

The Origin of Life

How many of you have opened your refrigerator and found some leftovers with an unpleasant surprise?



Teacher's Notes

- ❖ Mold
- ❖ Where did the mold come from?
- ❖ Was it in the air or in the food originally?
- ❖ Did these mudskippers come from the mud or from the air?









iStockphoto™



❖ Where did the mold come from?



Did these
mudskippers
come from the
mud or from the air?





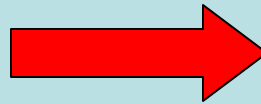
Define *Spontaneous Generations*

- Spontaneous generation is the idea that nonliving material can produce life.

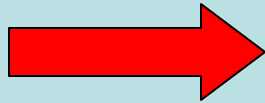
Spontaneous Generation

💡 Need to understand that old beliefs of our ancestors thought

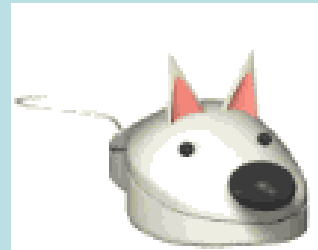
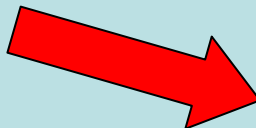
- Decaying meats



- Mud



- Grains



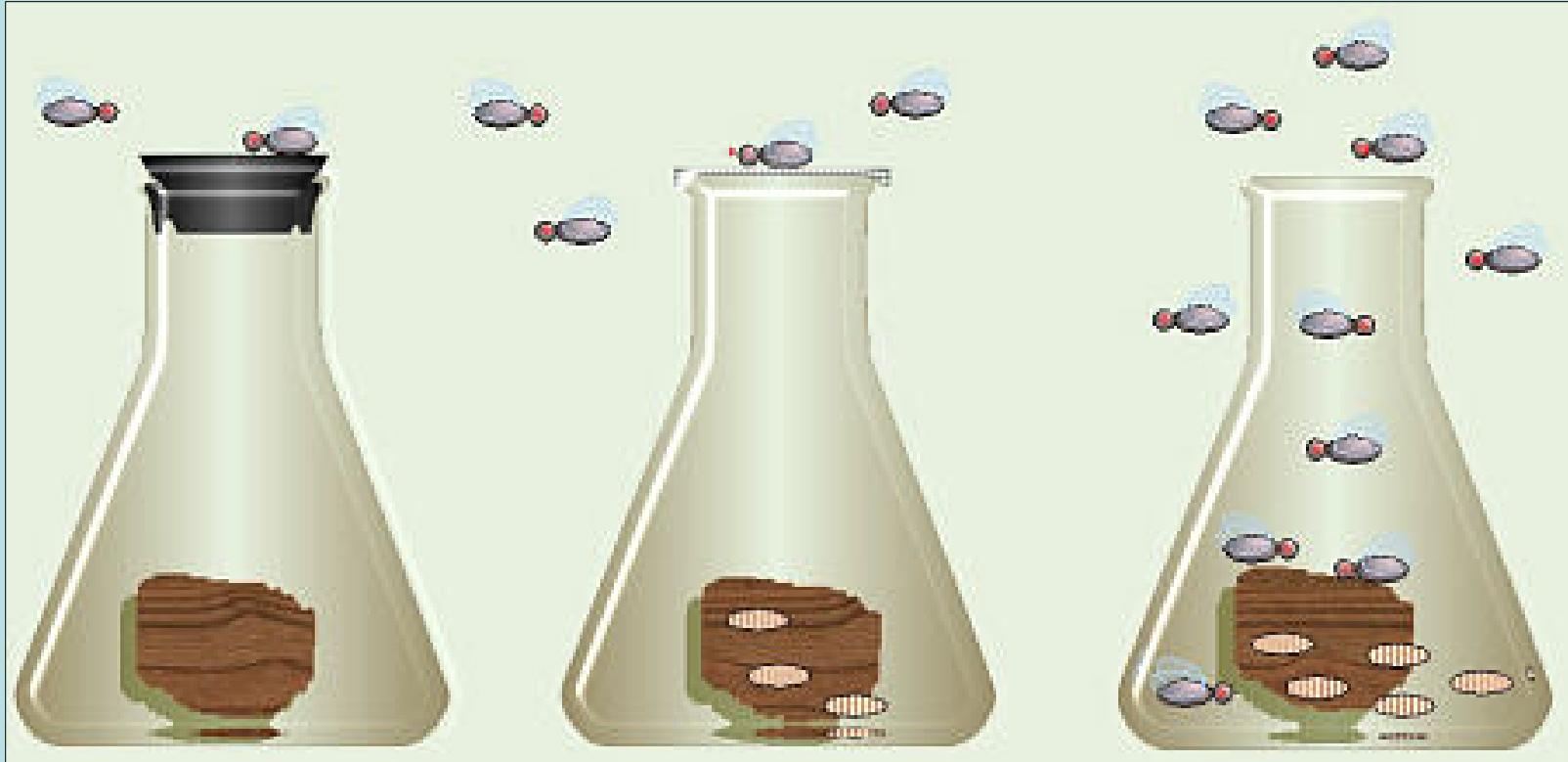


Name the theory that was disproved in 1668.

- The theory that the idea that decaying meat produced maggots was disproved by Francesco Redi.



How was Spontaneous Generation Disproved?



- Covered versus Uncovered Jars
- Results showed that only flies produce more flies.



Define *Biogenesis*.

