

EVIDENCE FOR EVOLUTION

<https://necsi.edu/evidence-for-evolution>

During and since Darwin's time, people have been looking for and studying evidence in nature that teaches them more about evolution. Some types of evidence, such as fossils and similarities between related living organisms, were used by Darwin to develop his theory of natural selection, and are still used today. Others, such as DNA testing, were not available in Darwin's time, but are used by scientists today to learn more about evolution.

Five types of evidence for evolution are discussed in this section: ancient organism remains, fossil layers, similarities among organisms alive today, similarities in DNA, and similarities of embryos. Another important type of evidence that Darwin studied and that is still studied and used today is artificial selection, or breeding.

Darwin found many types of remains of ancient organisms. In addition to fossil layers, he saw other fossils, bones, insects in amber (hardened tree sap), and petrified wood. Another type of preserved organism, which Darwin did not find, is animals such as mammoths frozen and preserved in ice.



This frozen baby woolly mammoth probably lived 22,000 years ago.

During his journey, Darwin found the bones of an extinct giant sloth, Megatherium. He realized that animals can become extinct and that life is not unchanging, and he also saw similarities between extinct and living animals. Darwin wondered how they could be related.

Darwin and scientists today have discovered that the ancient organisms whose remains they find look like organisms alive today because they are the living organisms' ancestors or evolved from a common ancestor. For example, megatherium was probably an ancient ancestor of tree sloths that exist today.

Today, fossils are still being studied to find out more about life in the past and its relation to life in the present. They provide valuable information about evolution and how life formed. Unlike in Darwin's time, now scientists can date these fossils and remains to get a more exact picture of when different organisms evolved. We are still learning new things from a valuable source that is literally millions of years old.

A paleontologist removes fossils from rock.



Minerals have replaced the plant matter to form this petrified wood.

This insect became trapped in tree sap, which then hardened into amber.



Fossil layers are fossils that formed in sedimentary rock. Sedimentary rock is rock that is formed in layers by the depositing and pressing of sediments on top of each other. Sediments are any loose material that gets broken away and carried: pieces of rocks, pebbles, sand, clay, silt, boulders, dead organisms, animals, plants, shells, insects When sediments move and settle somewhere, they are being deposited. When, over a long time, layers and layers of sediments get deposited on top of each other, the weight of the top layers presses down on the bottom layers, forming them into rock called sedimentary rock. The oldest layers are on the bottom, and the youngest layers are on the top. Because

sediments sometimes include once-living organisms, sedimentary rock often contains a lot of fossils. Fossils are once-living organisms that have been turned into rock, in which the shape or form of the organism can still be seen.

Once thing that Darwin noticed on his travels, and that people continue to notice today, is that fossils in the bottom layers are very different from the organisms alive today; Darwin didn't even recognize them. As one looks farther up, at younger and younger rock layers, the fossilized plants and animals become more and more familiar until they are a lot like organisms that are around now. The organisms also tend to become more and more complex.

From this, Darwin concluded that organisms have not remained the same since earth's beginning, and that they have changed a lot, gradually becoming more and more complex. He also realized that as new species arise, other ones become extinct.

People look at fossils to discover which life forms evolved first and which later on. Today scientists also have ways of dating the rocks, figuring out about how long ago each layer was deposited. This also helps us piece together the time scale of evolution and when certain events occurred.



Layers of sedimentary rock.

A sandstone fossil of a trilobite, which probably lived 500 to 600 million years ago.





A fossil of an ancient sea-lily, which probably lived 90 million years ago.