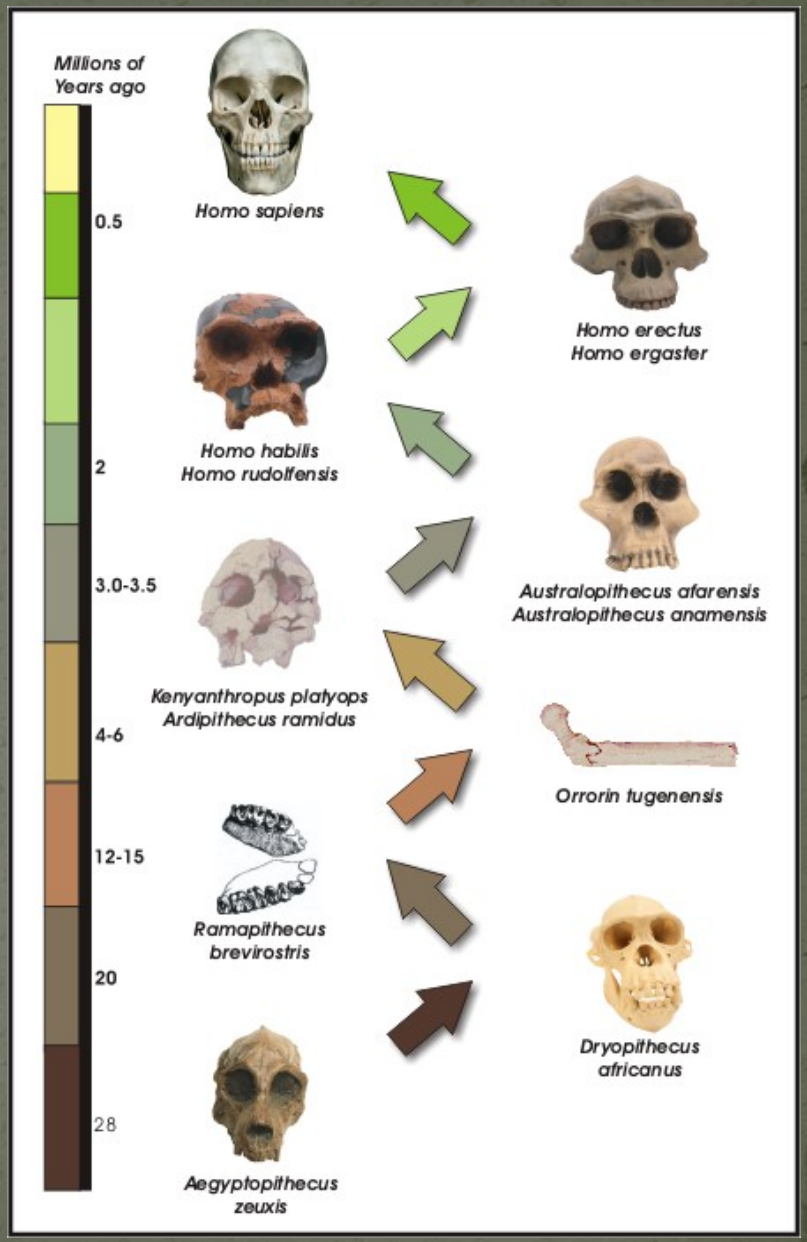
Evidence for Evolution

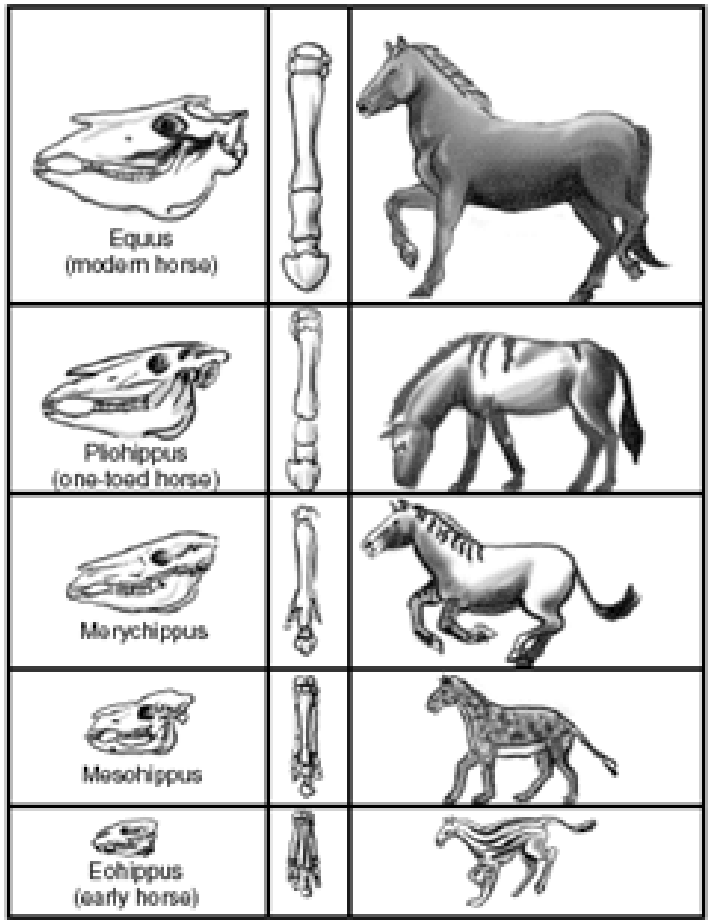
5 Types…

1. Fossil Record

- The fossil record shows that ancient species share similarities with species that now live on Earth.



How does the fossil record show <u>evidence for evolution</u>?



The diagram above shows the changes over time in the horse.

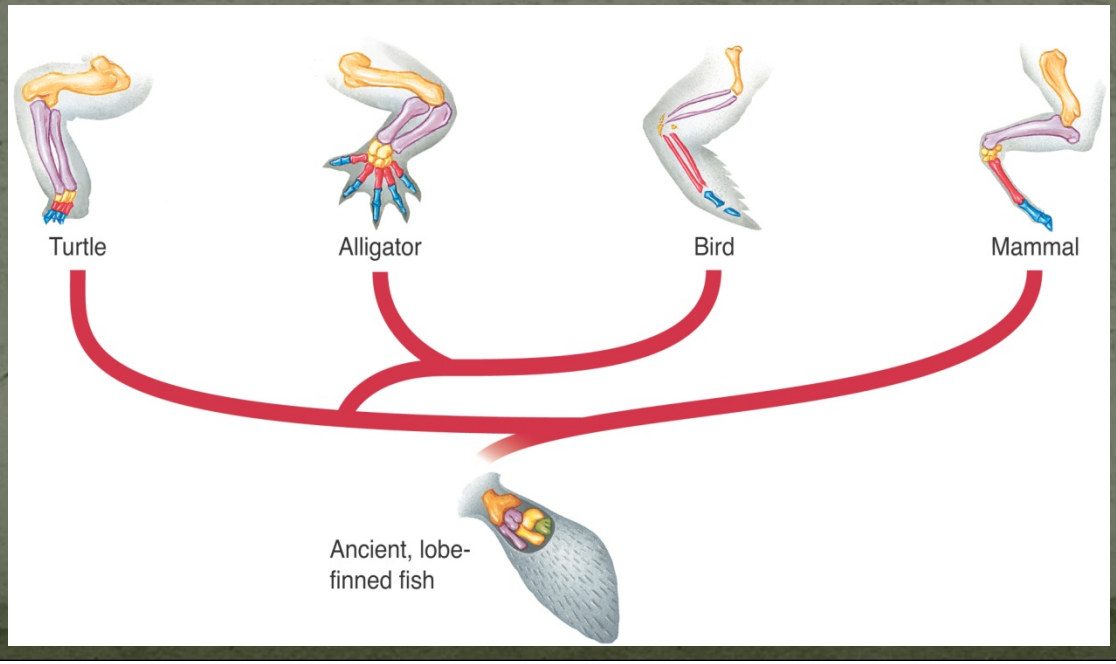
- Scientists compare older fossils with younger fossils & observe similarities in the fossils.
- They compare adaptations between the older and younger fossils.
- Fossils show that ancient species share similarities with species that now live on Earth.

2. Anatomical Similarities

- Homologous structures: **anatomically similar structures** inherited from a common ancestor.

How do **homologous structures** provide evidence for evolution?

- Similarities & differences show how recently species last shared a common ancestor.



2. Anatomical Similarities

- Vestigial structures: structures that are a smaller version of functional structures in other organisms.
  - Example: nictitating membrane