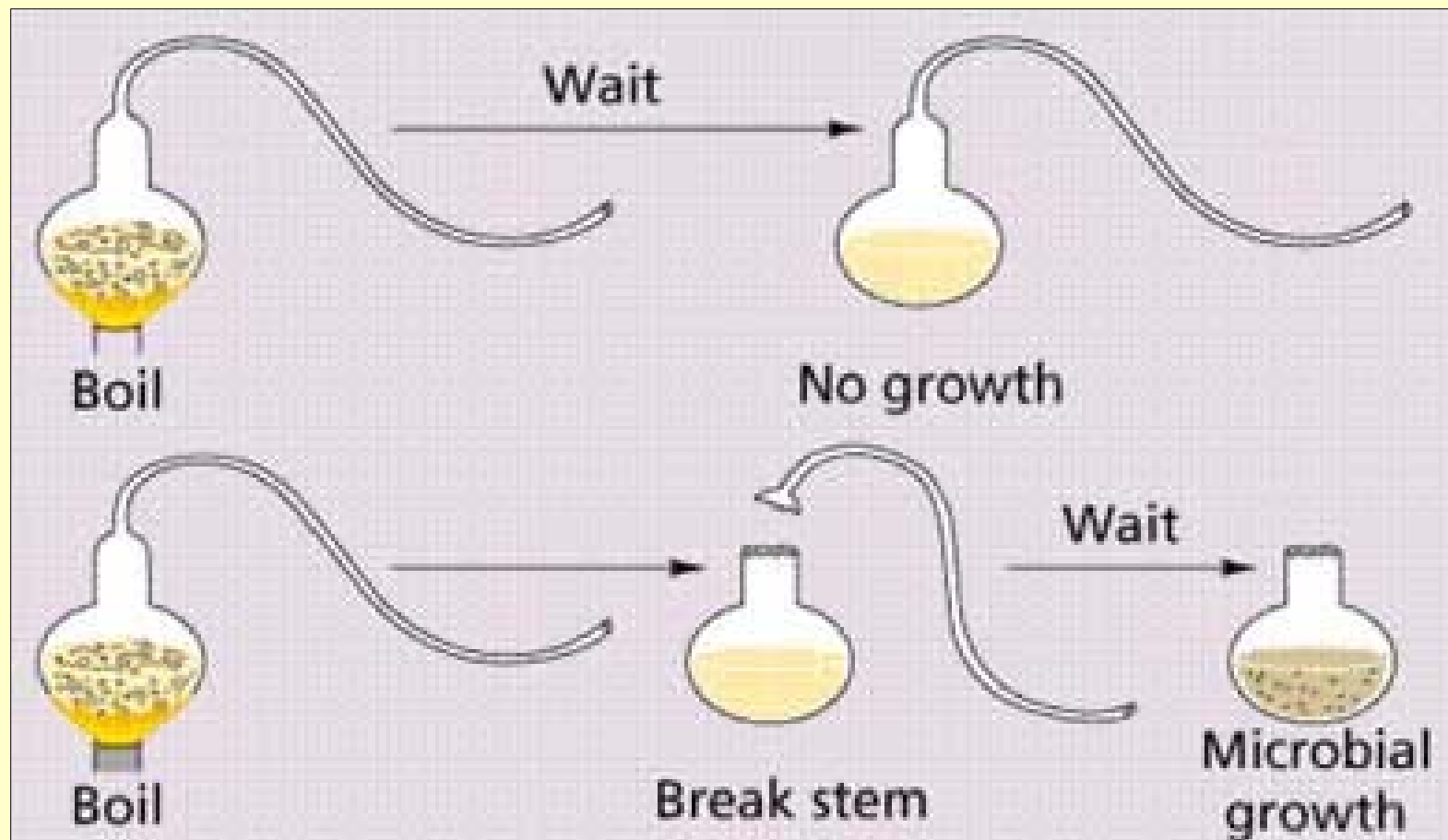
- ***Biogenesis*** is the idea that living organisms come only from other living organisms.
- Became of Cornerstone of Biology
- Relates to “**Cell Theory**”

🧠 Spontaneous Generation Continues...

Louis
Pasteur
(mid 1800)

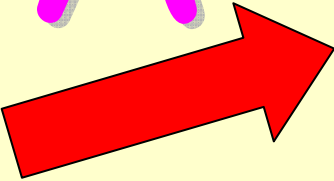


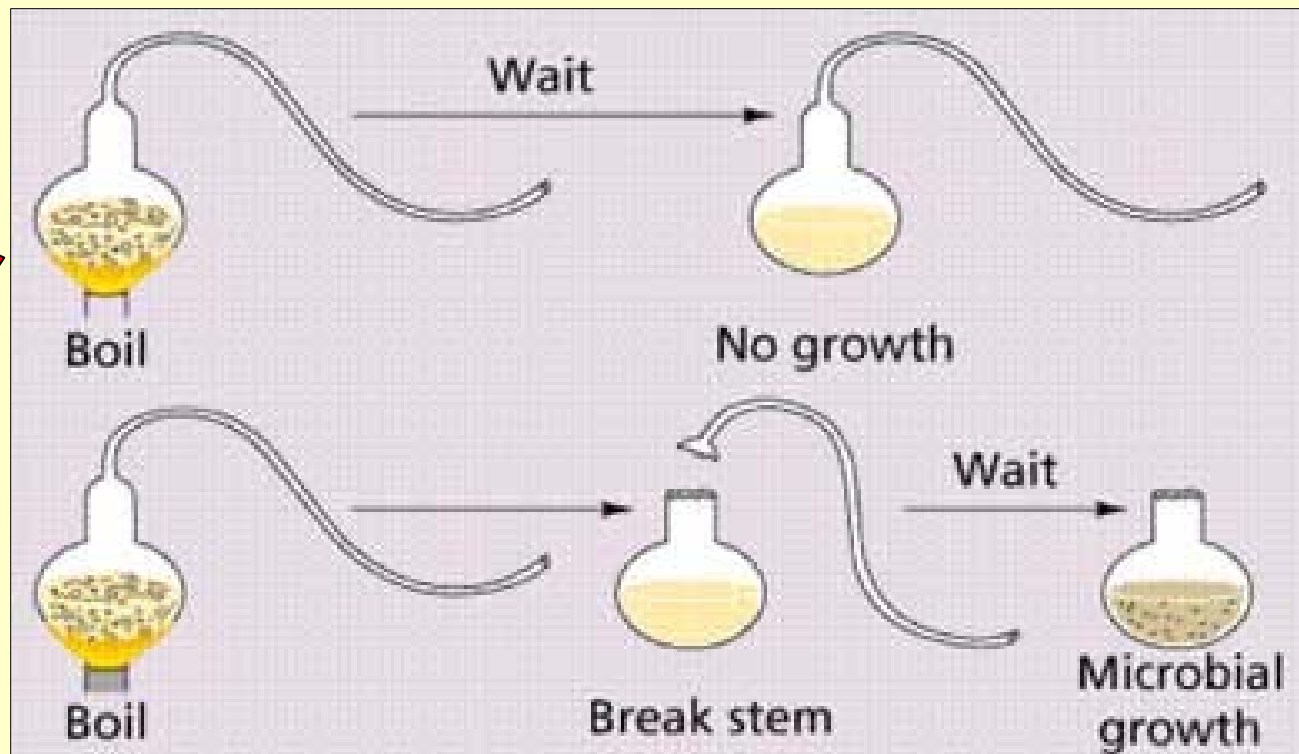
📖 Describe the steps in **Louis Pasteur's** experiment regarding the **disproval** of **spontaneous generation**.



