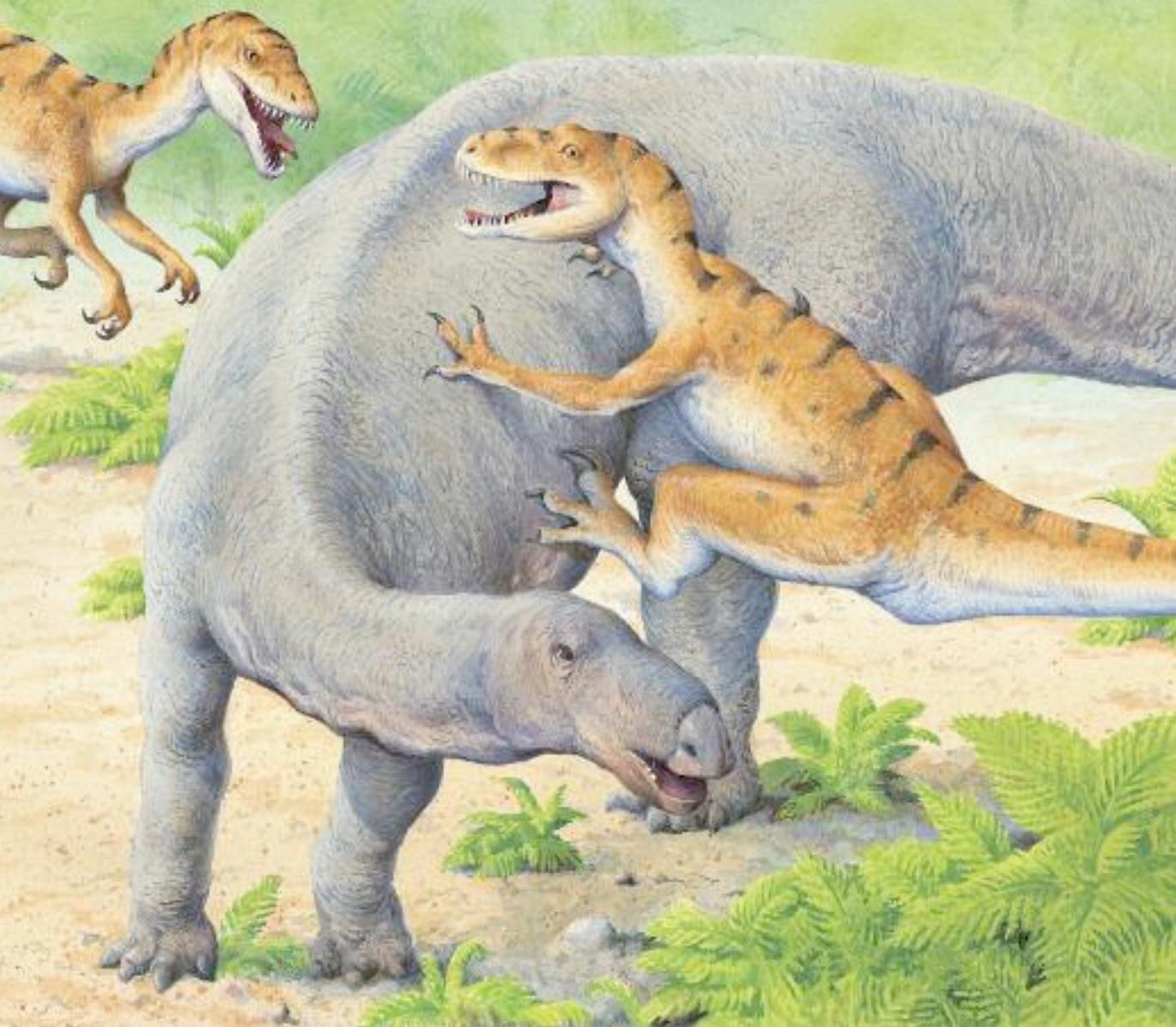


Dinosauria

PREDATORS



Dinosauria PREDATORS





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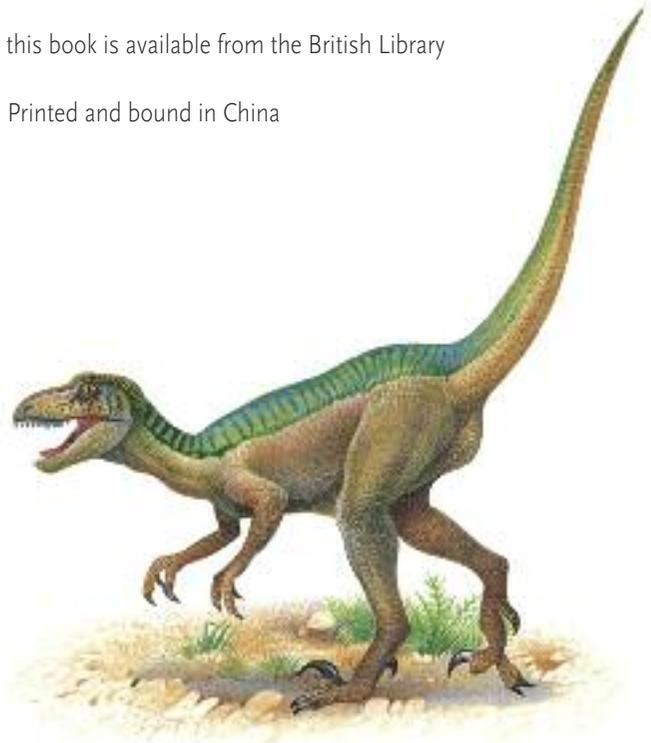
Text by Olivia Brookes

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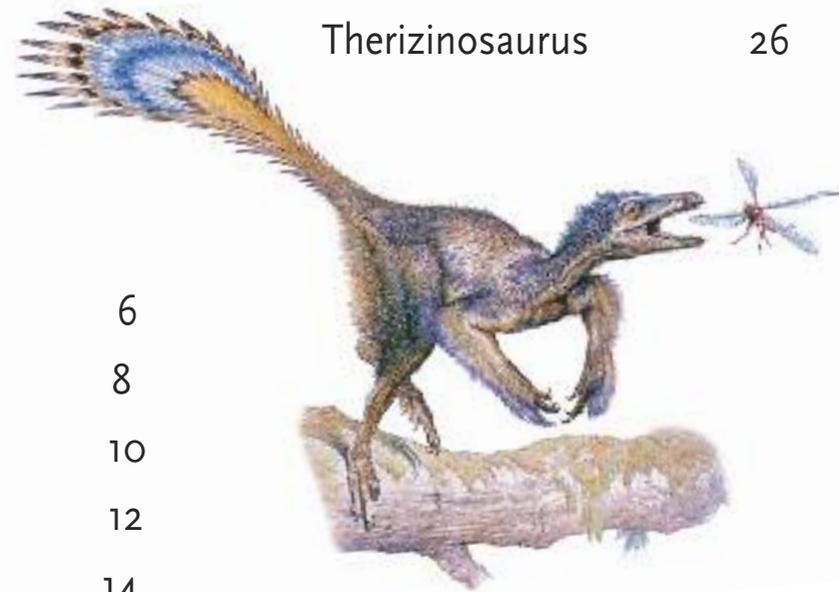
PREDATORS



 Orpheus

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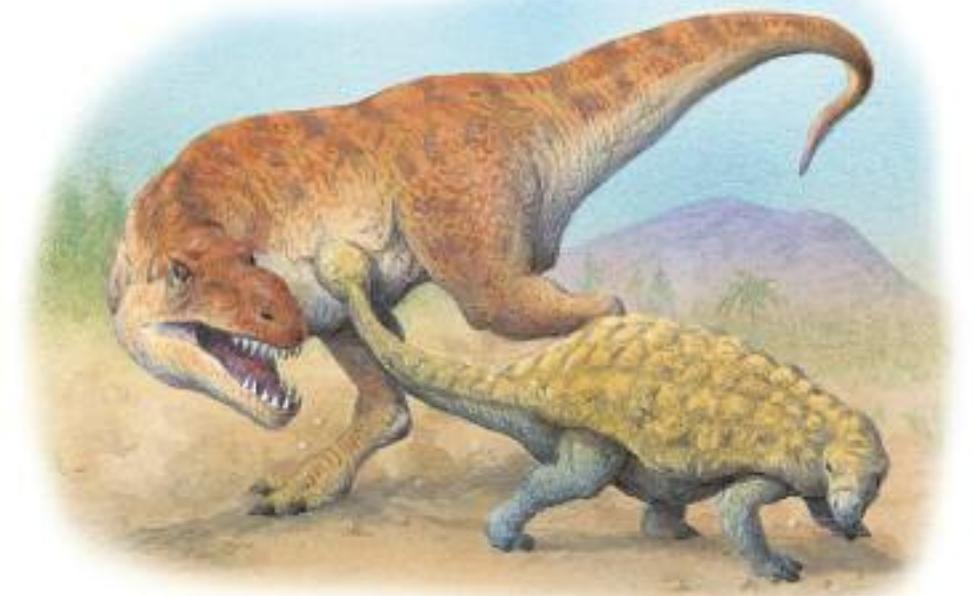
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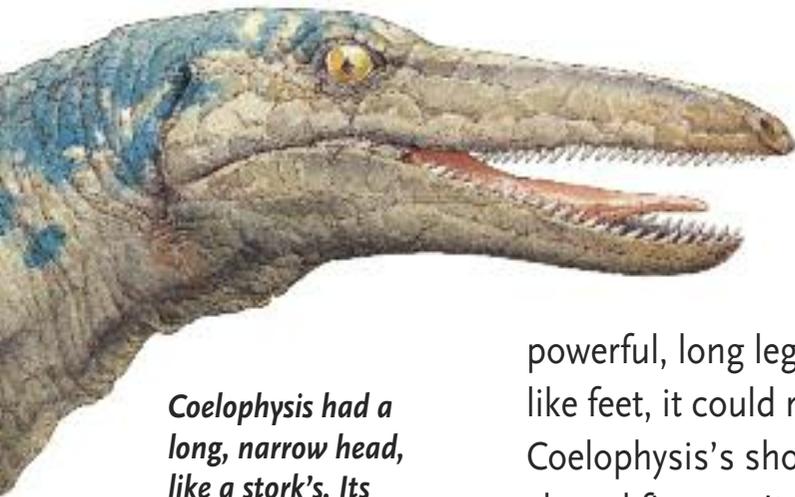


Introduction

MANY KINDS of dinosaurs were harmless plant-eaters that spent their days browsing on leaves or shrubs. But other kinds were far from harmless. They roamed the land searching for other animals to kill and eat. These predators were the theropods, and included some of the fiercest beasts that ever walked the Earth.

Theropods ran on two muscular hind legs. They had short arms with claws for grappling and long, curved necks. Some, like Tyrannosaurus rex, were 40-foot-long giants, while the smallest were cat-sized. One group of small theropods were probably the ancestors of birds, and may have had feathers. Another group, the ornithomimids, had a similar build to that of a modern ostriches. A large flesh-eater was a lone hunter, rushing at its victim and plunging its dagger-like teeth into its flesh. Smaller predators probably hunted in packs. This enabled them to bring down victims much larger than themselves.





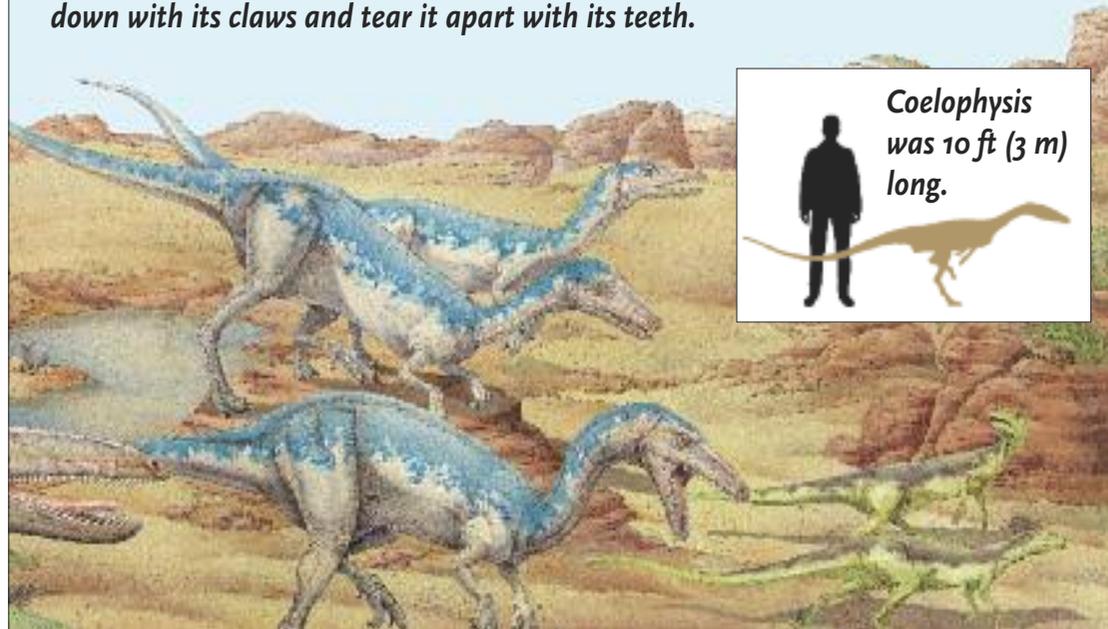
Coelophysis had a long, narrow head, like a stork's. Its jaws were lined with curved, saw-edged teeth.

COELOPHYSIS had a streamlined body with light, hollow bones and a long, curved neck. With its

powerful, long legs and three-toed, bird-like feet, it could run very fast.

Coelophysis's short arms each had three clawed fingers. Its long tail was half of its total body length. This gave it balance as it walked or ran.

Coelophysis was a ferocious pack hunter. The pack would surround its prey, then rush at it, attacking all at once. Coelophysis could swallow smaller prey whole. If the prey was larger, it would hold it down with its claws and tear it apart with its teeth.



Coelophysis was 10 ft (3 m) long.

