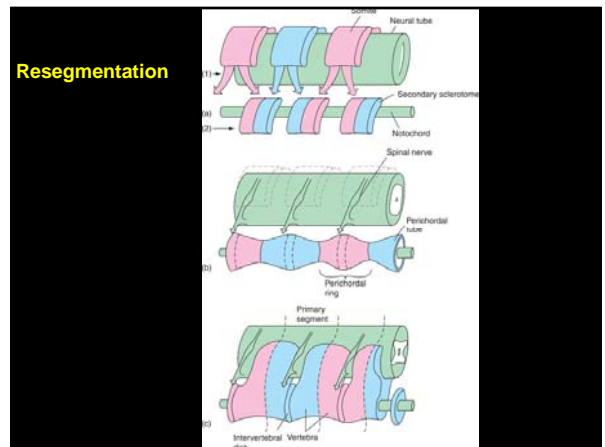
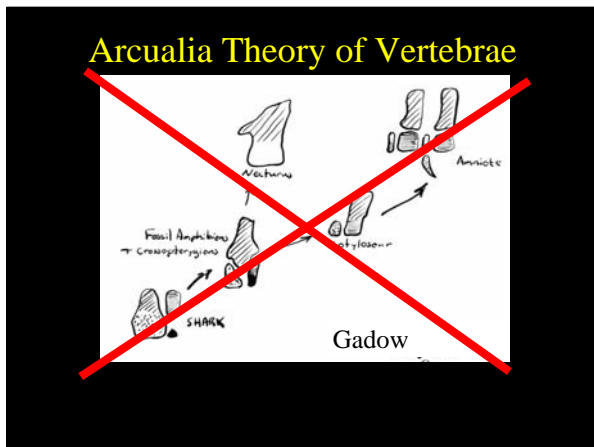
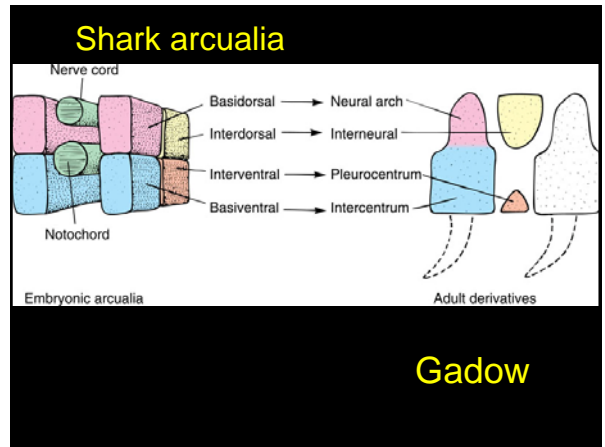
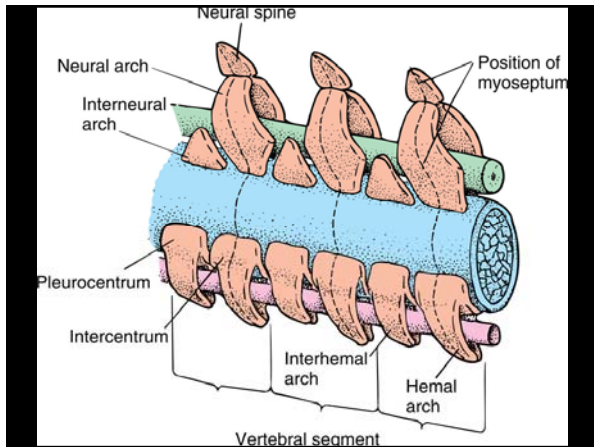
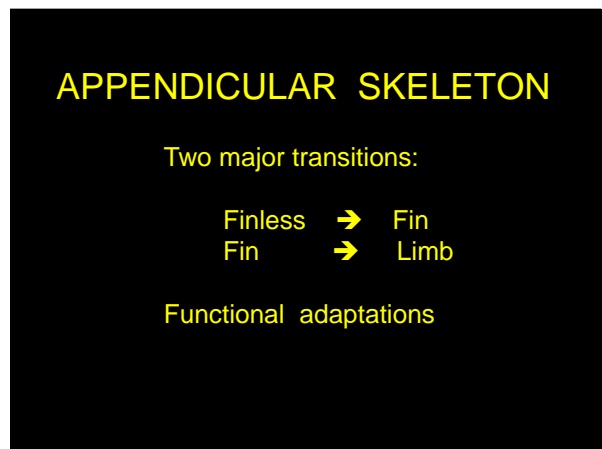
