

Fossil: any remains or traces of organisms that have been preserved in rocks.

Body Fossils: remnants of the actual body

- Bones, teeth, shell, tissue
- Altered remains: permineralized, replacements.



http://www.sawf.org/Newsphotos/Health/Ida_Fossil_Full_Body_2.jpg

Trace Fossils: doesn't include part of the body, but indicates the organisms activities.

- Footprints, burrows...ect.

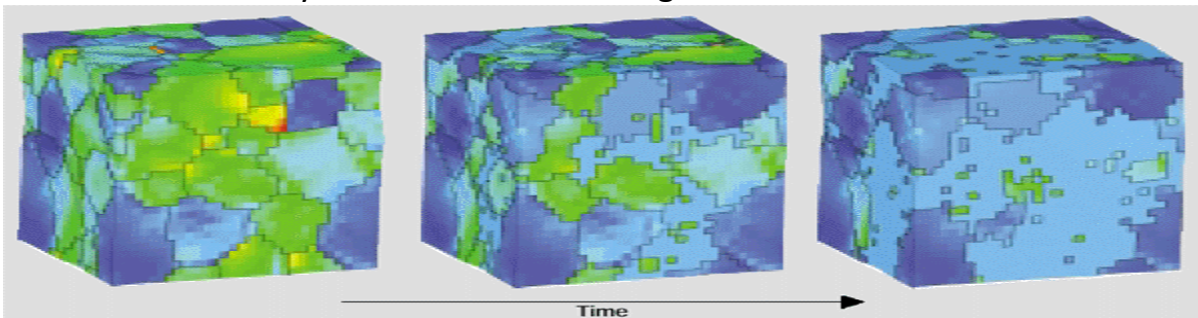
Coprolites: Fossil fecal matter (poo)

To Become a fossil

- Needs to be protected
- Death or rapid anoxic (oxygen poor environment)
- Rapid burial
- Presence of hard parts (soft things rot fast)
- Fossils are rare in metamorphic and volcanic rocks.

Types of preservation

- **Unaltered remains**
 - Some pollen and spores are weather resistant and are found in sediment and sedimentary rock.
- **Insects trapped in amber (sap)**
 - Trapped in tree sap that has hardened.
- **Mummification and freezing**
 - Freezing is good for preservation
- **Altered remains**
 - Recrystallization: going from one polymorph to another polymorph.
 - Crystal structure has changed



<http://www.tms.org/pubs/journals/JOM/0109/fig5.gif>

- Permineralization: Minerals precipitate in open spaces (teeth, bones, shells)



http://en.wikivisual.com/images/2/24/Petrified_wood_closeup_2.jpg

- Replacement: replaces original organic matter.
 - Saves original shape but loses detail and organic material.



<http://www.tyrrellmuseum.com/images/unaltered-fossil-galleryimage.png>

- **Carbonization**

- Most everything on the planet is made of carbon, oxygen, hydrogen, and phosphorus.
- When everything leaves but the carbon, and carbon film is left.
- Preserves a lot of fine detail in 2-D.

- **Molds and cast**

- Mold: empty space from previous organic material.
- Cast: when mineral water fills in a mold and hardens.

Cast



Mold



<http://petrifiedwoodmuseum.org/Images/ConeCastMoldGermany560.jpeg>