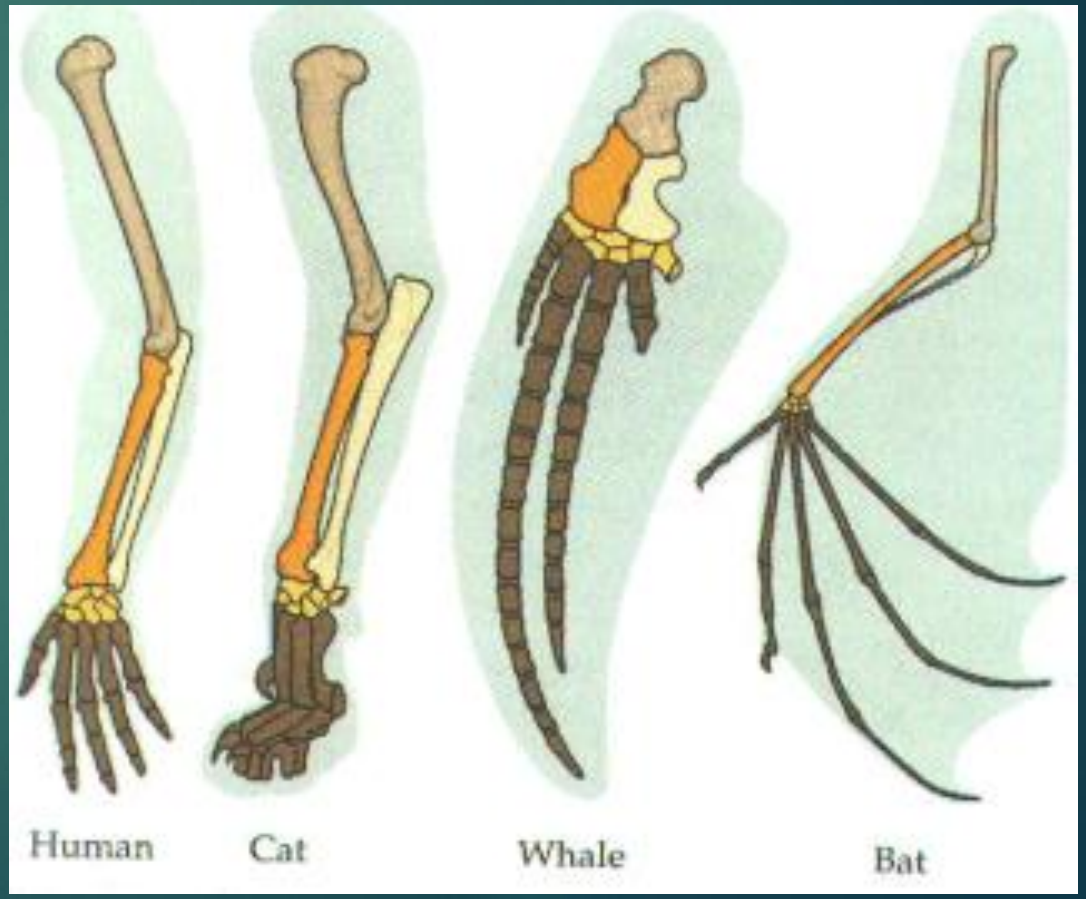