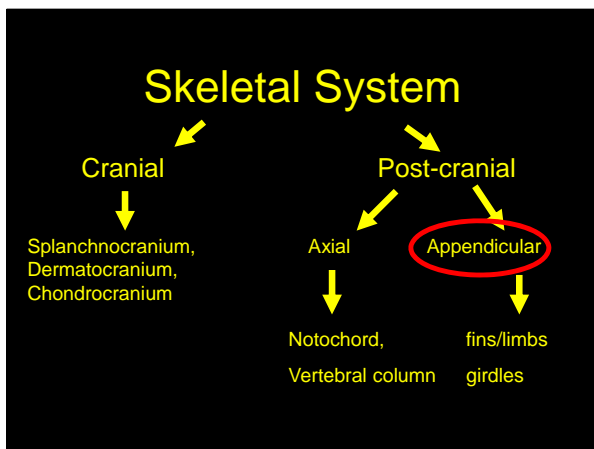
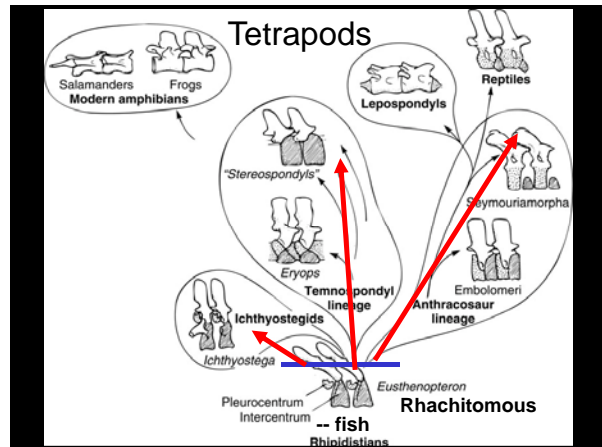
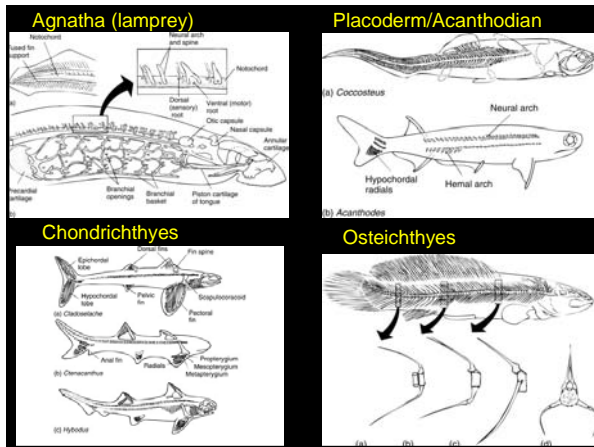
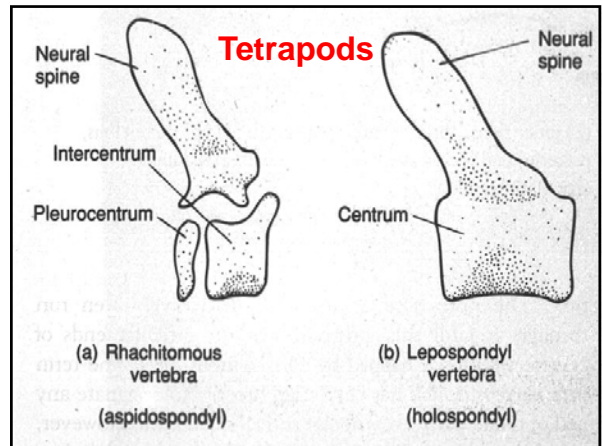
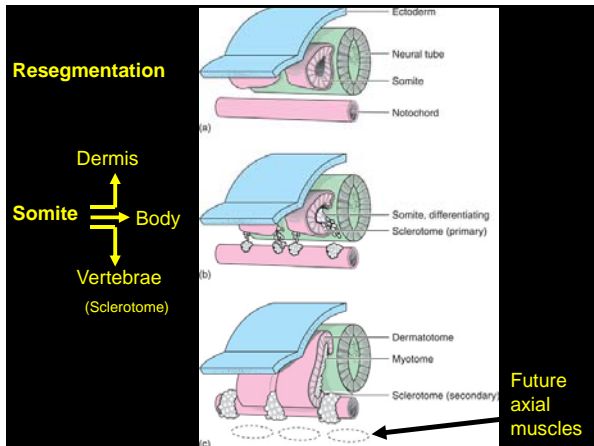


