

Reconstructing the Past

How Scientists Have Pieced Together the Appearance of Ancient Animals from Fossilized Data

Food

Based on the head shape, tooth shape, fossilized stomach content and even excrement of dinosaurs, scientists can figure out what kind of diet a species subsisted on, allowing inferences about the regions they inhabited and the role they played in their environment.

Soft Tissues

Some fossils are found so well preserved that parts of their soft tissues remain. These bits of tendon and muscle can reveal how dinosaurs moved and how their skeletal structure was filled out. In the case of *Stegosaurus*, spine plates were always found separate from the rest of the skeleton because they were attached in the soft tissues of the dinosaur rather than directly to the spine. It wasn't until a well-preserved specimen was found that we learned the plates stood vertically rather than flat along their backs.

Bone Matter

Aside from illustrating the general structure of the dinosaur, scientists can use bones to calculate the age of the dinosaur when it died, like with tree rings. This is how we know that dinosaurs grew very quickly- even the largest ones- and they experienced a teenage growth spurt!

Melanosomes

A recent discovery by scientist Jakob Vinther revealed that melanosomes, which are bits of melanin that add pigment to hair, eyes, feathers, and skin, can survive fossilization and can tell us what colors the living dinosaur would have been. These melanosomes can be different shapes depending on what color they produced.

Modern Relatives

Living ancestors of dinosaurs, especially birds, have been particularly helpful in providing information about dinosaur biology. The genetic legacy of these animals gives us insight, and some scientists are currently trying to encourage the reappearance of dormant genes that could have been responsible for dinosaur features like their distinctive skulls and teeth.

Technology Advancements

As technology advances, scientists have been able to uncover more and more data from dinosaur fossils. CT scans in particular have been extremely helpful by allowing for the digital reproduction of fossils that can then be studied and tested without risking the fragility of the bones. These tests recently revealed how *Stegosaurus* had a much stronger bite than previously assumed, especially for an herbivore.

