

# Evolution Is a Matter of Time

Toward the 18th century, scientific progress demanded a different explanation of the myth of the origin of the world and of life. Even before Darwin, the work of naturalists and the discovery of fossils pointed to the fact that time, measured not in years but in millennia, runs its course, allowing each species to become what it is. Genetic mutations occur through the generations, and interaction with the environment determines that the most suitable traits will be transmitted (natural selection) and that a population will evolve in relationship to its ancestors. The idea is not related to "improvement" but rather to change as the origin of diversity, to the ramifications of evolutionary lines tracked through paleontological or genetic studies. ●

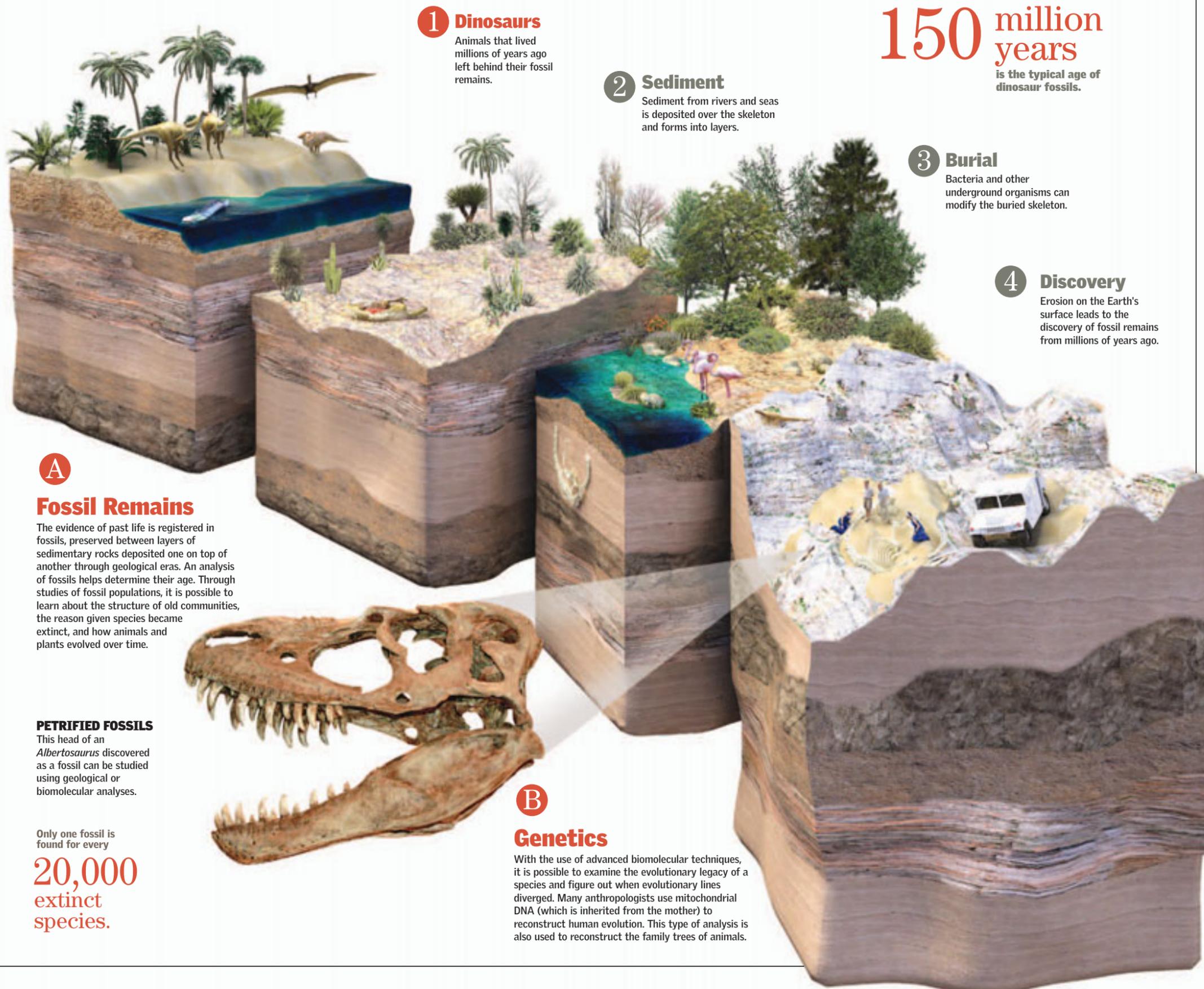
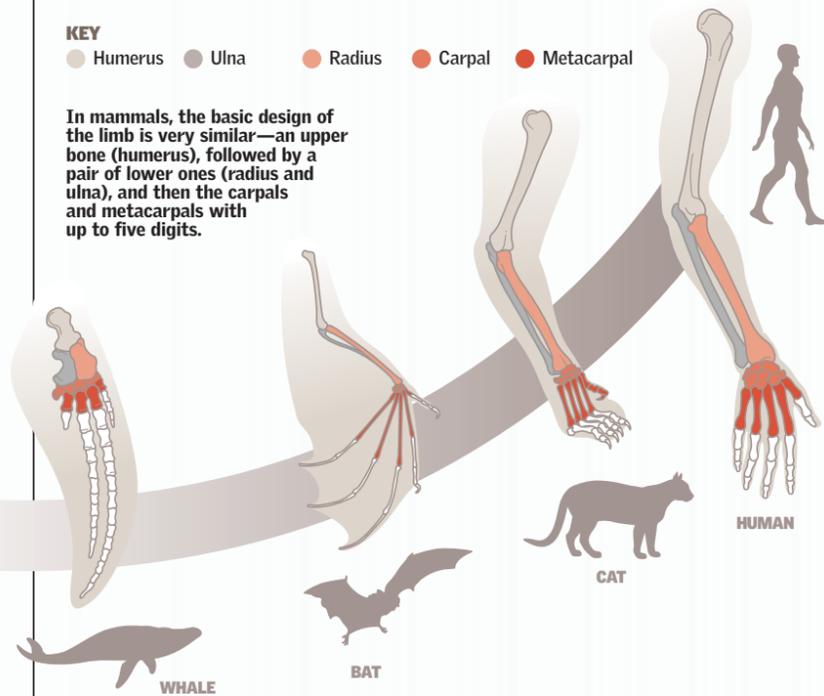
## A Common History

