

Plates and Fossils

- In 1915, the German geologist and meteorologist [Alfred Wegener](#) (1880-1930) first proposed the theory of continental drift,
 - states that parts of the Earth's crust slowly drift atop a liquid core.
- The fossil record supports and gives credence to the theories of continental drift and plate tectonics.

- Wegener hypothesized that there was an original, gigantic supercontinent 200 million years ago, which he named Pangaea, meaning "All-earth".
- Pangaea was a supercontinent consisting of all of Earth's land masses.

- About 250 million years ago, all the land masses were joined into one super-continent, Pangaea, with dramatic impacts on life on land and the sea.
 - The total amount of shoreline was reduced and shallow seas were drained.
- The interior of the continent was drier and the weather more severe.

- The formation of Pangaea had tremendous environmental impacts that reshaped biological diversity
 - by causing extinctions and providing new opportunities for taxonomic groups that survived the crisis.

- A second major shock to life on Earth was initiated about 180 million years ago, as Pangaea began to break up into separate continents.

Fig. 25.4

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- Each became a separate evolutionary arena and organisms in different biogeographic realms diverged.
 - For example, paleontologists have discovered matching fossils of Triassic reptiles in West Africa and Brazil, which were contiguous during the Mesozoic era.
 - The great diversity of marsupial mammals in Australia that fills so many of the ecological roles that eutherian (placental) mammals do on other continents is a product of 50 million years of the isolation of Australia from other continents.

Mesozoic

The Age of the Reptiles

divided into three time periods:

- **Triassic** (245-208 Million Years Ago)
- **Jurassic** (208-146 Million Years Ago)
- **Cretaceous** (146-65 Million Years Ago).

Mesozoic

The Age of the Reptiles

Triassic Period
248 - 208 million years ago

Jurassic Period
208-146 million years ago

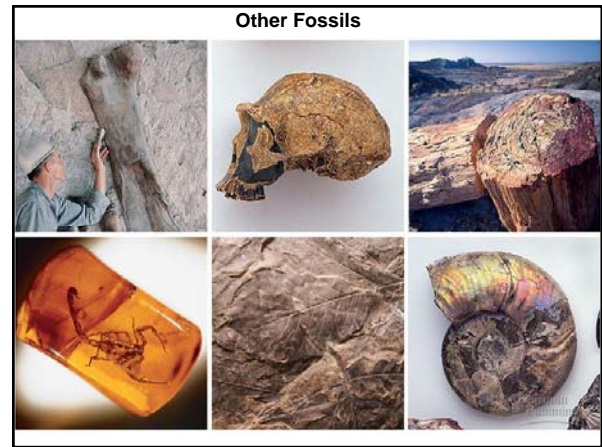
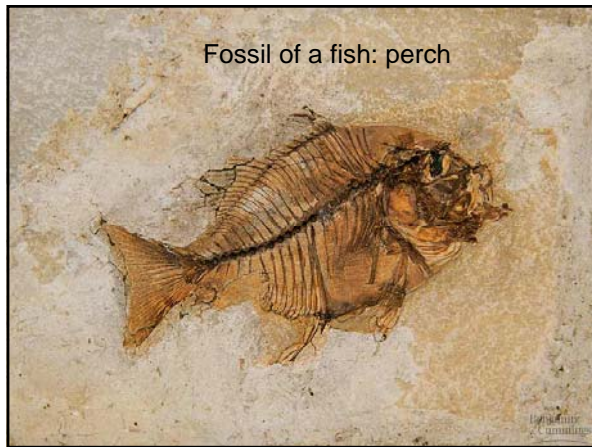
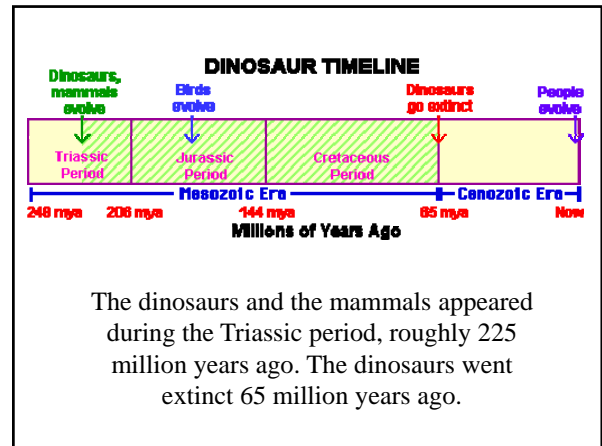
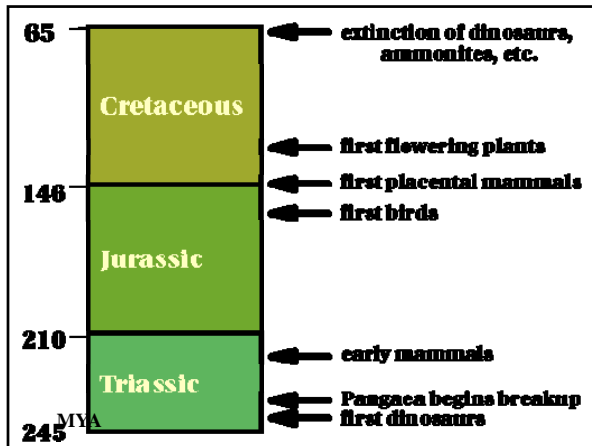
Cretaceous Period
146-65 million years ago