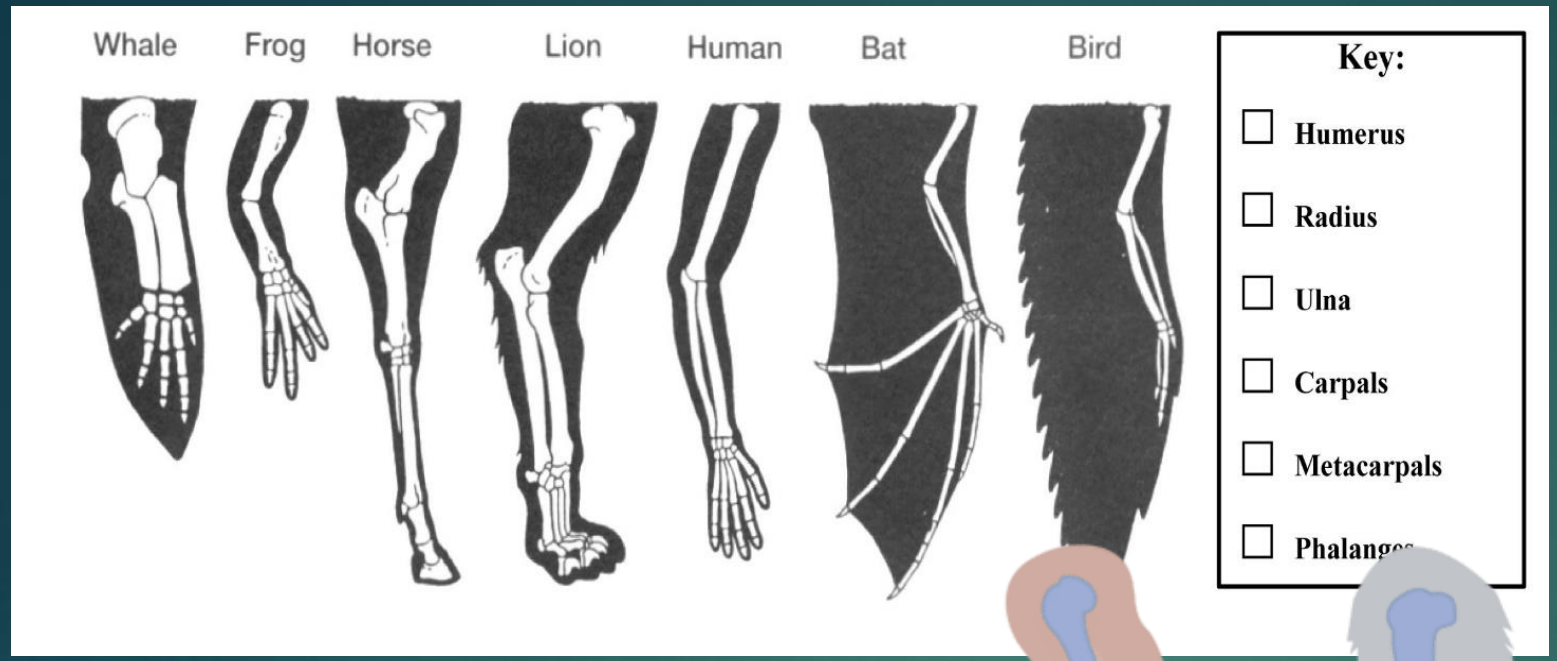
Evidence for Evolution