Step *One* (Letter A)

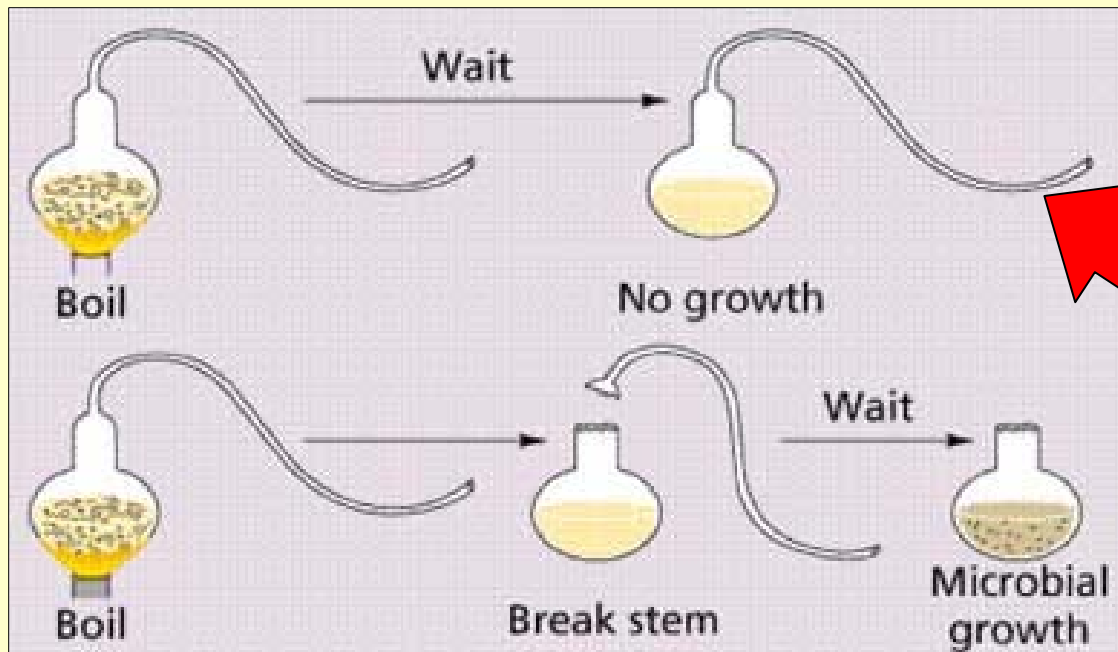
- ❖ Broth was boiled to kill all microorganisms.

A 



Step *Two* (Letter B)

- ❖ S-Shaped neck allows air to pass through but **NOT** microorganisms.

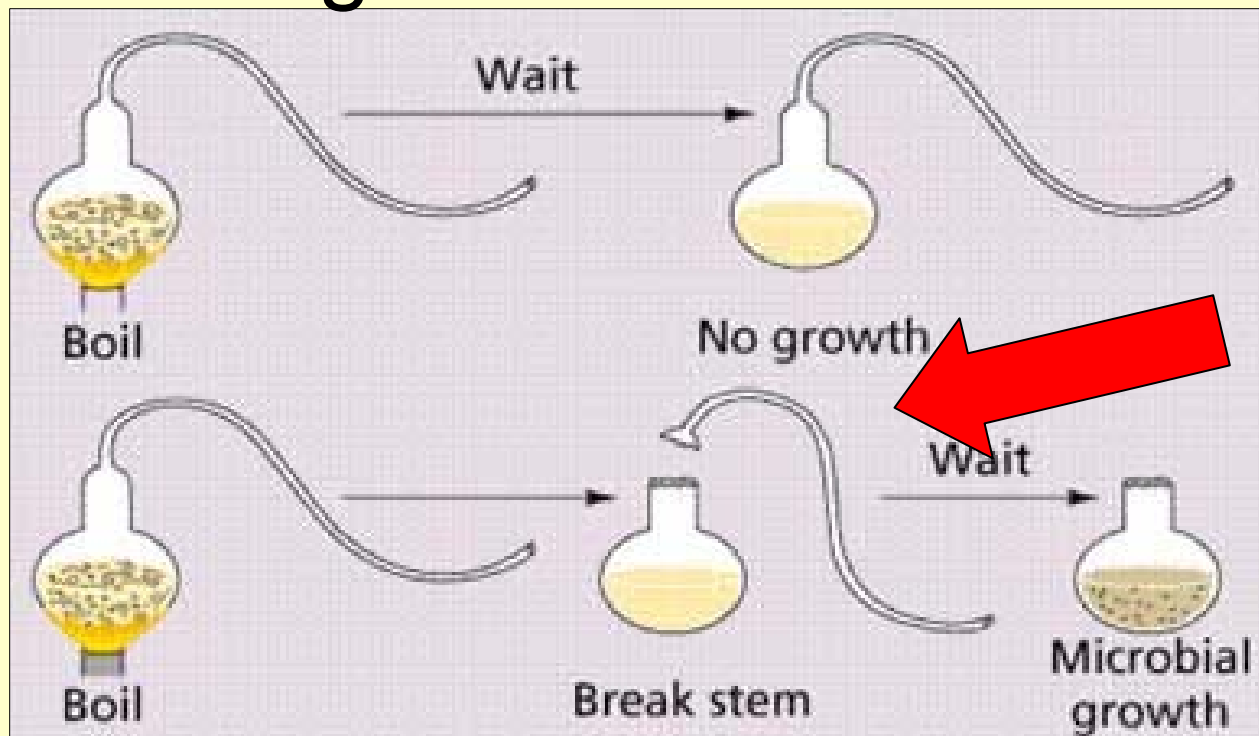


B



Step *Three* (Letter C)

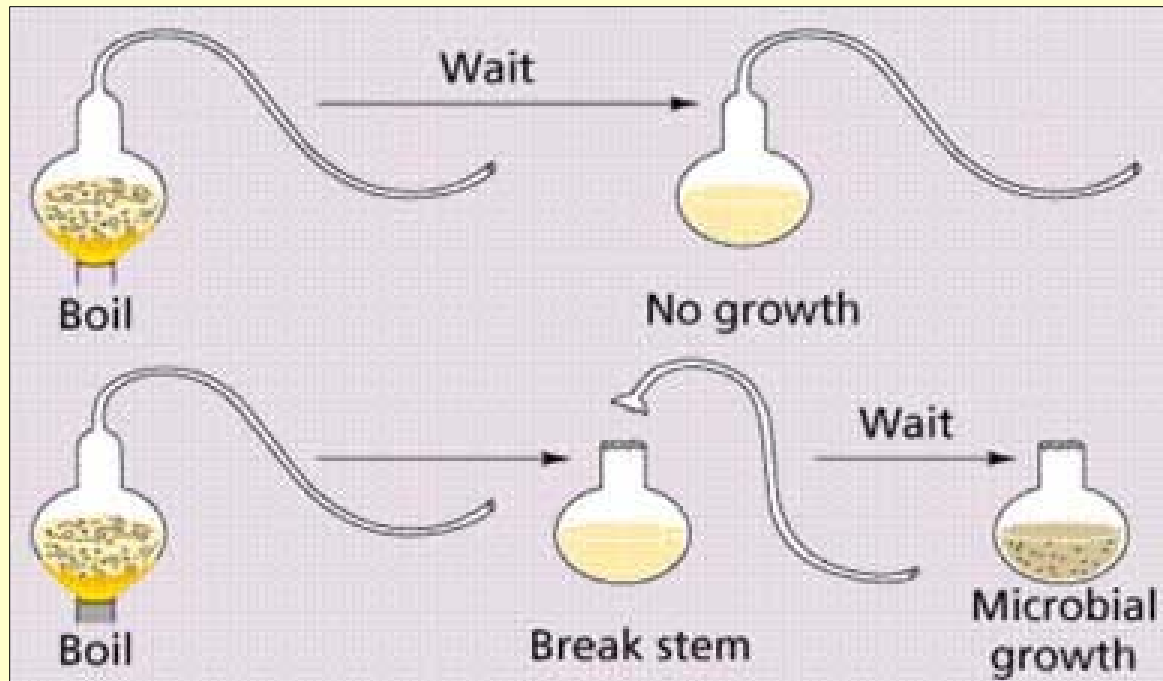
- ❖ Pasteur broke neck of flask to let broth come in contact with microorganisms.



