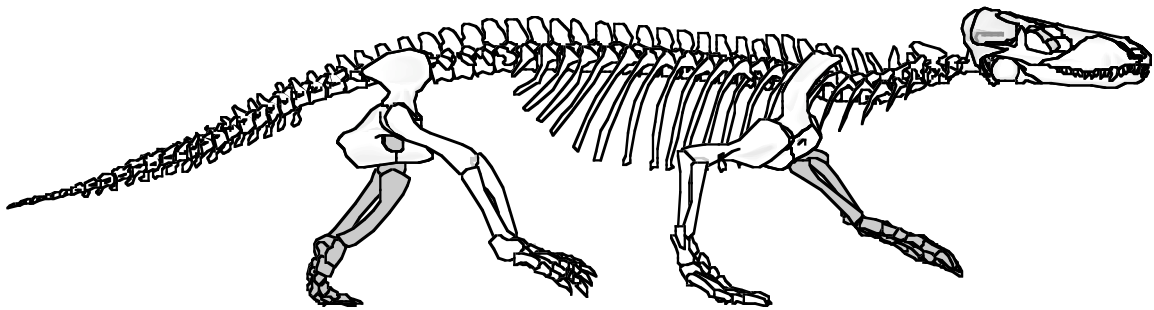


**GEOL431**  
**Due 3/2/15**  
**Homework II**

**General instructions:** Although you are allowed to discuss homework questions with your classmates, your work must be uniquely your own. Thus, please answer all questions in your own intelligible words. (When in doubt, use complete sentences.) If calculations are involved, show all work (so that I will have some basis for giving partial credit.)

This assignment involves the interpretation of illustrations. As long as what you turn in is intelligible, you may indicate your interpretations as you like, however we recommend that you use colored pencils to indicate structures and regions by neat clear cross-hatching.

**Major regions of the skeleton:** Interpret the skeletal illustration of the Permian protomammal *Procynosuchus delaharpae*.

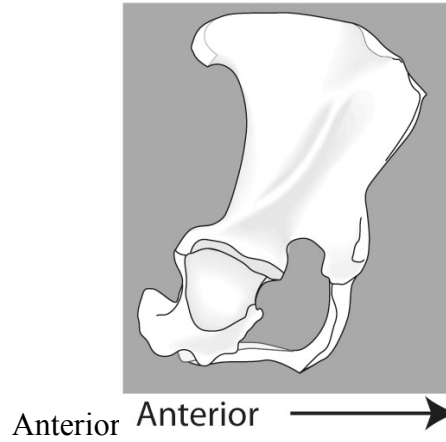


1. Using colored pencils or some similar means, shade in the elements of the appendicular skeleton.
- 2.) Label the major regions of the axial skeleton

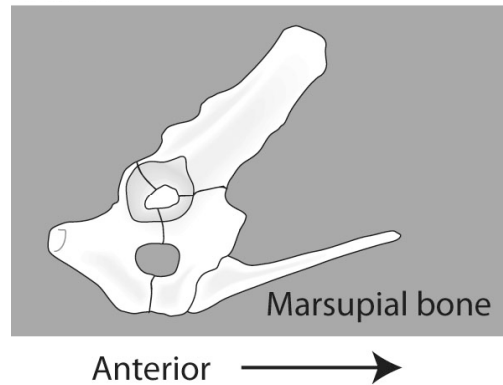
3. Three elements are visible in the pectoral girdle of the echidna, *Tachyglossus aculeatus* at right.

Label them and indicate for each whether it is endochondral or dermal.