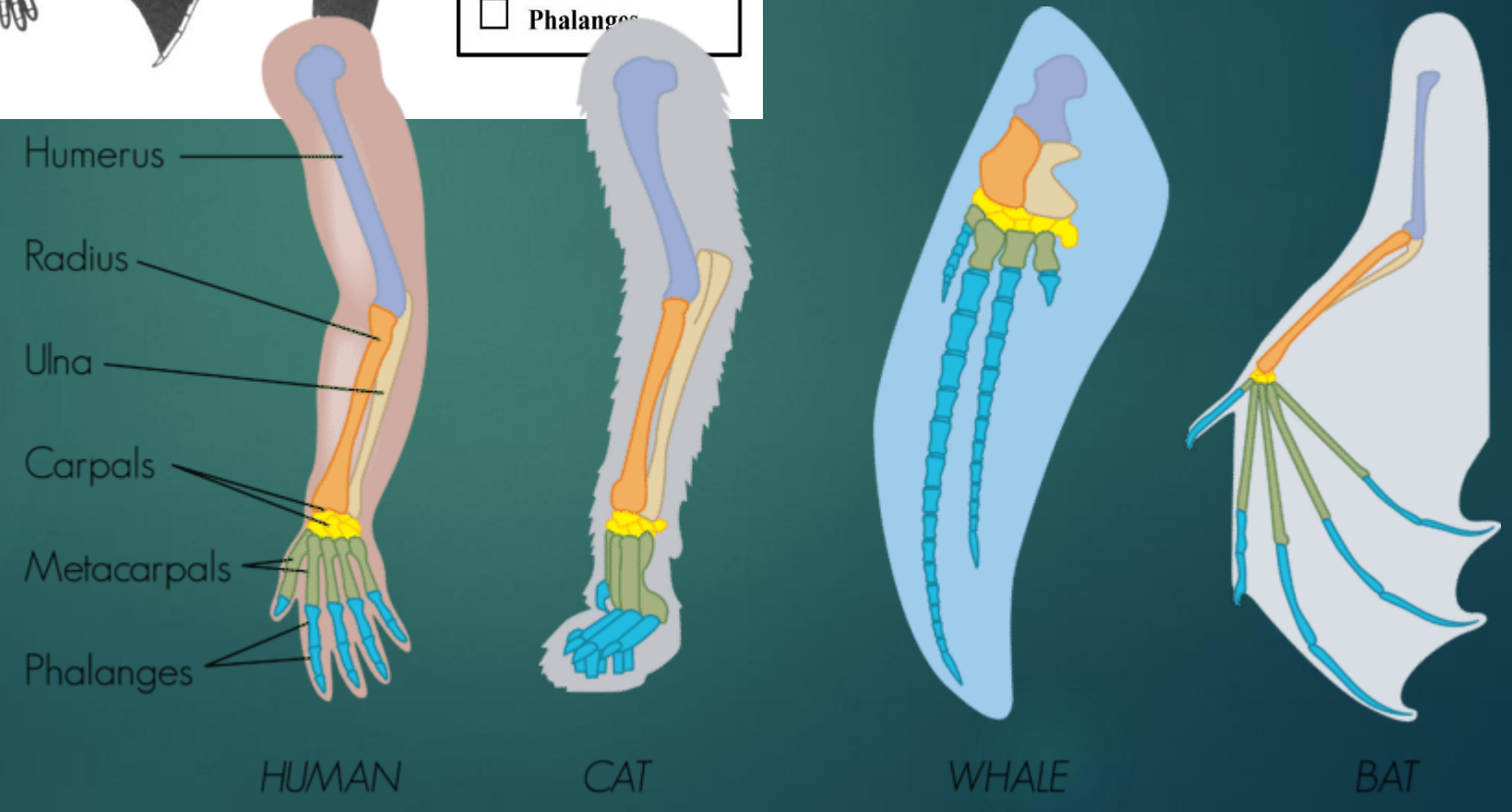
Comparative Anatomy

Homologous Structures

- **Similar in arrangement**
- **Suggest close common ancestry**




Whale
Frog
Horse
Lion
Human
Bat
Bird
Key:
Humerus
Radius
Ulna
Carpals
Metacarpals
Phalanges


Humerus
Radius
Ulna
Carpals
Metacarpals
Phalanges
HUMAN
CAT
WHALE
BAT

Analogous Structures

- **Similar in function but not structure.**
- They don't shed light on evolutionary relationships, they do provide evidence of evolution.
- For example, insect, bird and bat wings probably evolved separately when their different ancestors adapted independently to similar ways of life.

