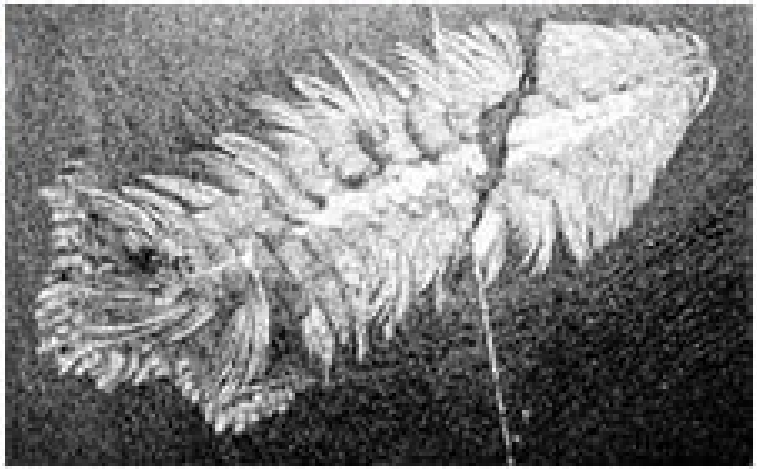
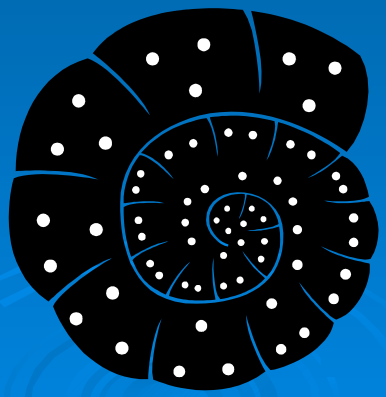
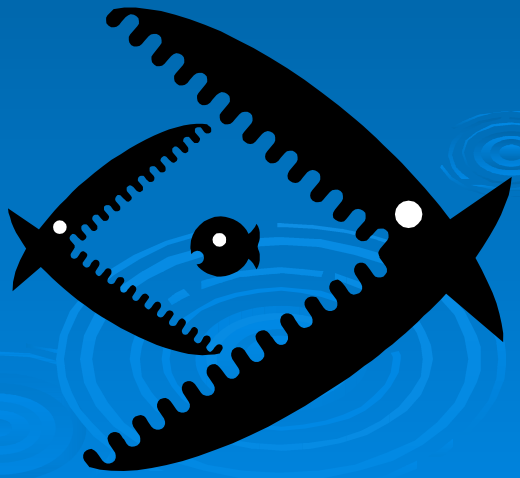
Fossils



What are Fossils?

Fossils are the preserved remains of plants or animals that lived a long time ago, or any evidence of their existence.





What Can Fossils Tell Us?

- How life forms have changed over time
- How the Earth's surface has changed
- Clues to past environments