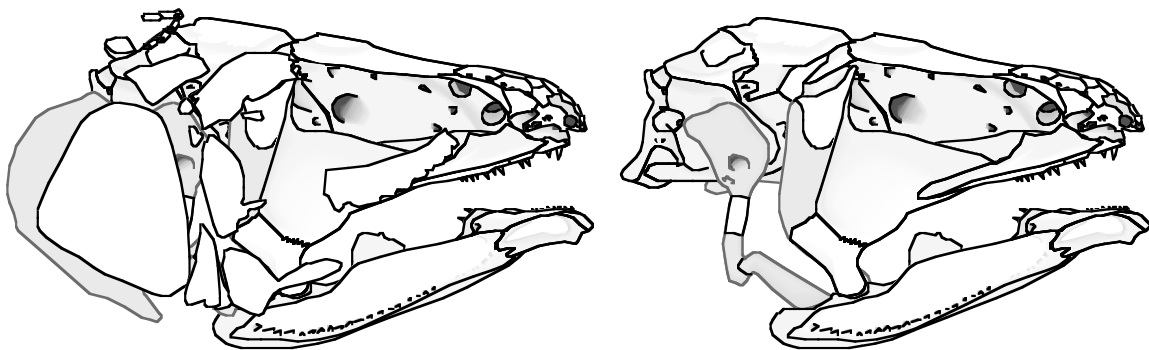
Label and identify the socket to which the humerus articulates.



4. Now do the same for the echidna's pelvic girdle. (In this case, the socket receives the femur.)



5. Below are images of the skull of the coelacanth *Latimeria*. At left we see it fully "clothed" with dermal bones of the cheek and snout. At right those have been removed. Using colored pencil (or whatever) shade in the neurocranium, palatoquadrate, Meckel's cartilage, and hyoid arch in different colors.



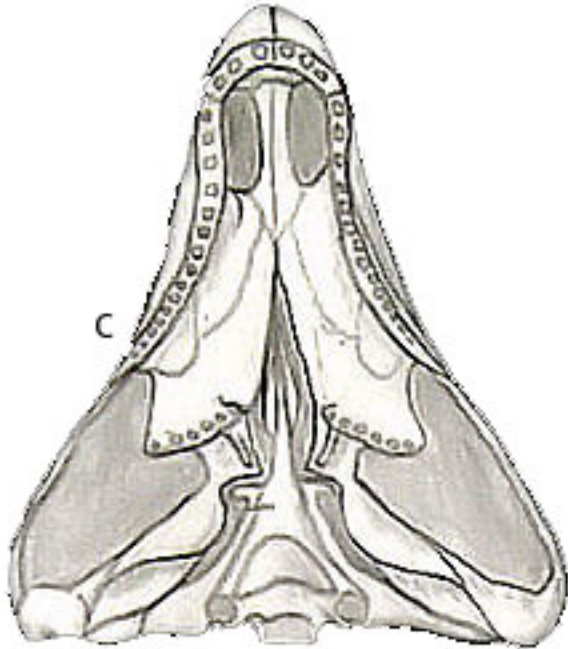
6. At right is the skull of *Limnoscelis paudis*, almost but not quite an amniote. In distinct colors, shade the elements of its:

- palatoquadrate
- neurocranium

leaving its dermal skull roof unshaded.

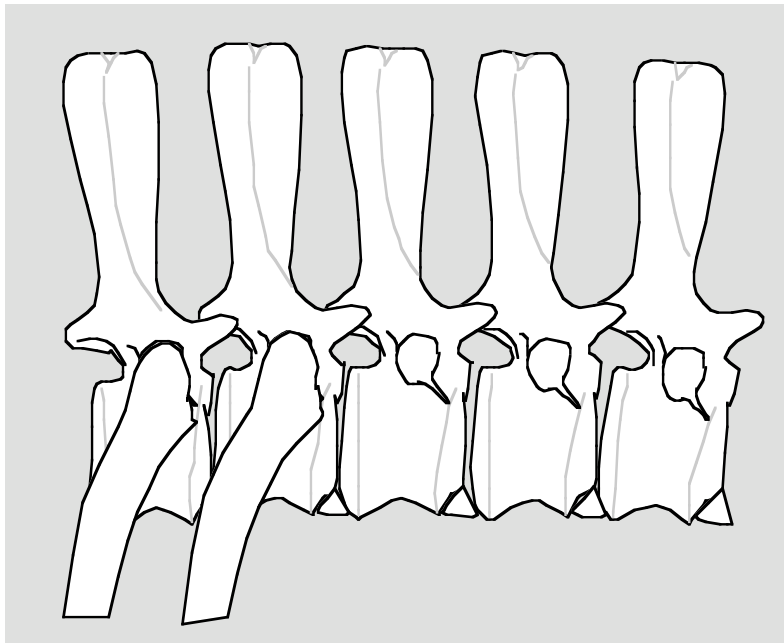
7. Label the following features:

