WRITTEN BY: Molly Sanchez and The Good and the Beautiful Team

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In times past the world was filled with aweinspiring creatures large and small. While many of these animals can no longer be found, they left behind clues about their existence on the earth. Studying teeth to toes, scientists use these pieces like a puzzle to give us a glimpse into the past.

New discoveries are constantly found, and new speculations are made about these ancient animals as we gather more information. The animals featured in this book are rendered from a compilation of the best information scientists have available today.

# DIMETRODON

Dimetrodon [die-MEH-truh-don], often mistaken for a dinosaur, was a mammal-like creature that fed on fish, reptiles, and amphibians. Since its initial discovery in 1878, twenty species have been identified. This animal walked on four legs and had a magnificent sail down its back. Many scientists believe that Dimetrodon's sail was used to help regulate its temperature, though other studies indicate that this may not have been the case.



Dimetrodon means "two measures of teeth." It had long teeth in the front and shorter teeth in the back.

NORTH AMERICA



SIZE: 1.83-4.57 m (6-15 ft) long

WEIGHT: 27.22–249.48 kg (60–550 lb)

CARNIVORE

**FOUND:** North America

#### INFO:

SIZE: Up to 11.89 m (39 ft) WEIGHT: Up to 4,989.52 kg (11,000 lb)

#### CARNIVORE

#### FOUND:

Mexico and 10 states in the USA (most abundant in Georgia)

#### FUN FACT:

USA

MEXICO

Deinosuchus possibly lived to be 50 years old. It was large enough to have preyed on dinosaurs.

## DEINOSUCHUS (MEGA (ROCODILE)

A close relative of the alligator, Deinosuchus [die-nuh-SOO-kuss] was larger than most other predators in the subtropical seawater that used to cover the state of Ohio, USA. A cunning predator, Deinosuchus would wait at the shoreline of the sea, ambush its prey, and drag it into the water to submerge it before eating it.

## ANOMALOCARIS (GIANT SHRIMP)

In Greek, anomalocaris [uh–NOH–muh–lo– CARE–iss] means "unusual shrimp." At a length of around 91.44 cm (3 ft) long, this ancient arthropod was certainly unusual. Anomalocaris was able to swim at great speeds due to its undulating motion, and it had sharp spikes on its limbs, useful for grabbing prey. With 32 overlapping plates in its mouth, Anomalocaris may have been able to crush the thick armor on food like trilobites, but it has also been theorized that it was a filter feeder, using its spiky arms to sift through gravel for smaller prey.

#### FUN FACT:

Anomalocaris's large stalked eyes had 16,000 lenses each, which gave it 360-degree eyesight.



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### INFO:

SIZE:

Up to 91.44 cm (3 ft)

WEIGHT: 9.07 kg (20 lb)

CARNIVORE

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FOUND: Utah, USA; Canada; China; Australia; and Greenland

## MEGALANIA (VARANUS PRISCUS)

Categorized in the monitor family of lizards along with today's Komodo dragon, fossils from the gigantic Megalania [meg-uh-LAY-nee-uh] lizard have been found all over Australia. At about 5 m (16.4 ft) long and with sharp, curved teeth, Megalania would have been able to take down large prey such as pygmy elephants (now extinct), kangaroos, and tortoises. It is believed that Megalania also carried venom in its bite.

#### FUN FACT:

Megalania is the largest-known land lizard. The Komodo dragon is one of its closest relatives.

AUSTRALIA

SIZE: 3.5-7 m (11.5-23 ft) WEIGHT: Up to 1,940.02 kg (4,277 lb) CARNIVORE

INFO:

FOUND:

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Australia

# ANDREWSARCHUS

By studying the skull of the Andrewsarchus [an-droo-SAR-kuss], scientists have theorized that this animal was either a hunter or a scavenger. It appears to have had characteristics such as a very strong jaw and wide cheekbones. Not much else is known about Andrewsarchus, but perhaps one day more fossils from this meat-eating creature will be found. FUN FACT:

The only fossil of this species ever uncovered is a skull found in Mongolia that measured 0.8 m (2.6 ft) long. From this specimen, scientists have only been able to make educated guesses about what the rest of the body may have looked like.



