



DINOSAURS

How to make your mobiles

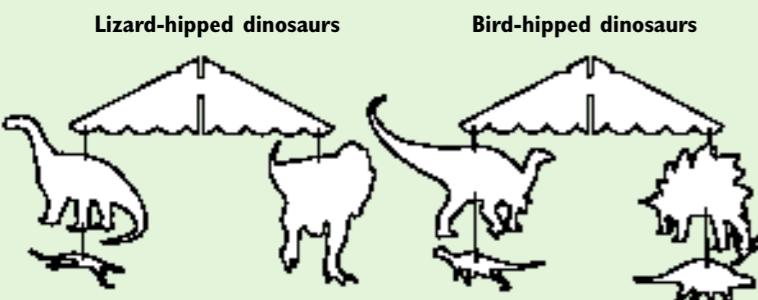
You will need some thread to hang your mobiles.

1 You will find the mobiles inside this book attached to pages 6 and 7, and pages 10 and 11. Carefully detach the mobile pieces along the perforated edges.

2 Press out all the mobile illustrations, except the pieces marked A, B, C and D. Cut small lengths of thread. Tie the thread to the mobile pieces by pushing the ends into the slits and winding them round at least three times.

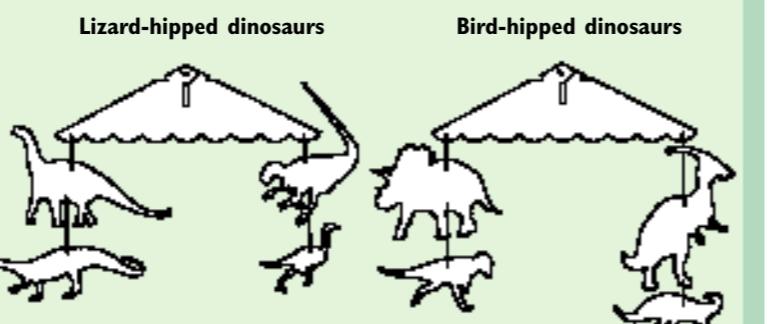


3 Press out one part of the hanger, marked A. Following the positions shown in the diagrams, assemble the mobile pieces and tie them to A.



The threads that link the mobile pieces should measure between 5 and 10 centimetres each.

4 Now do the same with the second part of the hanger, marked B. Tie a thread to the top of B.



5 Assemble the hanger by fitting A and B together. Following this diagram, slide A into B through the diagonal slit in B.



6 Press out the ring marked C. Pass the thread from the top of B through the centre of it. Press C onto the top of the hanger until the four points of the X-shaped hole fit into notches cut in the hanger.



