

Section 8: The Future of the Past

Fun Facts

- A scientist who studies droppings (coprolites), including dinosaur ones, is called a “coprologist.”
- Velociraptor means “fast thief.”
- Spielberg spent a week at the California Academy of Sciences in GG Park, studying the *velociraptor*-relative, *Deinonychus*, before giving this dino a major part in *Jurassic Park*.
- Scientists can make mistakes; one of the first recorded discoveries was an *Iguanodon* in England in 1854. They found two fossils that looked like horns with the skeleton and so put them on the nose. Later, they realized *Iguanodon* had no horn but a spike on each of its thumbs (the “horns”). More specimens of each species has helped correct these early errors.

Q&A

Q: How can scientists know how fast a dinosaur grew or how much weight it could gain?

A: By studying fossil bones; fossil bone is a code that can record an animal’s biology in microscopic detail.

Q: Were dinosaurs cold-blooded or warm-blooded?

A: There is no definitive answer; the question remains controversial. (Even the terms “warm-blooded” and “cold-blooded” are controversial and non-definitive). Birds, which are warm-blooded, are derived from dinosaurs, so logically we could assume that some dinos were warm-blooded. A purported fossilized dino heart from a late Cretaceous plant eater (*Thescelosaurus*) was discovered in S. Dakota and appears to have a four-chambered heart and a single aorta, quite different from existing reptiles but similar to modern warm-blooded animals. Other evidence includes the way dinos stood straight-legged like mammals, so their rib cages could have held heart and lungs similar to mammals and bones that contained channels for quick circulation, as found in warm-blooded animals. Recent studies suggest that dinos may have been neither warm-blooded nor cold-blooded, but somewhere in between. Big dinosaurs may not have had much control over body temperature but probably didn’t need it, since their huge size would have insulated them from temperature fluctuations. Whatever the answer, dinos were active, dynamic creatures, and not overgrown lizards.

Q: How intelligent were dinosaurs?

A: The EQ or Encephalization Quotient is a simple way of measuring an animal’s intelligence; it is the ratio of the brain weight of the animal to the brain weight of a “typical” animal of the same weight. Birds and mammals have brains about 10 times bigger than those of bony fish, amphibians, and reptiles of the same body size. Sauropods had an EQ of about .2; the smartest dinos (Troodon, Velociraptor, and Deinonychus) had an EQ of about 5.8; humans have an EQ in the range of 7 to 8.

Q: Did mammals ever eat dinosaurs?

A: Yes, a 130-million-year-old opossum-sized mammal was found with a juvenile psittacosaur in its stomach.

Q: How can we tell what dinosaurs ate?

A: By examining several lines of evidence. Looking at their teeth: carnivores had long, sharp teeth and herbivores had flat teeth for chewing tough plants. Fossil dino droppings, called “coprolites,” are another clue to the diet of a dinosaur. Scientists can tell what the dinos ate by grinding the coprolites and examining chemical evidence the dust or preparing very thin rock slices so light penetrates them, allowing microscopic study of small inclusions. Also trace fossils, where we see dinosaur bites on their prey.

Q: How do scientists calculate the weight gain of a dinosaur? For example, how much could a young *Protoceratops* gain in a decade?

A: By studying the inner structure of the fossil bone—it tells us that the youngster could gain 13.2 kg (about 30 pounds) a year.

Q: Why is the *Velociraptor* in this exhibit so much smaller than the “raptors” in the *Jurassic Park* movies?

A: *Velociraptor* did not exist during the Jurassic. Real *Velociraptor* were actually much smaller than the supposed “raptors” of the movies. However, there were very large dromaeosaur relatives living during the Jurassic; these dromaeosaurs were roughly the size of the “raptors” in the movies.

Q: How could the meat eating dinos of the Mesozoic be related to modern birds, since birds of today have no teeth?

A: Birds likely lost their teeth as they evolved more efficient flight adaptations and shed unnecessary weight, such as teeth. Birds and dinosaurs share many, many other characteristics.

Q: Who discovered the first dinosaur egg and where?

A: The first documented egg was a *Protoceratop* egg and was found in Mongolia in 1922 by Roy Chapman Andrews. (This is the first egg found, not the oldest.)