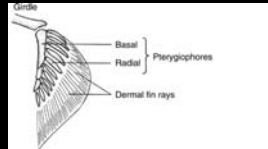
## AXIAL SKELETON



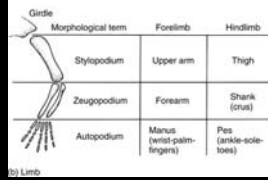


# Appendicular Skeleton

FINS + GIRDLES

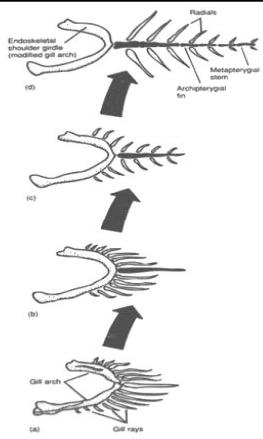


LIMBS + GIRDLES



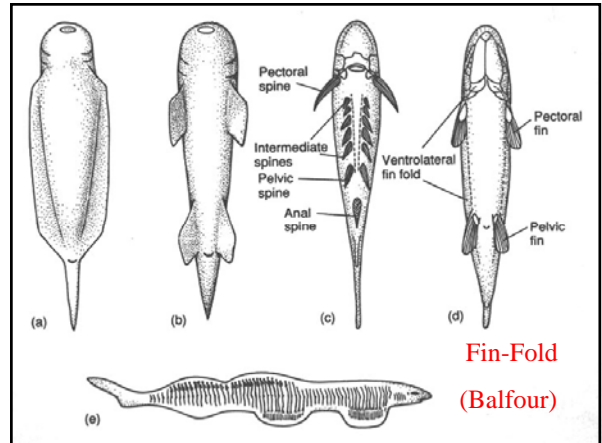
Finless → Fins (Paired)

# Origin of Paired Fins



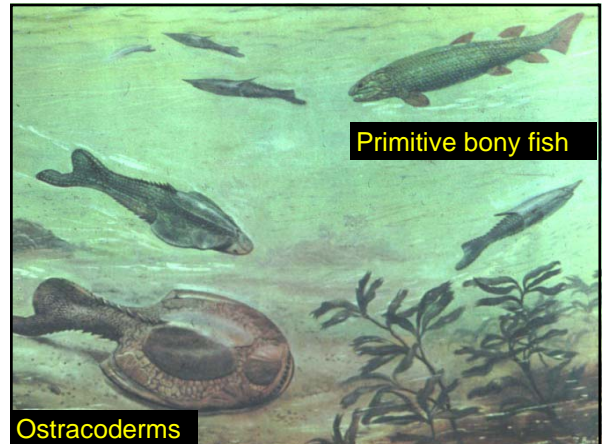
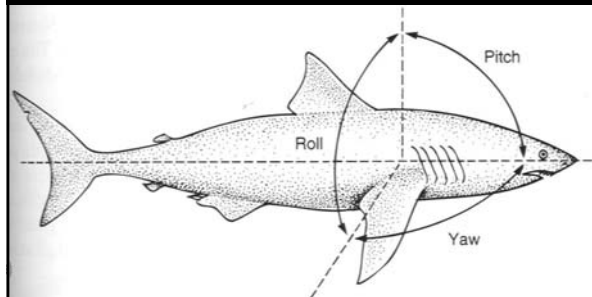
Gill-Arch