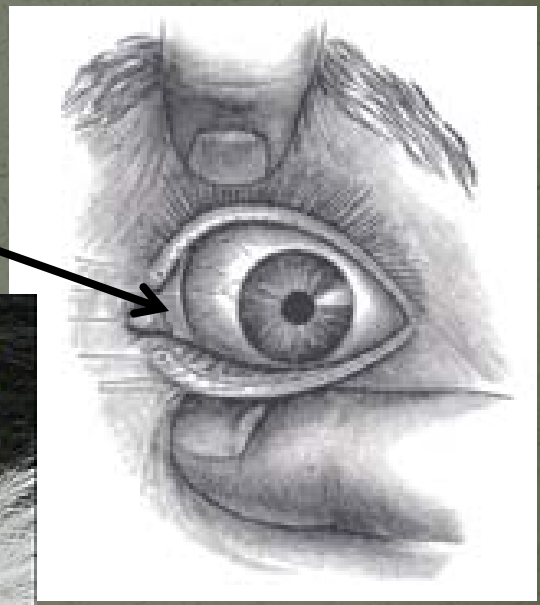


Table 15.2 Vestigial Structures

Trait	Description
	The attachment point for legs and is therefore nonfunctional in an animal without legs.
	The wings are too small to be of any use in flight.
	This is a 5–15 cm long structure important for digestion in many mammals, but of limited use.

Kiwi Wings

Human Appendix

Snake Pelvis

Drag each option to its corresponding description

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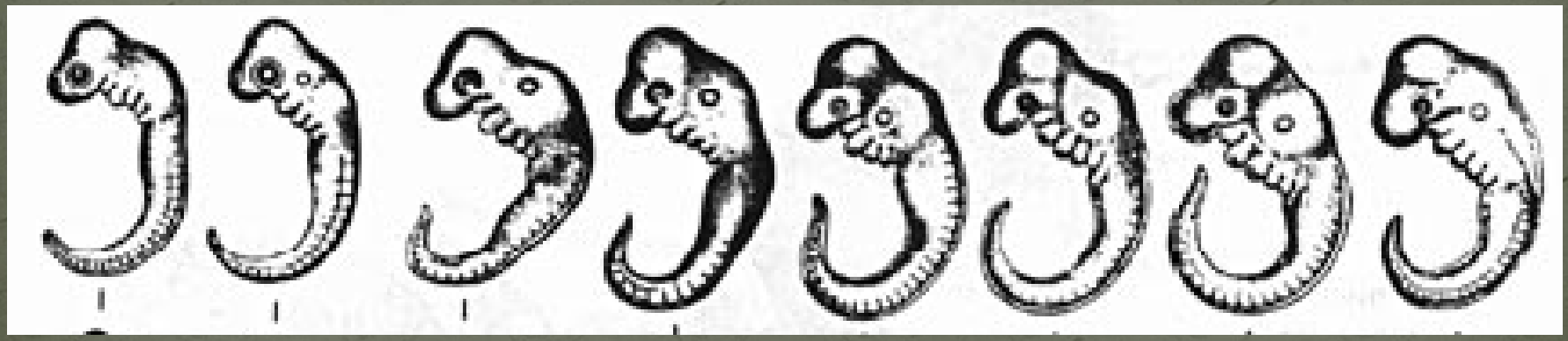
2. Anatomical Similarities

- Analogous structures: structures that are used for the same purpose, but are not inherited from a common ancestor.

3. *Embryology*

- The early developing stages of many animals with backbones are very similar.
- The same groups of cells develop in the same order & in similar patterns to make the tissues and organs of all vertebrates.

Embryos of 8 different species:



Can you tell which one is human?

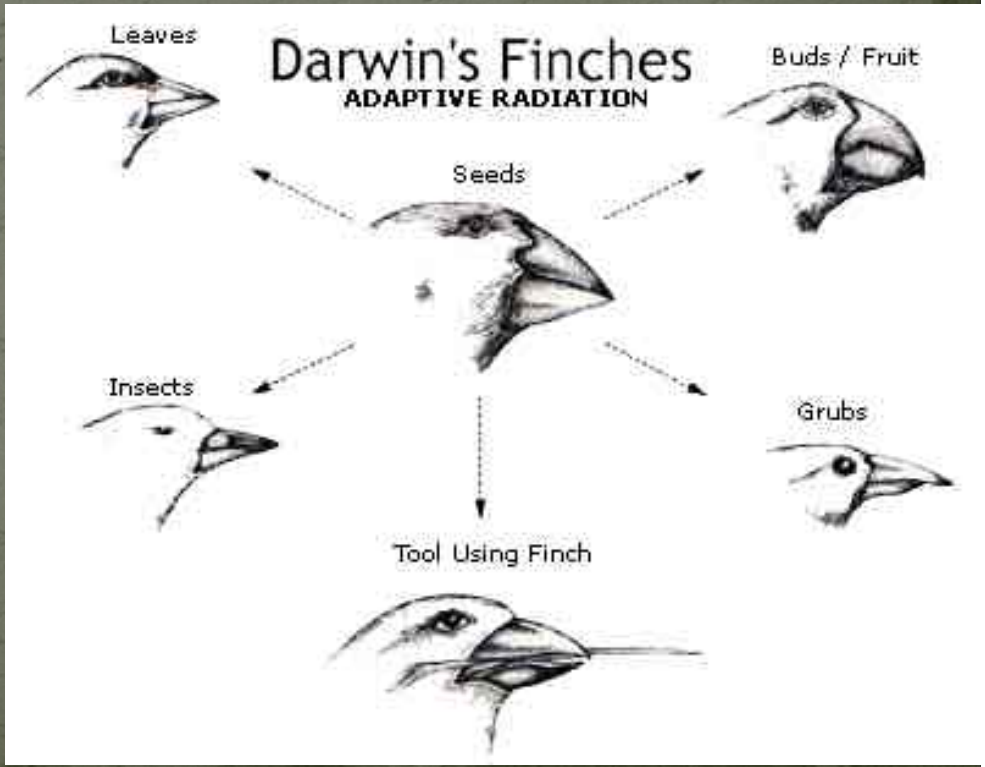
Fish Salamander Tortoise Chicken Pig Cow Rabbit Human