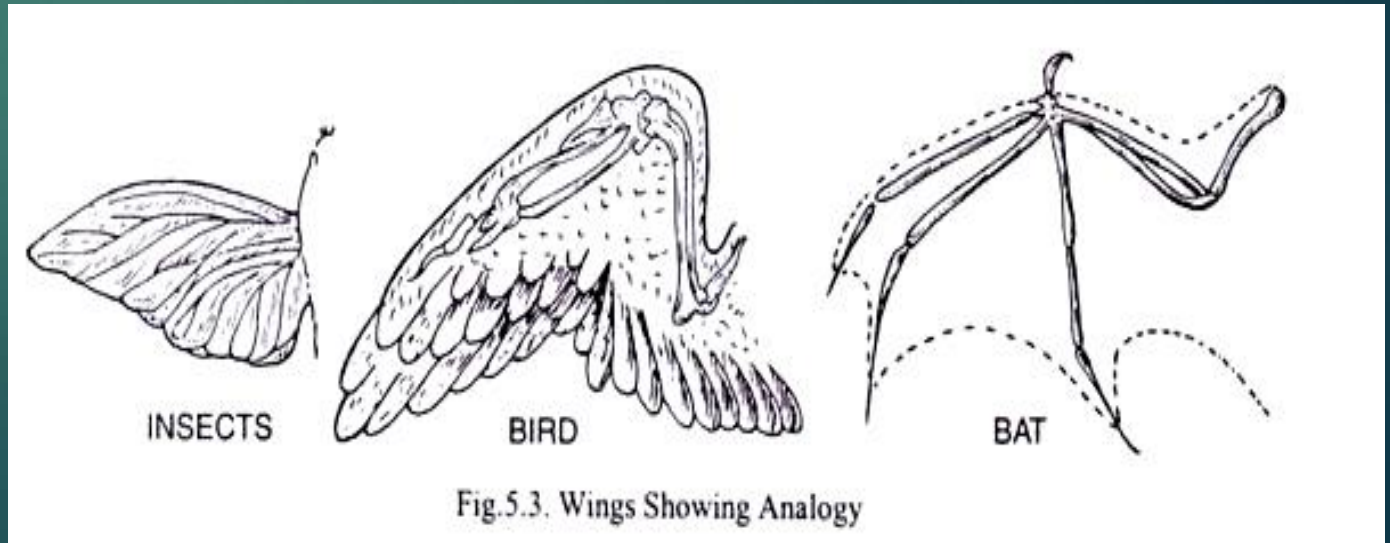


Fig.5.3. Wings Showing Analogy

Vestigial Structures

- **A body structure in a present-day organism that no longer serves its original purpose, but was probably useful to an ancestor.**
