Geology 103 Names:

Lab 6: Paleontology and paleoecology

Vertebrate fossils, both marine and terrestrial, are more rare in the rock record than invertebrate fossils. This is due to both the smaller populations and number of species of vertebrates. This paucity also means that most colleges are not able to maintain a good vertebrate fossil collection. Fortunately, we are near a major museum that specializes in curating such fossils.

Head south on I-5 to exit 169; take the NE 45th St. offramp. Turn left (east) onto NE 45th St. and continue past the Ave. to 15th Ave. NE and turn right. Head south past NE Pacific St., and find street parking; Hitchcock Hall is the reddish brown building on the southeast corner of 15th and Pacific. The displays are located in the lobby areas of various floors; their positions may have changed, so you may have to hunt for a bit.

Part 1 — Hitchcock Hall, University of Washington campus

Look at the display cases on the each of the stated floors.

4th floor, top of the stairs. 1. The Silurian Coral Reef diorama contains much information about habitat of these extinct creatures. It was reconstructed from fossils found in the Detroit Limestone in a quarry near Chicago. List at least *one* organism in the diorama from each of the following habitats: **planktonic** (floating), **nektonic** (swimming), **epifaunal** (on the ocean floor surface) or **infaunal** (burrowing).

1st floor lobby. 2. Do the same for the Eocene period diorama (derived from fossils in the Cowlitz Formation in southwestern Washington).

3. What **depositional environment** is the Cowlitz Fossil site shown as (look at the little map)? Where are these sediments shown to be coming from?

4th floor, top of stairs. 4. Look at the Silurian fossils display (behind the Siluran Coral Reef display). What is the **closest** to Seattle locality of any of these fossils? Yet the little map at the bottom of the case shows Silurian oceans where Washington one day would be. Why don't we find Silurian period fossils in Washington?

2nd floor lobby. 5. Look at the Washington State Fossils (the case nearest the door on the right side of the hall). What is the **oldest** fossil? Where is it found? What is the most **recent** fossil? Where is it found? As one moves **westward** from Spokane to Seattle, what happens to the age of the rocks?

If you have time, look at the impressive collections of **trilobites** (1st floor lobby), **ammonites** (3rd floor lobby) and **petrified wood** (2nd floor lobby).

Return to 15th Ave. NE and head north. Turn right on NE 45th St. and turn right again at 17th Ave. NE, which is the entrance to the UW campus. Stop at the kiosk and pick up a parking permit; pass the museum and turn right into the parking area for the museum. Go to the front entrance.

Part 2 — The Burke Museum, University of Washington campus
Enter the museum. After checking in at the information desk, go to the left and find the first kiosk (the tall thing with the monitors on it). From there, follow a clockwise path around the upper floor of the museum; look for the exhibits that will help you answer the following questions.

Along the first set of fossil displays, note that each window corresponds to a different period. Proceeding from left to right, the first window is the Cambrian, the next is the Ordovician, etc.

6. What depth of water did the **cystoids** in the Cambrian display live in?

7. With the "armor-plated predators" appearing in the Devonian display, why is it difficult to determine the **water depth** in which these organisms lived?

8. Off to the side, there is a **water lizard** skeleton in a glass case. How is this critter evidence that **continental drift** occurred?

Advance to the **dinosaur display**.

9. Observe the reconstruction of *Stegosaurus*. Look at the mouth of the dinosaur and determine if it was a **carnivore**, **herbivore** or **scavenger**. What feature of its mouth and jaw allowed you to draw this conclusion?

10. Look at the feet of *Archaeopteryx*, *Allosaurus* and *Stegosaurus*. From which of the two dinosaurs did *Archaeopteryx* evolve? What foot feature provides the evidence for your conclusion? (Also, look at the differences in the hips of the two dinosaurs; *Archaeopteryx* has a similar hip, though difficult to see in the fossil, as *Allosaurus*).

Move onto the **Tertiary Period** displays (the case on the left side of the hall).

11. Observe the diversity of Tertiary plant fossils found in Washington; what is the **grain size** of the sediment which preserves these fossils? What can you infer about the **water energy** in the water at the time these plant remains were deposited?

12. Note the lack of **vertebrate fossils** in this case. Suggest a reason that would account for the diversity of intact plant fossils and the missing vertebrate fossils. Hint: in what depositional environment were the plant fossils deposited?

You'll have to move back and forth between **the Mesozoic, Tertiary and Quaternary Period** halls for the next two questions.

13. Describe differences between the *Plesiosaur* (Mesozoic) and the whale (Cenozoic). Hint: look at the head and the backbone. The Plesiosaur is thought to have been cold-blooded (**ectotherm**) and the whale is warm-blooded (**endotherm**); how could you tell from the differences you described?

14. Describe differences in the **feet** of the *Stegosaurus* and the mammoth. What about the feet might suggest that the mammoth was an **endotherm**?

Wander into the **Ice Ages area** and look at the display case to the right.

15. Note that the arrowheads are all made of **chert**. How else does chert form? (Hint: this is not the story I told in class) Note that all these arrowheads were found in the East Wenatchee area. What might be the source of this chert?

16. What might have caused the "Washington Giants" (the **megafauna** of the Pleistocene) to go extinct? Look at the timing of this event and the advent of another species in North America.