A RARE SPECIMEN

The name Coelophysis means "hollow form." It was named for its light, hollow bones. Coelophysis was as long as a small car but weighed only as much as an eight-year-old child.



GHOST RANCH

Scientists excavating the site of Ghost Ranch, New Mexico,

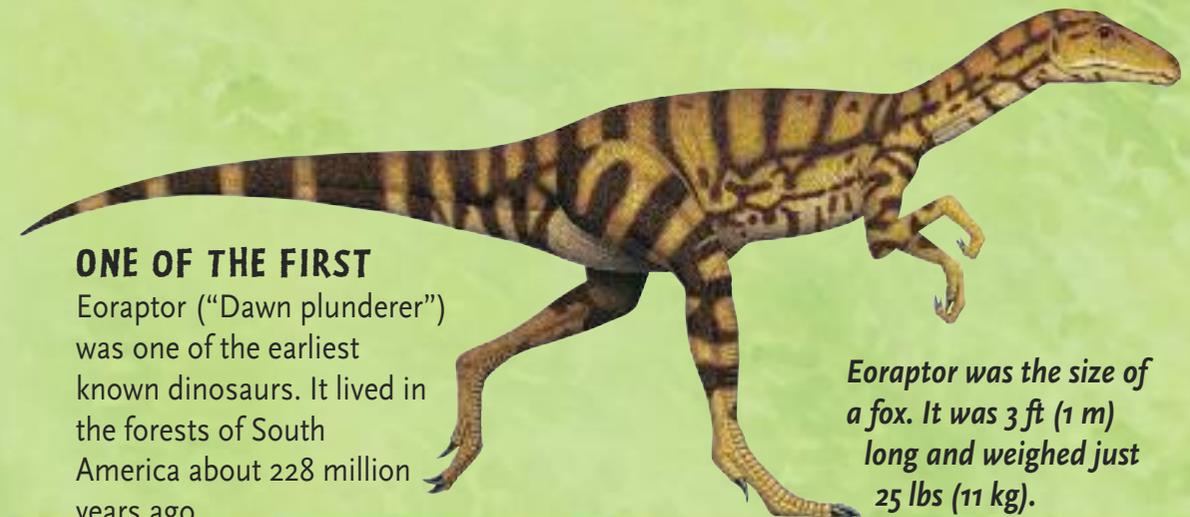
found many different Coelophysis skeletons of different sizes in one place. The dinosaurs lived together in a herd and probably died in a flash flood. Two of the adult skeletons had tiny skeletons inside. Scientists wondered at first whether these were babies that had been eaten by their parents. They later turned out to be small crocodiles that had been crushed beneath the larger dinosaurs during the flood.



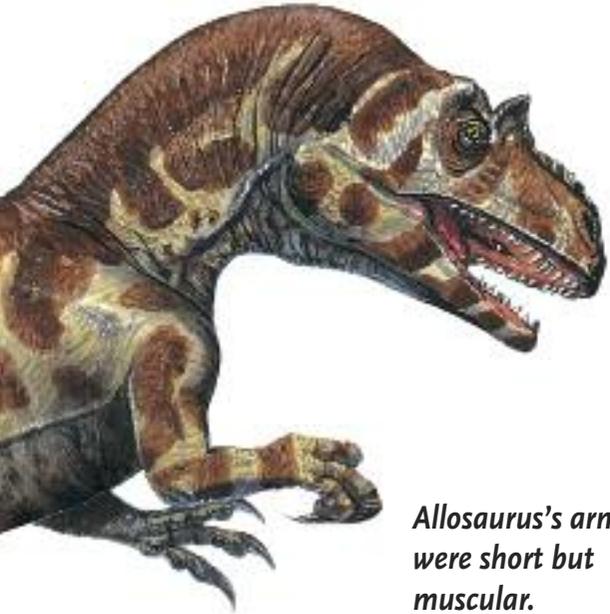
Another Triassic hunter, Herrerasaurus (above) was one of the largest and most skillful hunters of its time. It was three times the size of Eoraptor (below). Only the crocodile-like reptile Saurosuchus was bigger and more powerful.

ONE OF THE FIRST

Eoraptor ("Dawn plunderer") was one of the earliest known dinosaurs. It lived in the forests of South America about 228 million years ago.

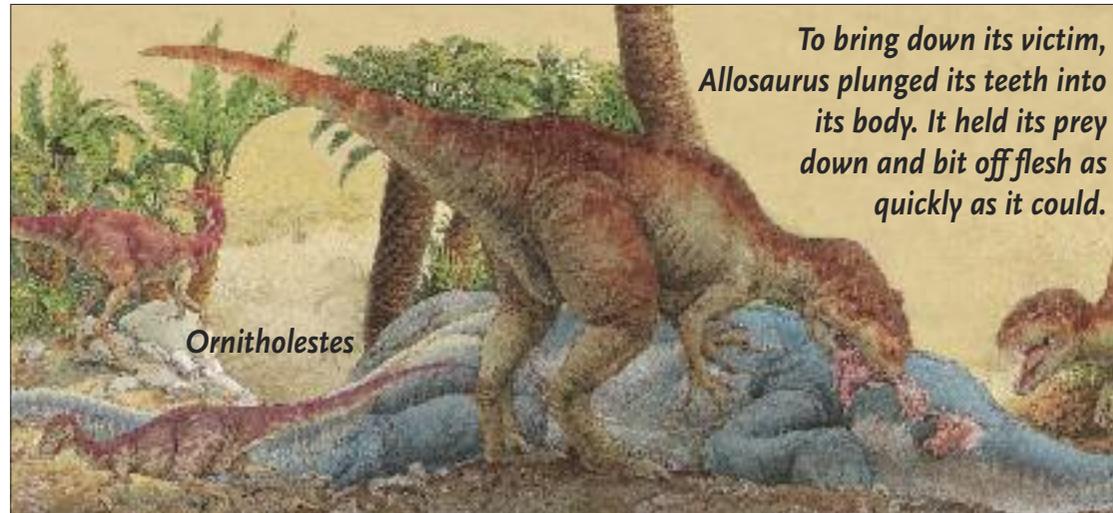


Eoraptor was the size of a fox. It was 3 ft (1 m) long and weighed just 25 lbs (11 kg).



Allosaurus's arms were short but muscular.

A LLOSAURUS walked on its huge hind legs. It had three, large claws on each foot and each arm. Its eyes had ridges above them. Another ridge ran down to the tip of its snout. Its wide jaws had 60 long, curved, fangs, good for tearing flesh. It preyed on plant-eating dinosaurs such as Apatosaurus, Camarasaurus, Diplodocus, and Stegosaurus.



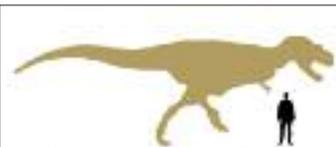
To bring down its victim, Allosaurus plunged its teeth into its body. It held its prey down and bit off flesh as quickly as it could.

Ornitholestes



MOVIE STAR

Dilophosaurus (left) had a double crest. This dinosaur had a starring role in the 1993 movie *Jurassic Park*, although its neck frill and its ability to spit venom were fictional.



Allosaurus was 32 ft (10 m) long and 8 ft (2.4 m) tall.

BIG AL

The name Allosaurus means “different lizard.” It was called this because its bones had a different shape from other known dinosaurs when it was first discovered in 1877. Allosaurus also goes by “Big Al” among fossil hunters. Allosaurus’s teeth fell out very easily (these teeth are common fossils today) but they grew back again and again during its lifetime.



Allosaurus's skull was about 3 ft (1 m) long. The large space for its nose showed it had a strong sense of smell. Its lower jaws were fairly loosely jointed. This gave it a wide gape.

DINOSAUR TRAP

The Cleveland-Lloyd Dinosaur Quarry in Utah could have been a “predator trap.” Usually, plant-eaters outnumber big predators. But here 40 Allosauruses were found, many more than their victims. There might have been a volcanic mud pit on this spot. Plant-eaters trapped in the mud probably lured predators to their deaths.

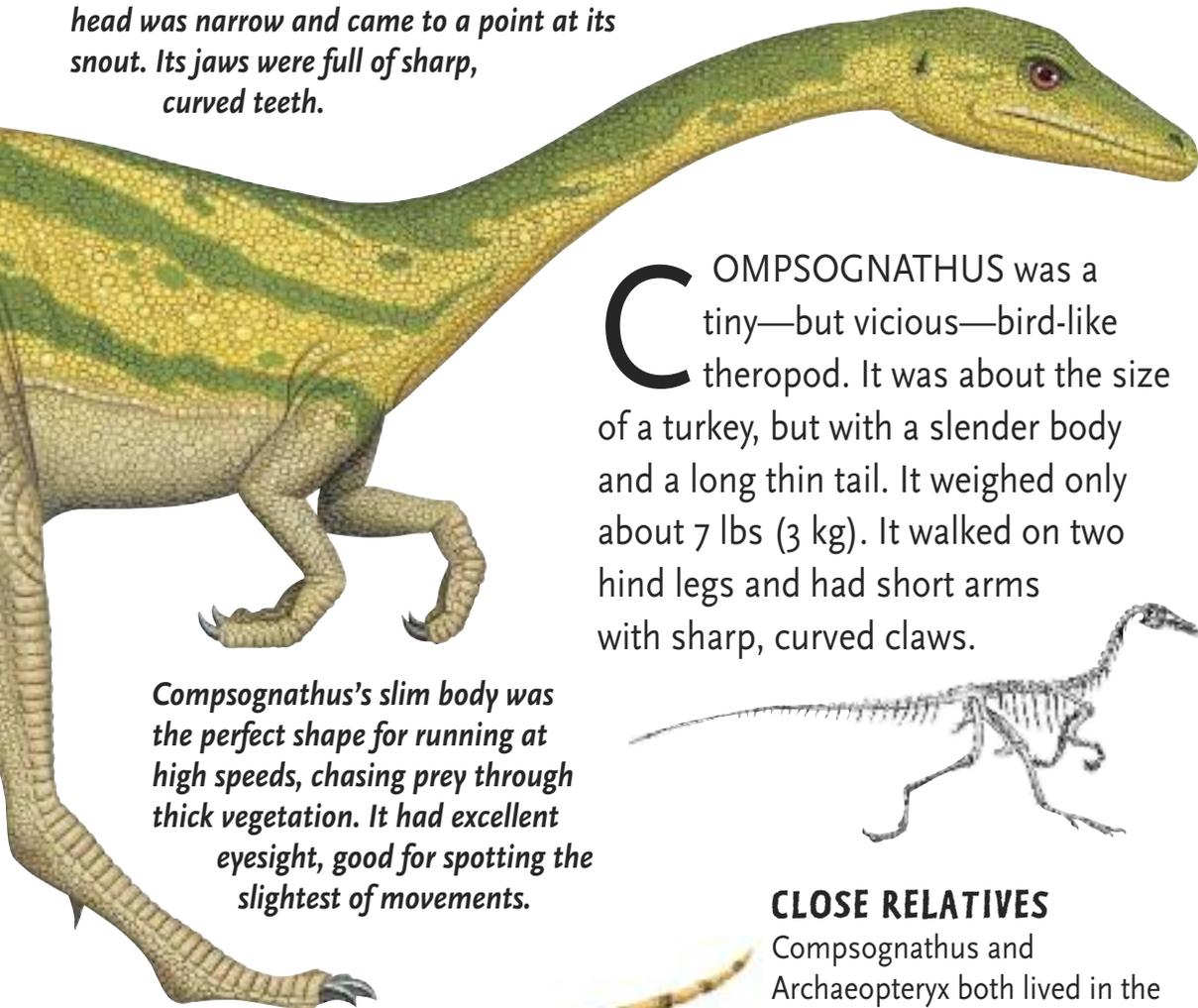


Compsognathus

komp-SOG-nuh-thus

Late Jurassic European islands, 150 million years ago

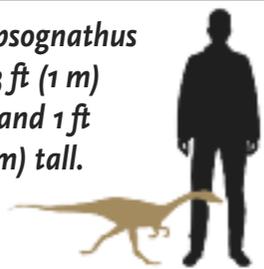
Compsognathus had a long, flexible neck. Its head was narrow and came to a point at its snout. Its jaws were full of sharp, curved teeth.



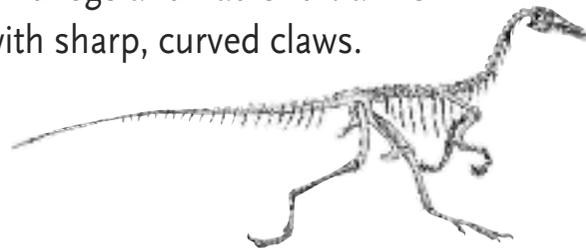
Compsognathus's slim body was the perfect shape for running at high speeds, chasing prey through thick vegetation. It had excellent eyesight, good for spotting the slightest of movements.

Sinosauropteryx (right) a relative of Compsognathus

Compsognathus was 3 ft (1 m) long and 1 ft (61 cm) tall.

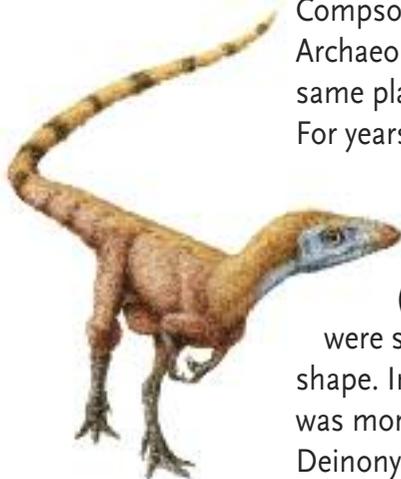


COMPSOGNATHUS was a tiny—but vicious—bird-like theropod. It was about the size of a turkey, but with a slender body and a long thin tail. It weighed only about 7 lbs (3 kg). It walked on two hind legs and had short arms with sharp, curved claws.



CLOSE RELATIVES

Compsognathus and Archaeopteryx both lived in the same place at the same time. For years, scientists mistook Archaeopteryx skeletons for those of Compsognathus (above) because they were so similar in size and shape. In fact, Archaeopteryx was more closely related to Deinonychus and Velociraptor.