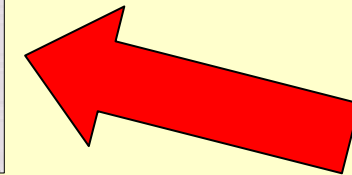
C



Step *Four* (Letter D)



D



- ❖ Microorganisms began growing in broth; therefore proving it is air-borne.

How did life began?

1.) 3.9 to 5 billion years ago, solar system was a **collection** of gases and dusts.

2.) The gases and dusts **collapsed inward** and the **sun** was created.



3.) **Remaining** gases and dusts formed **planets** and the **moon**.



4.) Volcanoes and meteorites had shaken the planet, Earth.



5.) Lava released hot gases into the atmosphere.



6.) Overtime, Earth's temperature dropped below its boiling point.

7.) Water vapor cooled, condensed, and precipitated as rain (ocean formed).





Define *Evolution*.

- ❖ Evolution is the change in population over time.





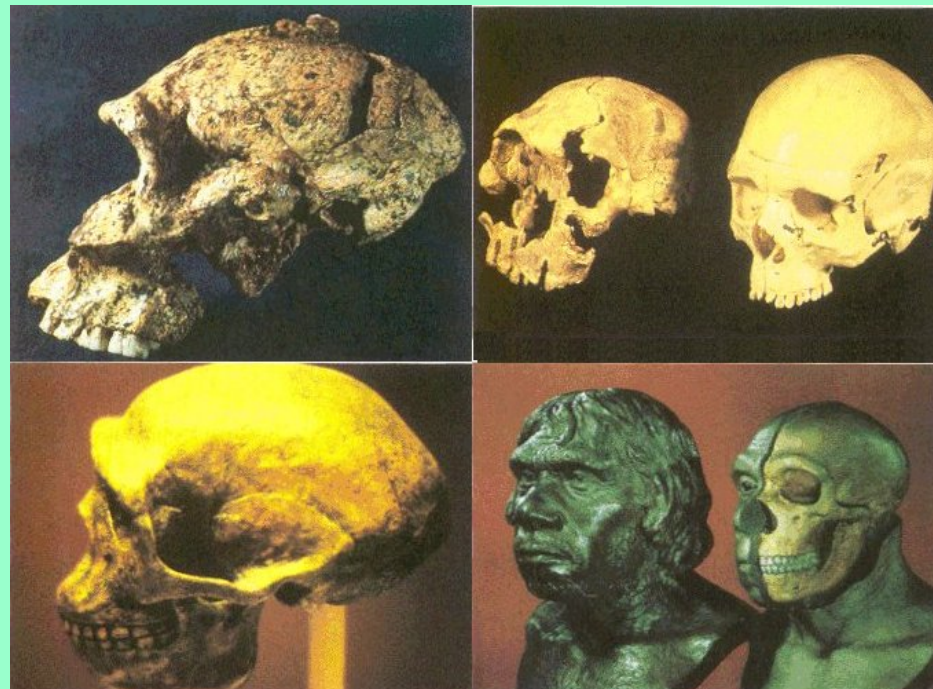
Name the form of evidence that scientists used for the basis of early evolutionary concepts.

Fossils



Evolution

- ❖ Need to understand that fossils are used to see what kind of relationship exist between extinct and modern species.



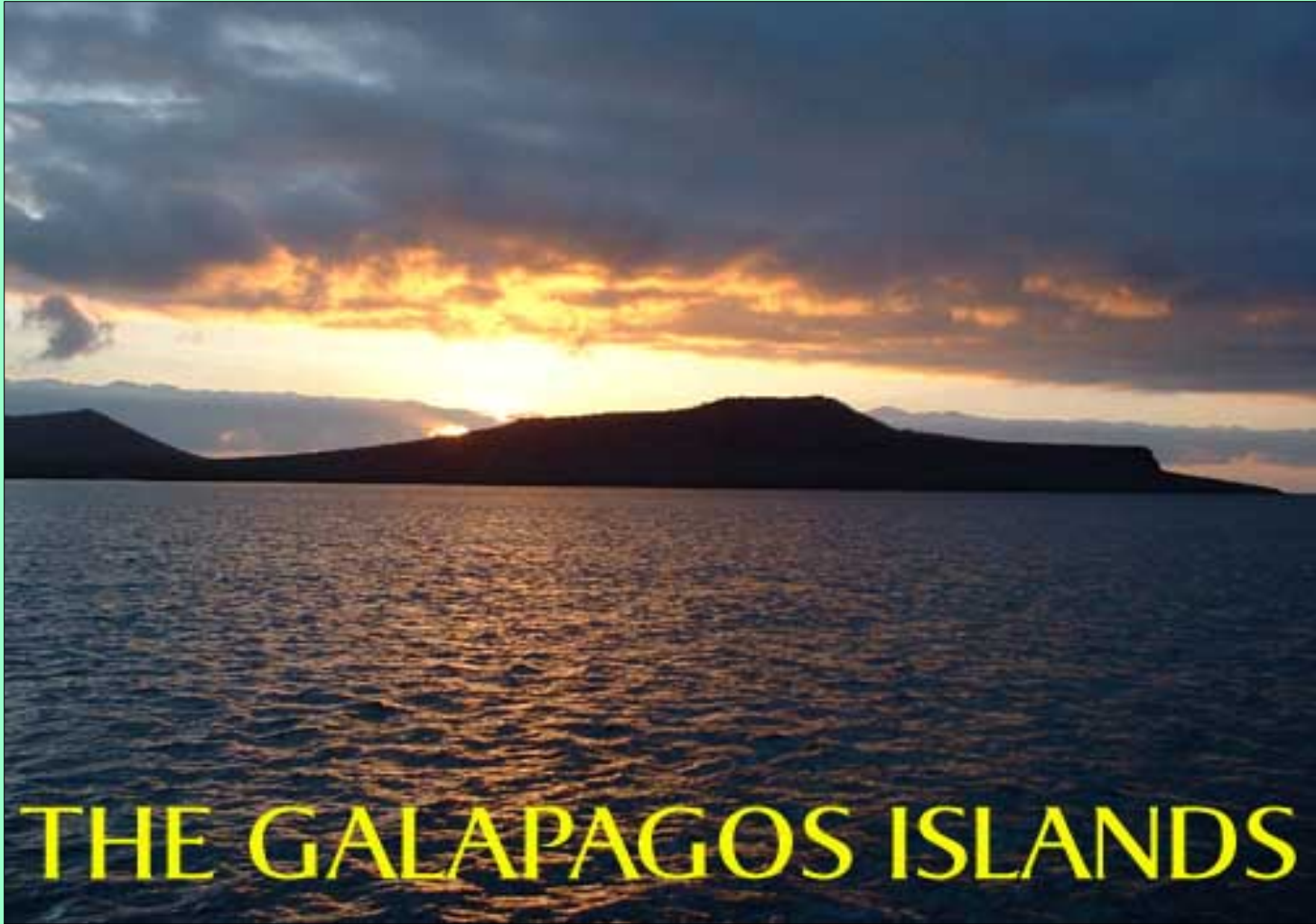
📖 Name the person responsible for establishing the basis of modern evolutionary theory.