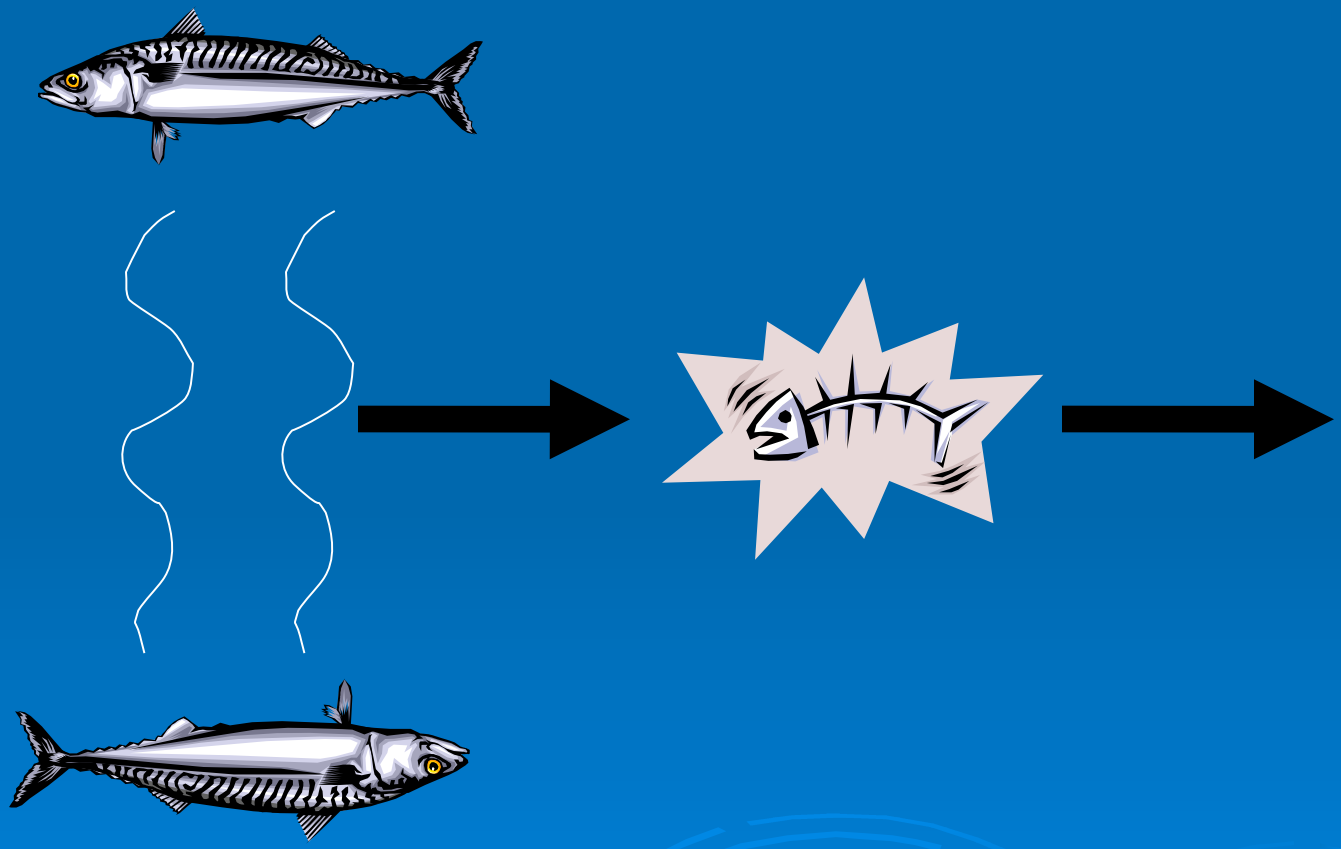
Where are Fossils Found?

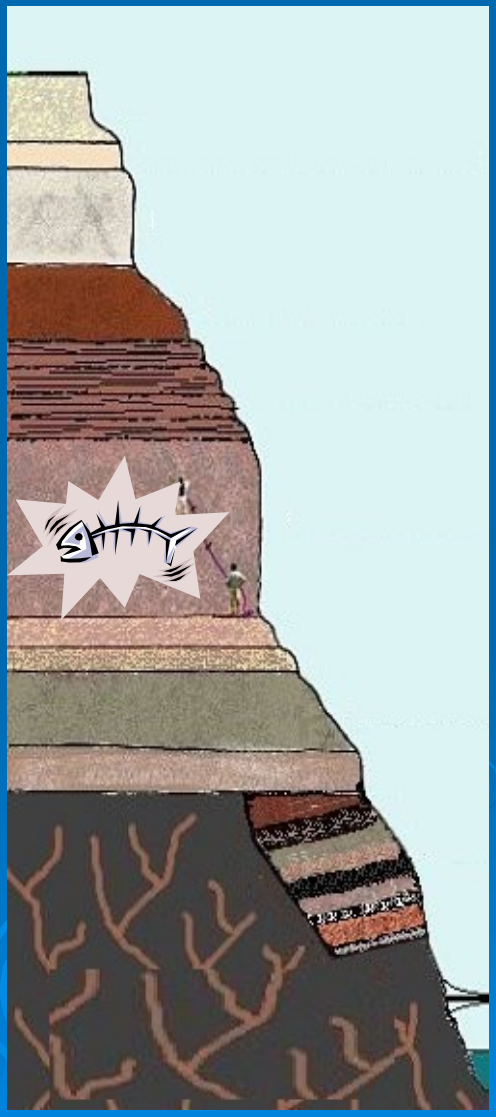
Usually in arid environments, including Colorado!

Colorado LOVES It's Fossils

- Colorado's State Fossil is the Stegosaurus because so many have been found here.
- Denver's new mass transit system is named T-Rex after a fossil was found during construction.