Gegenbaur



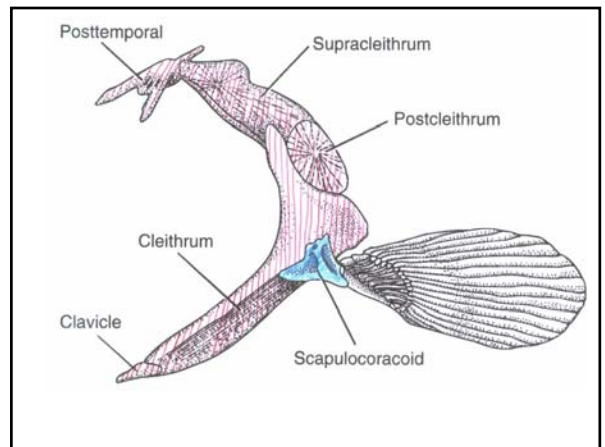
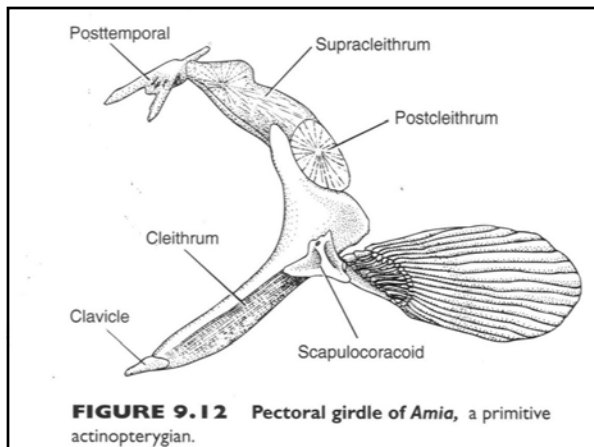
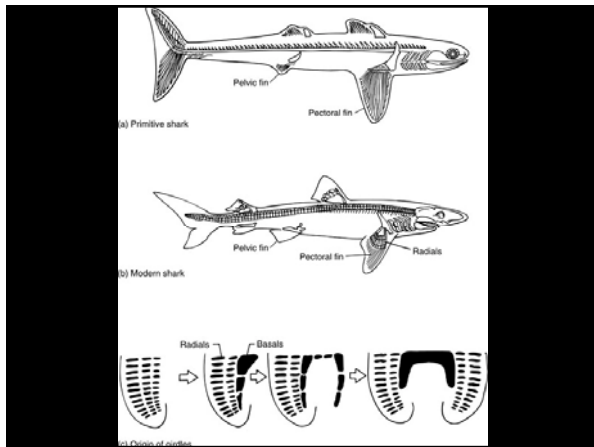
Fin-Fold (Balfour)

