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# TERRESTRIAL VEGETATION

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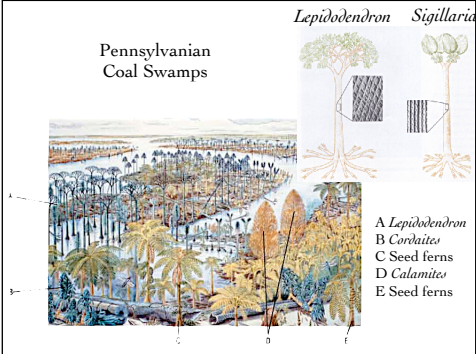
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Late Pennsylvanian/Early Permian



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Permian Vegetation

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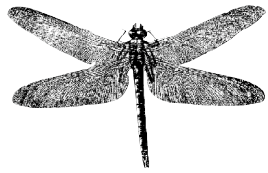
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*Meganuera* lived from Pennsylvanian through late Permian and had a wingspan of 75 cm!

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## VERTEBRATES

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# AMPHIBIANS

- **Ichthyostegalia** - Devonian
- **Batrachomorpha** - Miss. to Recent - includes modern amphibians
- **Lepospondyli** - Miss. to early Permian - various aquatic forms

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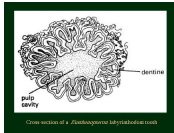
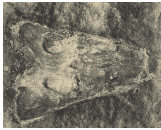
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## Oldest Amphibians Ichthyostegalian Labyrinthodonts



... and reconstruction  
The limbs were probably not strong enough to support a quadrupedal gait.

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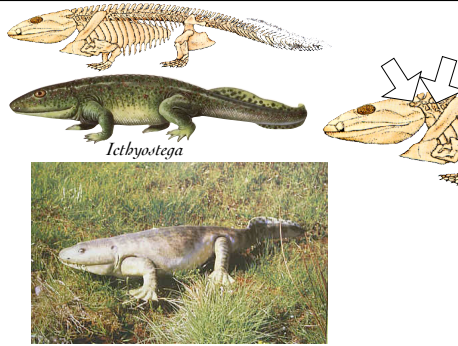
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*Ichthyostega*

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## BATRACHOMORPHA



Larval form



*Trimerorhachis*



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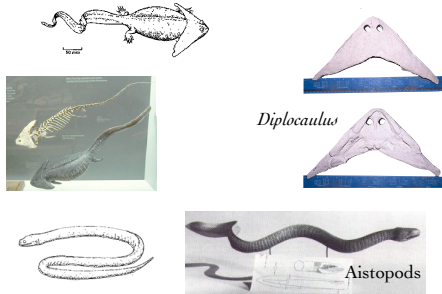
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# LEPOSPONDYLS



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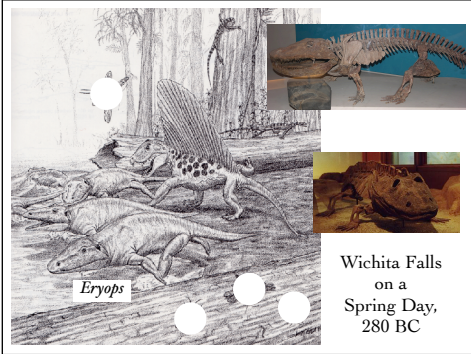
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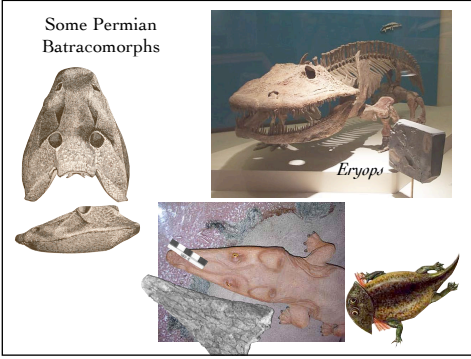
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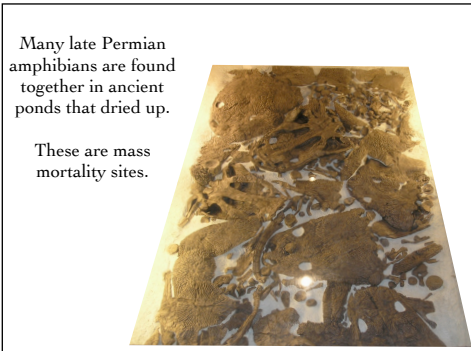
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### Dominant Groups of the Latest Paleozoic