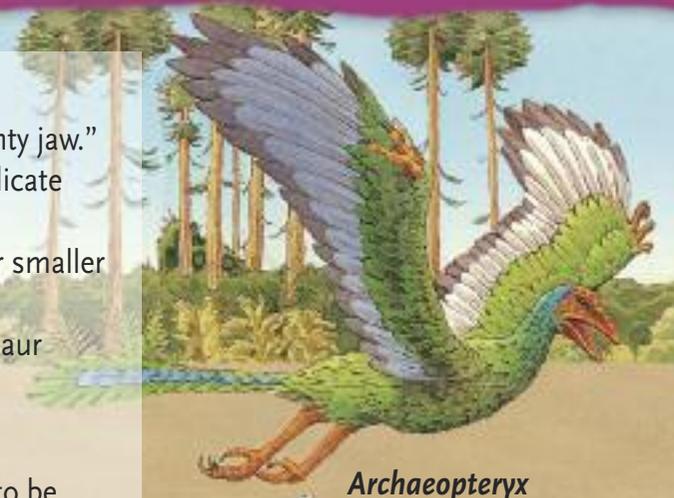


DELICATE BUT DEADLY

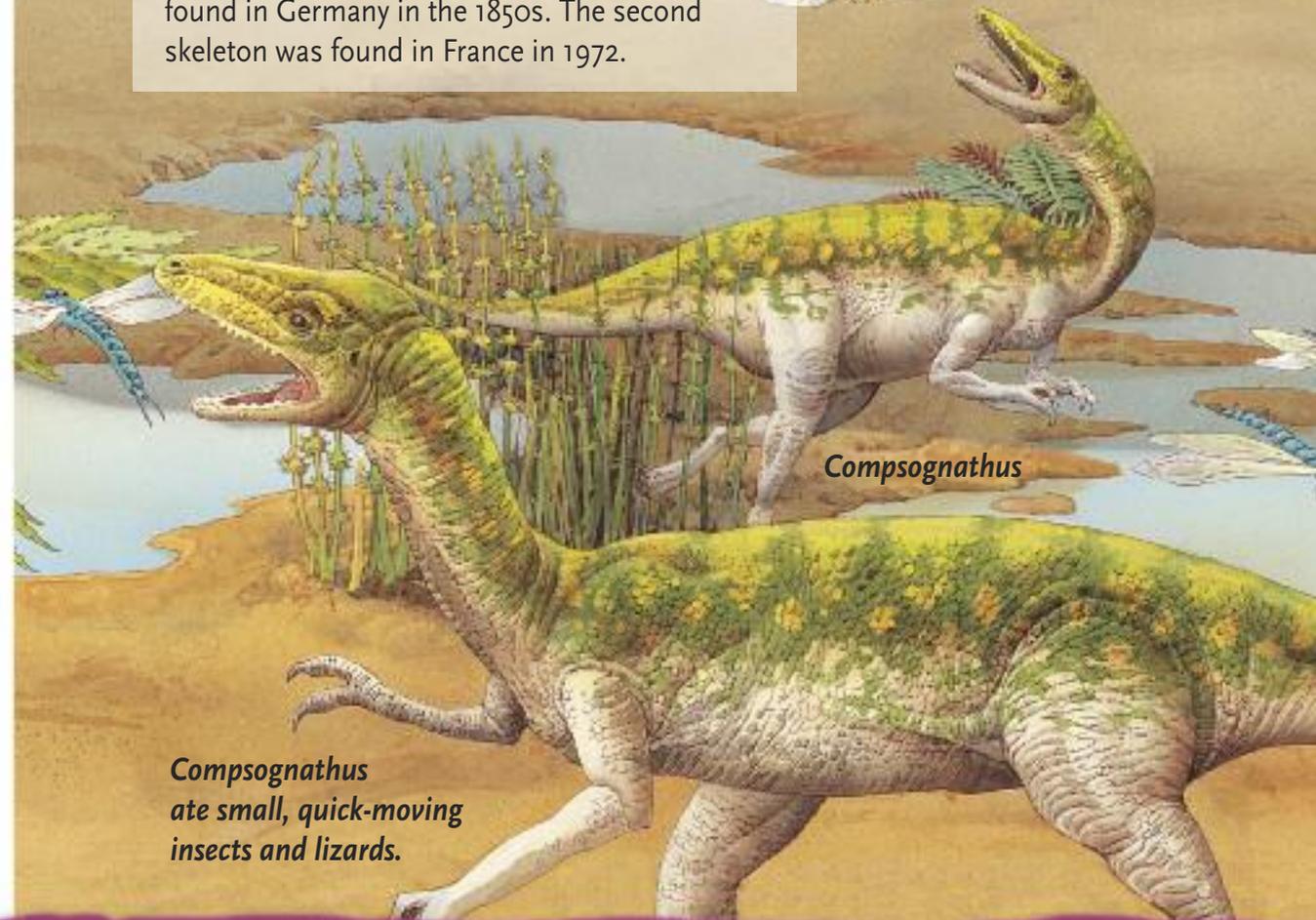
The name Compsognathus means “dainty jaw.” It was so named because of the fine, delicate features of its skeleton. Until the recent discovery of fossils of a number of other smaller feathered dinosaurs in East Asia, Compsognathus was the smallest dinosaur known to scientists.

FIRST COMPLETE

Compsognathus was the first dinosaur to be found as a complete skeleton. Only two skeletons have been found in all. The first was found in Germany in the 1850s. The second skeleton was found in France in 1972.



Archaeopteryx



Compsognathus

Compsognathus ate small, quick-moving insects and lizards.

Archaeopteryx

ahr-kee-OP-teh-riks

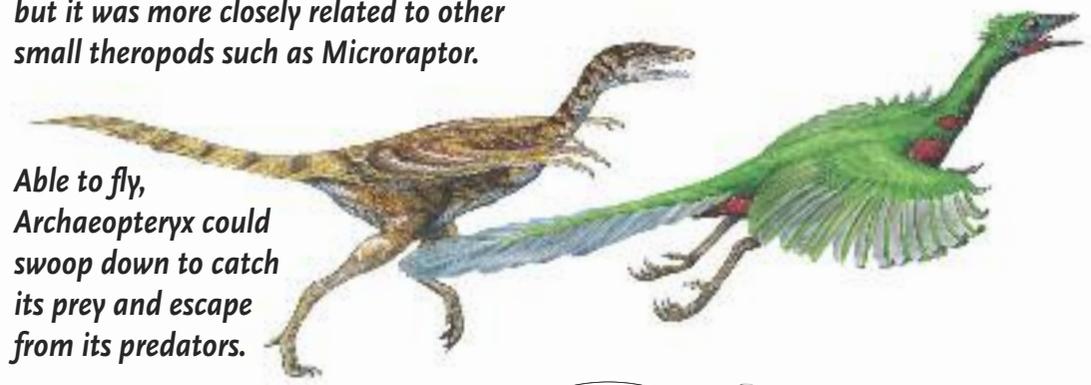
Late Jurassic European islands, 150 million years ago



ARCHAEOPTERYX was a bird-dinosaur. Like a bird, it had broad wings, a small, light body, and flight feathers. Like a dinosaur, it had sharp teeth, a long neck, and three-clawed fingers. It also had a long bony tail and a “killing claw” on its feet for catching prey.

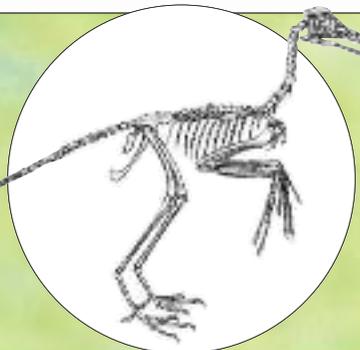
Archaeopteryx looked like Compsognathus, but it was more closely related to other small theropods such as Microraptor.

Able to fly, Archaeopteryx could swoop down to catch its prey and escape from its predators.

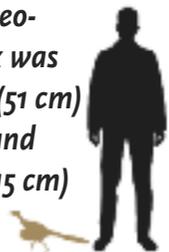


ANCESTOR OF THE BIRDS?

Archaeopteryx was probably not a direct ancestor of modern birds. Birds are descended from dinosaurs, but it could have been an offshoot from the earliest line of birds.

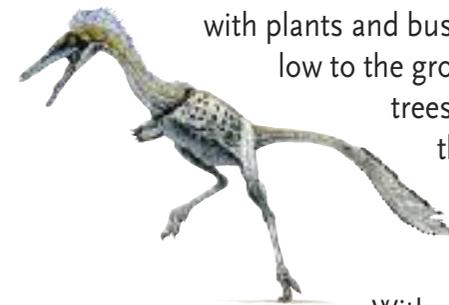


Archaeopteryx was 20 in (51 cm) long and 6 in (15 cm) tall.



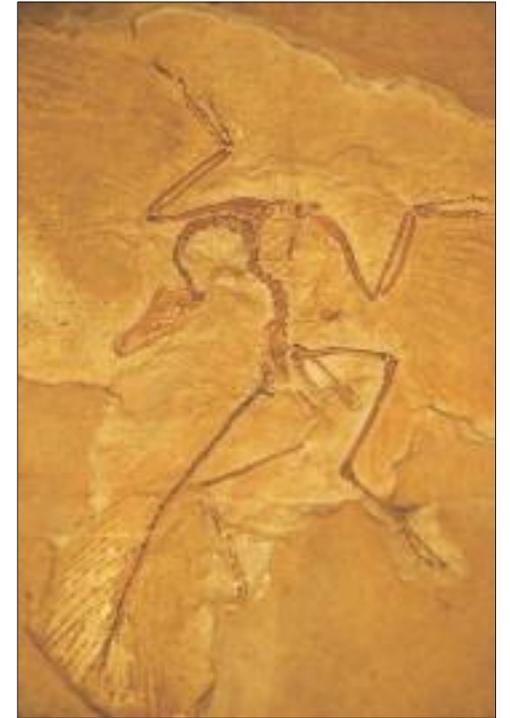
LIFE ON THE GROUND

The name Archaeopteryx means “ancient wing.” It is the earliest and most primitive bird known. It lived in dry scrublands, with plants and bushes growing low to the ground instead of trees. Because of this, it was most likely a ground dweller.



Shuvuuia was a bird-like dinosaur from Mongolia. Its pointed beak, which was full of sharp teeth, could open very wide.

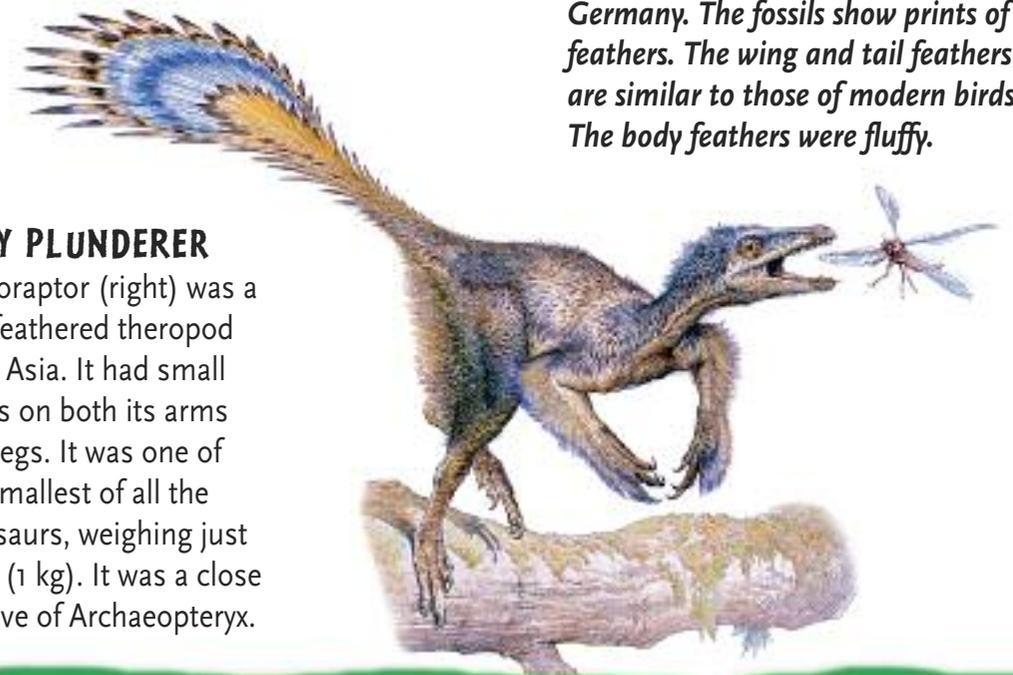
Without the strong breastbone birds have today, Archaeopteryx would have taken off in short hops or by gliding down from a perch.



All Archaeopteryx fossils come from limestone quarries near Solnhofen, Germany. The fossils show prints of feathers. The wing and tail feathers are similar to those of modern birds. The body feathers were fluffy.

TINY PLUNDERER

Microraptor (right) was a tiny feathered theropod from Asia. It had small wings on both its arms and legs. It was one of the smallest of all the dinosaurs, weighing just 2 lbs (1 kg). It was a close relative of Archaeopteryx.