Most Fossils Form in Sedimentary Rock





- When an organism dies, it's soft parts usually decay or are eaten by animals
- Usually only hard parts get fossilized
  - Bones
  - Shells
  - Teeth
  - Seeds
  - Leaves
  - Stems and Trunks

How can Fossils be Preserved?

- Unaltered Preservation
- Altered Preservation
- Trace Fossils
- Molds and Casts

Unaltered Preservation

Insects that got stuck in tree sap were preserved unaltered.

The La Brea tar pits in California trapped and preserved organisms.

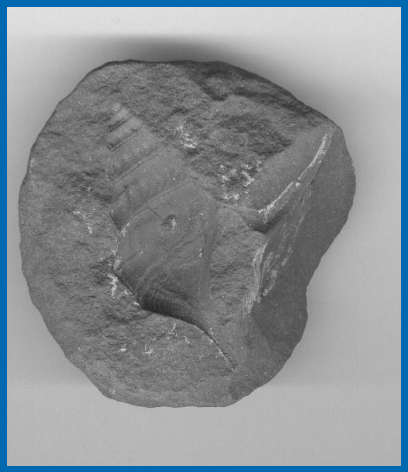
Frozen remains of Wooly Mammoths have been found in ancient glaciers.

Altered Preservation

The organism is preserved but its original skeletal material is altered by chemical changes, such as petrified wood. The cells in the wood are slowly replaced by minerals, turning it to stone.

Molds and Casts

- Molds
  - A mold forms when something is pressed into soft mud and removed by decomposition or pulled out, leaving an impression of the object.



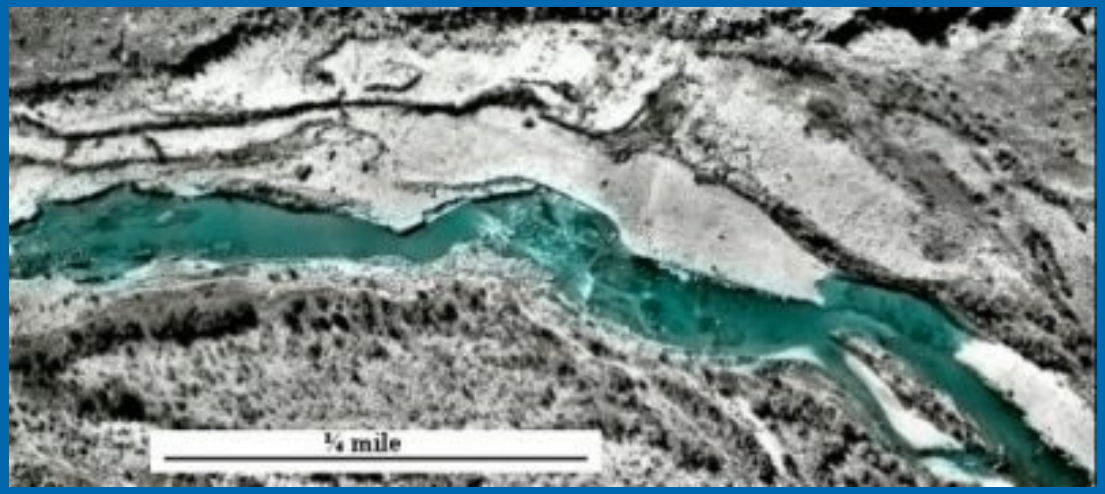
- Casts
  - A cast is a 3-D representation of an object from the past. It is created when a mold fills up with sediment that hardens.

Trace Fossils

Trace fossils are indications that an organism existed, not the actual organism. They include footprints, nests, tooth marks, worm burrows, root traces, etc.