Charles
Darwin



Where did his major studies take place?











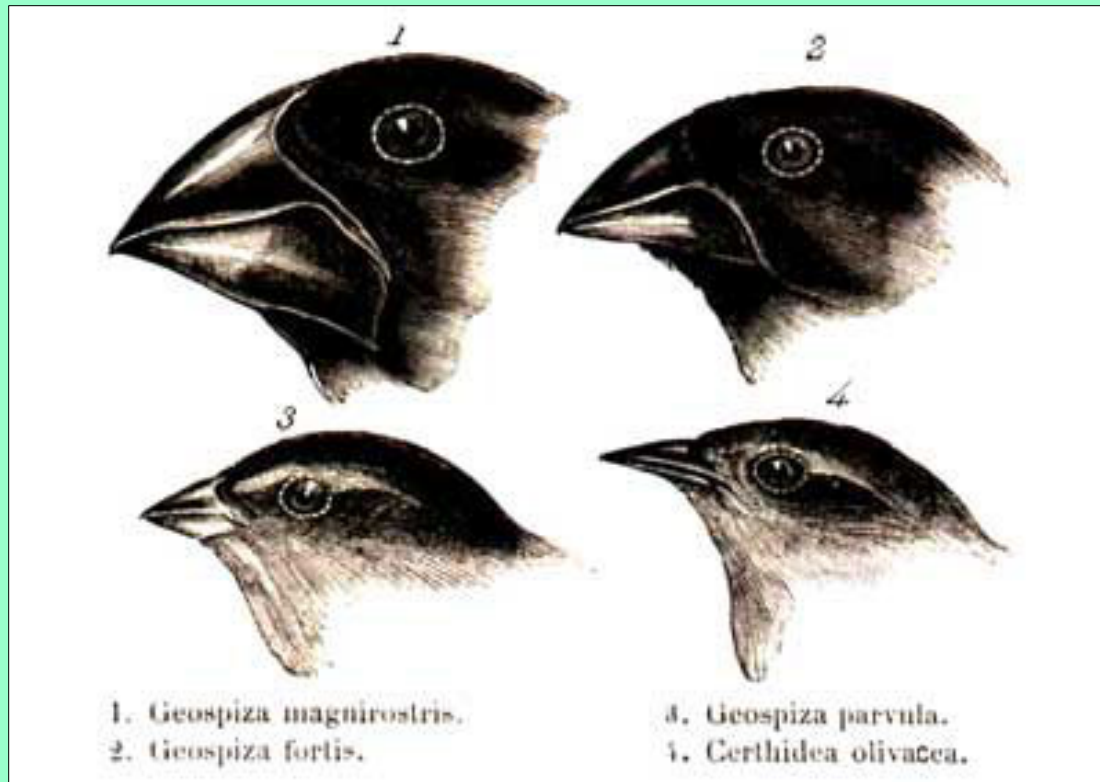
How can different bird species live in the same tree?



💡 Need to understand that...

❖ Shape and sizes of beaks were different.

❖ Ate different insects.





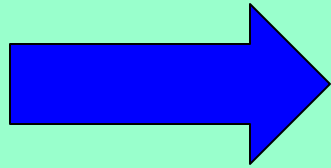
Define Natural Selection.

- ❖ When organisms undergo a mechanism to cause a change in populations.

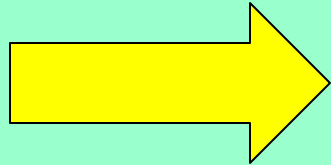


When does natural selection occur?

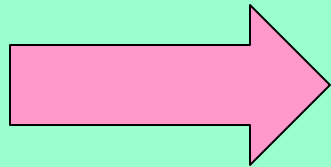
❖ When organisms with favorable traits...



Survive



Reproduce



Pass on

to the next generation.

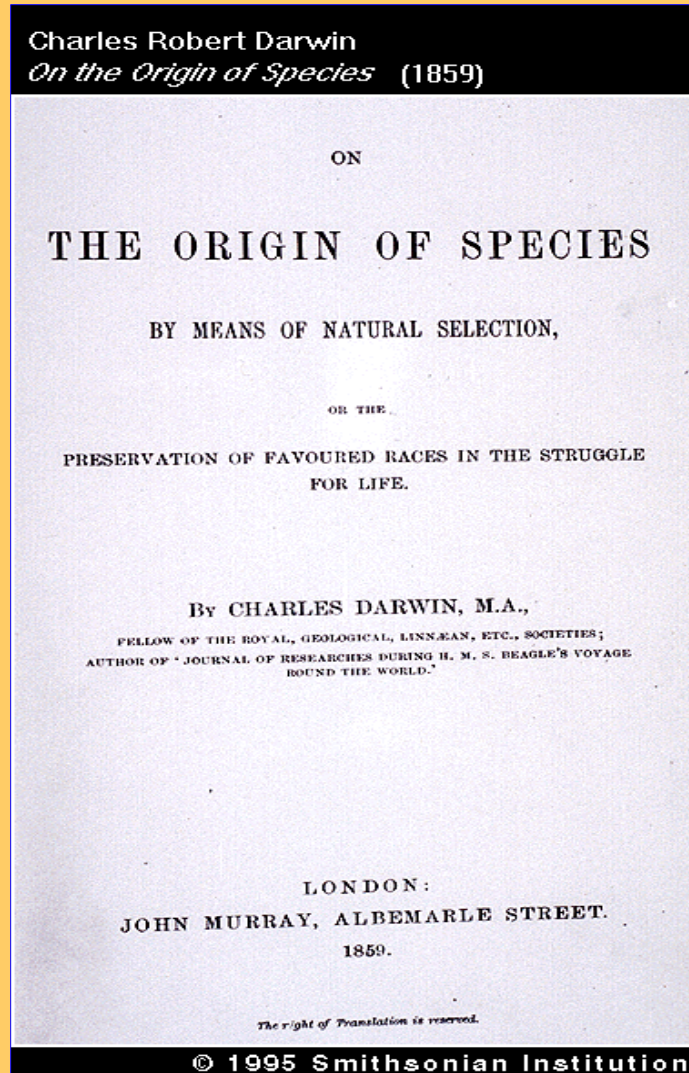
📖 Name the person who joined
and supported the studies of
Charles Darwin

Russell
Wallace





Name the book that was
published in **1859**.



“On the Origin of Species
by Means of
Natural Selection”

Four Main Points Discussed in the Published Book.

- 1.) Organisms produce **more** offspring for **survival**.
- 2.) In **any** population, individuals have **variations**.

Four Main Points Discussed in the Published Book.