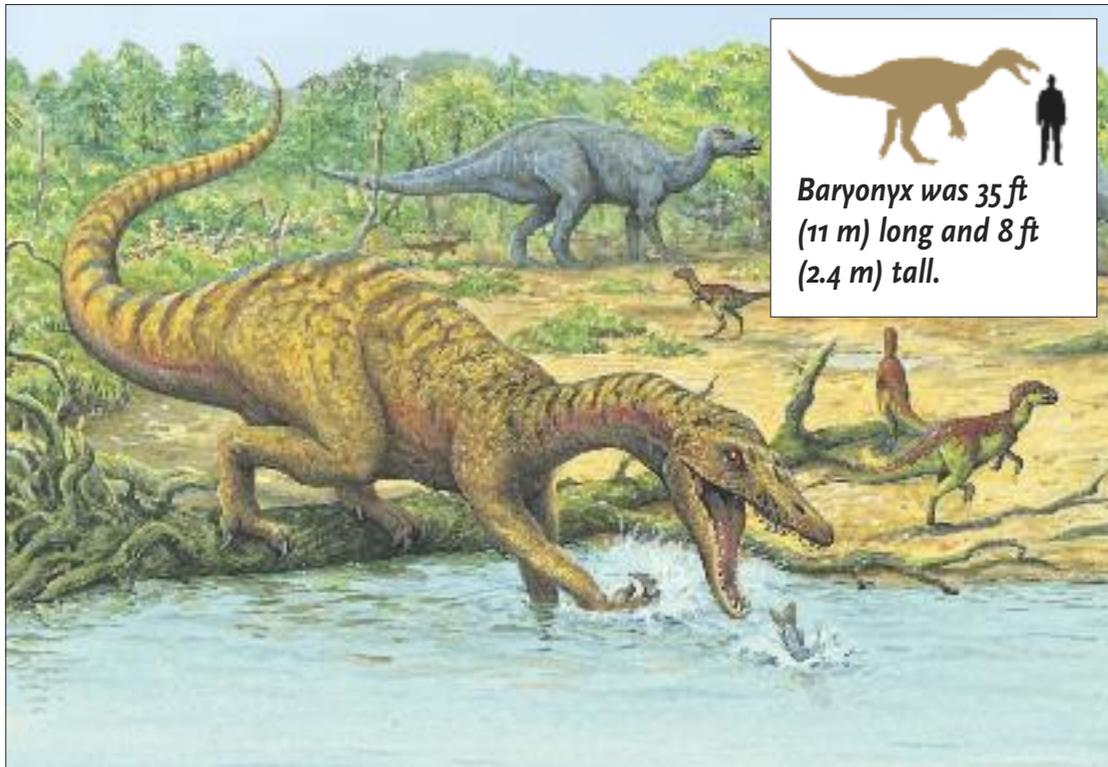




HOW TO CATCH A FISH

Baryonyx could wade into a river and hook fish with its thumb claws. It could also stand underwater with only its eyes and nostrils above the surface, and catch fish in its jaws.

BARYONYX had a long, narrow snout. Looked down on from above, it was shaped like a spoon. A row of sharp, sawlike teeth lined its jaws. Its nostrils were close to its eyes, which meant it could breathe while almost entirely underwater. It had a long, straight neck and held its head low. Baryonyx's muscular arms had a 1-foot- (61 cm) long thumb claw on each hand.



Baryonyx was 35 ft (11 m) long and 8 ft (2.4 m) tall.

GIANT CLAWS, LOTS OF TEETH

The name Baryonyx means “heavy claw.” It was named for its huge thumb claws. Its skull was set at an obtuse angle to its neck. Most other dinosaur skulls were set at right angles. This meant that Baryonyx's head and neck were almost in a straight line like a modern crocodile or alligator. Inside its jaws, there were 96 teeth: twice as many as the other theropods.

FISH FOR DINNER

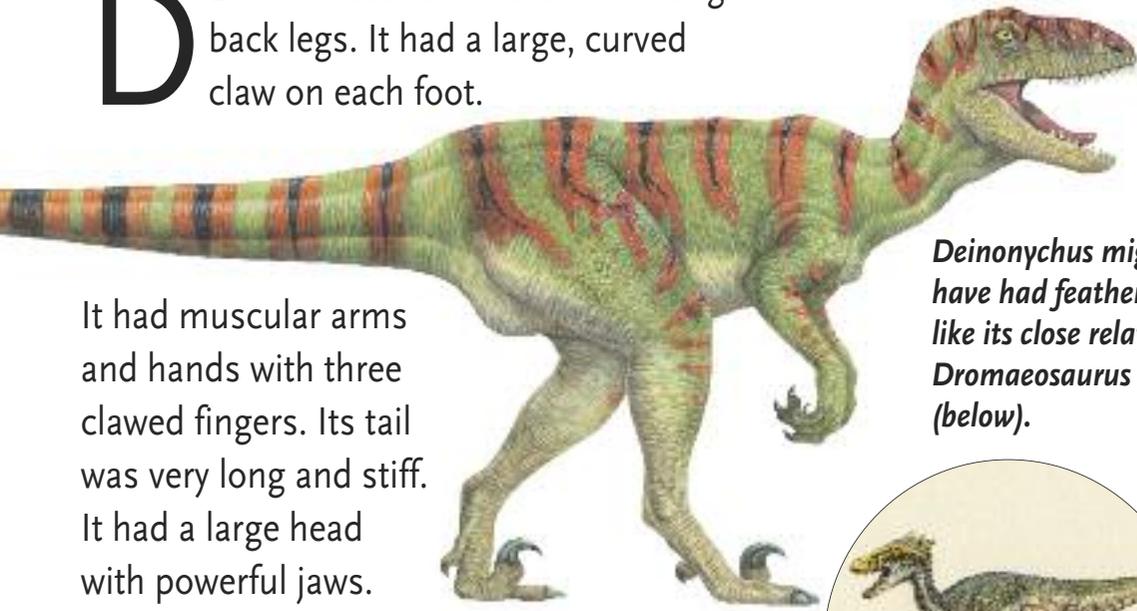
The fossil remains of Baryonyx were discovered in 1983 by William Walker, an amateur fossil hunter. He came across an enormous claw sticking out of the side of a clay pit on the Isle of Wight in England. It was about 30 ft (9 m) long. This specimen may not even have been fully grown. Inside its belly were fossilized scales from a type of fish called Lepidotes.

Scientists think fish-eating Baryonyx might have also eaten meat. No large land animals alive today could survive eating only fish. It is possible that Baryonyx was a scavenger. Its long snout was perfect for digging inside a carcass. Its hooked claws were also good for tearing flesh. Bones from a young Iguanodon have been found inside Baryonyx's stomach, so it could have snacked on a corpse of one of them (below).



DEINONYCHUS walked on its long back legs. It had a large, curved claw on each foot.

It had muscular arms and hands with three clawed fingers. Its tail was very long and stiff. It had a large head with powerful jaws. Inside its mouth were 60 saw-edged teeth.

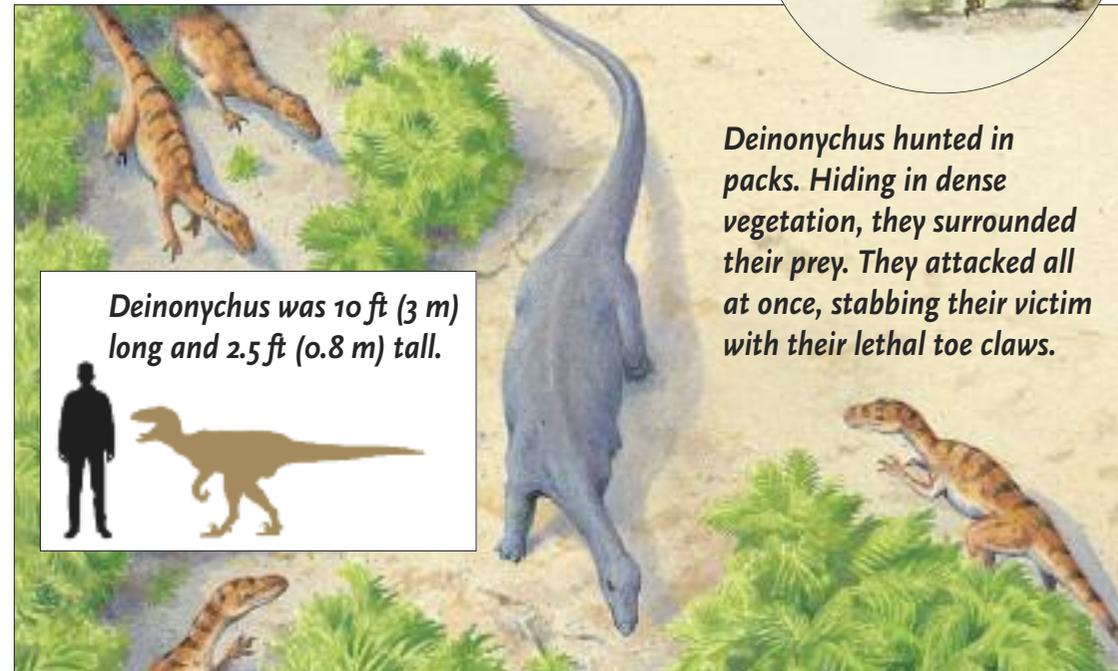


Deinonychus might have had feathers like its close relative Dromaeosaurus (below).



Deinonychus hunted in packs. Hiding in dense vegetation, they surrounded their prey. They attacked all at once, stabbing their victim with their lethal toe claws.

Deinonychus was 10 ft (3 m) long and 2.5 ft (0.8 m) tall.



A QUICK, SMART KILLER

The name *Deinonychus* means “terrible claw.” It was named for the deadly scythe-shaped claws on its feet. The claws were so long that they had to be raised up as the dinosaur ran or else they would get in the way.

Deinonychus was probably one of the smartest dinosaurs. Its brain was large compared to its body size.

SCENE OF THE CRIME

Deinonychus was discovered by accident while scientists were excavating the remains of *Tenontosaurus*, one of the large dinosaurs *Deinonychus* preyed on. Teeth found near *Tenontosaurus* show that several *Deinonychuses* hunted the larger dinosaur.

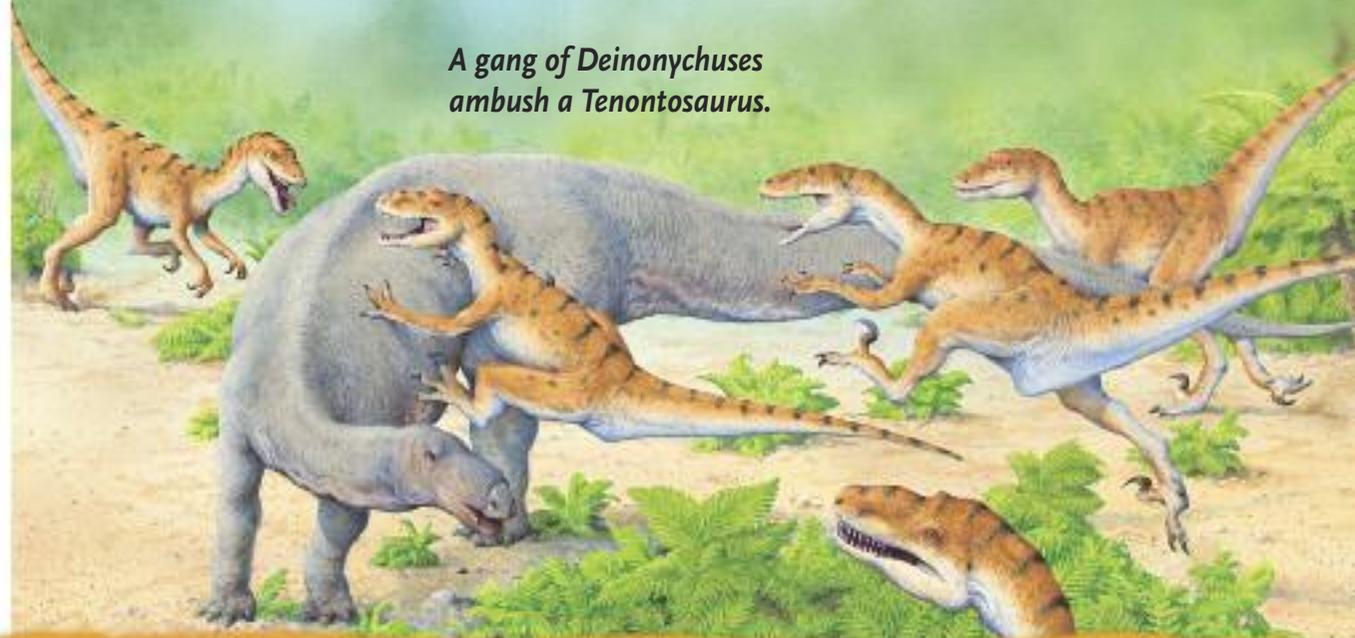
Deinonychus was fierce, but it also had a softer side. Fossil eggshells have been found near an adult dinosaur, and scientists think *Deinonychus* probably cared for its young.



THE PERFECT WEAPON

Deinonychus's toe claw (above) was perfect for stabbing through thick skin when attacking its prey. The dinosaur would use its other claws to grip its victim while it tore at the flesh with both its large toe claw and its teeth. Its long tail helped with its balance.

A gang of Deinonychuses ambush a Tenontosaurus.

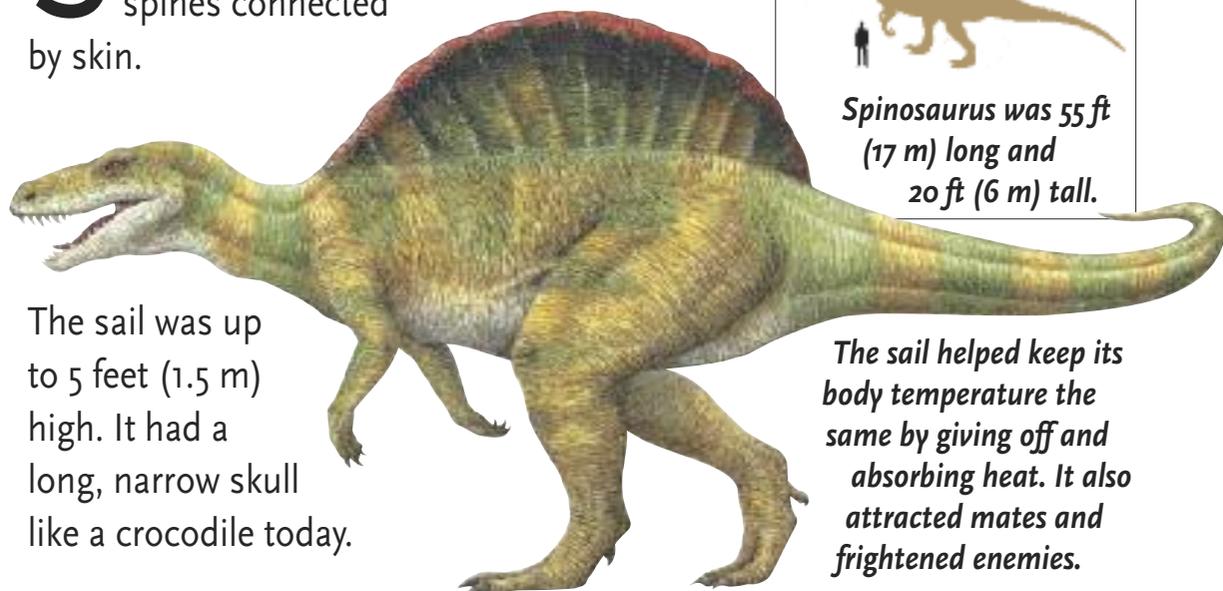


Spinosaurus

spy-noh-SAWR-us

Middle Cretaceous North Africa, 97-95 million years ago

S PINOSAURUS had a distinctive sail along its back made up of spines connected by skin.



