

Principles of Evolution

Early Ideas about Evolution

- There were theories of biological and geologic change before Darwin.
- Early scientists proposed ideas about evolution.
- Theories of geologic change set the stage for Darwin's theory.
- Evolution is the process of biological change by which descendants come to differ from their ancestors.
- Evolution is a central theme in all fields of biology.
- Carolus Linnaeus:
 - Developed a classification system for all types of organisms known at the time.
 - He proposed instead that some might have arisen through hybridization—a crossing that he could observe through experiments with varieties, or species, of plants.
 - A species is a group of organisms so similar to one another that they can reproduce and have fertile offspring.
- Georges Louis Leclerc de Buffon:
 - He proposed that species shared ancestors instead of arising separately.
 - Buffon also rejected the common idea of the time that Earth was only 6000 years old.
- Erasmus Darwin:
 - Charles Darwin's Grandfather, he was an English doctor and a poet.
 - He proposed that all living things were descended from a common ancestor and that more-complex forms of life arose from less complex forms.
- Jean-Baptiste Lamarck:
 - French naturalist, that proposed that all organisms evolved toward perfection and complexity.
 - He did not think that species became extinct, he believed they developed into different forms.

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- He also proposed that changes in an environment caused an organisms' behavior to change, leading to greater use or disuse of a structure or organ.
- The organism would pass on these changes to its offspring.
- Lamarck's idea is known as the inheritance of acquired characteristics.
- Fossils are traces of organisms that existed in the past.
- Fossils in the deepest layers were quite different from those in the upper layers, which were formed by more recent deposits of sediment.
- This theory became known as catastrophism.
- The theory of catastrophism states that natural disasters such as flood and volcanic eruptions have happened often during Earth's long history.
- These events shaped landforms and caused species to become extinct in the process.
- A principle that became known as gradualism was that, landforms resulted from slow changes over a long period of time.
- Gradualism is often used to mean the gradual change of a species through evolution.
- Lyell expanded Hutton's theory of gradualism into the theory of uniformitarianism.
- This theory states that the geologic processes that shape earth are uniform through time.

1735 <i>Systema Naturae</i>	1749 <i>Histoire Naturelle</i>	1794–1796 <i>Zoonomia</i>	1809 <i>Philosophie Zoologique</i>
<p>Carolus Linnaeus proposed a new system of organization for plants, animals, and minerals, based upon their similarities.</p> 	<p>Georges Buffon discussed important ideas about relationships among organisms, sources of biological variation, and the possibility of evolution.</p> 	<p>Erasmus Darwin considered how organisms could evolve through mechanisms such as competition.</p> 	<p>Jean-Baptiste Lamarck presented evolution as occurring due to environmental change over long periods of time.</p> 

CATASTROPHISM	GRADUALISM	UNIFORMITARIANISM
<p>Volcanoes, floods, and earthquakes are examples of catastrophic events that were once believed responsible for mass extinctions and the formation of all landforms.</p> 	<p>Canyons carved by rivers show gradual change. Gradualism is the idea that changes on Earth occurred by small steps over long periods of time.</p> 	<p>Rock strata demonstrate that geologic processes, which are still occurring today, add up over long periods of time to cause great change.</p> 