# Why evolve?

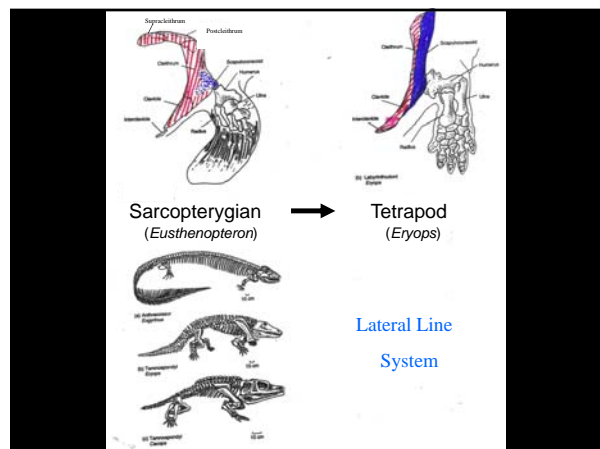
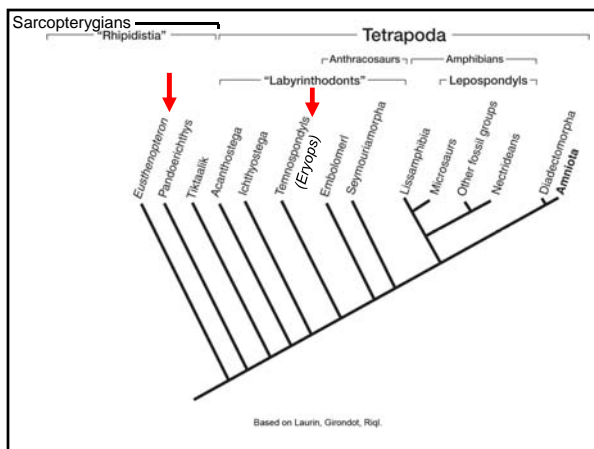
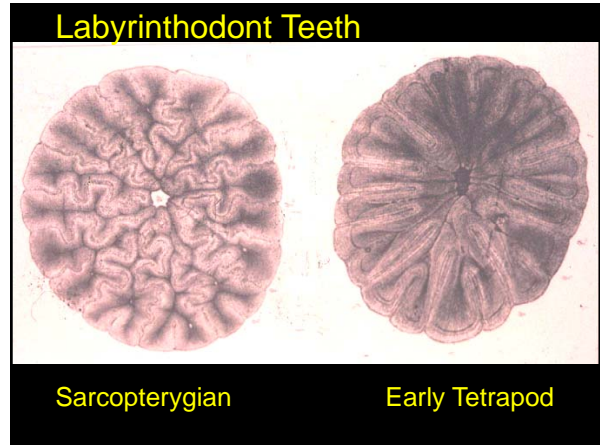
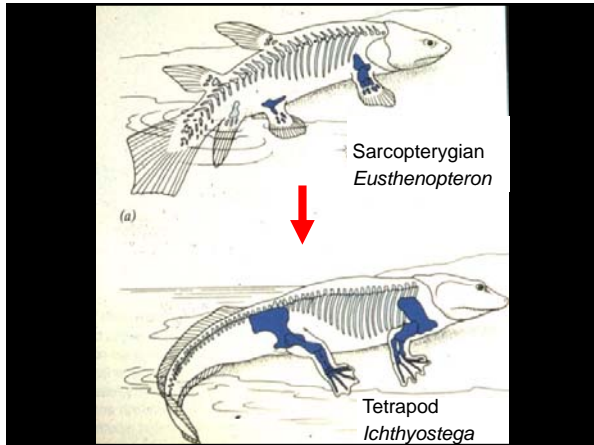
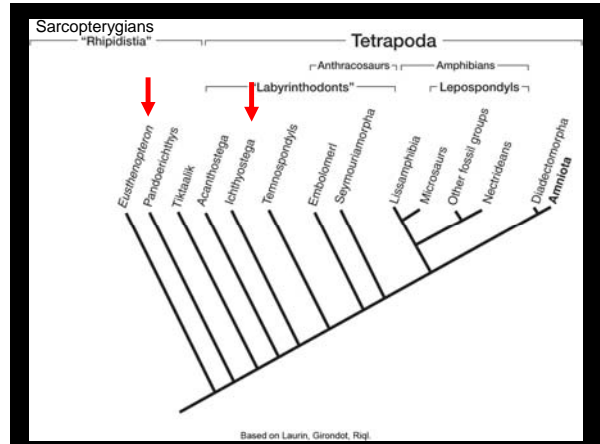


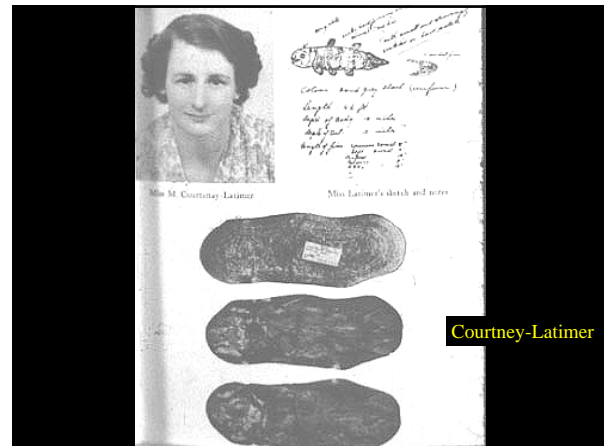
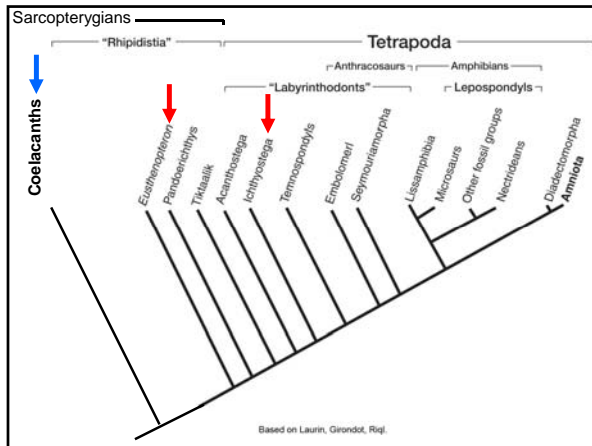
Primitive bony fish

