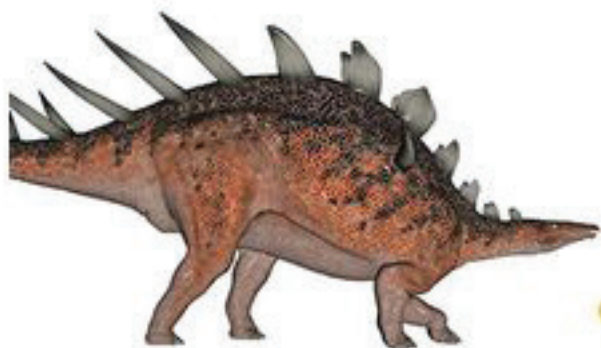




GUIDE TO  
**DINOSAURS**



INSTITUTE FOR  
CREATION  
RESEARCH

Dallas, Texas  
[www.icr.org](http://www.icr.org)



# GUIDE TO DINOSAURS

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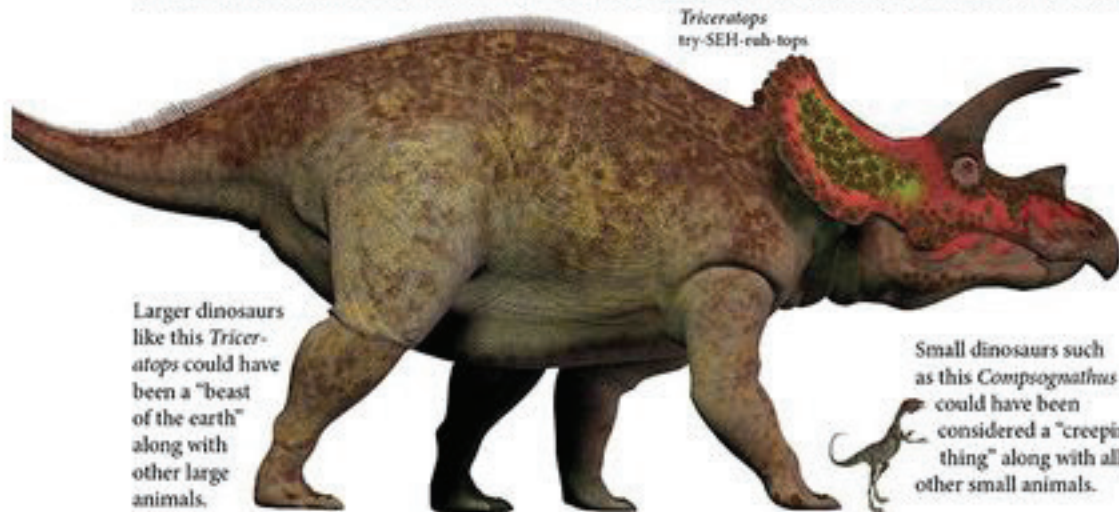
All Scripture quotations are from the New King James Version.

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*Triceratops*  
try-SEH-ruh-tops

Larger dinosaurs like this *Triceratops* could have been a "beast of the earth" along with other large animals.



Small dinosaurs such as this *Compsognathus* could have been considered a "creeping thing" along with all other small animals.

*Compsognathus*  
COMP-sog-NATH-us



For unknown reasons, some Bible translators describe behemoth as a hippopotamus or possibly an elephant. But the Bible is clear that behemoth had a "tail like a cedar" (Job 40:17) and was "the first of the ways of God" (Job 40:19), meaning it was very large. Thus, the Bible's description best fits a sauropod.



Elephant



Hippopotamus



Lebanese Cedar

## The First Discoveries

Dragon sightings have occurred for millennia, and Chang Qu wrote about “dragon” bones found in what is now Sichuan Province, China, around 300 B.C. Had he written about them today, they would



