

## 7.2 The Evolution of an Idea

p. 288 - 293

### Aristotle (384-322 BCE)

- Most Europeans accepted the idea that Earth and all living things had been created in their \_\_\_\_\_ forms and were immutable
- Immutable: unchanging

### Buffon (1707-1788)

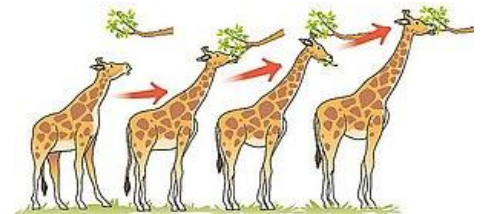
- He studied anatomy and compared the structure to the \_\_\_\_\_ of various body parts
- He noted that some anatomical features serve no purpose
  - E.g. He wondered why pigs have extra toes that do not reach the ground.
- He believed that species had been created in a more perfect form but had changed over time

### Carl Linnaeus (1707 - 1778) and Erasmus Darwin (1731 - 1802)

- Both also proposed that life \_\_\_\_\_ over time.
- **Erasmus Darwin** (Charles Darwin's grandfather) suggested life might have evolved from a \_\_\_\_\_ original source
- They could not explain \_\_\_\_\_ living things changed.

### Lamarck (1744-1829)

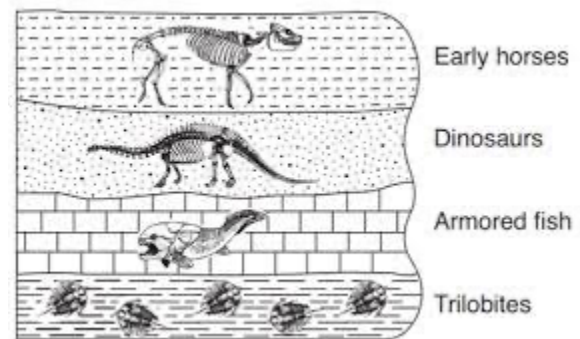
- A student of Buffon's
- Was the first to provide an explanation as to HOW species \_\_\_\_\_ (his explanation was faulty, but was an attempt!)
- Believed evolutionary changes resulted from 2 principles:
  1. \_\_\_\_\_ - structures that were used became larger and stronger, and structures that were not used became smaller and weaker
  2. Inheritance of \_\_\_\_\_ characteristics - individuals could pass on characteristics they acquired during their lives
- His ideas suggest that:
  - the more a giraffe stretches its neck, the longer it will become
  - the giraffe will pass down the long neck it acquired during its lifetime, to its offspring



- Despite Lamarck's flawed theory, he made a number of important contributions to our understanding of evolution:
  - all species evolve over time
  - a species evolves in response to its \_\_\_\_\_ and becomes better \_\_\_\_\_ to that environment
  - changes are \_\_\_\_\_ from generation to generation

**Fossils**

- Scientists observed patterns of change over time by studying fossils.
  - Fossils: \_\_\_\_\_ remains in rocks or other mineral deposits
  - Note: Remains have to be at least \_\_\_\_\_ years old to be considered a fossil!
- Fossils are formed when the remains of buried organisms are gradually replaced by \_\_\_\_\_ deposits.
- **Fossil formation: The Process**
  - An organism dies and is quickly buried by \_\_\_\_\_.
  - The lack of \_\_\_\_\_ prevents decomposition.
  - The \_\_\_\_\_ causes the deposits to harden and form sedimentary rock
  - Fossil remains become \_\_\_\_\_.
  - As erosion or excavation occurs, the fossil remains are exposed.
- Organisms can also be trapped and \_\_\_\_\_ in:
  - amber (fossilized tree sap),
  - volcanic ash,
  - ice formations.

**Cuvier (1769 - 1832) and Lyell (1797 - 1875)**

- Both studied fossil evidence, but had opposing ideas

**→ Cuvier (1769 - 1832)**

- Paleontologist to first study fossils.
- He found that:
  - fossils of very simple organisms were found in \_\_\_\_\_ depths of fossil deposits
  - fossils of more complex organisms are only found in \_\_\_\_\_ depths
  - fossils in shallower depths are more likely to “resemble” living species
  - the fossils from deeper layers were “simpler” than the more \_\_\_\_\_ fossils above them
  - rock layers contain fossils of many species that do \_\_\_\_\_ occur in layers above or below them
- He did not believe that species change over time.
- He developed the theory of **Catastrophism**: the theory that the pattern of fossils could be accounted for by a series of global catastrophes that wiped out most species on Earth
- E.g. layers with different species are a result of mass \_\_\_\_\_ events with new species then forming
- His theory could not explain why the species increased in \_\_\_\_\_

**→ Lyell (1797 - 1875)**

- Father of modern \_\_\_\_\_
- In opposition with Cuvier, Lyell came up with the theory of **uniformitarianism**.
- **Uniformitarianism**: the theory that geological changes are \_\_\_\_\_ and gradual (not fast and catastrophic) and that natural laws influencing these changes are \_\_\_\_\_
- His theory put forth the idea that Earth was much \_\_\_\_\_ than previously thought