Dinosaur Trackway in Picketwire Canyon, CO

Aerial view

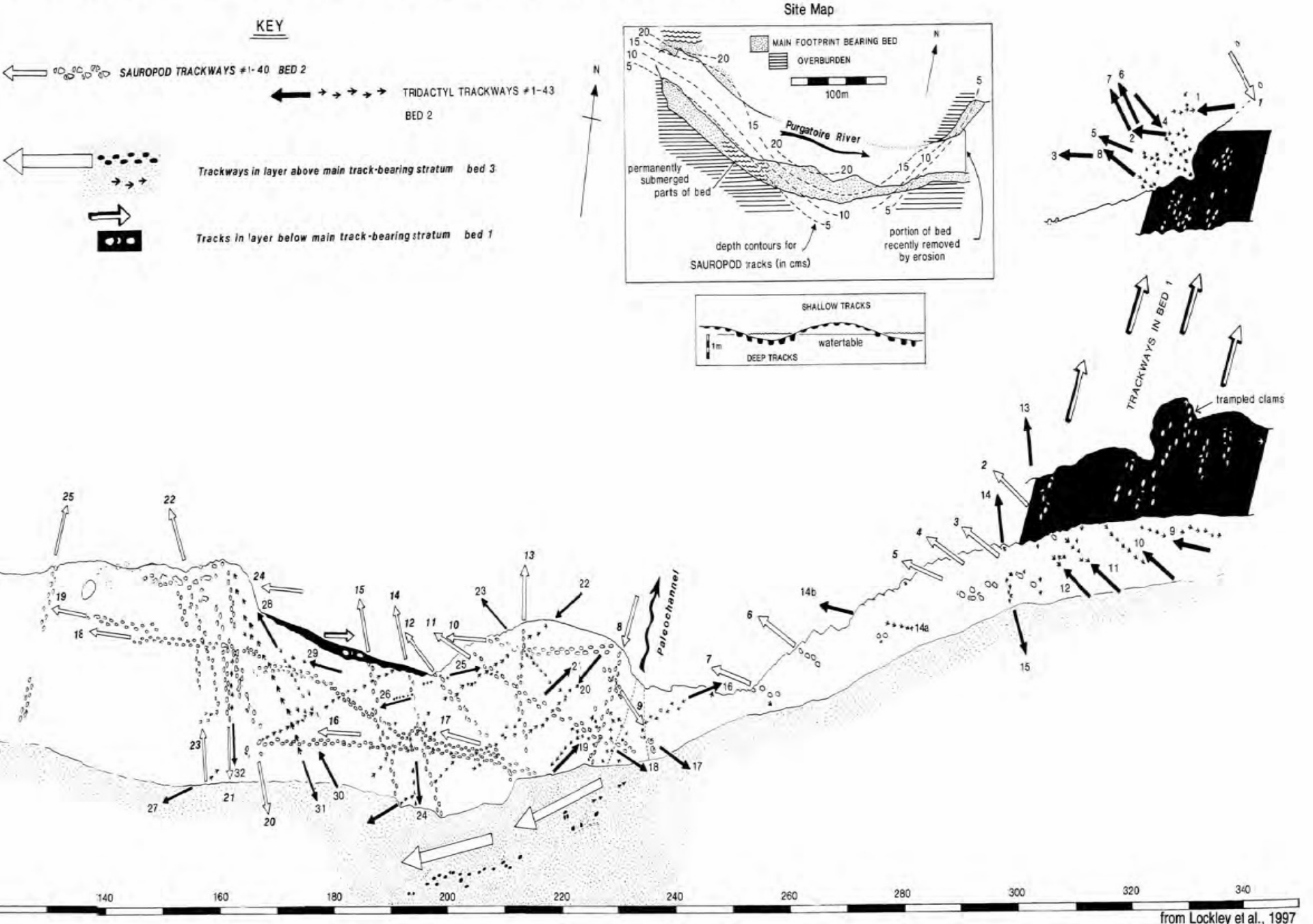


Closer view

Track Details:

- Over 1300 tracks in an area about 1/4 of a mile long.
- Made in the mud on the shore of an ancient lake
- Made by plant-eating brontosaurs and smaller meat-eating allosaurs.
- Two to three feet long, a foot or more deep.
- Parallel pair of tracks = evidence that they traveled together in herds?
- Tracks are even older than the Rocky Mountains!