- A structure becomes vestigial when the species no longer needs the feature for its original function, yet it is still inherited as part of the body plan for the species.

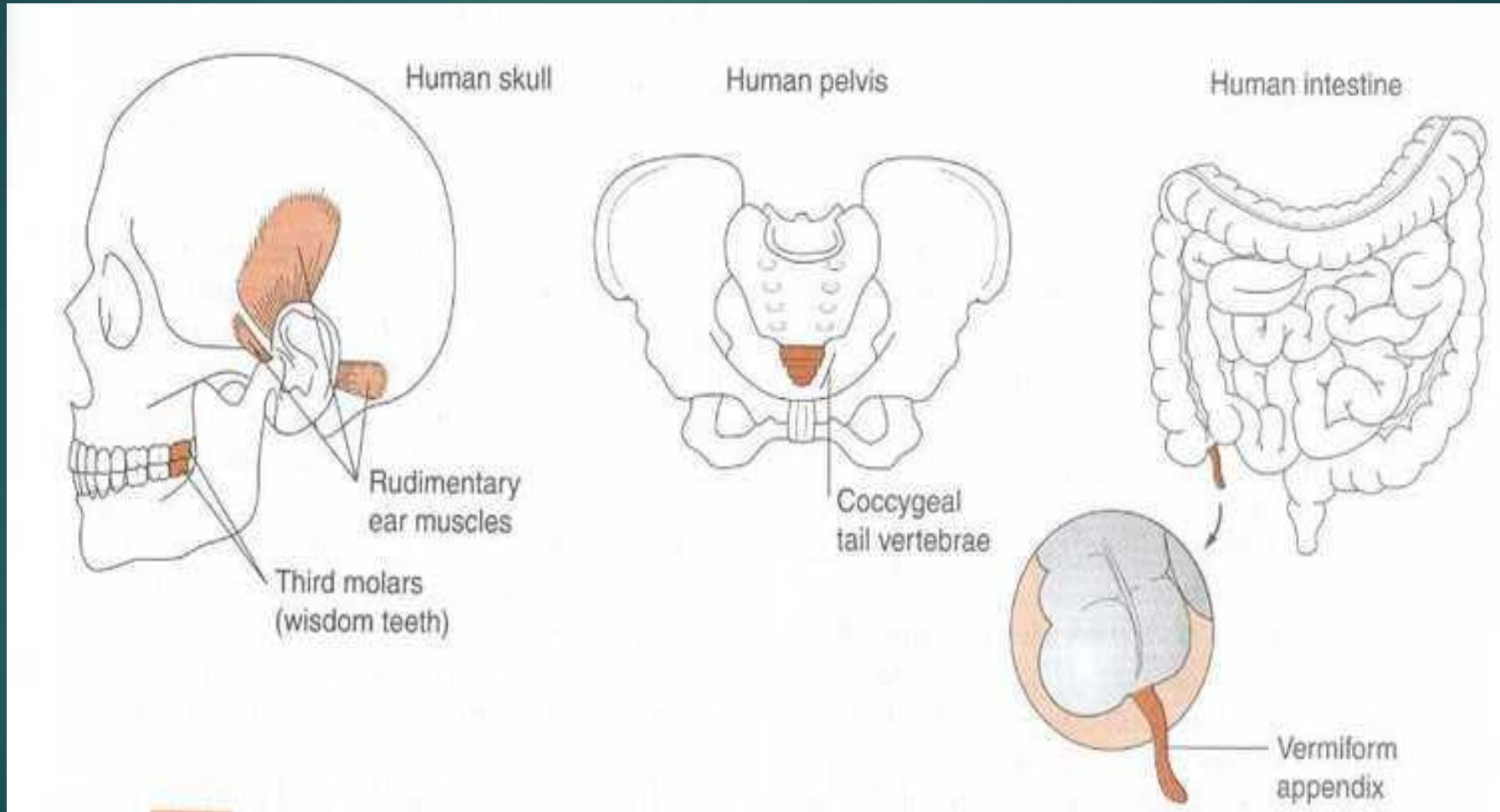
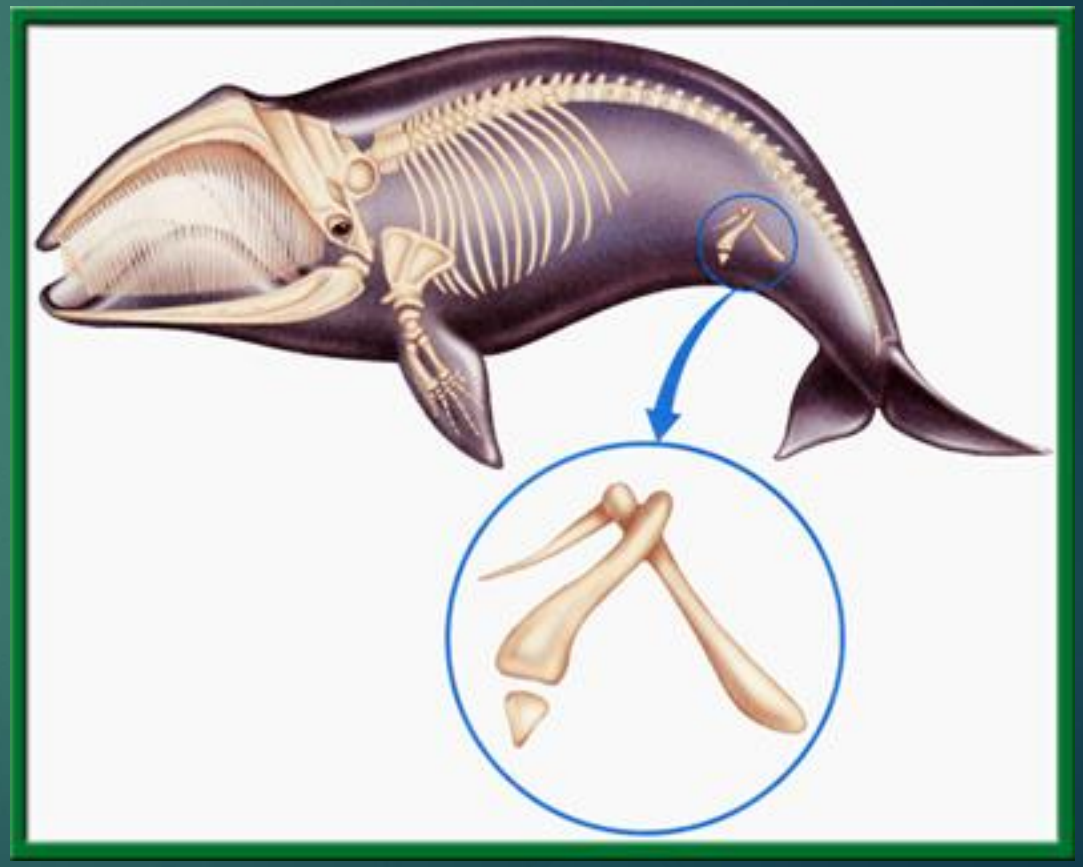


