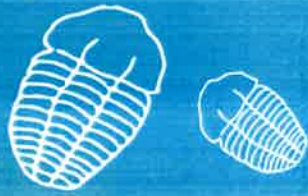


FOSSILS

www.geolsoc.org.uk/factsheets

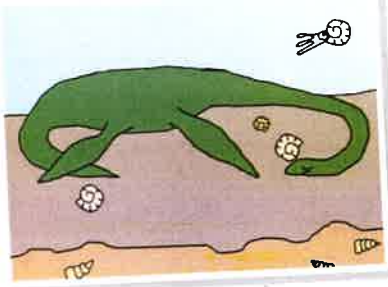


HOW DO FOSSILS FORM?

Fossils can form in a few different ways but usually an organism has to be **buried** very quickly in **soft sediment** such as mud or sand, in a calm, watery environment like the muddy sea floor, bottom of a lake or a river estuary. Here are the stages in which a fossil might form:

STAGE 1: DEATH

A marine reptile from the **Jurassic** period called a **plesiosaur** dies and its body falls to the sea floor.



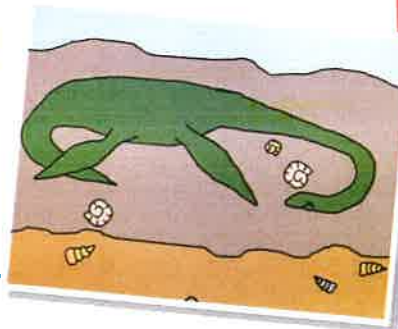
STAGE 2: RAPID BURIAL

A **landslide** occurs nearby and the plesiosaur is buried quickly in mud, preventing **scavenging** animals from gobbling it up.



STAGE 3: DECAY OF SOFT PARTS

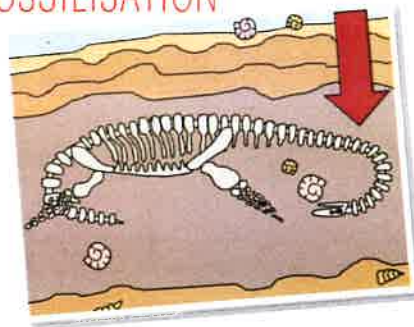
The muscles, skin and other soft parts of the plesiosaur are digested by bacteria in the sediments. Only the hardest parts such as the bones and teeth are left.



STAGE 4: BUILD-UP OF SEDIMENTS & FOSSILISATION

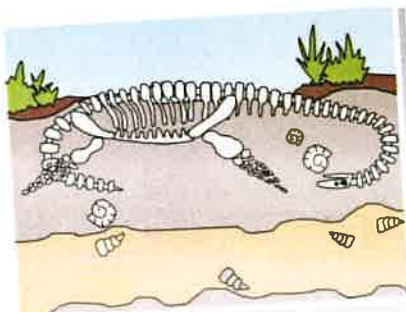
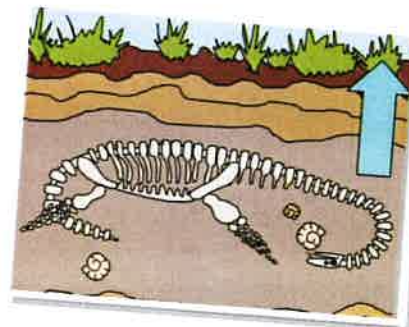
As time passes, more and more sediment builds up. The weight of the overlying layers squashes the soft mud and it begins to turn into rock. This is called **lithification**.

Water is squeezed out of the mud and seeps into the plesiosaur bones. Minerals and chemicals in this water gradually change the bones and teeth into stone. The plesiosaur is now a fossil but it is buried under layers and layers of rock under the ocean.



STAGE 5: UPLIFT ONTO LAND

Over millions of years, sections of the Earth's crust called **tectonic plates** move around. **Continents** crash into each other and shove the rocks upwards. Rocks that were previously at the bottom of the ocean can be raised above sea level!



STAGE 6: EROSION & EXPOSURE

Over time the rock layers are gradually stripped away by **erosion** (wind, rain, waves and ice). Part of the fossil is revealed at the surface to be discovered by a lucky fossil hunter!

EXCEPTIONAL PRESERVATION

Very rarely the soft parts of animals such as muscles, feathers, skin are preserved as fossils. Sometimes even entire animals made of **soft tissue**, like jellyfish and worms, are preserved. Palaeontologists call this **exceptional preservation**.

Exceptionally preserved fossil dragonfly from the Solnhofen limestones of Germany



FOSSIL COLOUR

Exceptional preservation can sometimes even show us prehistoric animal **colours**! Feathers, scales and hair contain **microscopic** structures called **melanosomes**. Melanosomes have different shapes depending on their colour and in extremely rare cases they can be preserved in fossils. Using **powerful microscopes**, palaeontologists can work out some of the colours of fossil feathers and scales.

Melanosomes have recently revealed that a dinosaur called **Sinosauropteryx** would have been covered in orange feathers with a white and orange striped tail! Another dinosaur called **Microaptor** is now known to have been covered in glossy black feathers like a starling!



Sinosauropteryx fossil from China with fossil feathers and melanosomes!
Credit: James St. John/ Wikimedia Commons