

Evolution

Change in the gene pool
of a population over time

Process by which modern
organisms have descended from
ancient organisms

Darwin's Influences

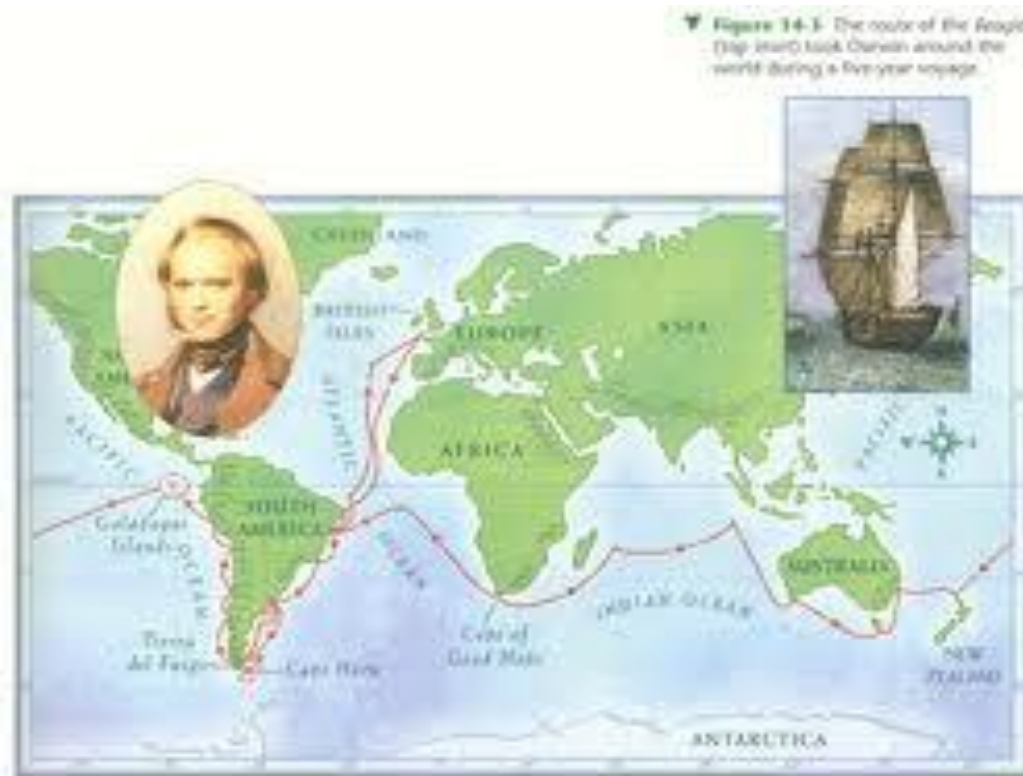
James Hutton 1785	Proposes Earth is millions of years old
Thomas Malthus 1798	Principle of (human) Population (competition)
Jean-Baptiste Lamarck 1809	Erroneous theory of acquired traits
Charles Lyell 1833	Principles of Geology (Earth is old & still changing)
Alfred Wallace 1858	Essay about evolution similar to Darwin's theory