Ostracoderms



Fin → Limb





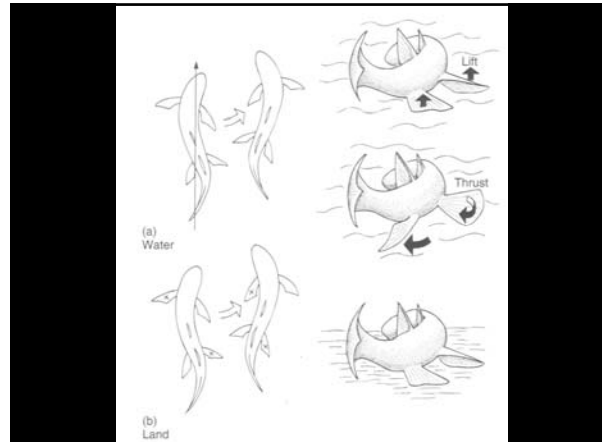
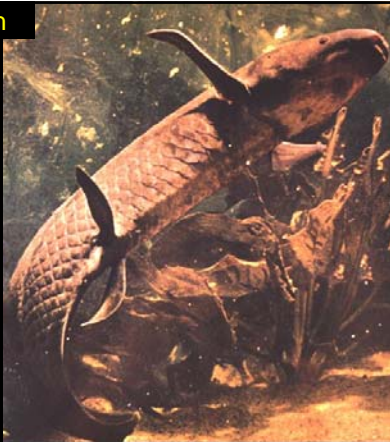
Courtney-Latimer



- Pectoral Girdle of Dual Origin
  - a) **endochondral component**--basal fin elements  
articulation of fin/limb  
attachment of musculature
  - b) **dermal component**—dermal armor  
brace & support
- Other Systems change as well

- Pectoral Girdle of Dual Origin
  - a) **endochondral component**--basal fin elements  
articulation of fin/limb  
attachment of musculature
  - b) **dermal component**—dermal armor  
brace & support
- Lobe-fins **Preadapted** → Limbs  
feature has necessary form and function *before*  
environment experienced  
--fortuitous  
--immediate selective advantage

Lungfish



•Pectoral Girdle of Dual Origin

- a) **endochondral component**--basal fin elements  
articulation of fin/limb  
attachment of musculature
- b) **dermal component**--dermal armor  
brace & support

•Lobe-fins **Preadapted** → Limbs

- feature has necessary form and function *before* environment experienced
- fortuitous
- immediate selective advantage

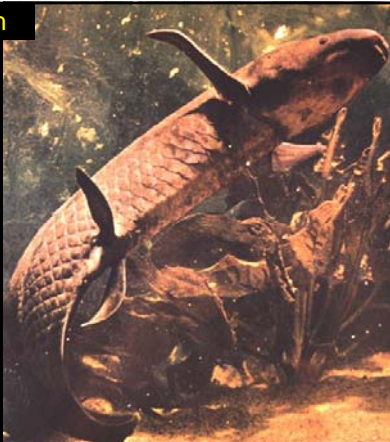
•Why move to land??

