

Fossils

Fossils are the precious gifts of the geological past. They are the signs and remains of ancient living things preserved in the Earth's crust. The word fossil has a Latin origin, i.e. from fossilis meaning "dug up," and that remains the key attribute to label something as fossils. When we think of fossils, a picture of skeletons of animals or leaves and wood from plants, all turned to stone came to our mind. But geologists have a more complicated view.

Fossilisation

The process of a once living organism becoming a fossil is called fossilization. Fossilization is a very rare process: of all the organisms that have lived on Earth, only a tiny percentage of them ever become fossils. To see why, imagine an antelope that dies on the African plain. Most of its body is quickly eaten by scavengers, and the remaining flesh is soon eaten by insects and bacteria, leaving behind only scattered bones. As the years go by, the bones are scattered and fragmented into small pieces, eventually turning into dust and returning their nutrients to the soil. It would be rare for any of the antelope's remains to actually be preserved as a fossil.

On the ocean floor, a similar process occurs when clams, oysters, and other shellfish die. The soft parts quickly decay, and the shells are scattered over the sea floor. If the shells are in shallow water, wave action soon grinds them into sand-sized pieces. Even if they are not in shallow water, the shells are attacked by worms, sponges, and other animals.

For animals that lack hard shells or bones, fossilization is even more rare. As a result, the fossil record contains many animals with

shells, bones, or other hard parts, and few soft-bodied organisms. There is virtually no fossil record of jellyfish, worms, or slugs. Insects, which are by far the most common land animals, are only rarely found as fossils. Because mammal teeth are much more resistant than other bones, a large portion of the mammal fossil record consists of teeth. This means the fossil record will show many organisms that had shells, bones or other hard parts and will almost always miss the many soft-bodied organisms that lived at the same time.

Because most decay and fragmentation occurs at the surface, the main factor that contributes to fossilization is quick burial. Marine animals that die near a river delta may be buried by sediment carried by the river. A storm at sea may shift sediment on the ocean floor, covering and helping to preserve skeletal remains.

On land, burial is rare, so consequently fossils of land animals and plants are less common than marine fossils. Land organisms can be buried by mudslides or ash from a volcanic eruption, or covered by sand in a sandstorm. Skeletons can be covered by mud in lakes, swamps, or bogs as well. Some of the best-preserved skeletons of land animals are found in the La Brea Tar Pits of Los Angeles, California. Although the animals trapped in the pits probably suffered a slow, miserable death, their bones were preserved perfectly by the sticky tar.

In spite of the difficulties of preservation, billions of fossils have been discovered, examined, and identified by thousands of scientists. The fossil record is our best clue to the history of life on Earth, and an important indicator of past climates and geological conditions as well. The fossil record also plays a key role in our lives. Fossil fuels such as coal, gas, and oil formed from the decayed remains of plants and animals that lived millions of years ago.