

# 10.1 Early ideas about Evolution

# Evolution

## What it is

- Change in allele frequency of a population over time
- Descent with modification
- An explanation of how life changes over time (from the point of origin on)

## What it is *not*

- An explanation of the origin of the earth (consult an astronomer)
- An explanation of the origin of life
  - However, these topics absolutely come up and have a place in the discussion of evolution

# Before Darwin

- Several scientists began laying the groundwork for Darwin's theory of evolution at least 100 years before his time in the 1700s
- Carolus Linnaeus
  - Developed a classification system based on similarities
  - Abandoned belief that organisms are fixed and do not change

# Before Darwin

- Georges Louis Leclerc de Buffon
  - Proposed that organisms share ancestors (common ancestry) instead of arising separately
  - Along with **Charles Lyell**, rejected belief that earth was only 6,000 years old
- Erasmus Darwin
  - Charles Darwin grandfather
  - Considered ways evolution might occur
    - Competition

# Before Darwin

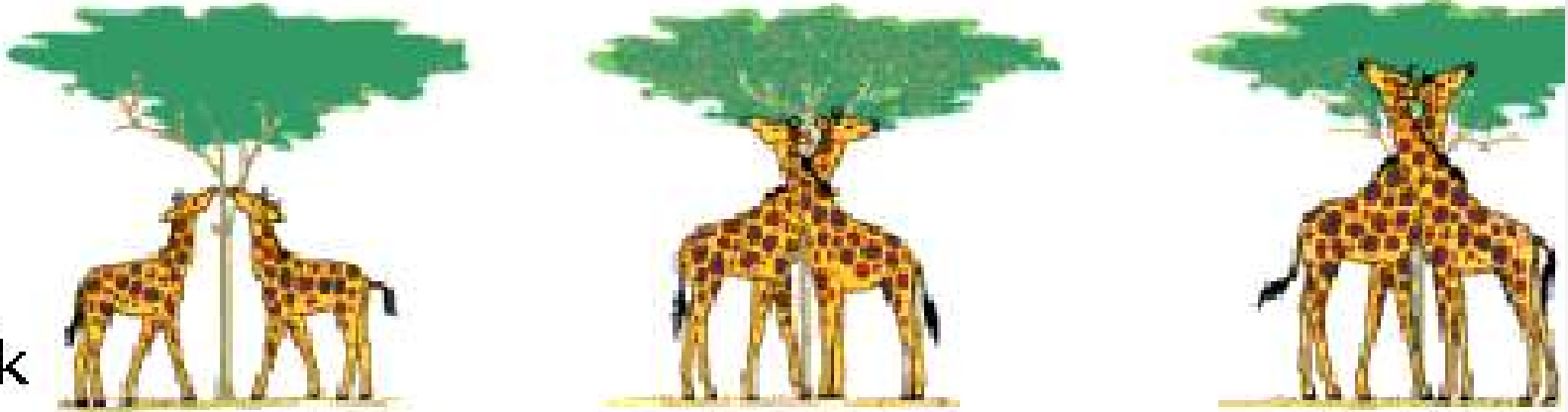
- Jean-Baptiste Lamarck
  - Proposed that all animals evolve toward perfection
  - Believed in inheritance of acquired characteristics
    - Changes in environment cause changes in behavior
  - Did not believe in extinction, only further evolution



Lamarck's ideas were completely wrong... so why do we learn about him?

# Lamarck v Darwin

Lamarck



Darwin



Evolution by natural selection as Darwin proposed relies on variation. Variation is the result of mutation. Some mutations are adaptive.

# Theories of geologic change

- Radical thoughts for the time
  - The earth is over 6,000 years old
  - Species can and have changed over time
  - Species can and have gone extinct
- Catastrophism
  - Catastrophic events responsible for mass extinction and shaping landforms
- Gradualism
  - Earth changed gradually over time (ex: rivers carving canyons)
- Uniformitarianism (favored)
  - Rock strata account for catastrophes and gradual changes in the past and ones that occur today

# 10.2 and 10.3

- Mutation in Rock Pocket Mouse leads to variation
- Different variants are adaptive under different conditions
- Principles of natural selection
  - Variation
  - Overproduction of offspring
  - Adaptation
  - Descent with modification
- Watch video
  - [http://www.youtube.com/watch?v=AMtT5\\_AQmLg](http://www.youtube.com/watch?v=AMtT5_AQmLg)
- Video 2
  - <https://www.youtube.com/watch?v=jS4KQMyPN2A>
- Adaptations as compromises
  - Organisms aren't perfect
  - Nature acts on what already exists
  - Example: panda "thumb"
- Artificial selection
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