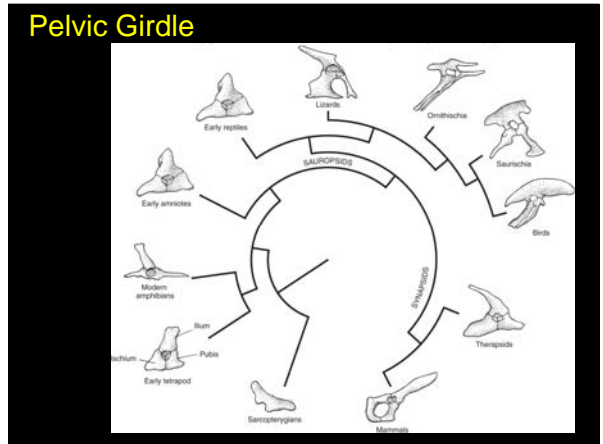
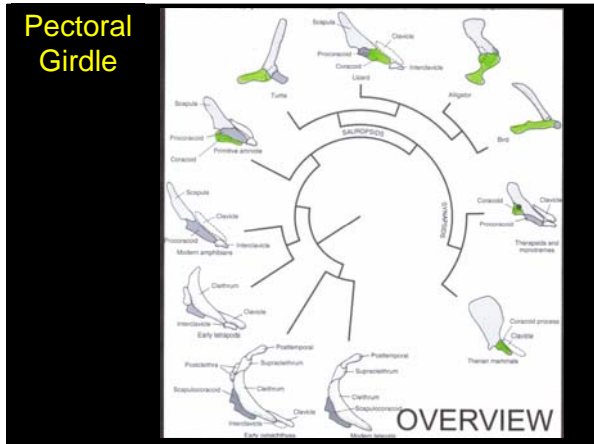
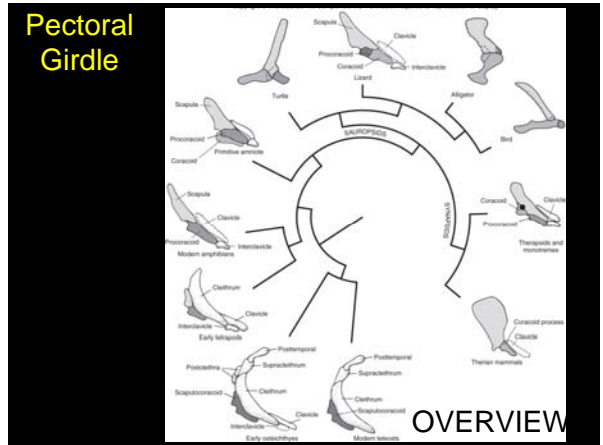
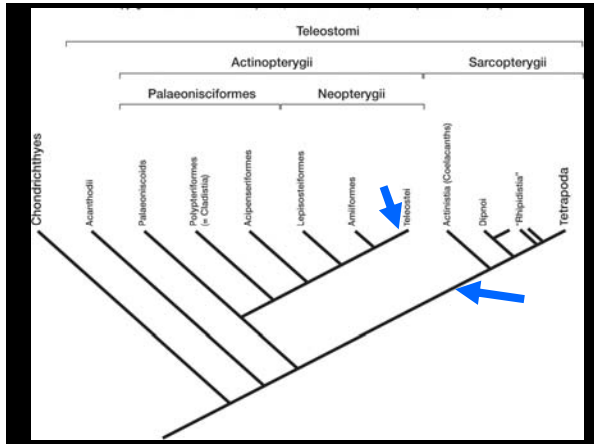
- stay in the water [but aestivate]
- escape predation
- other