FOOTPRINTS IN THE MORRISON FORMATION, PURGATOIRE RIVER SITE, SE COLORADO

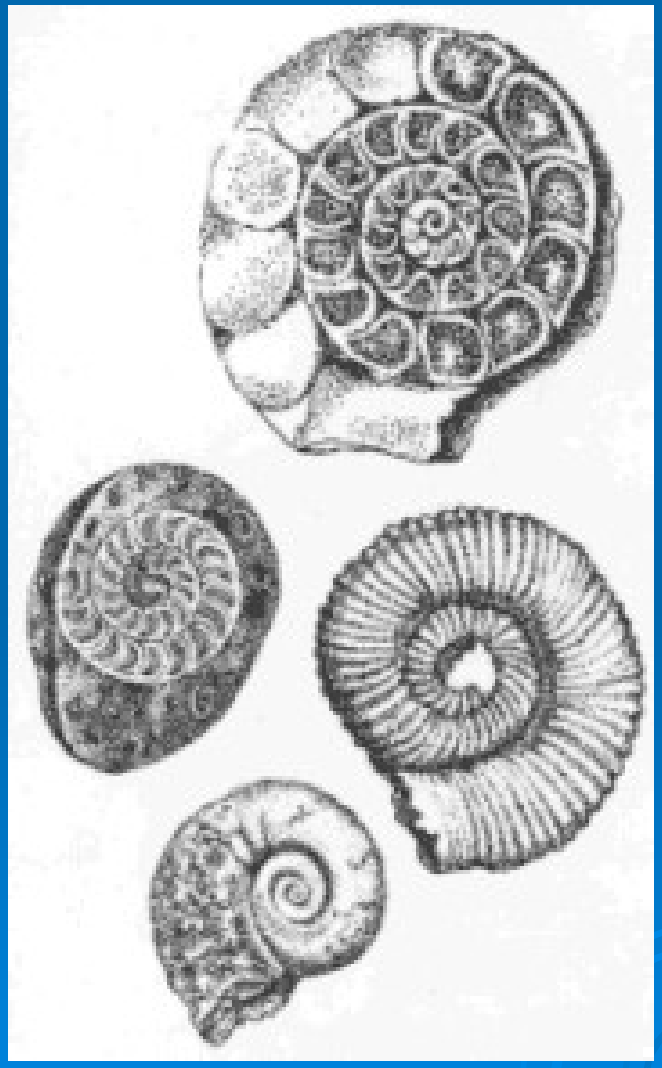


from Lockley et al., 1997

An Up Close Look at the Track Way

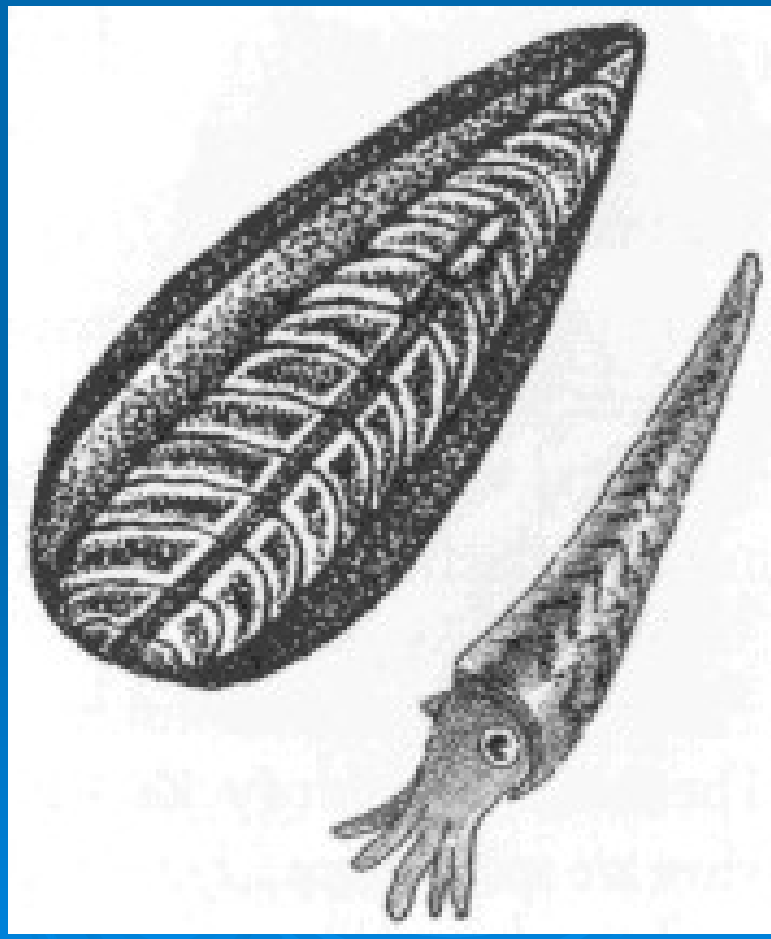
Examples of Fossils

Sporadoceras

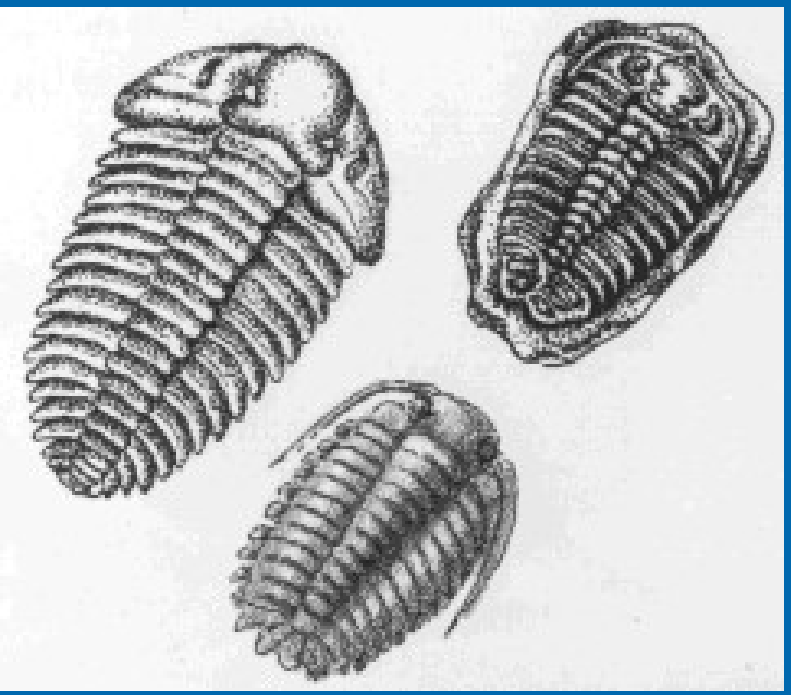


Nautilus

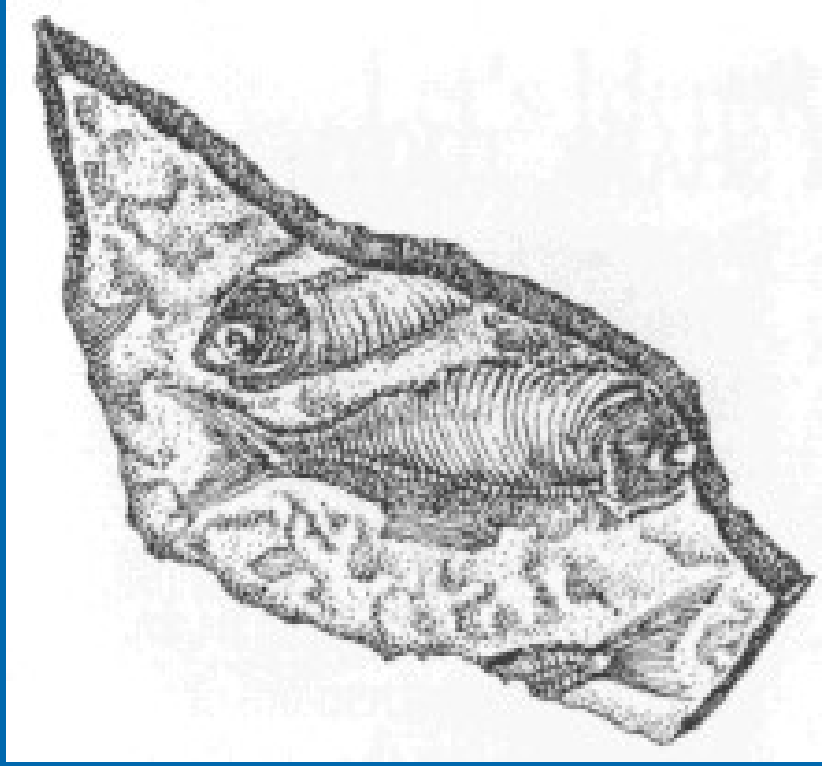