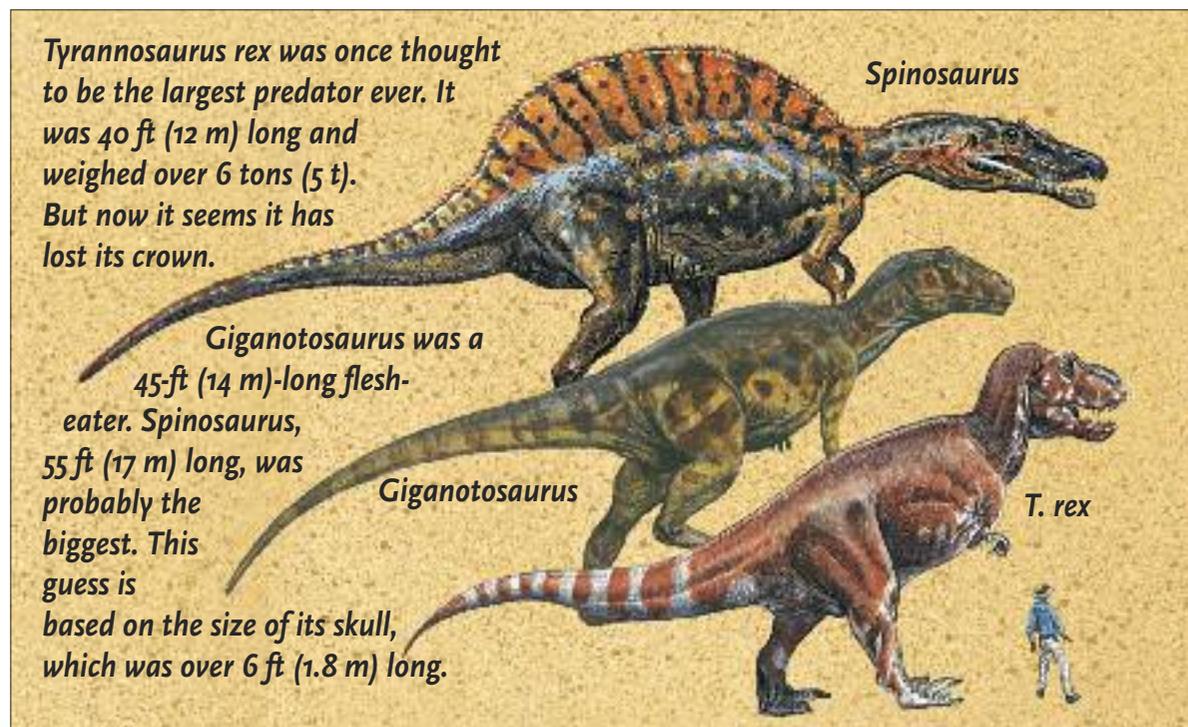
Spinosaurus was 55 ft (17 m) long and 20 ft (6 m) tall.

The sail was up to 5 feet (1.5 m) high. It had a long, narrow skull like a crocodile today.

The sail helped keep its body temperature the same by giving off and absorbing heat. It also attracted mates and frightened enemies.

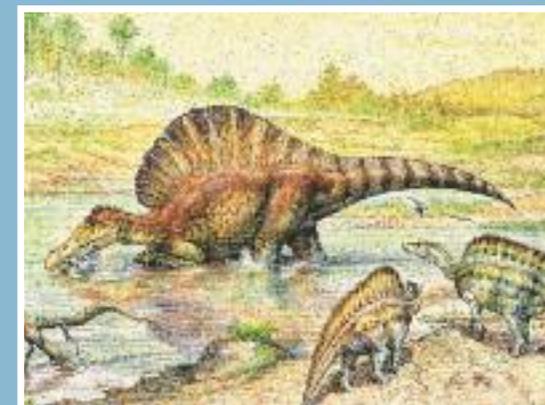
Tyrannosaurus rex was once thought to be the largest predator ever. It was 40 ft (12 m) long and weighed over 6 tons (5 t). But now it seems it has lost its crown.

Giganotosaurus was a 45-ft (14 m)-long flesh-eater. Spinosaurus, 55 ft (17 m) long, was probably the biggest. This guess is based on the size of its skull, which was over 6 ft (1.8 m) long.



SAIL OR HUMP?

Spinosaurus means “spine lizard.” It was named for the spines on its back. Some scientists think these could have been covered in fat to form a hump instead of a sail. But many think the sail had blood vessels inside it that helped the animal both to warm up or cool down as needed.



AMPHIBIOUS LIFESTYLE

Spinosaurus lived in tropical swamps and mangrove forests. It spent part of its day in the water catching fish (above, right). Its long jaws and pointed teeth were perfect for this. The rest of the day it spent on land scavenging for food or hunting smaller plant-eating dinosaurs.

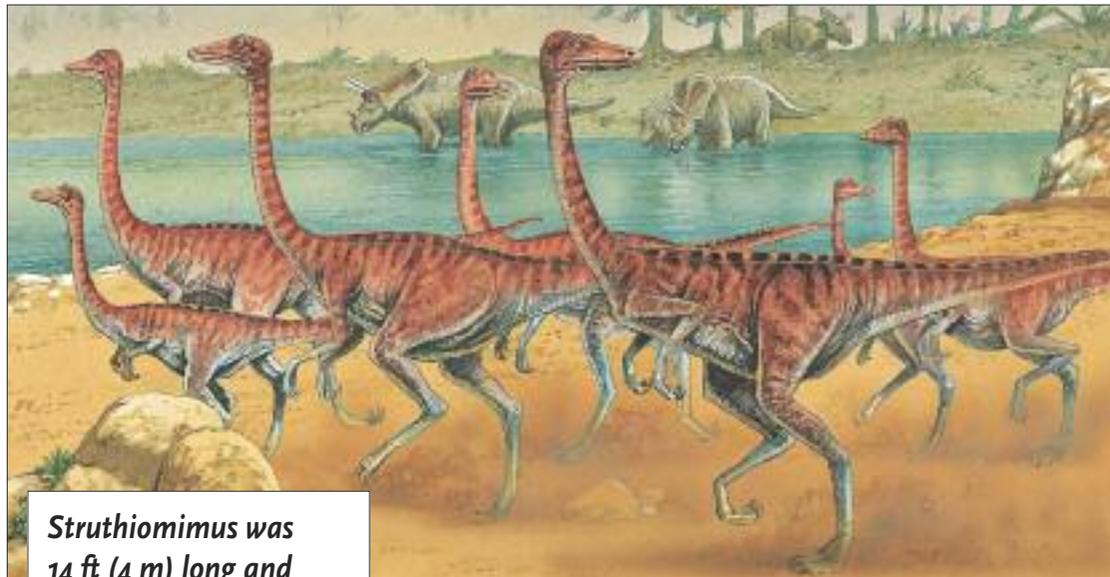
Below is a tropical river in North Africa 95 million years ago. The fearsome giant, Spinosaurus, spots an easy lunch: a small, herbivorous dinosaur by the edge of the water. This tiny creature is no match for Spinosaurus's strong arms and jaws.





Struthiomimus was a typical "ostrich dinosaur" (ornithomimid). It had a small head, large eyes, a bony, toothless beak, and a long, slender neck. This neck was nearly half the length of its whole body.

STRUTHIOMIMUS was one of the smartest and fastest dinosaurs that ever lived. With its long legs and agile feet, it could run at speeds of 30-50 mph (48-80 km/h). Holding its stiff tail straight behind, it could make quick turns while running at speed. Its favorite foods were fruit, nuts, plants, insects, and small animals. It was a good hunter, and might have hunted at night.



Struthiomimus was 14 ft (4 m) long and 5 ft (1.5 m) tall.



Struthiomimus probably lived in wandering herds. These dinosaurs probably roamed across hot, dry plains, eating whatever food was available. They took care of their young while on the move. When danger came, they would all run away at high speed.

DYING OF THIRST

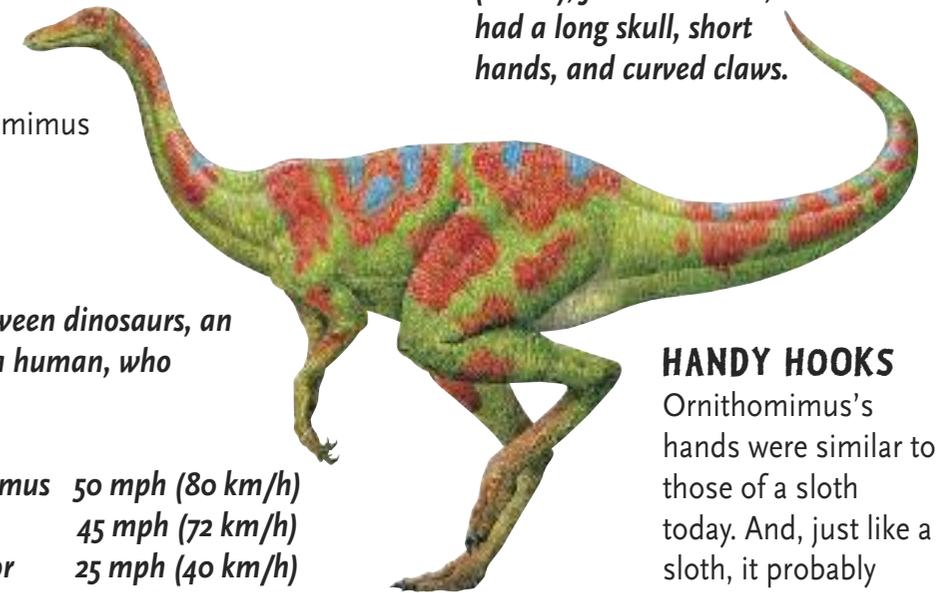
Struthiomimus means "ostrich mimic." It was so named because it is similar to ostriches today. (*Struthio* is the scientific name for "ostrich.") Many of its fossil remains have been found complete, with the head and tail pulled back. This is usually a sign of drying out. The dinosaurs might have died of thirst in a drought. Dry conditions could also explain why these fossils are so well preserved. Scavengers would normally eat carcasses, scattering bones all around. But scavengers could not survive such a harsh environment any better than Struthiomimus could.



Ostrich dinosaurs looked alike, with only small differences. In North America, Dromiceiomimus (left) had a short back, long arms and legs, and small claws. Gallimimus (above), from East Asia, had a long skull, short hands, and curved claws.

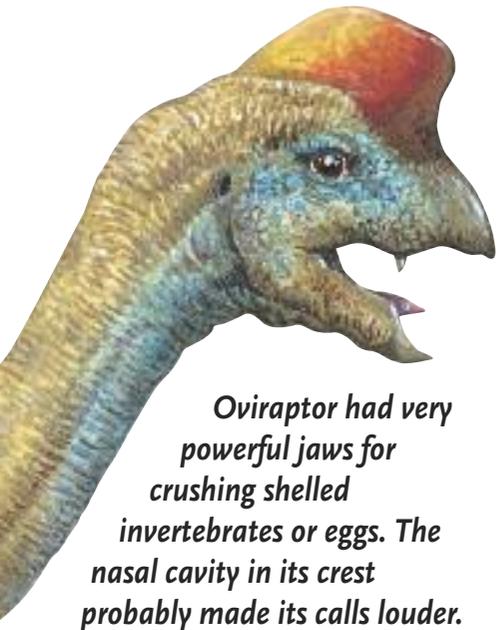
In a race between dinosaurs, an ostrich, and a human, who would win?

- | | |
|-----------------|------------------|
| 1 Struthiomimus | 50 mph (80 km/h) |
| 2 Ostrich | 45 mph (72 km/h) |
| 3 Velociraptor | 25 mph (40 km/h) |
| 4 Allosaurus | 21 mph (34 km/h) |
| 5 Tyrannosaurus | 19 mph (31 km/h) |
| 6 Human | 17 mph (27 km/h) |



HANDY HOOKS

Ornithomimus's hands were similar to those of a sloth today. And, just like a sloth, it probably used them to hook branches down and pull leaves off.