- 3.) Only those organisms with **favorable variations survive** to the **next** generations.
- 4.) **Overtime**, populations will become **more diverse**.

 Name some structural adaptations that arise over time.

1.) **Mimicry** –

Structural adaptations that enable **one** species to resemble **another** species.



Who's the

yellow jacket wasp
and the harmless
syrphid fly?







Structural Adaptations continue.

2.) Camouflage –

An adaptation that enables a species to blend within their surroundings.



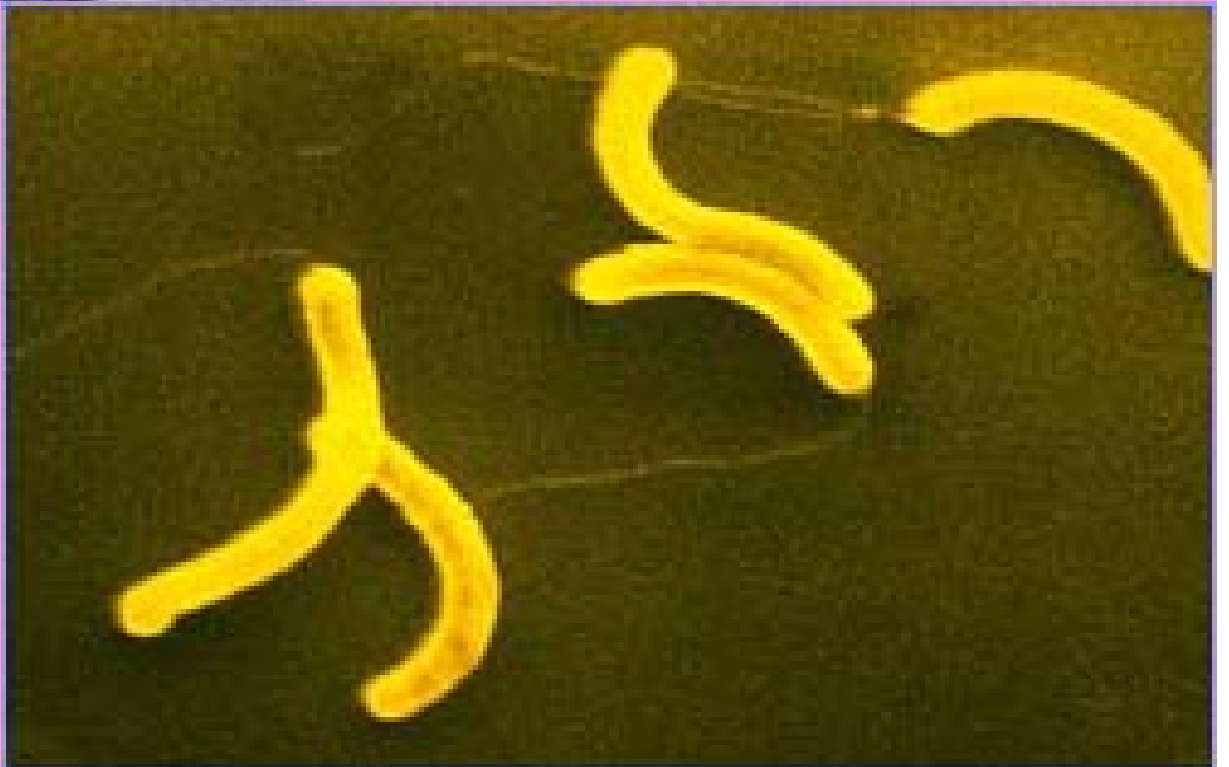
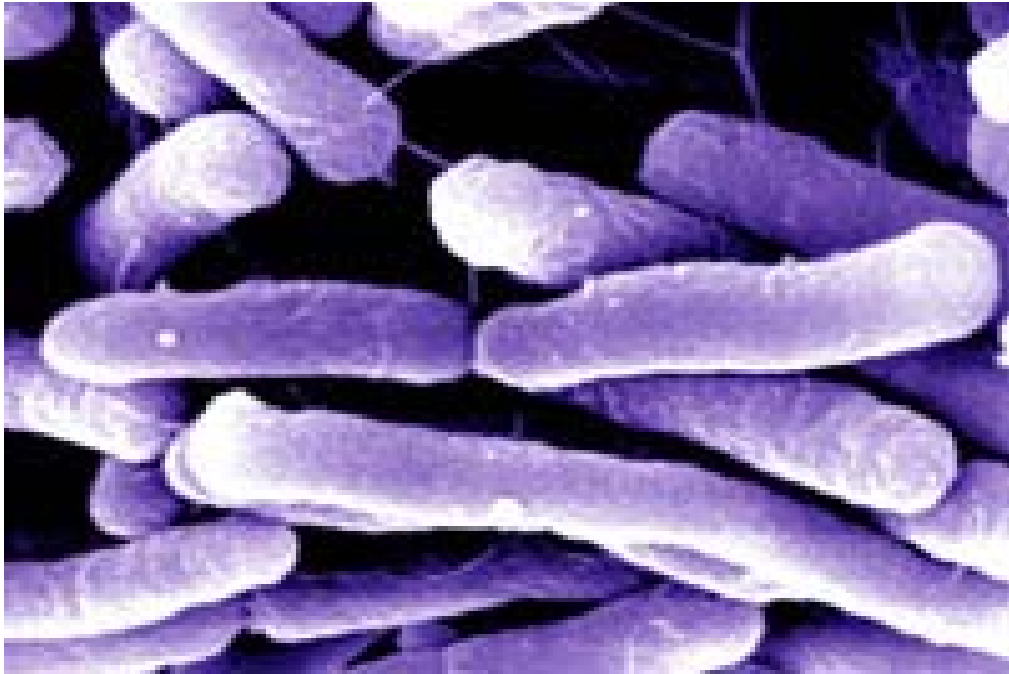


Structural Adaptations continue.

3.) Physiological Adaptations –

50 years ago → “wonder drug” → penicillin

Today bacteria strains have evolved to
become more resistant against penicillin.