#### INFO:

#### SIZE:

About 1.77 m (5.8 ft) tall at the shoulder

3.35 m (11 ft) long

WEIGHT: Maybe 907.18-1,814.37 kg (2,000-4,000 lb)

CARNIVORE OR OMNIVORE

FOUND:

Mongolia

# PALAEEUDYPTES (GIANT PENGUINS)

Including four species of large ancient penguins, fossils of the Palaeeudyptes [PAH-lay-you-DIP-teez] genus of birds have been found on Seymour Island, Antarctica, and in New Zealand. At about 2 m (6.7 ft) tall, the largest of the four species was taller than most humans while the smallest was closer to the size of modern emperor penguins. Based on their size, scientists think these "colossus penguins" were able to stay underwater for around 40 minutes at a time.

#### FUN FACT:

A similar penguin today is the emperor penguin at 1.22 m (4 ft) tall and close to 45 kg (100 lb).

ANTARCTICA

**NEW ZEALAND** 

#### INFO:

SIZE: 1.83 m (6 ft) tall

WEIGHT: About 113.4 kg (250 lb)

CARNIVORE

FOUND:

Antarctica and

New Zealand

S) ANCIENT ANIMALS

# MEGAPIRANHA

Only the teeth from this ancient fish have been found, making it difficult to decipher what this fish looked like and what it ate. What scientists do know is that the teeth of the Megapiranha [MEG-uh-per-ah-nuh] were arranged in a zigzag pattern across the front jaw and could have been useful for either a carnivorous or herbivorous fish species.

# HIERAAETUS MOOREI (HAAST'S EAGLE)

This magnificent creature is the largest eagle ever known to exist, with the females being much larger than the males. The Hieraaetus moorei [hi-yer-ATE-us MOREay] lived on the islands of New Zealand, where their sharp talons and curved beaks enabled them to feast on flightless birds and eggs. Scientists speculate that their muscular legs and wing muscles allowed them to take off in flight from the ground.



STUPENDEMYS





Have you ever thought about the extraordinary animals that lived long ago? Paleontologists and other scientists have made many fascinating discoveries about these incredible, often spine-chilling ancient creatures.

Join us for a ton of fun as we learn about them one by one!

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# THE ULTIMATE

# DINOSAUR GUIDE



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Heather Hawkins

### Diplodocus [dih-PLOD-uh-kuss]

Like all Sauropods, *Diplodocus* was an herbivore that walked on four legs. It had an extremely long tail and neck and a very small head relative to the rest of its body. *Diplodocus* had a double row of 88 bones down the length of its tail! The bones along the bottom of its tail are beam shaped, a unique feature that gave *Diplodocus* its name, which means "double beam."

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#### FASCINATING FACT

When British King Edward VII saw a picture in Andrew Carnegie's Scottish castle of the newly found *Diplodocus* specimen, the king requested a copy. Carnegie donated a cast to London's Natural History Museum in 1905, which "Dippy," as it came to be nicknamed, has called home

ever since.

Group <u>Sauropod</u> Ing the LENGTH <u>27 m (88 ft)</u>

**CLASSIFICATION** 

Order Saurischia

16 ft.

6 ft.

WEIGHT 12,000 kg (26,455 lb)

NAME MEANING "Double Beam"

**FOUND** North America (Colorado, Wyoming, Utah, New Mexico)

Diplodocus

tail bones

88 ft.



Scientists believe that *Diplodocus* used its whiplike tail in defense, whipping its tail to make a loud cracking sound (one that could burst the eardrums of its enemies) in warning. Its tail could move at speeds of up to 1,200 km/hr (745 mph)! Even its most fearsome predator, the mighty *Allosaurus*, likely was not a match for *Diplodocus*' deadly tail.

Although all Sauropods are extremely long, Diplodocus is the longest of all the dinosaurs for which we have complete skeletons. In fact, Diplodocus was longer than a tennis court and one of the longest land animals that has ever lived!

### FOSSIL STUDY

Diplodocus teeth

Different from the other dinosaurs in its group, *Diplodocus* had teeth that angled outward. These teeth, which look like pegs bunched up at the front of its mouth, were used to strip leaves from branches. Because *Diplodocus* needed so much vegetation to feed itself, its teeth became worn down and often fell out. It was able to grow new teeth, though!

Roaming around on its stocky legs, *Diplodocus* looked for enough plant matter to fill its belly. Its diet consisting of conifer trees, ferns, cycads, and mosses, the dinosaur would have used its peg-like teeth to strip off leaves and swallow them whole.