FIGURE 3–9 Some vestigial structures found in humans. (*After Romanes, modified.*)

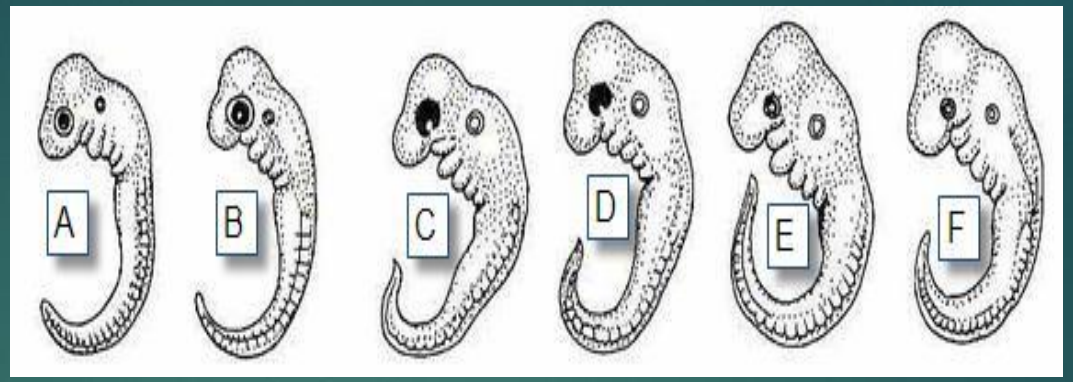
Vestigial Structures

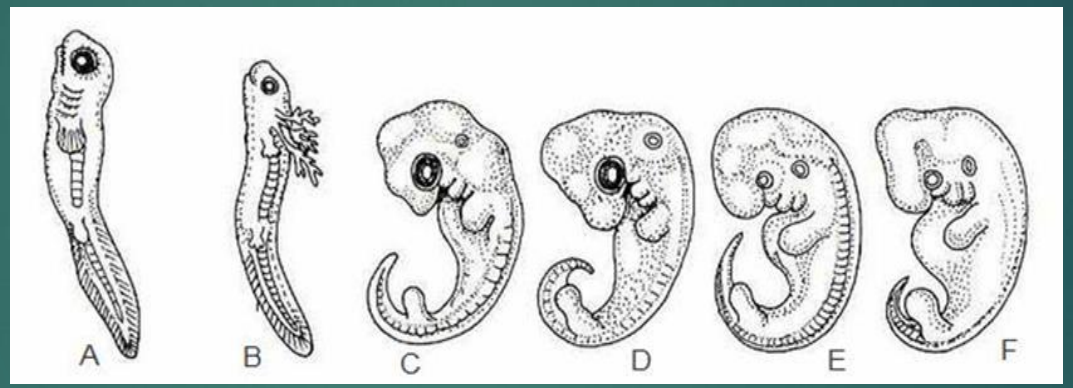
- Vestigial structures, such as pelvic bones in the baleen whale, are evidence of evolution because they show structural change over time.



Embryology

- The science dealing with the formation, development, structure, and functional activities of embryos.
- Scientists have compared similarities in the origin, growth, and development of an embryo.
- **These similarities in embryos suggest common ancestry.**