Robert Plot

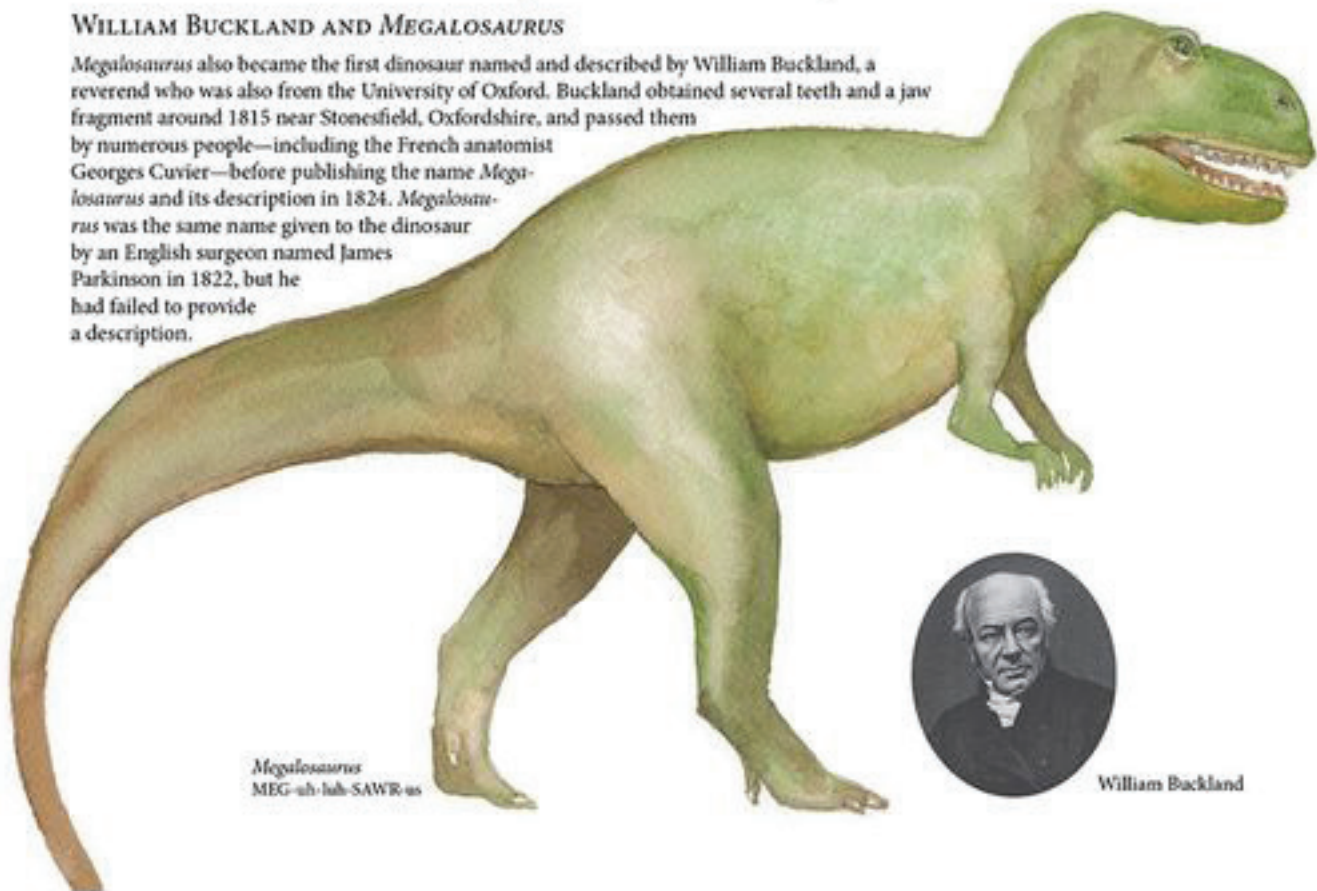
probably have been called dinosaur bones. But the first “official” dinosaurs were not named and described until relatively recently. The first



drawing and description of a dinosaur bone in scientific literature was by University of Oxford clergyman and chemist Robert Plot in 1677. He believed the specimen, which was found near Oxfordshire, was from a modern elephant brought to Britain by the Romans. The original specimen was lost, but we now believe it was part of the femur of a theropod dinosaur called *Megalosaurus*.

### WILLIAM BUCKLAND AND *MEGALOSAURUS*

*Megalosaurus* also became the first dinosaur named and described by William Buckland, a reverend who was also from the University of Oxford. Buckland obtained several teeth and a jaw fragment around 1815 near Stonesfield, Oxfordshire, and passed them by numerous people—including the French anatomist Georges Cuvier—before publishing the name *Megalosaurus* and its description in 1824. *Megalosaurus* was the same name given to the dinosaur by an English surgeon named James Parkinson in 1822, but he had failed to provide a description.