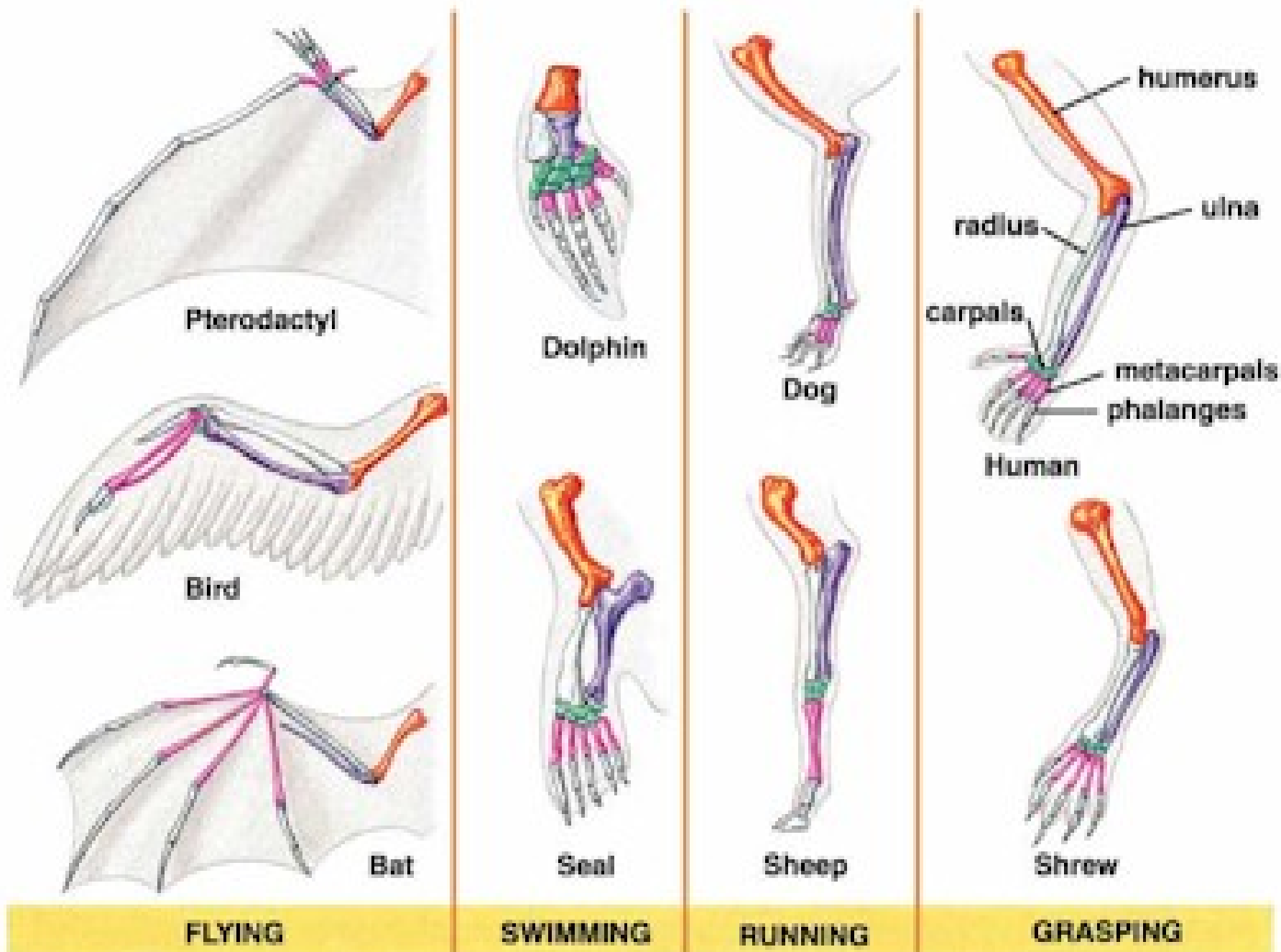




Structural Adaptations continue.

4.) Homologous Structures –

- ❖ Structural features with a common evolutionary origin.
- ❖ Similar in arrangement, in function, or in both.





Structural Adaptations continue.

5.) Analogous Structures –

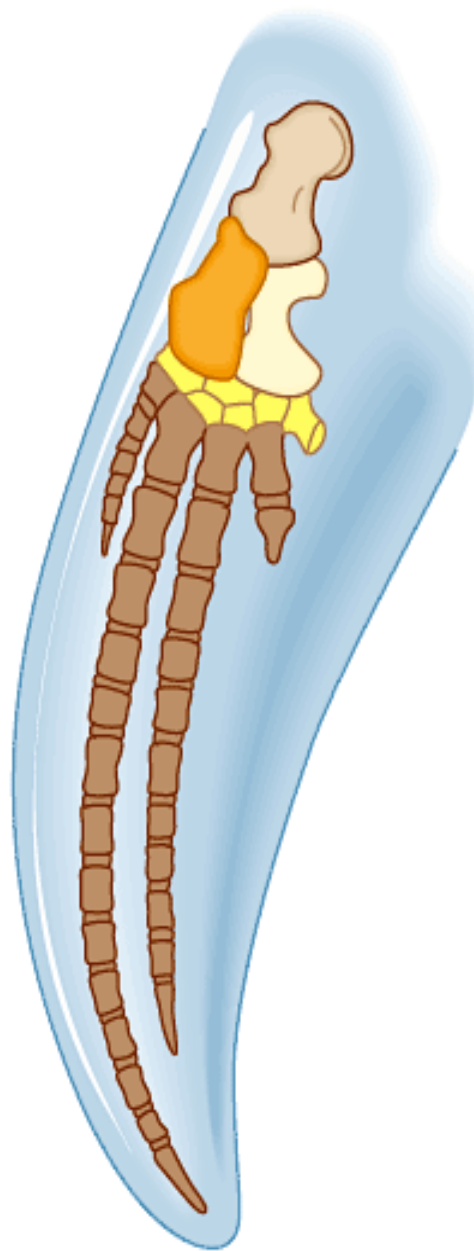
- ❖ The body parts of organisms that do not have a common evolutionary origin but are similar in function.



