny was raising the Adirondack Mountains.
- B) The most recent continental glaciers were melting over much of North America.
- C) **The Palisades sill was intruding in the area of New York State.**
- D) Many kinds of marine animals, including trilobites, were becoming extinct.

102. Base your answer to the following question on your knowledge of Earth science, the *Earth Science Reference Tables*, and the diagram below showing a cross-sectional view of an outcrop found in New York State today in which overturning has not occurred.



If rock layer C was deposited in New York State during the Devonian Period, then rock layer B could only have been deposited during which period? [ Use the *Earth Science Reference Tables* . ]

- A) Cambrian
- B) **Devonian**
- C) Permian
- D) Jurassic

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103. Which type of surface bedrock is commonly found in New York State between Elmira and Ithaca?

A) granite

B) quartzite

C) **shale**

D) marble