*Megalosaurus*  
MEG-uh-luh-SAWR-us



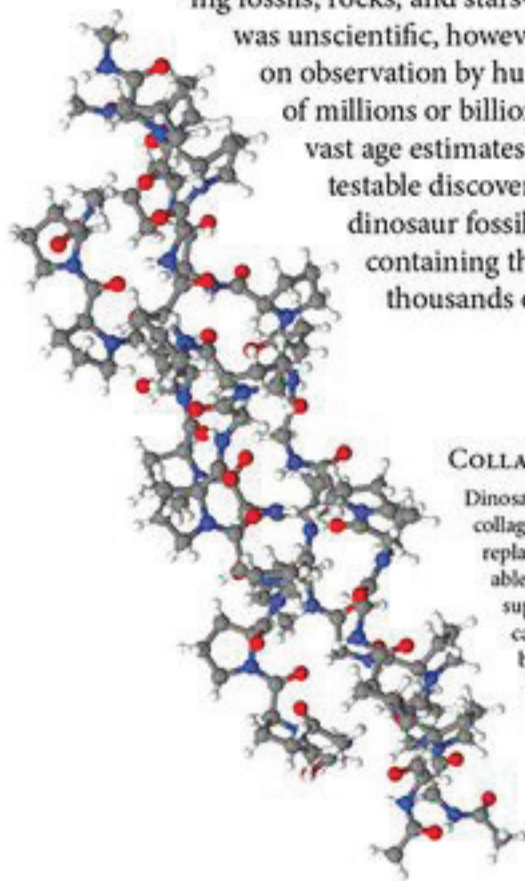
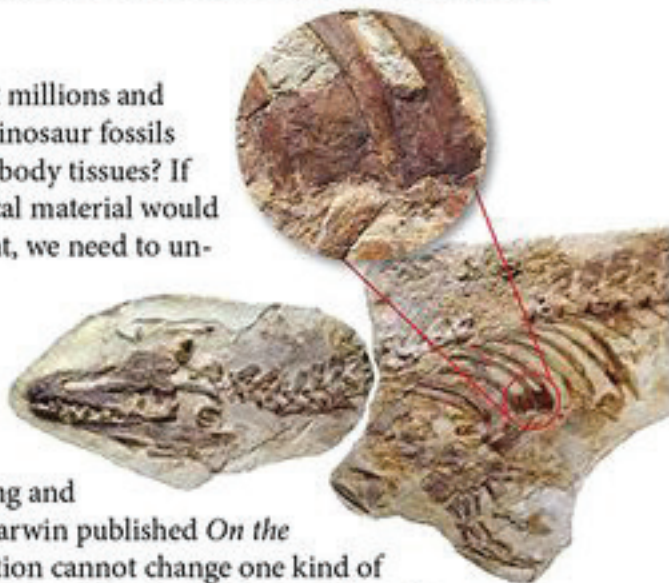
William Buckland

## Soft Fossil Discoveries

In evolution's story, dinosaurs lived and died out millions and millions of years ago. But did you know some dinosaur fossils still have partly decayed remains of their original body tissues? If these fossils are millions of years old, this biological material would be long gone! To understand why this is important, we need to understand something called uniformitarianism.

The biblical genealogies place the earth's age around 6,000 years old. But in the late 18th and into the 19th centuries, geologists began to develop a philosophy of uniformitarianism, in which Earth's processes were viewed as unchanging and progressing at very slow rates. In 1859, Charles Darwin published *On the Origin of Species*. Since his theory of natural selection cannot change one kind of organism into a different kind within a person's lifetime, Darwin had to include vast amounts of time for evolution to seem viable.

Uniformitarians ran with this idea, applying vast ages to everything—including fossils, rocks, and stars—thereby undermining Scripture. This was unscientific, however, because science is conducted based on observation by humans, and there are no human records of millions or billions of years. Without historical records, vast age estimates cannot be verified. Also, observable and testable discoveries in recent times, such as soft material in dinosaur fossils, show that these animals and the rocks containing them cannot possibly be older than thousands of years.