Animals that look very different may be built according to the same basic body design. For example, dogs, whales, and human beings are mammals. All have the same skeletal design with a spinal column

and two pairs of limbs connected to it. This suggests that they all share a common ancestor. In mammals, the bones of the limbs are the same even if they are morphologically different from one another.

**KEY**  
 ● Humerus ● Ulna ● Radius ● Carpal ● Metacarpal

In mammals, the basic design of the limb is very similar—an upper bone (humerus), followed by a pair of lower ones (radius and ulna), and then the carpals and metacarpals with up to five digits.



**1 Dinosaurs**  
 Animals that lived millions of years ago left behind their fossil remains.

**2 Sediment**  
 Sediment from rivers and seas is deposited over the skeleton and forms into layers.

**150 million years**  
 is the typical age of dinosaur fossils.

**3 Burial**  
 Bacteria and other underground organisms can modify the buried skeleton.

**4 Discovery**  
 Erosion on the Earth's surface leads to the discovery of fossil remains from millions of years ago.

## A Fossil Remains

The evidence of past life is registered in fossils, preserved between layers of sedimentary rocks deposited one on top of another through geological eras. An analysis of fossils helps determine their age. Through studies of fossil populations, it is possible to learn about the structure of old communities, the reason given species became extinct, and how animals and plants evolved over time.

**PETRIFIED FOSSILS**  
 This head of an *Albertosaurus* discovered as a fossil can be studied using geological or biomolecular analyses.

Only one fossil is found for every  
**20,000**  
 extinct species.



**B Genetics**  
 With the use of advanced biomolecular techniques, it is possible to examine the evolutionary legacy of a species and figure out when evolutionary lines diverged. Many anthropologists use mitochondrial DNA (which is inherited from the mother) to reconstruct human evolution. This type of analysis is also used to reconstruct the family trees of animals.