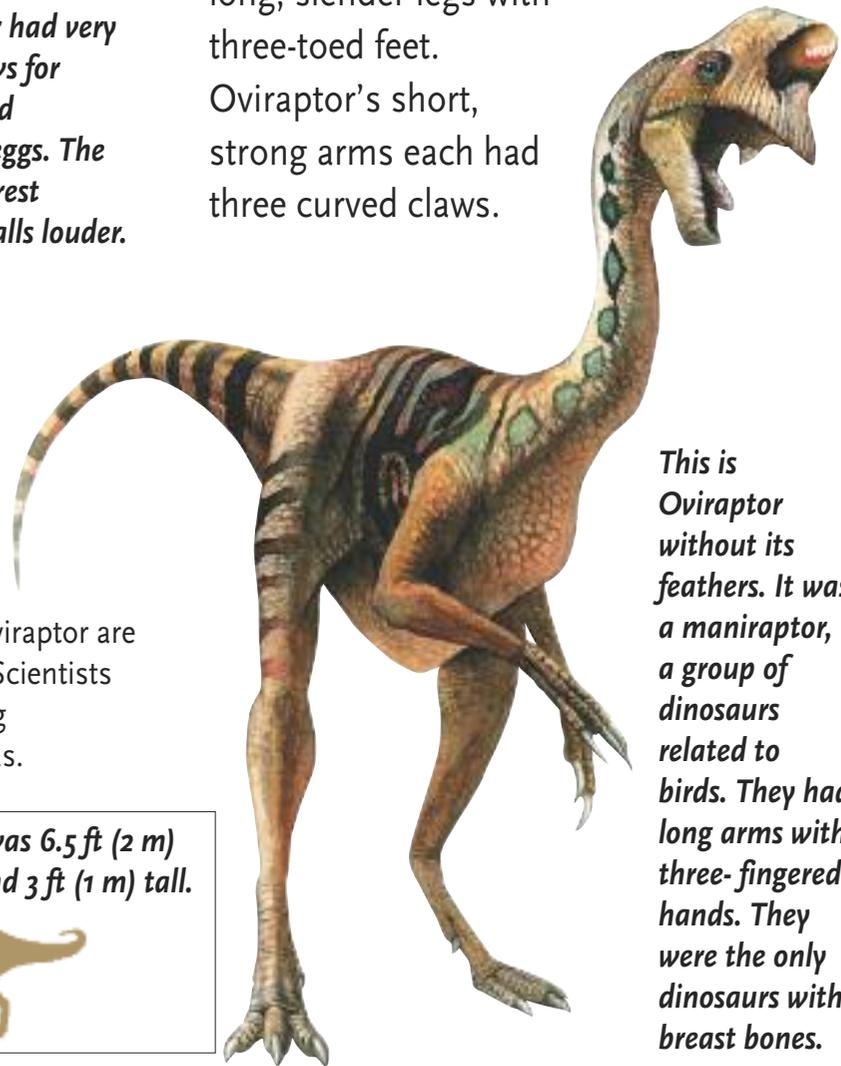


Oviraptor had very powerful jaws for crushing shelled invertebrates or eggs. The nasal cavity in its crest probably made its calls louder.

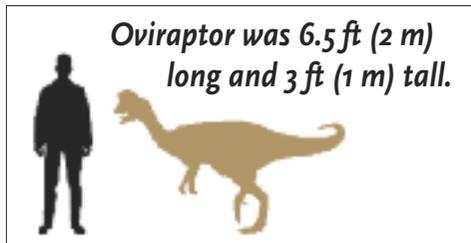
MISTAKEN IDENTITY?

Oviraptor is often confused with its cousin Citipati. Citipati also had a tall crest. In fact, many pictures of Oviraptor are actually of Citipati. Scientists are not sure how big Oviraptor's crest was.

OVIRAPTOR had a parrot-shaped head with a bony crest and a short, toothless beak. Its body was covered with feathers, including its two wings and tail fan. Its strong jaws could crush prey. It had a flexible S-shaped neck, a long tail, and long, slender legs with three-toed feet. Oviraptor's short, strong arms each had three curved claws.



This is Oviraptor without its feathers. It was a maniraptor, a group of dinosaurs related to birds. They had long arms with three-fingered hands. They were the only dinosaurs with breast bones.



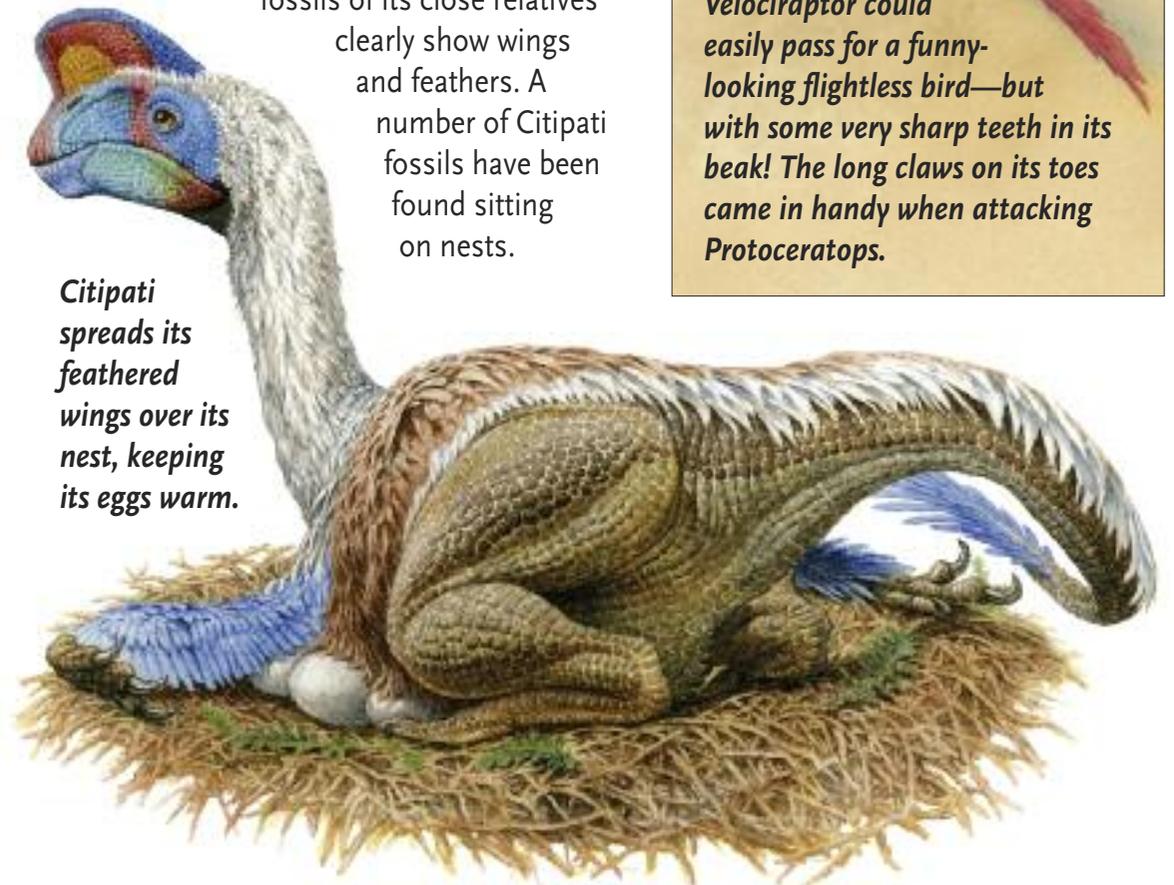
Oviraptor was 6.5 ft (2 m) long and 3 ft (1 m) tall.

ACCUSED OF THEFT

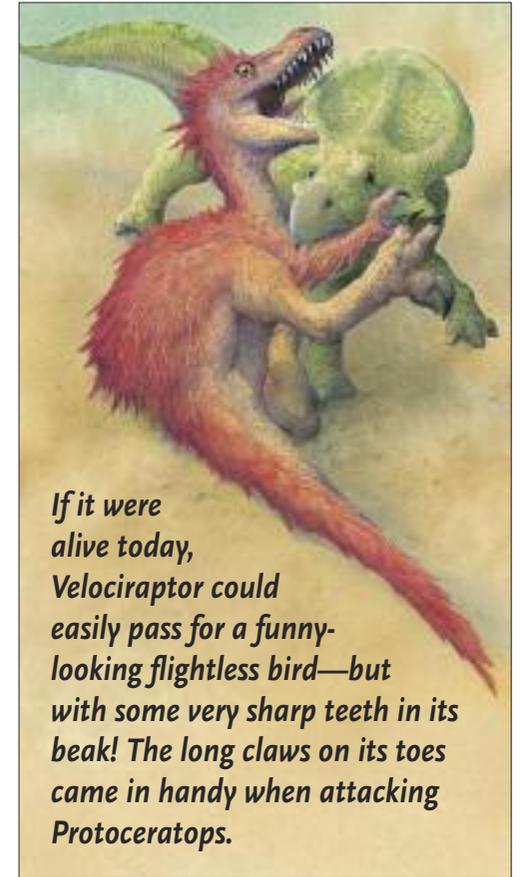
Oviraptor means “egg thief.” When the first fossil of Oviraptor was discovered in 1924, it was on top of a pile of Protoceratops eggs. Its full species name, *Oviraptor philoceratops*, means “egg plunderer, lover of ceratopsians.” Later, scientists learned that the eggs probably belonged to Oviraptor itself and that the dinosaur was actually sitting on its own eggs.

JUST LIKE A BIRD

Oviraptor was one of the most bird-like dinosaurs. Skin impressions from fossils of its close relatives clearly show wings and feathers. A number of *Citipati* fossils have been found sitting on nests.



Citipati spreads its feathered wings over its nest, keeping its eggs warm.

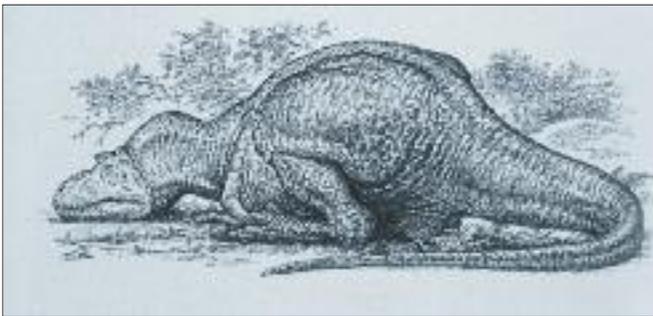


If it were alive today, Velociraptor could easily pass for a funny-looking flightless bird—but with some very sharp teeth in its beak! The long claws on its toes came in handy when attacking Protoceratops.



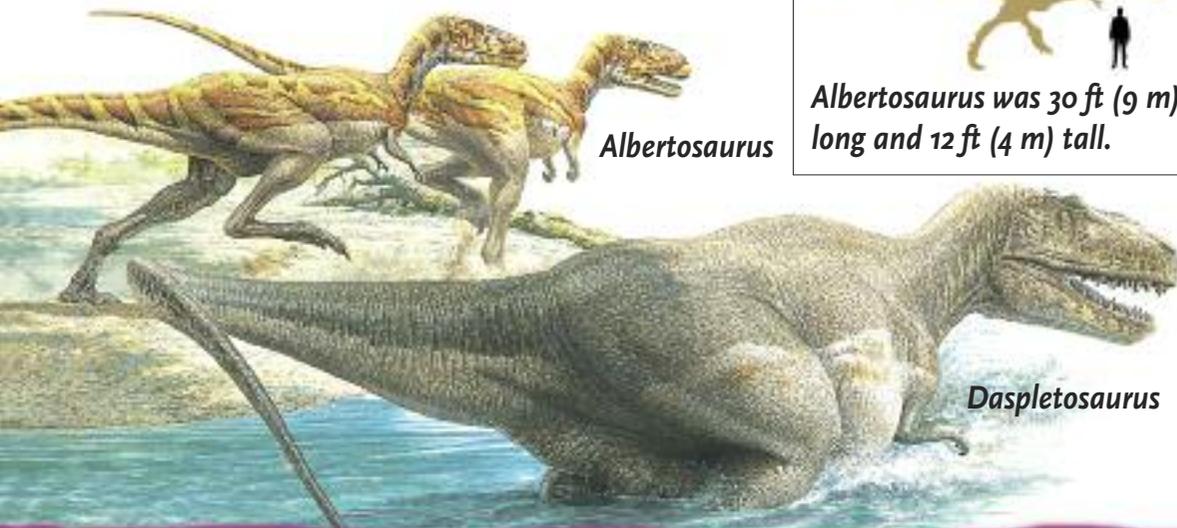
Albertosaurus's long, powerful jaws contained more than 60 curved teeth. When old teeth fell out, new ones would grow in their place.

ALBERTOSAURUS'S giant head was 3 ft (1 m) long. It had bony crests above each eye. It had a slender S-shaped neck and was slimmer than its cousin Tyrannosaurus rex. It walked on its four-toed feet. Its long tail gave it balance and allowed it to turn quickly while running. Its tiny arms had two fingers on each hand.



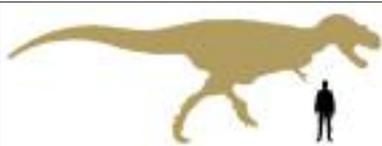
How did dinosaurs sleep? Like birds today, they adopted a squatting position (left). Some tucked their heads into their bodies. Albertosaurus rested its heavy head on the ground.

Daspletosaurus had tiny horns above its eyes.



Albertosaurus

Daspletosaurus



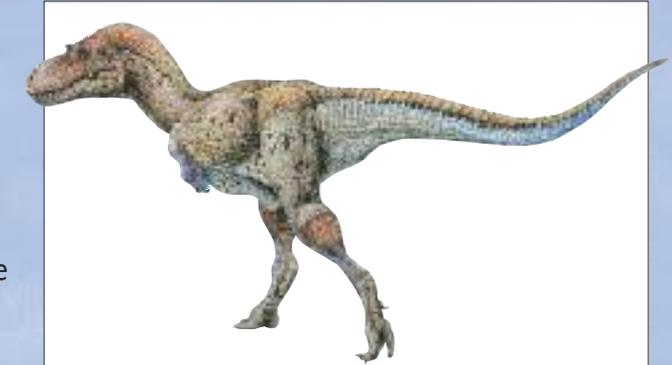
Albertosaurus was 30 ft (9 m) long and 12 ft (4 m) tall.

LEADER OF THE PACK

The name Albertosaurus means “Alberta lizard.” It was named for the Canadian province where its fossils were first found. Most predators hunted alone, but 22 individual Albertosaurus fossils were found at one site. This led scientists to think it probably hunted in packs.