A
B
C
D
E
F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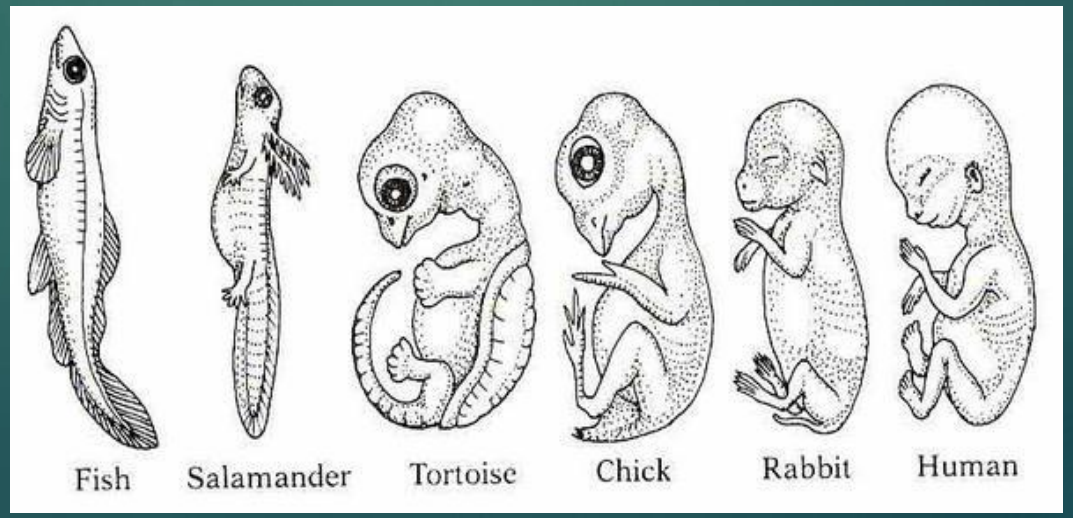
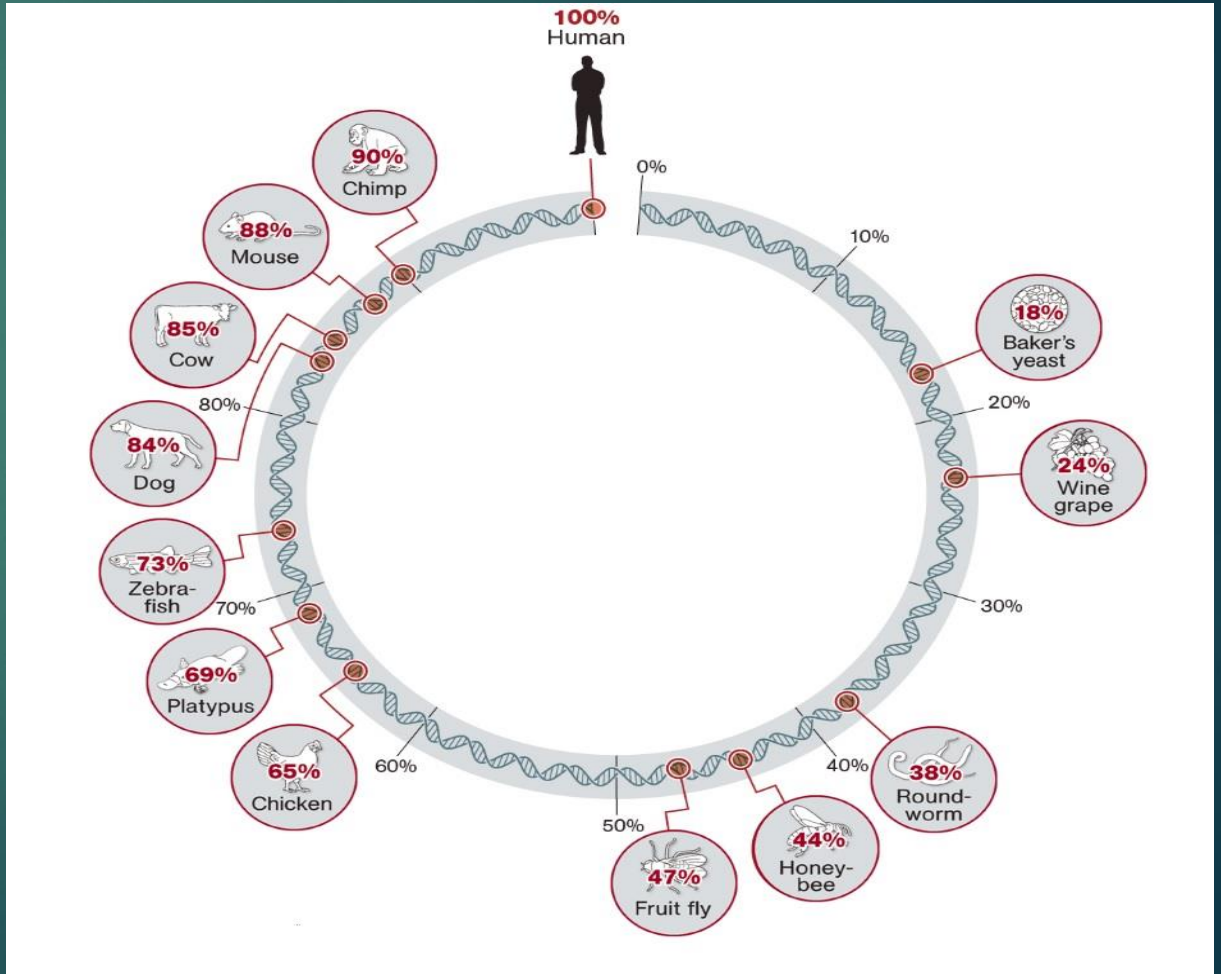