 Phylum Brachiopoda - Articulates

 Phylum Cnidaria - Rugose corals

 Phylum Echinodermata - Crinoids

 Phylum Mollusca - Class Gastropoda

 Phylum Mollusca - Class Pelecypoda

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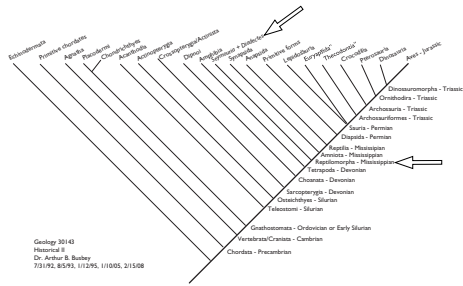
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### Phylogeny of the Vertebrates



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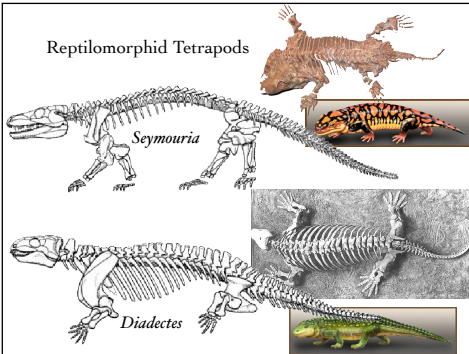
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### Reptilomorphid Tetrapods



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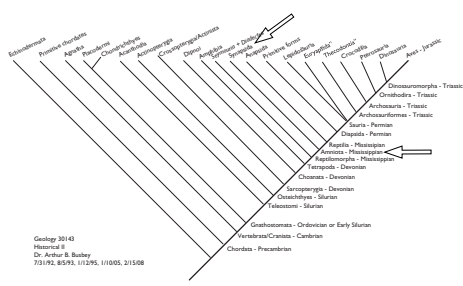
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### Phylogeny of the Vertebrates



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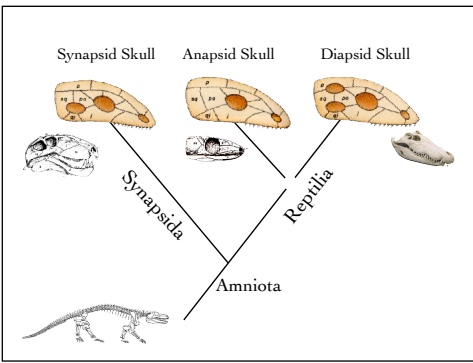
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### AMNIOTA

Amniotes have a variety of adaptations for terrestrial life, including:

- Amniote Egg
- Stronger limbs and vertebrae
- Epidermal layer of dead cells (epidermis)
- Lungs with negative pressure - costal pumping

Embryo    Yolk Sac

Chorion    Allantois

*Freedom From Water!!*

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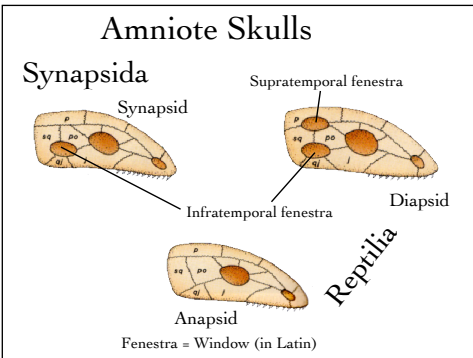
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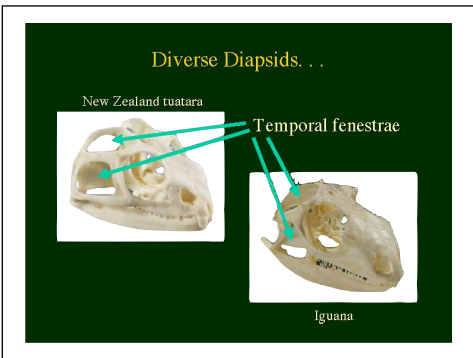
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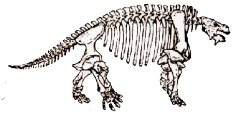
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**Anapsida**  
 (Pennsylvanian to Recent)  
 Many extinct forms  
 and Turtles  
 Largest numbers and  
 diversity in the Permian

Though there are a few small Diapsid  
 reptiles in the Paleozoic they are small,  
 not numerous and of minor importance.

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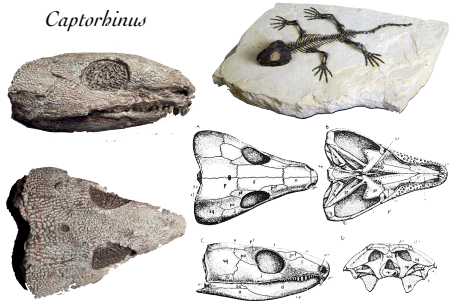
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*Captorhinus*



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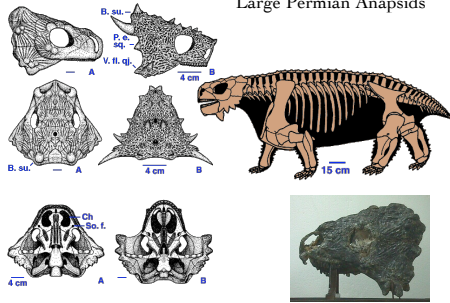
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**Pariesauridae**  
 Large Permian Anapsids



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*Mesosaurus*



Small,  
 Permian,  
 fresh water  
 anapsids of  
 the southern  
 hemisphere.