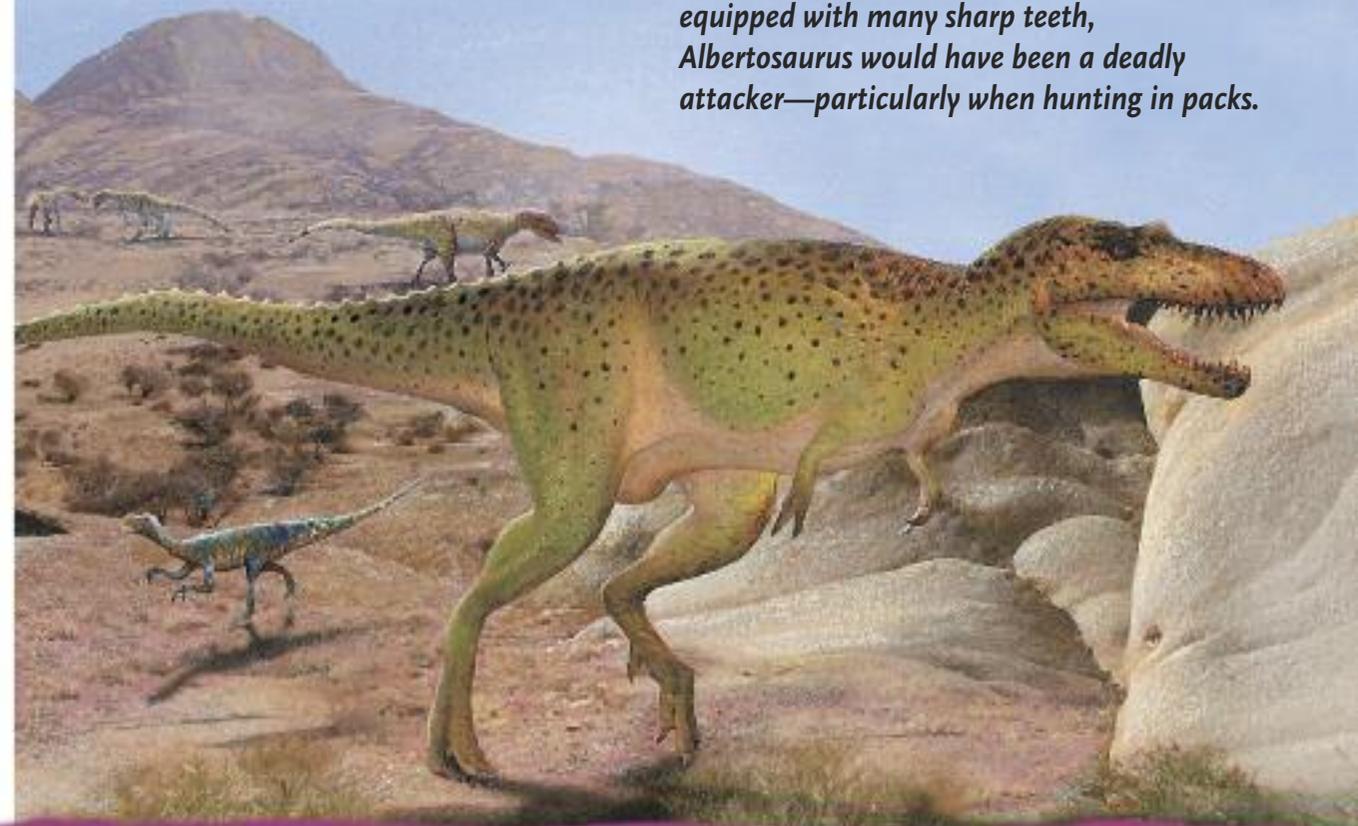
GROWING UP

Albertosaurus became an adult at between 12 and 16 years old. The crests above its eyes could have been brightly colored to help attract a mate.



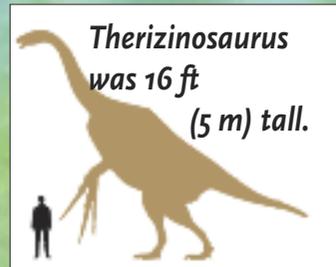
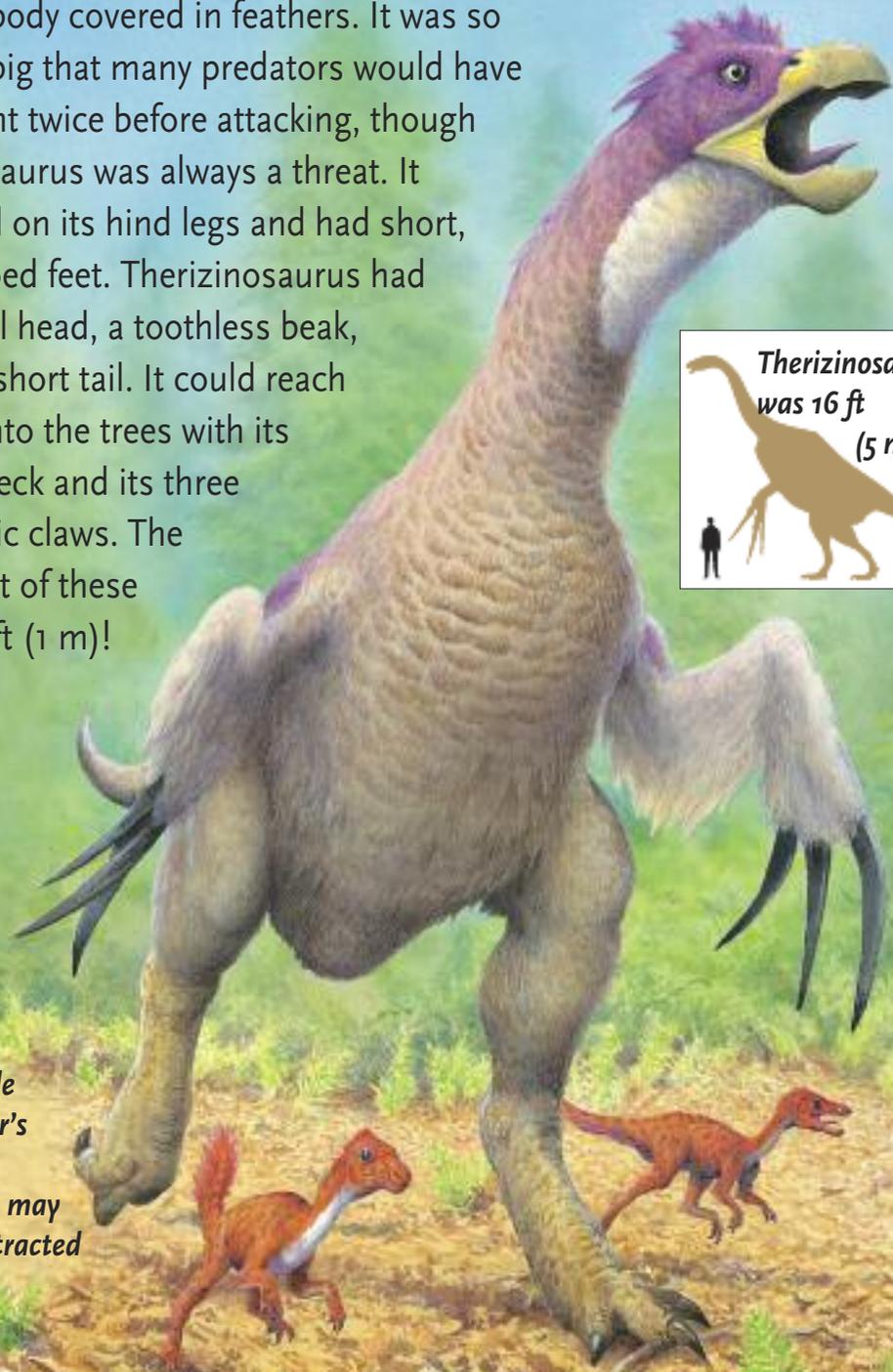
Gorgosaurus was a relative of Albertosaurus. It lived at the same time and in the same place as Daspletosaurus. They got along because they hunted different prey.

Albertosaurus could sprint at speeds of up to 25 mph (40 km/h). Fast, strong, and well equipped with many sharp teeth, Albertosaurus would have been a deadly attacker—particularly when hunting in packs.



THERIZINOSAURUS had a bulky body covered in feathers. It was so big that many predators would have thought twice before attacking, though Tarbosaurus was always a threat. It walked on its hind legs and had short, four-toed feet. Therizinosaurus had a small head, a toothless beak, and a short tail. It could reach high into the trees with its long neck and its three gigantic claws. The longest of these was 3 ft (1 m)!

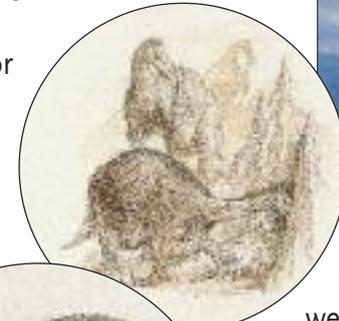
The male dinosaur's colorful feathers may have attracted mates.



MULTIPURPOSE CLAWS

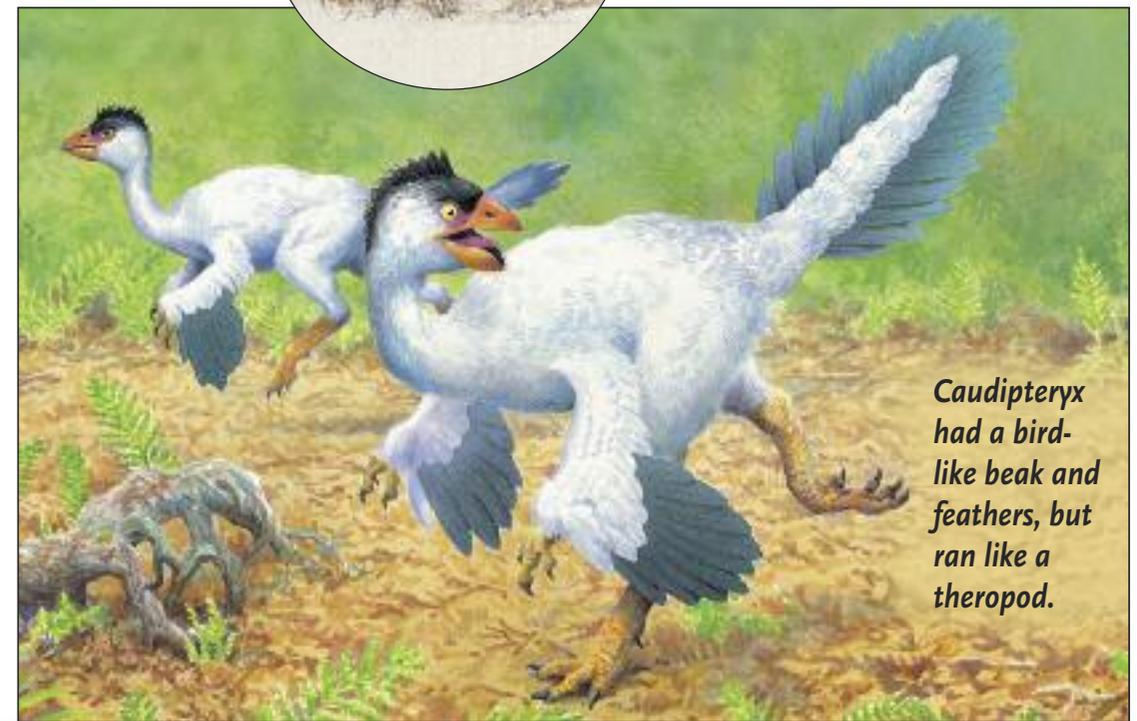
Therizinosaurus means “scythe lizard.” It was named for its extremely long claws. Scientists thought these claws must have belonged to a giant turtle, but later changed their minds. The claws were good for ripping open termite’s nests (right), raking out water plants (below), or pulling down branches. During courtship, they could be used to attract a mate or fight rival males. They were good for self-defense, too.

Beipiaosaurus, a cousin, was also covered in fine feathers.



I'M A VEGETARIAN!

Therizinosaurus and its relatives were not only the weirdest-looking dinosaurs that ever lived. They were also unusual because, although they were theropods (normally meat-eaters), they ate only plants.

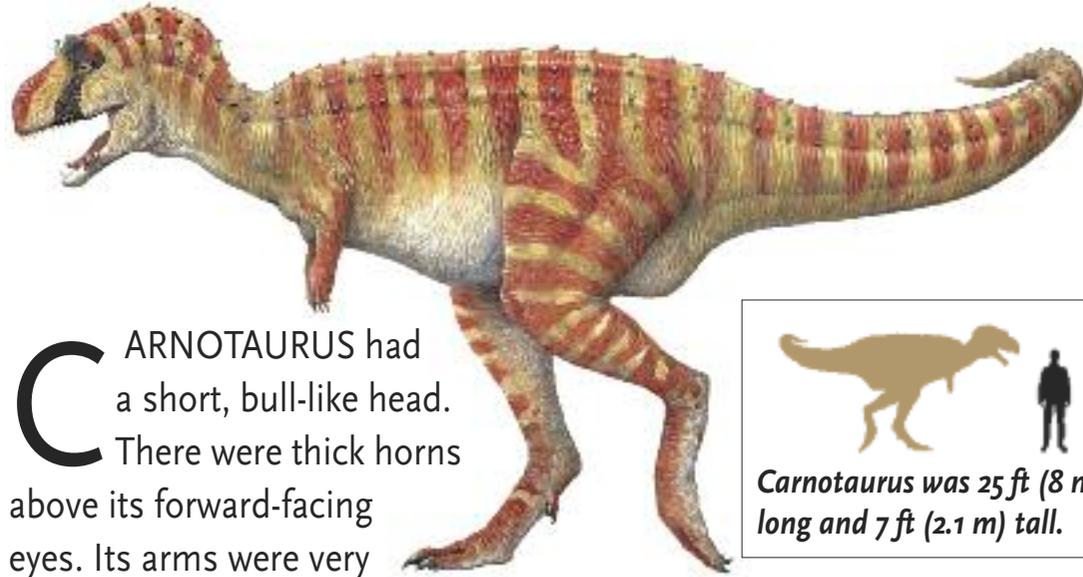


Caudipteryx had a bird-like beak and feathers, but ran like a theropod.

