

Methods of Fossilization

Fossils are preserved in the rock record in several ways;

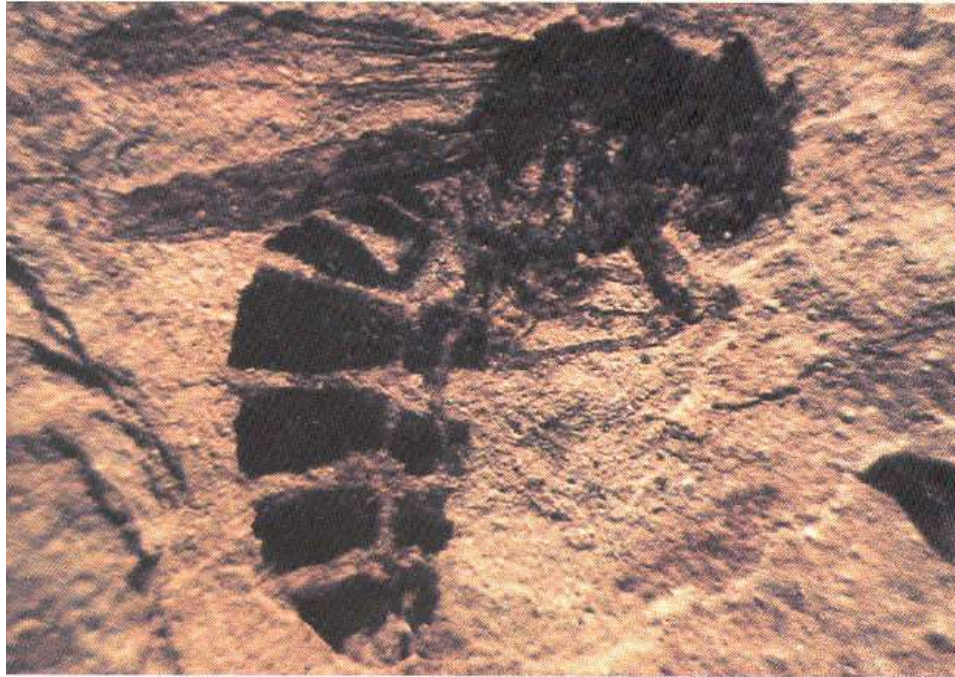
- 1) Petrification
- 2) Carbonization
- 3) Mold and Cast
- 4) Preservation
 - Ice, Mummification, and Amber
- 5) Traces
 - Tracks, Burrows, and Coprolites.

Petrification

- occurs when the small internal cavities and pores of the original structure are filled with precipitated mineral matter carried by water.
- sometimes internal details and structures are retained.



Carbonization



- when fine sediment encloses delicate matter (such as leaves) in an oxygen poor environment. Over time, pressure squeezes out liquid and gaseous components of the organism leaving behind a thin residue of carbon.

Mold and Cast

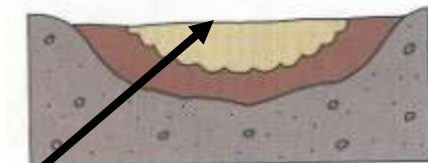
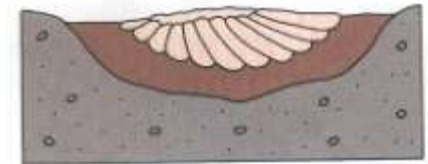
➤ I.e. replica of a plant or animal in sedimentary rocks.



➤ organism is buried in sediment and then dissolved by underground water leaving a hollow depression or an impression, called a **mold**.

➤ The mold shows only the original shape and surface markings of the organism; it does not reveal the internal structure.

➤ Minerals or sediment fills the hollow depression or impression it forms a **cast**.



Preservation



- Original remains can be preserved in ice or in amber (tree sap).
- Ice and amber protect the organism from decay (oxygen free environment) and from pressures that would crush the organisms.
- The entire animal has been preserved, even the soft parts which usually decay and disappear.

Examples:

- (1) Woolly Mammoths preserved in ice in Alaska and Siberia.
- (2) Insects preserved in tree sap (amber). Cane in Jurassic Park.

Trace Fossils



➤ show traces left in the rock by an animal, such as;

- 1) **Tracks** - animal footprints made in soft sediment that later formed solid sedimentary rock.
- 2) **Burrows** - animal trails made in soft sediment that later formed solid sedimentary rock.
- 3) **Coprolites** - Fossil poo and stomach contents.

Sample Problem

Fossils are commonly formed by the following methods:

- formation of molds and casts
- petrification by replacement

Describe these, including in your description, the conditions necessary for fossilization to occur.

Petrification: Hard parts of an organism, such as bone or trees, get buried rapidly in sediment. Pores and cavities in the material (organism) takes in water (fluid) which precipitates minerals to produce a solid replica of the organism, preserving all details, external and internal.

Molds and Casts: Organisms with hard parts get rapidly buried in sediment. The sediment compresses and hardens, the organism dissolves/decays, and an impression (mold) is left. For a cast, an impression (mold) fills with sediment and hardens/compacts, forming a solid representation of the organism. Only external features are fossilized.