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# SYNAPSIDA

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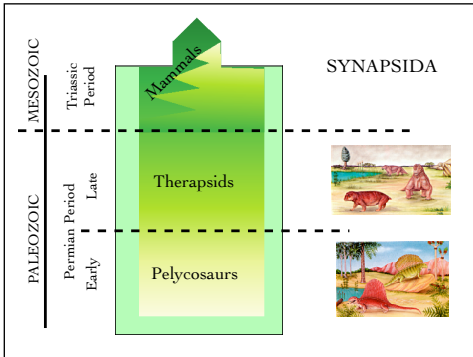
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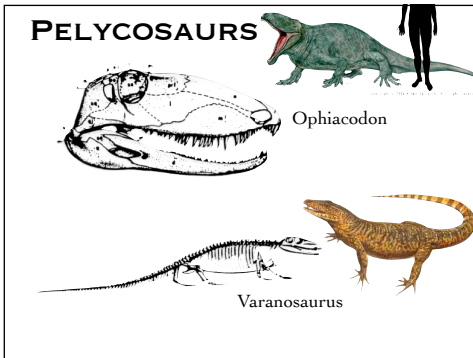
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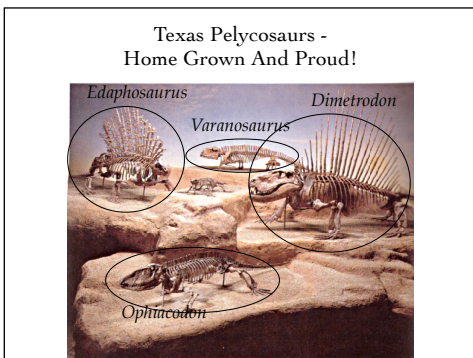
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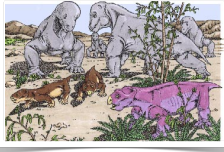
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Head butting  
Dinocephalians



49

# Three groups theriodonts – gorgonopsians, therocephalians and cynodonts

THERIODONTS

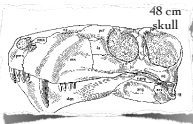
Theriodonts included the rest of the therapsids, including the ancestors of mammals.

In this reconstruction from South Africa, a large carnivorous Cynodont (Gorgonopsian) faces two small carnivorous forms. Two herbivorous forms plod on in the foreground.

The hair and snow are totally problematic.

50

Gorgonopsians - early Theriodont  
Therapsids



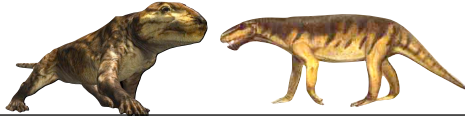
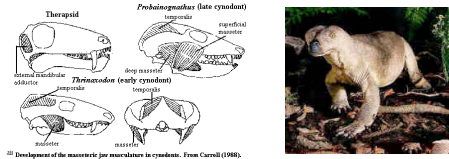
51

Therocephalians - Advanced Theriodont Therapsids



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# CYNODONTS



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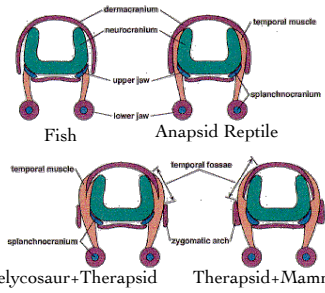
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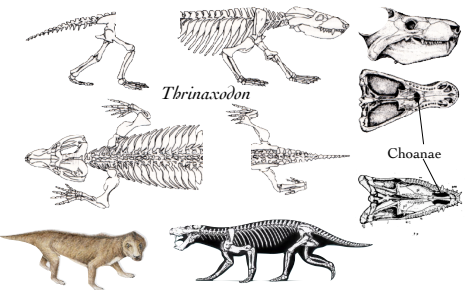
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## Advanced Cynodonts



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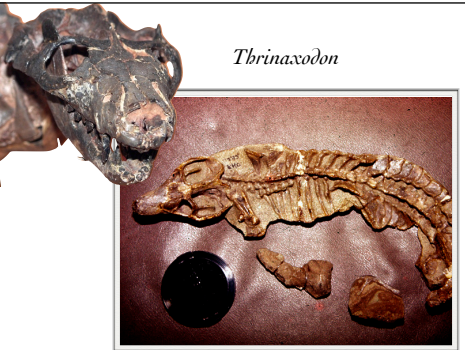
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## Thrinaxodon



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