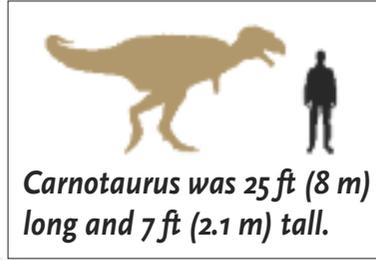
Carnotaurus

kar-nuh-TAWR-us

Late Cretaceous South America, 70 million years ago



CARNOTAURUS had a short, bull-like head. There were thick horns above its forward-facing eyes. Its arms were very short with four stiff fingers and no claws. Carnotaurus's skin was lined with rows of bony lumps. It had a long, thin tail.



Carnotaurus was 25 ft (8 m) long and 7 ft (2.1 m) tall.

Carnotaurus was a descendant of Ceratosaurus (below), a theropod that lived in North America, Europe, and Africa in Jurassic times. Ceratosaurus had a large horn on its snout.

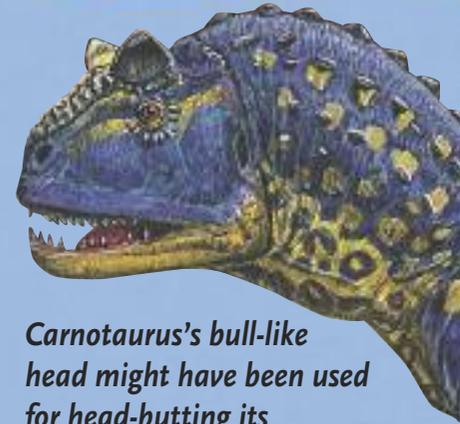


LIKE A BULL

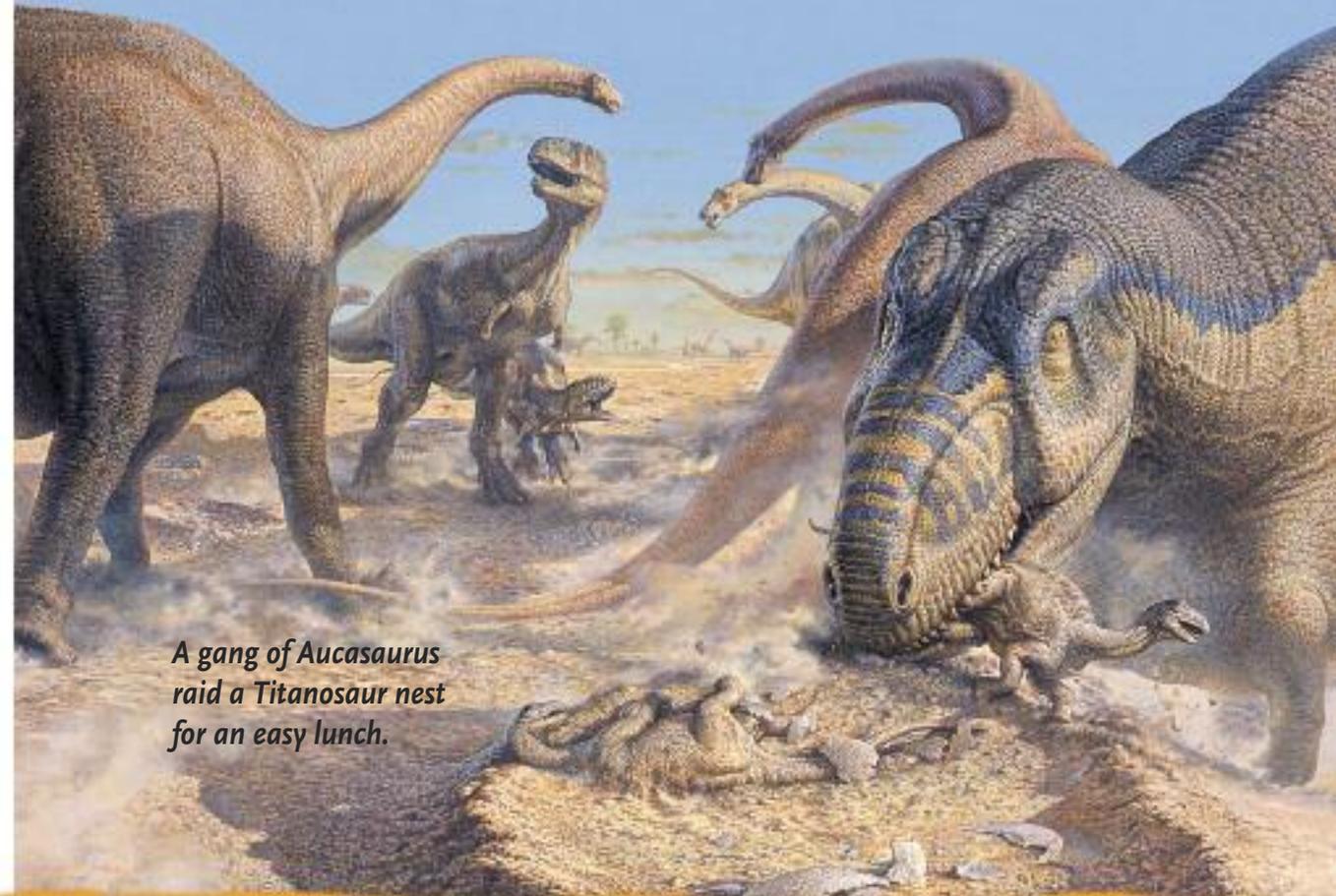
The name Carnotaurus means “flesh-eating bull.” It was named because it looked like a bull. Carnotaurus, along with other dinosaurs from South America in the Cretaceous period, was different from its relatives on other continents. This was because South America was geographically isolated from the rest of the world.

SKIN AND BONES ... AND SCALES

Only one fossil of Carnotaurus has ever been found. It was almost a complete skeleton, which, unusually, still had skin impressions. Its skin was made up of disklike scales. But, unlike a lizard's or a snake's scales today, these did not overlap.



Carnotaurus's bull-like head might have been used for head-butting its enemies. Its forward-facing eyes gave it 3D vision. Its teeth were like blades, perfect for tearing flesh.



A gang of Aucasaurus raid a Titanosaurus nest for an easy lunch.

Tyrannosaurus rex

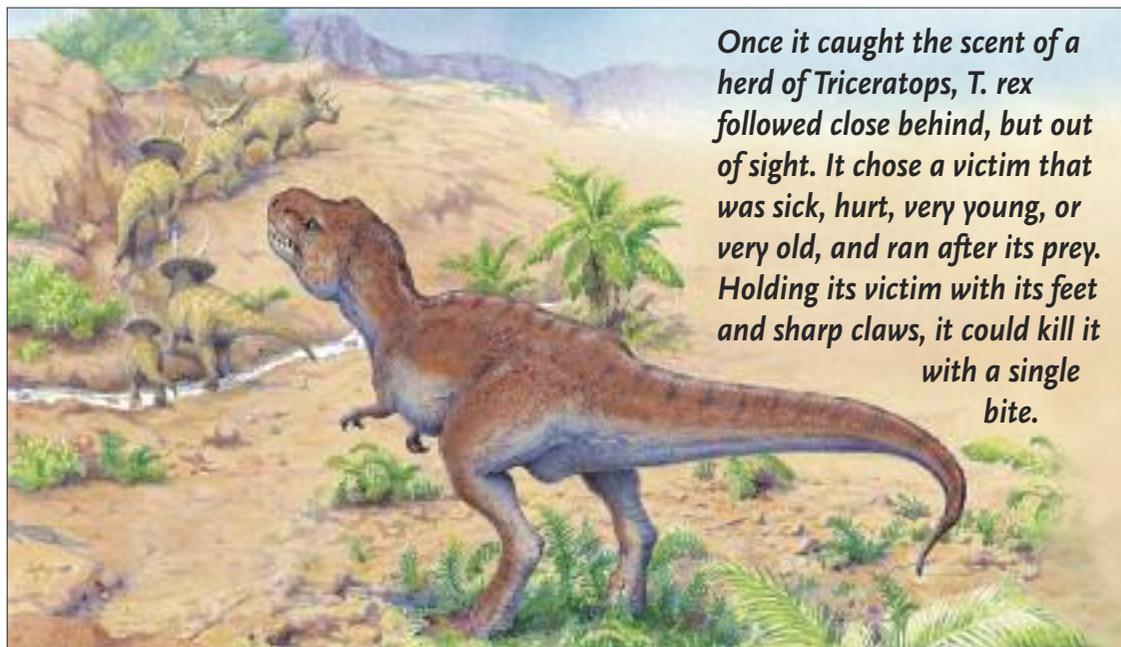
tuh-ra-nuh-SAWR-us REX

Late Cretaceous North America, 68–65 million years ago

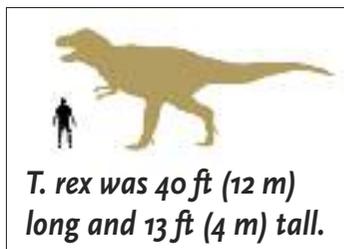


Tyrannosaurus rex's enormous dagger-like teeth could crush bone.

TYRANNOSAURUS REX is nicknamed “King of the Giants.” It had a huge head with massive jaws. Its two muscular hind legs were gigantic, but its arms were tiny. The long, heavy tail balanced the weight of its body as it lumbered along. Each of its toes and fingers had a long, sharp claw.



Once it caught the scent of a herd of Triceratops, T. rex followed close behind, but out of sight. It chose a victim that was sick, hurt, very young, or very old, and ran after its prey. Holding its victim with its feet and sharp claws, it could kill it with a single bite.



T. rex was 40 ft (12 m) long and 13 ft (4 m) tall.

T. rex's skull had large eye sockets and nasal cavities, so it probably had good vision and a sharp sense of smell. It could see in 3D with its forward-facing eyes.



KING OF THE DINOSAURS

“Tyrannosaurus” means “tyrant lizard” and “rex” means “king,” but it once had a different name. First, it was *Manospondylus* after its remains were first found in 1892. Eight years later, a second fossil was found and named *Dynamosaurus*. Only by 1905 did it officially become known as *Tyrannosaurus rex*.



TWINKLE TOES

Tyrannosaurus rex was enormous. An eight-year-old child could fit inside its mouth. Its head and body were so large that if its tiny arms had been any bigger, it would have tipped over. But despite its great size, it walked on tiptoe, like all other dinosaurs.

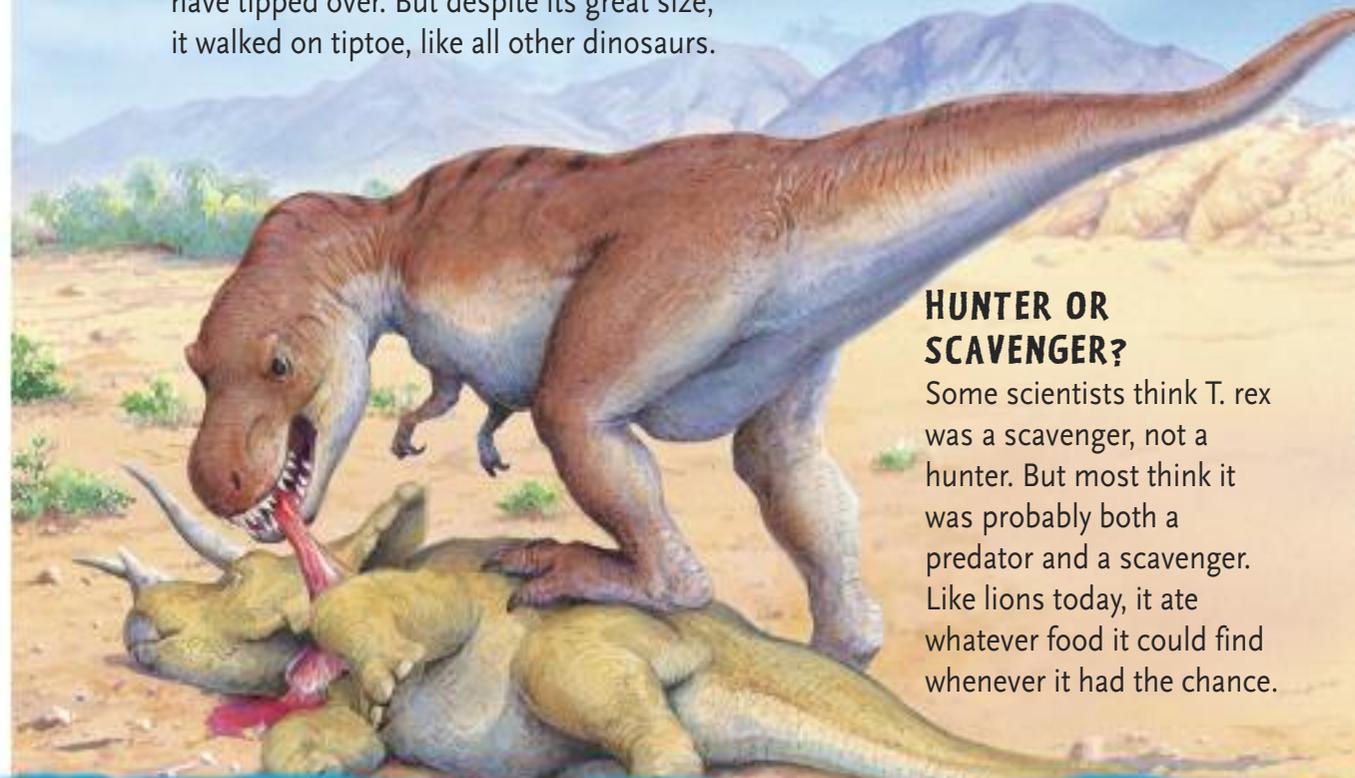
THE SKULL OF A TYRANT



T. rex had an extra joint in its lower jaw so that it could open its mouth very wide. Its jaws were curved so that when they closed, all the teeth came together. Its teeth had saw-like edges, great for slicing through tough skin. The large holes in its skull made its head lighter.

HUNTER OR SCAVENGER?

Some scientists think *T. rex* was a scavenger, not a hunter. But most think it was probably both a predator and a scavenger. Like lions today, it ate whatever food it could find whenever it had the chance.



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