Gary Larson →

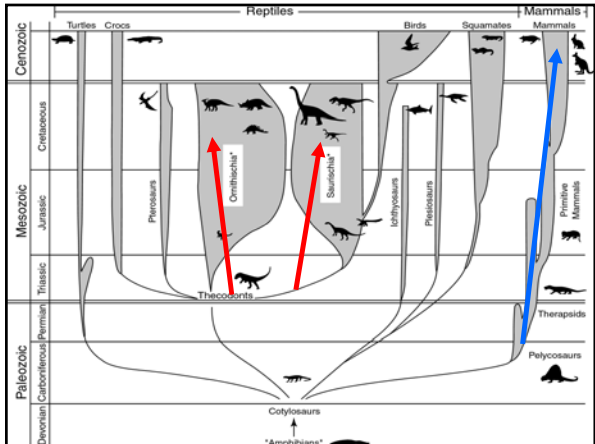
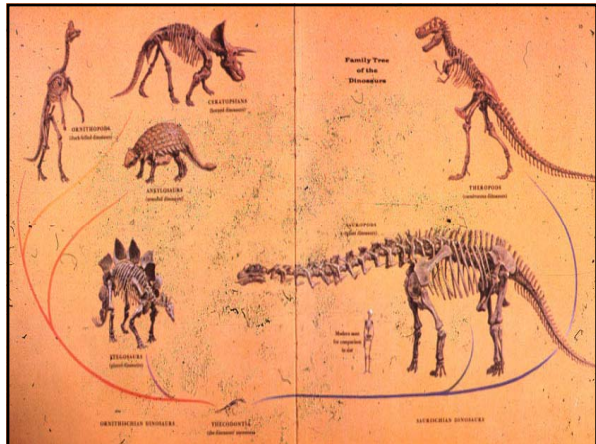
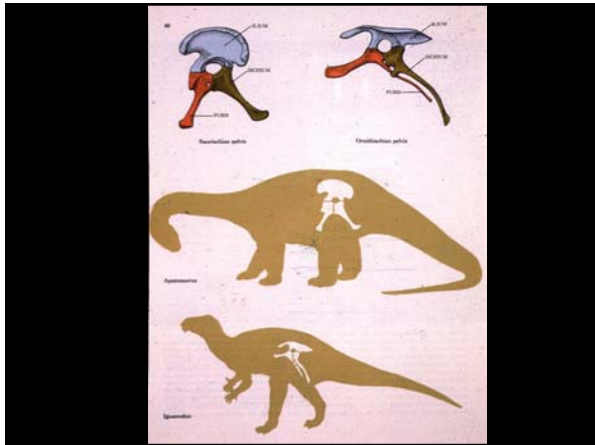
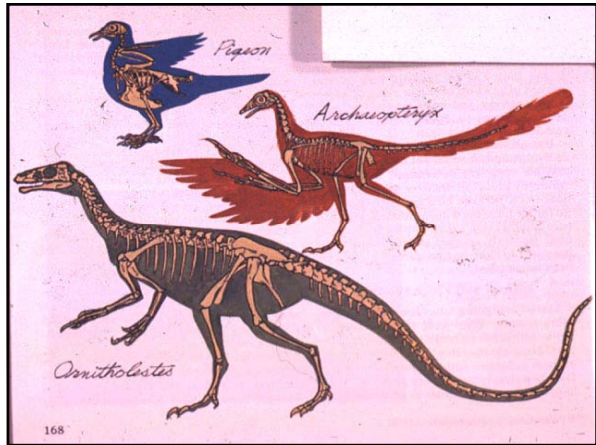
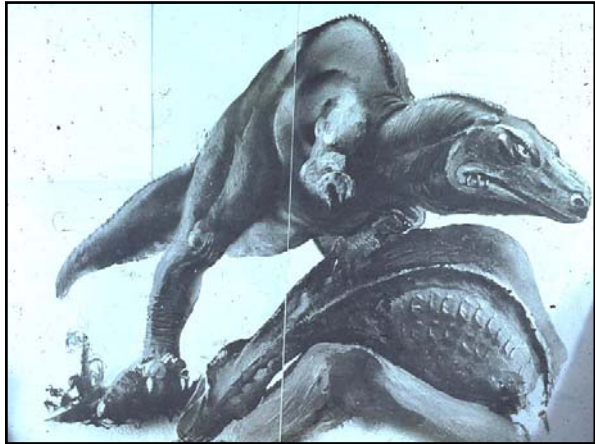


Lungfish

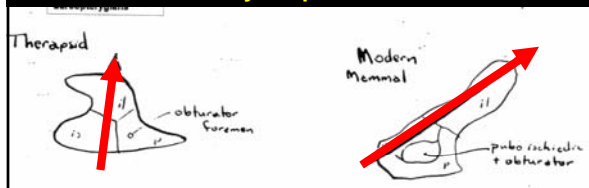








## Synapsids



- Excavation
- Orientation
- Pubis reduced