### COLLAGEN

Dinosaur bone is made of a hard mineral called bioapatite and a softer protein called collagen, both produced by bone cells. Most fossilized bones have their soft parts replaced with inorganic minerals from groundwater. However, scientists have been able to find collagen, as well as blood vessels and cells, in dinosaur bones that are supposedly millions of years old. Chemical studies have shown that collagen cannot last longer than 900,000 years at normal Earth-surface temperatures before fully degrading, and yet researchers have found measurable collagen in dinosaur bones labeled as 180 million years old. Red blood cells and blood vessels would likely break down even quicker than collagen. This all shows that the dinosaurs these fossils belonged to were deposited no more (and likely far less) than 900,000 years ago, which is consistent with the Bible's historical record.

## Brachiosaurus: The Big-Nose Giant

Because of large nasal opening on top of its head, *Brachiosaurus* is sometimes included in a new subcategory of sauropods called Macronaria, which means “big noses.” They were a bit different from most sauropods. Because of the large nasal opening on the top of their skulls, early paleontologists believed brachiosaurs lived in water, using it to buoy their massive bodies and breathing out of the barely exposed tips of their skulls. However, later studies of their compact foot structure suggested that they were land-dwellers like most dinosaurs. Dr. Larry Witmer, an American paleontologist, suggested that the nose openings on these dinosaurs were closer to the front of the skull and filled with fleshy nasal tissue, giving them an increased sense of smell.

*Brachiosaurus* is one of the heaviest and strangest sauropod dinosaurs. It is estimated to have weighed up to 50 tons with a length of 85 feet. The strangest feature is not its bulbous nose but its front legs, which were longer than its hind legs. This caused the animal to hold its head up extremely high in the air, possibly up to 60 feet above the ground! Paleontologists still struggle to explain the blood pressure necessary to supply the brain at such a great height.



Elmer Riggs and H. W. Menke working on *Brachiosaurus altithorax* bones

In 1900, *Brachiosaurus altithorax* was found in western Colorado by Elmer Riggs of the University of Chicago. He recovered about 20% of the specimen, including some of the leg bones, ribs, pelvis and vertebrae—just enough material to name the new species the “arm lizard” in honor of its long front legs. Today, most of the original specimen is stashed out of public view at the Field Museum of Natural History in Chicago, but replicas are on display outside the Field Museum and in Chicago’s O’Hare International Airport.

A more complete *Brachiosaurus* specimen was described by Werner Janensch in 1914 after German expeditions to Tanzania in 1909–1912. American paleontologists were able to take bone replicas from this find and construct and mount their original *Brachiosaurus*. Recently, the Tanzanian specimen, housed at the Berlin Museum, was renamed *Giraffatitan brancai* due to slight differences in bone proportions. Creation scientists, by contrast, consider both of these species—and subsequent species—of brachiosaurs the same “kind” and attribute any minor differences to being merely variations in God’s well-designed brachiosaur theme.



## CERATOPSIA

Most Ceratopsia were large, around 20 to 30 feet long. They ate plants, walked on all four limbs, and had extremely large skulls (up to eight feet long). They also had a wide variety of horn and frill shapes. The basic body structure of all of these dinosaurs was the same design, and they probably even looked identical as hatchlings. When

they matured, however, the differences in horn and frill shape became evident. They had toothless, beaked jaws with brackets of cheek teeth similar to hadrosaurs, including three to four replacement teeth below the active teeth on top. The teeth came together at a high angle, producing a scissor-like motion. Combined with the large frills for jaw muscle attachment, these dinosaurs could chew up the coarsest of plant material.



*Torosaurus*  
TOR-uh-SAWR-us

## FRILL

Many paleontologists used to think the frill was used for protection from predation, but after careful examination that seems less likely. First, the frills usually had large holes in them, which does not serve for much protection. Secondly, the frills had lots of blood vessels and were filled with internal openings, similar to stegosaur plates. That means that they likely bled if broken or bitten.

Most paleontologists now think the frills were for muscle attachment, giving the creature a strong bite.



*Triceratops* skull  
try-SEH-rah-tops

*Protoceratops*  
pro-toe-SEH-rah-tops



*Peltancosaurus*  
SIT-eh-kuh-SAWR-us



*Pachycephalosaurus*  
PACK-ee-SEF-uh-kuh-SAWR-us

# GUIDE TO DINOSAURS



**D**inosaurs were amazing creatures. We're learning more about them all the time, but there are still many questions. How do they fit with the Bible? Are they really millions of years old? Did they live at the same time as humans? Were dinosaurs on the Ark? If so, why are they extinct today? Examine the evidence and discover that the Bible tells the real dinosaur story.



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