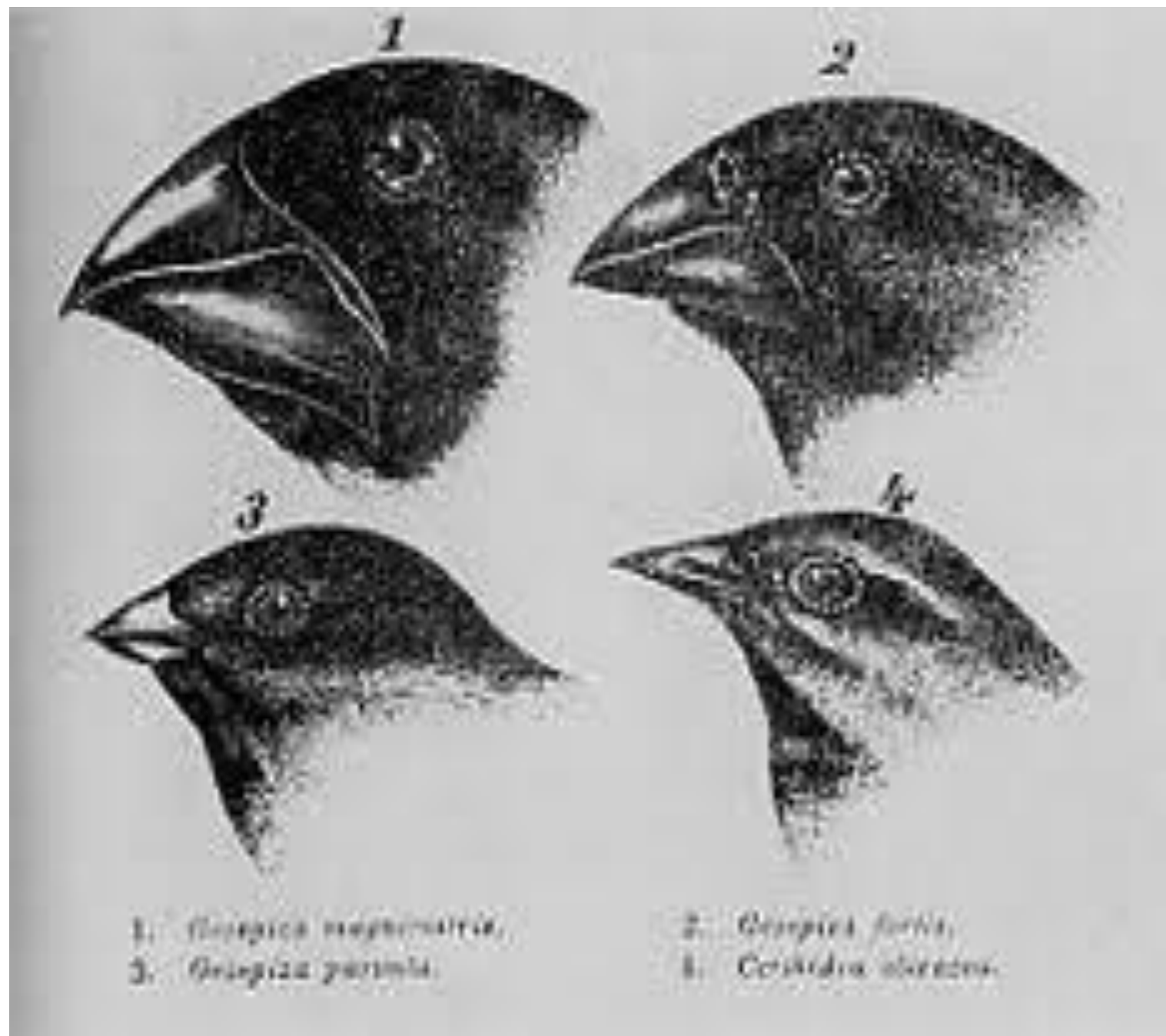
Lamarck's Theory of Acquired Traits

Selective Use or Disuse
Tendency towards
Complexity and Perfection



Charles Darwin and his Voyage around the World (1831-1836)





Darwin's Observations

Enormous biological diversity

Fossils unlike existing species

Organisms well-suited (adapted) to environment

Artificial Selection

Humans select desired traits.



Natural Selection

Process by which organisms with certain traits have a better chance of surviving and reproducing.

External (environmental) pressures "select" traits.

Inheritance of these traits is the mechanism that drives evolution.



Main Elements of Natural Selection

- *Genetic Variation
- *More Offspring than can survive
- *Struggle for Existence (competition for resources)
- *Ability to survive & reproduce = Fitness
- *Over time, inheritance of beneficial adaptations results in changes = evolution