Human



Cat



Whale



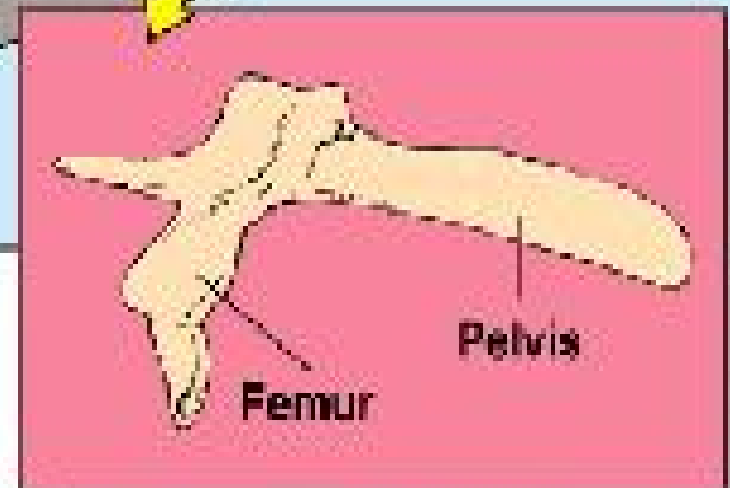
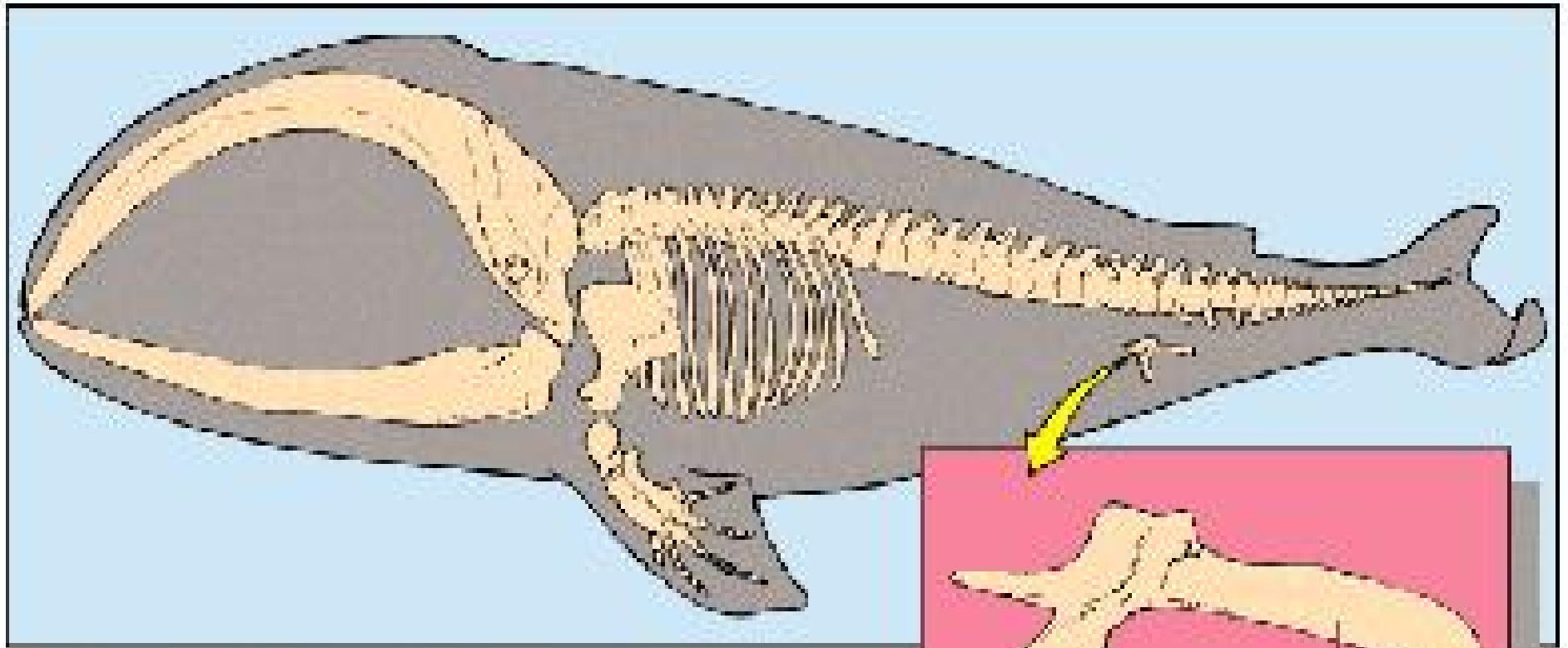
Bat



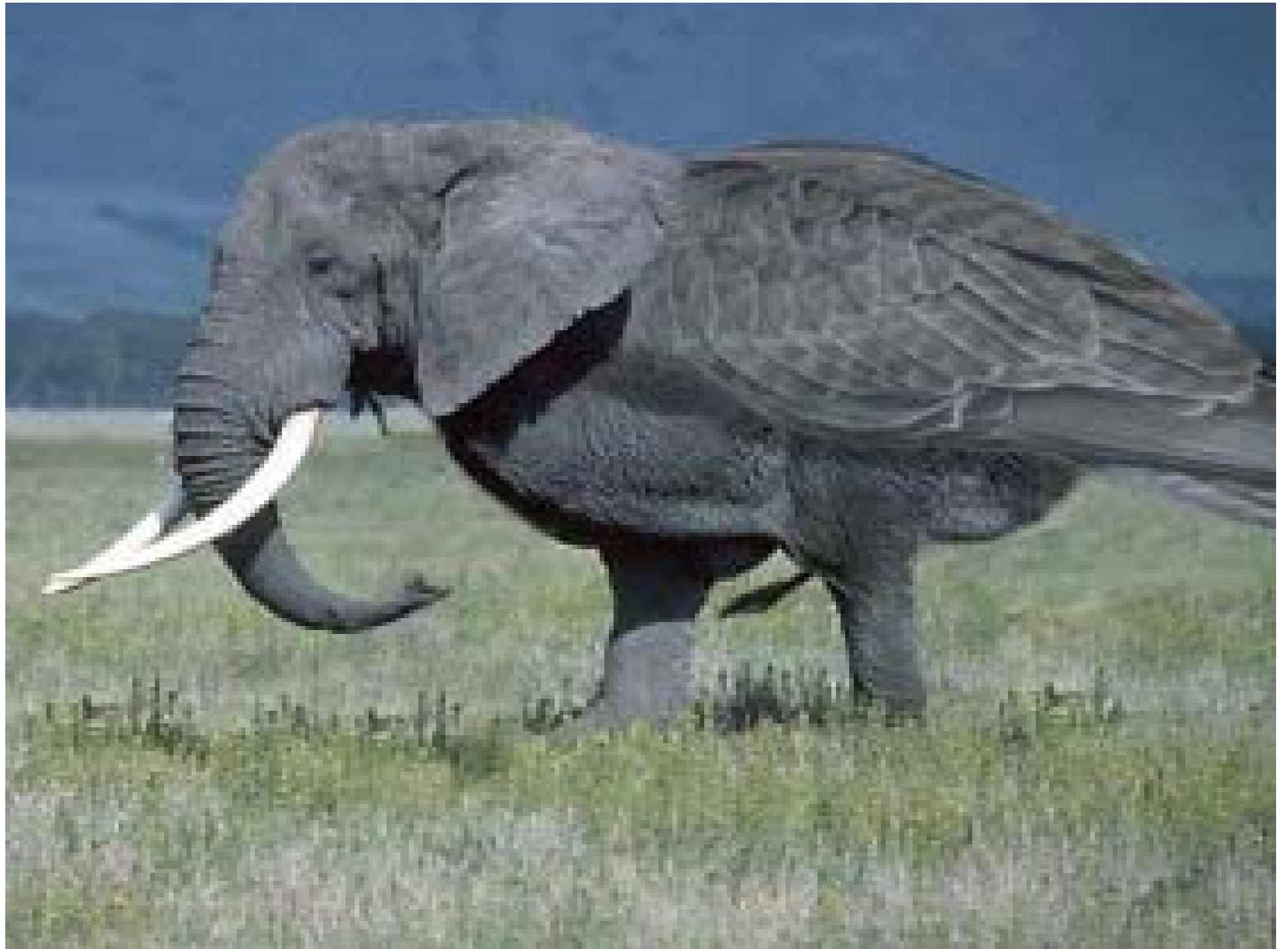
Structural Adaptations continue.

6.) Vestigial Structure –

❖ A body structure in a present
day organism that no longer
serves its original purpose.



Baleen Whale







Structural Adaptations continue.

7.) Embryo –

- ❖ Earliest stage of growth and development of both plants and animals.
- ❖ These shared features show an evolutionary relationship.





Structural Adaptations continue.

8.) Biochemistry –

- ❖ *Amino acid sequences* are used to show evolutionary relationships.
- ❖ Groups that share more similarities are considered more closely related.
- ❖ The more amino acid substitutions that take place, the more diversity will result.