4. Biochemistry Similarities

- Some molecules are essential for all life processes
  - Examples: DNA, RNA, and proteins
- Common ancestry can be seen between different species in how similar complex molecules are that they share.
  - Example: Amino Acid sequences in hemoglobin protein in different species

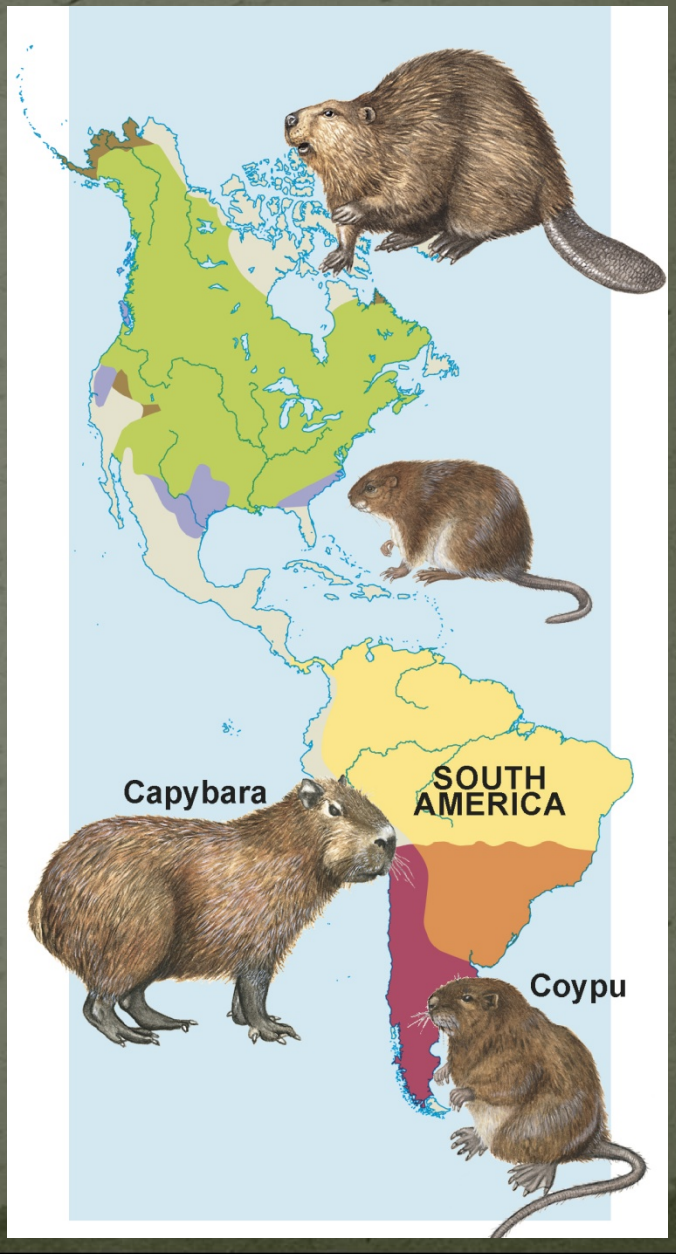
5. Geographic Distribution

- Darwin observed:
  - All Galápagos finches could have descended with modification from a common **mainland ancestor**
- He noticed that **similar environments** have **similar types of organisms**.



5. Geographic Distribution

- Animals on each continent living under similar ecological conditions are exposed to similar pressures of natural selection.
- Because of these similar selection pressures, different animals ended up evolving certain features in common.



What are the 5 Types of Evidence for Evolution?

1. Fossil Record
2. Anatomical Similarities
   Examples: *homologous structures & vestigial organs*
3. Embryology
4. Biochemistry Similarities
5. Geographic Distribution