- Choanae
- Occipital condyle
- Interpterygoid vacuity
- Basipterygoid articulation



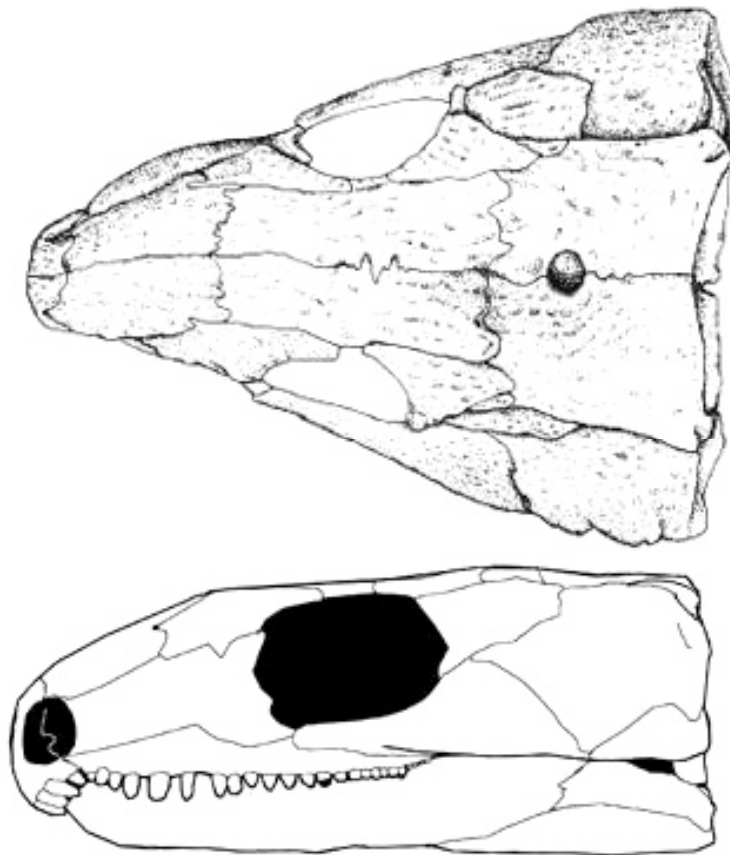
8. The image below shows dorsal vertebrae of the Permian protomammal *Ophiacodon retroversus* with some ribs removed. Label one each of the following:

- |                 |                  |
|-----------------|------------------|
| Neural arch     | pleurocentrum    |
| intercentrum    | neural spine     |
| prezygapophysis | postzygapophysis |



Is anterior to the left or right?

9. Label every visible element of the dermal skull roof (and jaw) of the stem reptile *Captorhinus aguti*. Don't neglect the small elements at the posterior end of the skull. (Hint: Some of the elements in *Greererpeton* are not present. In fact, only the posteriormost of the temporal series is there, and it is inconspicuous.)



10. In the skeleton of the dogfish *Squalus acanthias* identify at least one of the following features:

Neurocranium

Meckel's cartilage

Ceratohyal

Epibranchial

Hypobranchial

Palatoquadrate

Hyomandibula

Pharyngeobranchial

Basibranchial

Pharyngeobranchial

