CHAPTER 7 THE THEORY OF EVOLUTION

7.1 BIOLOGICAL CHANGE OVER TIME p. 282

What is the source of genetic variation? Mutations

Describe the three types of mutations.

Neutral These mutations pose no harm or benefit

Harmful those that reduce reproductive success

Beneficial Any mutation that increases the reproductive success of an individual

Explain why harmful mutations do not accumulate over time and cause harm to populations.

Groups with harmful mutations die off and do not reproduce for long

ARTIFICIAL SELECTION: Directed breeding in which individuals that exhibit a beneficial trait are selectively bred to produce more offspring that exhibit the beneficial trait.

How have modern genetic engineering methods changed artificial selection of potentially valuable traits?

They have significantly reduced the amount of time required for an individual to exhibit these traits.

The Power of Artificial Breeding

Reduction in genetic diversity and thus a reduction in environmental adaptability.

1. Mutations affect the reproductive success of a species and members of a species reproduce more depending on their survivability in the current environment.
2. A species may be more likely to survive if a change in the environment occurs.
3. Members of the species with harmful mutations die off and do not reproduce for long.

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7.2 THE EVOLUTION OF AN IDEA p. 288

In the mid 1700s, what did Buffon question?

The purpose of vestigial anatomic features

Explain Lamarck's principle of use and disuse.

Anatomical structures that an individual uses become larger and stronger, while structures that aren't used become smaller and weaker

Explain Lamarck's principle of the inheritance of acquired characteristics.

Individuals can pass to their offspring characteristics the had acquired during their lives.

Explain why Lamarck's theory is flawed.

Use of specific traits do not affect what an offspring inherits.

Lamarck was a student of Buffon. List his three contributions to our understanding of evolution.

1. All species evolve over time
2. A species evolves in response to its environment and becomes better adapted to their environment
3. Changes are passed on from generation to generation

What is a fossil?

Ancient remains, impressions, or traces of an organism or traces of its activity that have been preserved in rocks or other mineral deposits in Earth's crust

How are fossils formed?

Fossils are formed when the remains of a buried organism are gradually replaced by mineral deposits. As sediment accumulates over time, the body compresses and very gradual chemical changes occur that mineralize the body.

Explain the famous paleontologist, Cuvier's (1769 – 1832) observations of the fossil record like the one depicted to the right.

Cuvier observed that identical fossils could be found in continents and of organisms that were very distinct

Explain Cuvier's theory of **Catastrophism** which was his analysis of these observations.

The pattern of fossils could explain how series of global catastrophes wiped out many species on the Earth

Lyell (1797 – 1875) revolutionized geology with his principles of **uniformitarianism** in 1830:

Processes that occurred in the past and occur in the present shape the Earth

Geological change is slow and gradual, rather than fast and catastrophic

Natural laws that influence these changes are constant and eternal, and they operated in the past with the same intensity as they do today

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4. Speed to hunt prey resulted in stronger legs and more elastic bodies
5. One can practice many instruments and study music theory

10. Location, degree of decomposition and patterns of surrounding fossils can provide clues as to the behaviour of organisms.