### SPINOSAURUS [SPY-no-SOR-us]

Like all other Theropods, *Spinosaurus* was a bipedal (walking on two legs) carnivore, although its longer arms suggest that it may have occasionally walked on all four limbs. *Spinosaurus* lived in the coastal mangroves of Egypt and Northern Africa and spent considerable time in the water. It had long spines protruding from its back that were covered with skin, forming a fin-like sail. The sail alone would have been more than 2 meters (6.5 feet) tall—taller than most adults! *Spinosaurus* is believed to be the largest carnivorous dinosaur, even bigger than *Tyrannosaurus rex*!



54 ft.

22 ft.

6 ft.



#### FASCINATING FACT

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The remains of the first discovered Spinosaurus skeleton were housed in a museum in Munich, Germany, until they were destroyed by Allied bombing during World War II.

THEROPODS

In addition to the standard carnosaur diet of mammals, birds, and possibly other dinosaurs, the semiaquatic *Spinosaurus* ate fish and marine reptiles. The skull of *Spinosaurus* was 1.75 m (6 ft) in length and resembled that of a crocodile. The snout was long and narrow, and the nostrils were on the top of the head, near the eyes instead of on the end of the snout. Also like a crocodile, it had jaws full of straight, sharp, cone-shaped teeth, perfectly suited to snatching fish from the rivers of its African habitat.

What a strange Theropod this was—eating fish, sometimes walking on all fours, and all with a sail attached to its back! FOSSIL STUDY

Spinosaurus means "spined lizard." Can you guess why it was given that name? The large thorn-like spikes that grew out of Spinosaurus' back were joined together and covered with skin. Scientists still debate the purpose of Spinosaurus' huge "sail." Some say the sail may have helped the dinosaur warm its body quickly by absorbing heat from the sun. Others believe the sail may have been brightly colored and used to either attract mates or ward off enemies. Some even think the appendage was more like a hump that was used to store water, similar to that of a camel! What do you think the purpose of the sail may have been?

> Backbone spines of a Spinosaurus

### CORYTHOSAURUS [ko-RITH-oh-SOR-us]



*Corythosaurus* is an Ornithopod dinosaur, specifically part of a sub-group called hadrosaurs, or duck-billed dinosaurs. These large herbivores all display a hollow crest or helmet-like structure on their heads, likely used for ornamentation and communication. The unique crest of *Corythosaurus* looks very similar to the helmets worn by ancient Greek soldiers from Corinth, thereby giving *Corythosaurus* its name.

*Corythosaurus* lived in a woodland environment, possibly near swampy areas. Because it had a fragile, short beak, early speculation was that it lived in or near water and fed mainly on soft vegetation. New evidence, including specimens found with pine needles, seeds, twigs, and fruit, reveal that *Corythosaurus* would have been competing with other low-grazing herbivores for the ground-level vegetation. In dry times, though, *Corythosaurus* could have moved to the swamps to find water vegetation.

*Corythosaurus*, like all other dinosaurs, had bony rings around its eyes known as scleral [SKLAIR–uhl] rings. The scleral rings of *Corythosaurus* are very similar to those of modern birds and reptiles, evidence that *Corythosaurus* would have been active only for short periods, but all throughout the day and night.

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Fossilized Corythosaurus skin imprint

Scientists believe that the hollow crest of *Corythosaurus* may have been a complex tool for communicating with other members of its species. When air passed through these structures, which were connected to the nasal passages, sound reverberated and was amplified, much like a horn. These loud calls could have been warnings or used in mating.





Corythosaurus skull

### **FASCINATING FACT**



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A collection of *Corythosaurus* fossils—two nearly complete specimens—were being shipped across the Atlantic on a merchant ship in 1916 during World War I. The ship was sunk by a German cruiser, and all cargo, including the precious *Corythosaurus* remains, was lost.

### ULTIMATE DINOSAUR GUIDE

Do you know which dinosaur looked like it was wearing a Grecian helmet and which dinosaur skeleton fascinated an English king? How are dinosaurs classified, and what can be learned from fossils today? Learn the answers to these questions and more as you encounter thirty awe-inspiring creatures in *The Ultimate Dinosaur Guide.* 

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