Fish
Salamander
Tortoise
Chick
Rabbit
Human

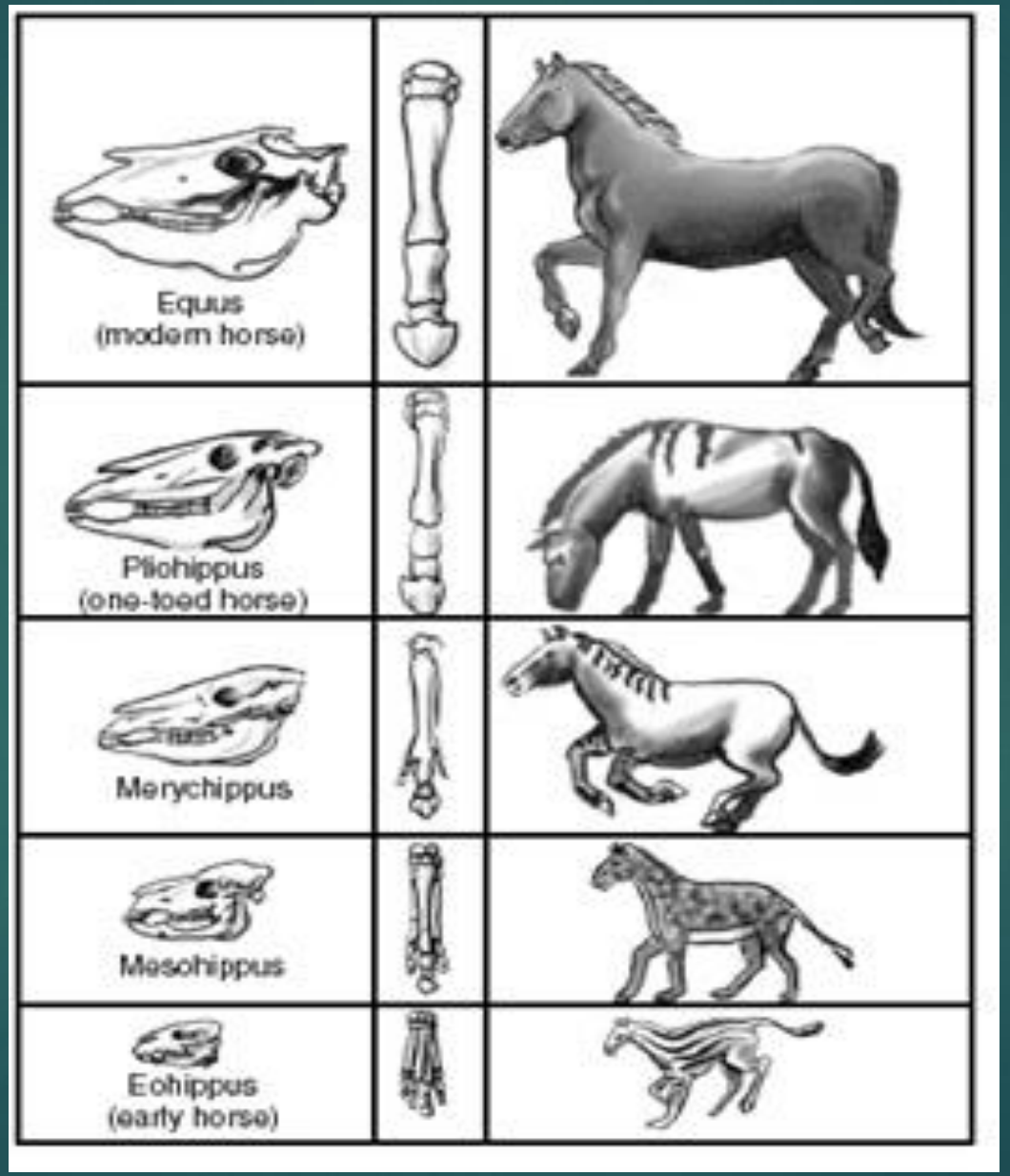
Shared DNA sequences

- Nearly all organisms share some of the same DNA base pairs.
- **The more base pairs that are the same the more alike or related the organisms are.**



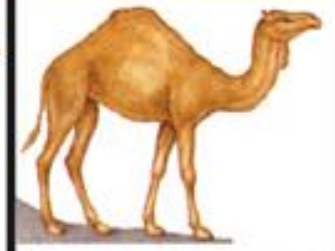
Fossils

- Fossils are an important source of evolutionary evidence because they **provide a record of early life and evolutionary history**.
- **As the fossil record becomes more complete, the sequences of evolution become clearer.**
- For example, you can see how paleontologists have charted the evolutionary path that led to today's camel after piecing together fossil skulls, teeth, and limb bones.


Equus
(modern horse)
Pliohippus
(one-toed horse)
Merychippus
Mesohippus
Eohippus
(early horse)

Fossils

Camel Evolution

Age	Paleocene 65 million years ago	Eocene 54 million years ago	Oligocene 33 million years ago	Miocene 23 million years ago	Present
Organism					
Skull and teeth					
Limb bones					

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