<http://www.enchantedlearning.com/subjects/dinosaurs/mesozoic/>

Fossil Evidence in Support of the Theory

The Breakup of Pangaea 130 mya

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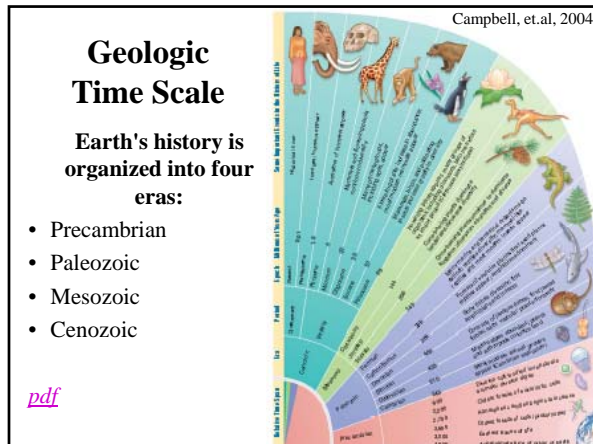


- If an organism dies in a place where decomposition cannot occur, then the entire body, including soft parts may be preserved as a fossil.
 - These organisms have been trapped in resin, frozen in ice, or preserved in acid bogs.

Two images illustrating fossil preservation: a scorpion trapped in a piece of amber and a mammoth tusk protruding from a block of ice.

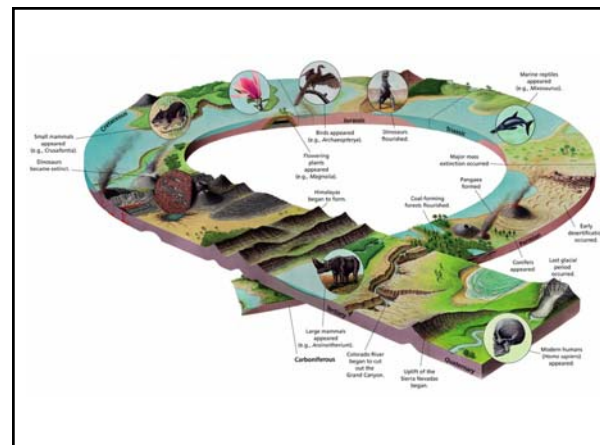
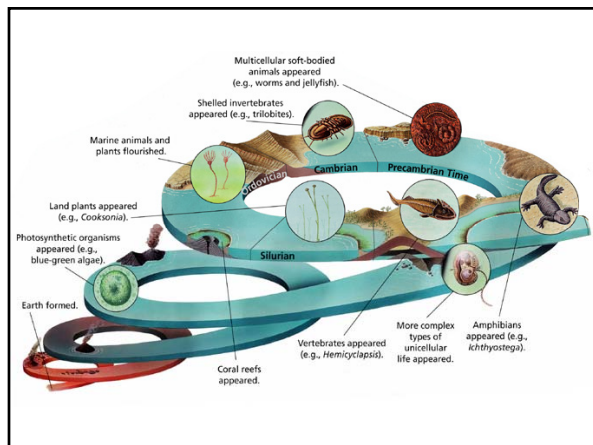
- Fossils are the preserved remnants or impressions left by organisms that lived in the past.
 - historical documents of biology
- The **fossil record** is the ordered array in which fossils appear within sedimentary rocks.
 - These rocks record the passing of geological time.

Two images illustrating the fossil record: a long bone embedded in a rock matrix and a colorful ammonite shell.



The Fossil Record and Geologic Time

- Role of sedimentary rocks
- Fossil dating, use of strata location vs. absolute dating
- Fossil record incomplete, favors species that existed for a long time
- Role of continental drift
- Mass extinctions and adaptive radiations



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