

# Outline 14: Reptiles and Dinosaurs

## Evolution of Reptiles

- The first reptiles appeared in the Mississippian.
- They evolved from amphibians, which first appeared in the Devonian.
- The evolutionary jump was the invention of the amniote egg.

## The Amniote Egg

- Requires internal fertilization, unlike amphibians.
- Has a hard, but porous shell.
- Can be laid on dry land. Skips the tadpole stage of amphibians.
- Has a complex series of membranes and a very large yolk.

## Major Reptile Groups

- Anapsids - the stem reptiles, turtles are the only living group.
- Synapsids - the mammal-like reptiles. Mammals evolved from synapsids.
- Diapsids - all modern reptiles except for turtles. Dinosaurs evolved from diapsids.

## Evolution of Dinosaurs

- First appeared in late Triassic, 220 MY ago.
- Evolved from thecodont archosaurs (crocodiles are closest living relatives)
- Thecodont ancestor was bipedal and carnivorous.
- First dinosaurs were bipedal and carnivorous.

## Evolution of Dinosaurs

- Later dinosaurs that walked on 4 legs were secondarily quadrupedal.
- Herbivorous dinosaurs evolved from carnivorous dinosaurs.

## 2 Major Groups of Dinosaurs

- Saurischians - theropods and sauropods
- Ornithischians - a variety of herbivores
  - Ornithopods
  - Pachycephalosaurs
  - Stegosaurus
  - Ankylosaurus
  - Ceratopsians

## Dinosaur Paleobiology

- Herbivorous dinosaurs - sauropods, the largest animals ever on land, had very small heads. How were they able to eat enough? Gizzards
- In contrast, ornithischians had massive grinding teeth.

## Dinosaur Paleobiology

- Posture - all dinosaurs had erect limbs, like mammals and unlike living reptiles.
- Complex behaviors - moved in herds, hunted in packs, had breeding grounds like birds.

## Warm-Blooded Dinosaurs?

### Evidence

- Erect posture, particularly bipedal
- Bone histology - extensive vascular canals for production of red blood cells
- Structure of the heart - probably had 4 chambers like birds and mammals, rather than 3 chambers like reptiles.
- Birds evolved from theropods
- Evidence of feathers in some dinosaurs