

UFOP Basic Paleontology I

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Part 1. Evolutionary Theory

- 1. Pre-Darwinian Ideas:
Greeks (Aristotle) believed that creatures were produced randomly; only those that could feed themselves and reproduce would survive.

Creationism – God created species, they could not change or interact.

Geological theory of uniformitarianism – small changes over geologic time - adaptations

Darwin's Natural Selection

- 2. Inspired by voyages on the Beagle – different species adapt to their surroundings (natural selection, survival of the fittest).
- 3a. Micro-Evolution – occurrence of small changes within a population, over a few generations, below species level
- 3b. Macro-Evolution – occurrence of changes at or above species level, evolution of the horse family is a typical example

Part 2. What is a Fossil?

- Remains or traces of ancient creatures
- 1. Processes of fossilization (altered remains):
 - Permineralization – addition of minerals
 - Replacement – replacement by minerals
 - Carbonization – preserved as carbon film or trace
 - Molds, external – depression of external features
 - Molds, internal – internal cavity of organism
 - Casts - replica of organism in mineral matter

Part 2. What is a Fossil?

- 1. Processes of fossilization (unaltered remains)
 - Original Hard Parts (shells, bones, teeth)
 - Incrusted remains (covered with minerals)
 - Pickled or Entombed remains (tar, amber)
 - Mummified remains (dried, dessicated)
 - Frozen remains (in frozen sediments or ice)

Part 2. What is a Fossil?

- 2. Invertebrate Fossils
 - Simple, small, soft – preservation as impressions, films

Part 2. What is a Fossil?

- 3. Vertebrate Fossils
More complicated organisms, larger, usually with bones, greater chance of preservation

Part 2. What is a Fossil?

- 4. Trace Fossils
Tracks and Burrows – dinosaur and mammal tracks, worm tracks and burrows
Coprolites – fossilized excrement
Gastroliths – gizzard or ballast stones

Parts 3-4-5. History of Life

- Geologic Time Scale
 - Paleozoic
 - Mesozoic
 - Cenozoic

Parts 3-4-5. History of Life

- Video: Earth Revealed-Evolution Through Time