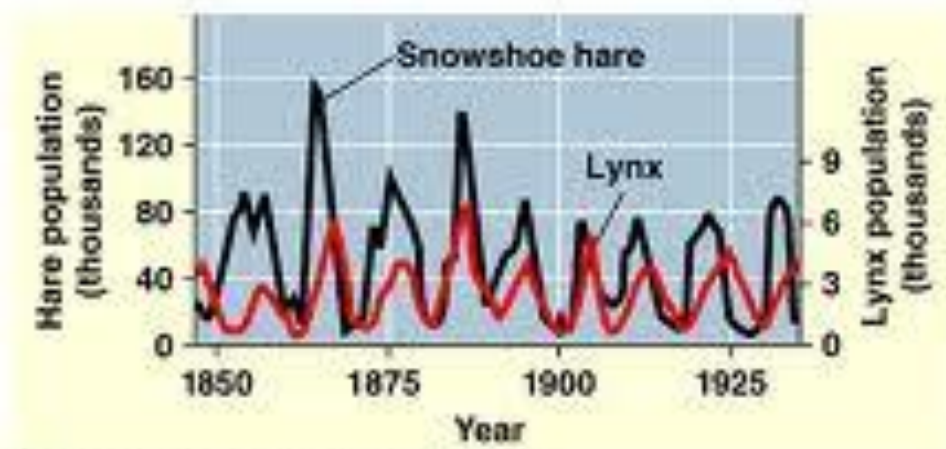
Genetic Variation



More Offspring than can Survive



Competition for Resources

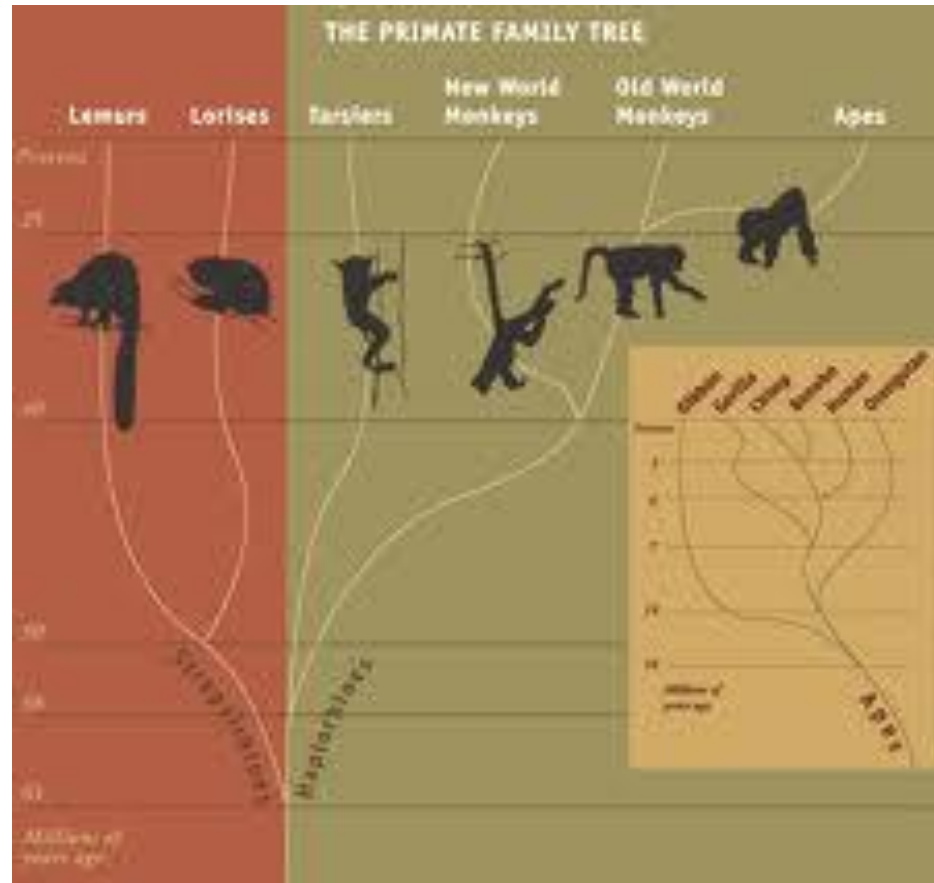


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Adaptations



Descent with Modification

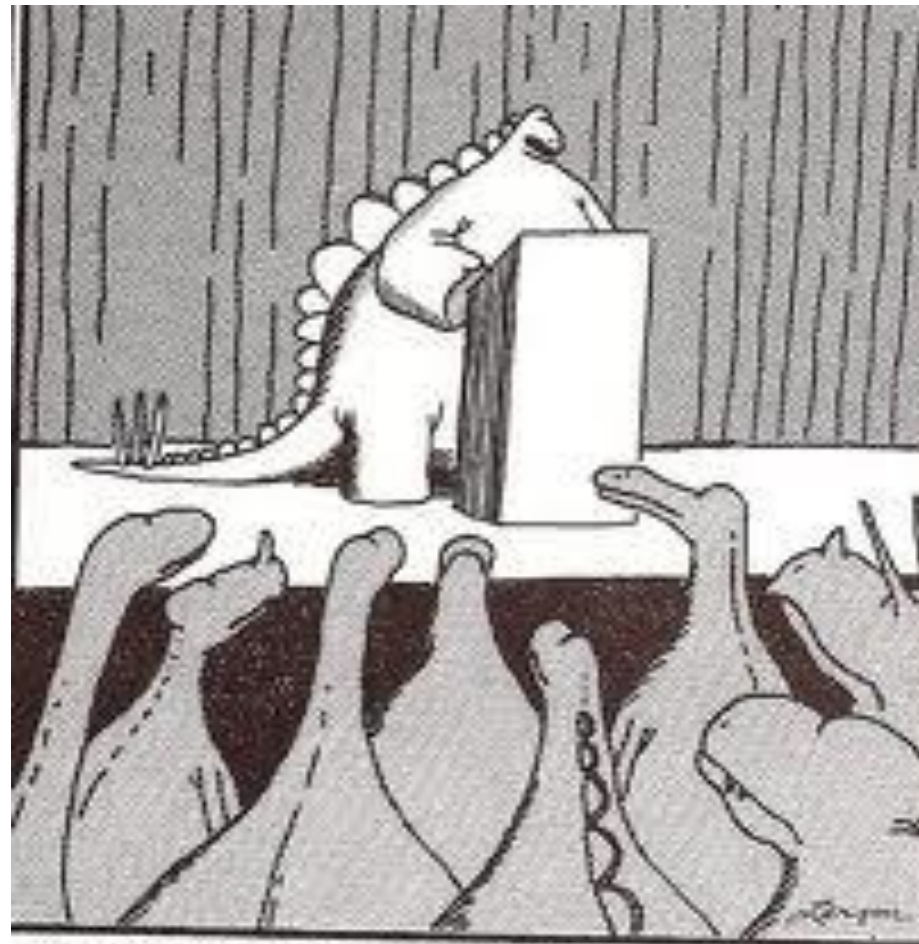


What's Wrong?



Hmm...

What's Right?



"The picture's pretty bleak, gentlemen. ... The world's climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut."

Why?



Balance of Selective Pressures



Reproductive Fitness
vs.
Environmental Fitness