Orthoceras



Trilobites



Fossil Fish



Dinosaur Bone

Brachiopods

Echinoderms

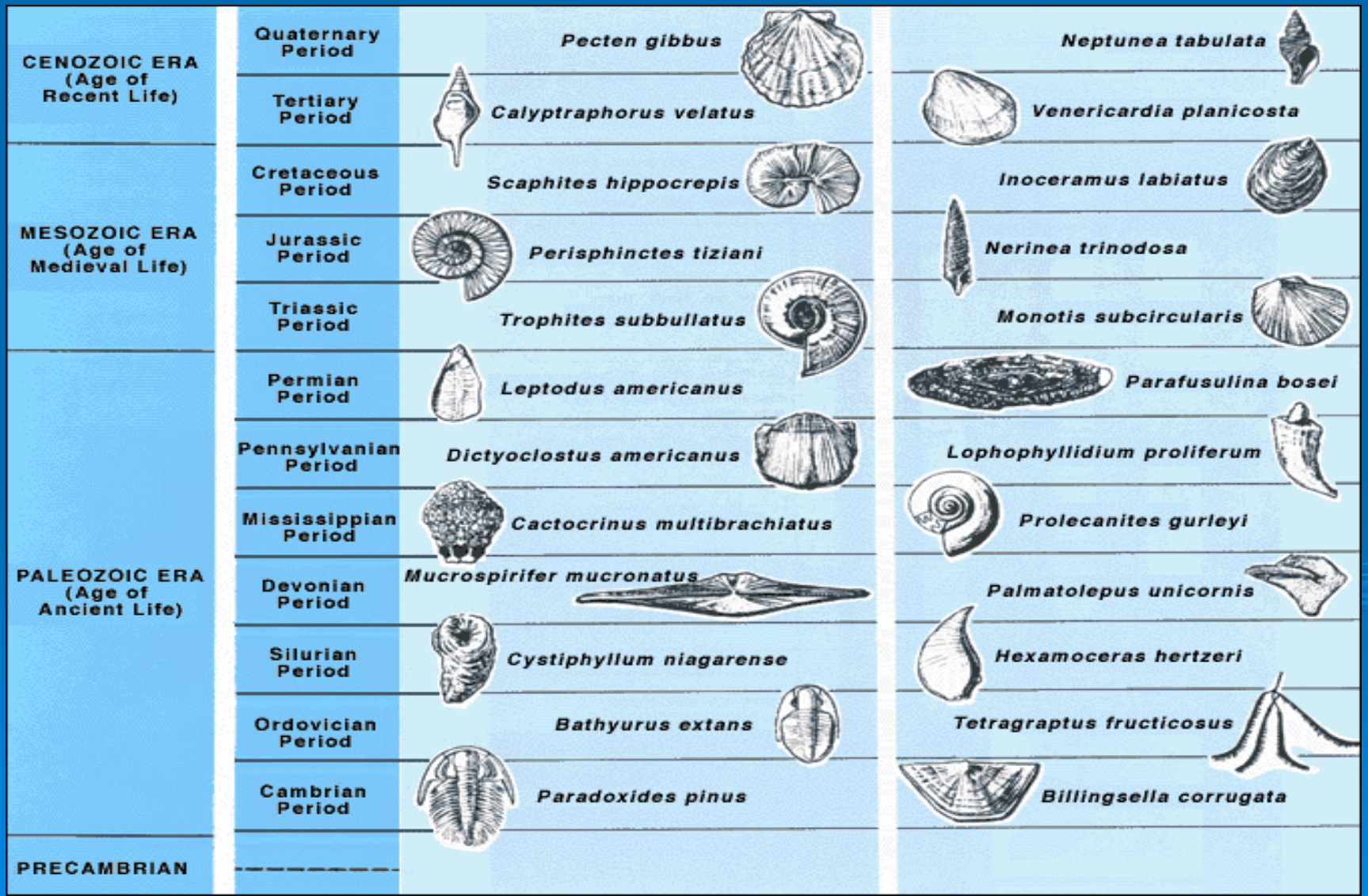
Chrinoid Stems

Coral Fossils

Plant Fossils

Snails and Slugs

Different Fossils Belong to Different Time Periods



Fossil Molds

Sometimes you find a fossil mold of a shell, like this one. Depending on the shape of the mold, it is sometimes possible to make a cast of the shell.

Making a Cast

By filling the mold with plaster, a cast of the fossil can be made. In nature, sediments would fill the mold and eventually harden, also forming a cast.

The Cast

When the plaster dries
it can be separated from the mold, resulting in two types of fossils, a mold and a cast.