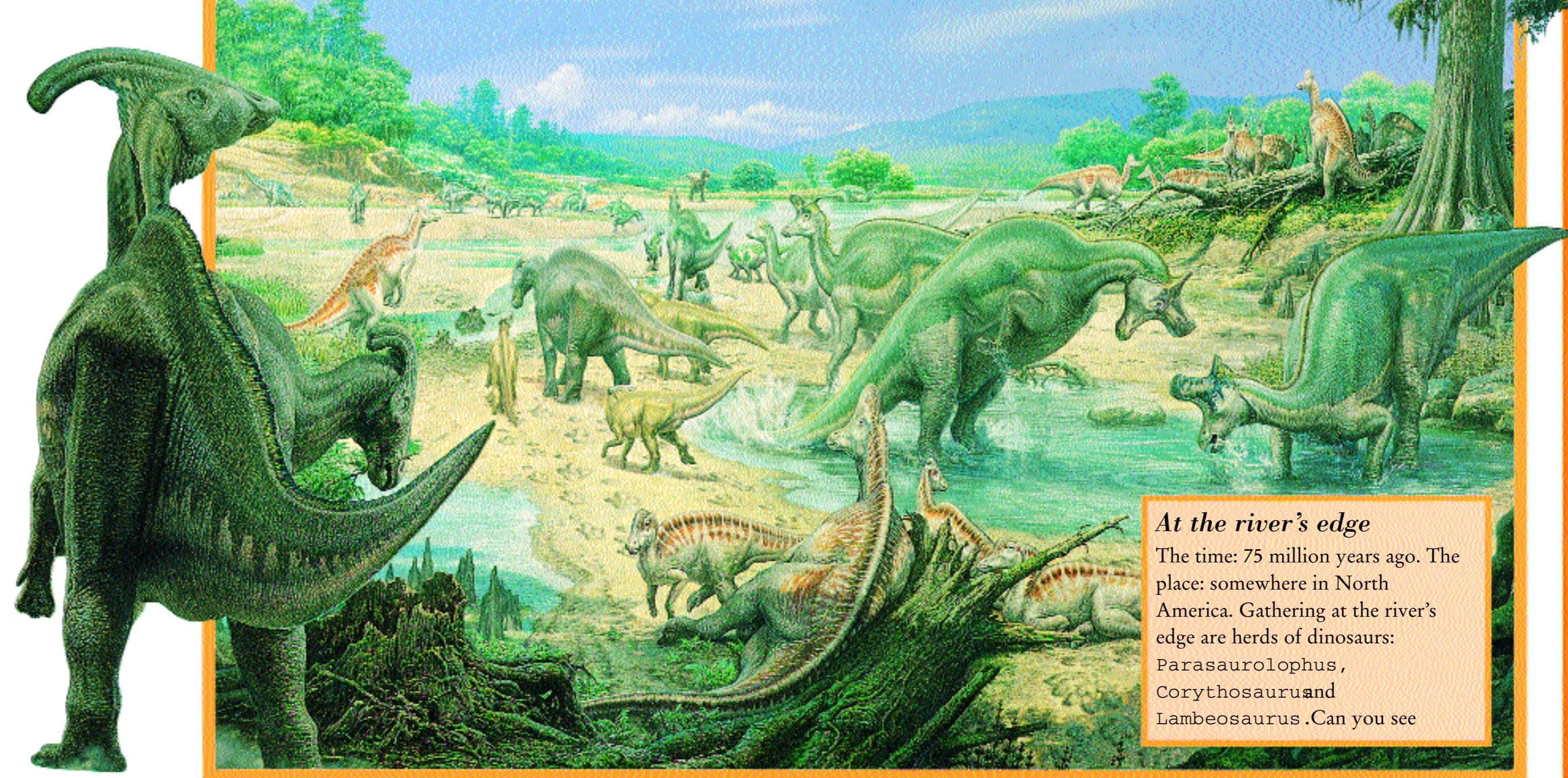
7 Press out the hook marked D and attach it to the thread from the top of the hanger. You can use the hook to hang up your mobile.



The world of dinosaurs

ABOUT 230 million years ago—long before people existed—the first dinosaurs lived on Earth. They were reptiles, but unlike other reptiles they walked with their legs held straight and tucked underneath their bodies, just as birds and mammals do today. In time, hundreds of different kinds of dinosaurs spread all over the world. There were massive beasts the size of buses and tiny ones smaller than cats. Some grazed peacefully on plants, while others, armed with sharp teeth and claws, were savage hunters.

Dinosaurs lived only on land. (Flying reptiles that lived at about the same time were not dinosaurs, but pterosaurs.) For 165 million years, they were rulers of the planet. No one knows why they died out suddenly 65 million years ago. Perhaps a comet collided with Earth, bringing years of continuous dark, cold winter that the dinosaurs simply couldn't survive. For whatever reason, their reign was over.

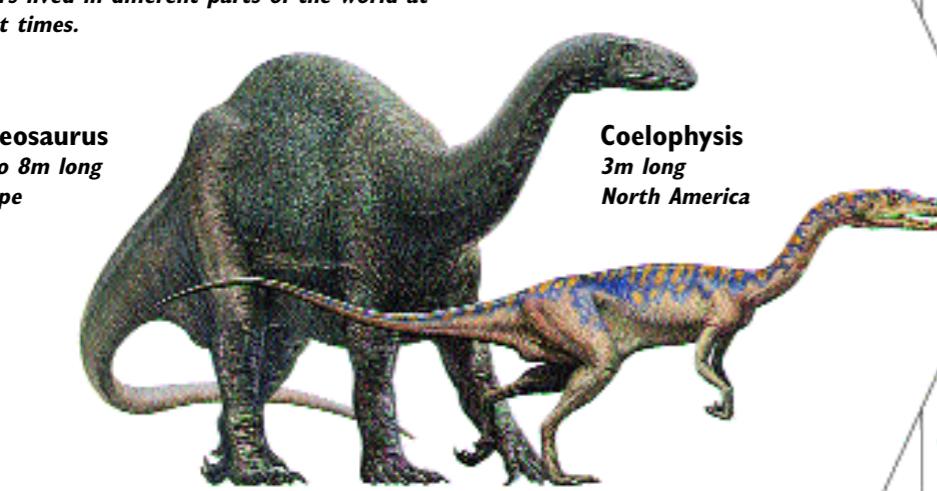


At the river's edge

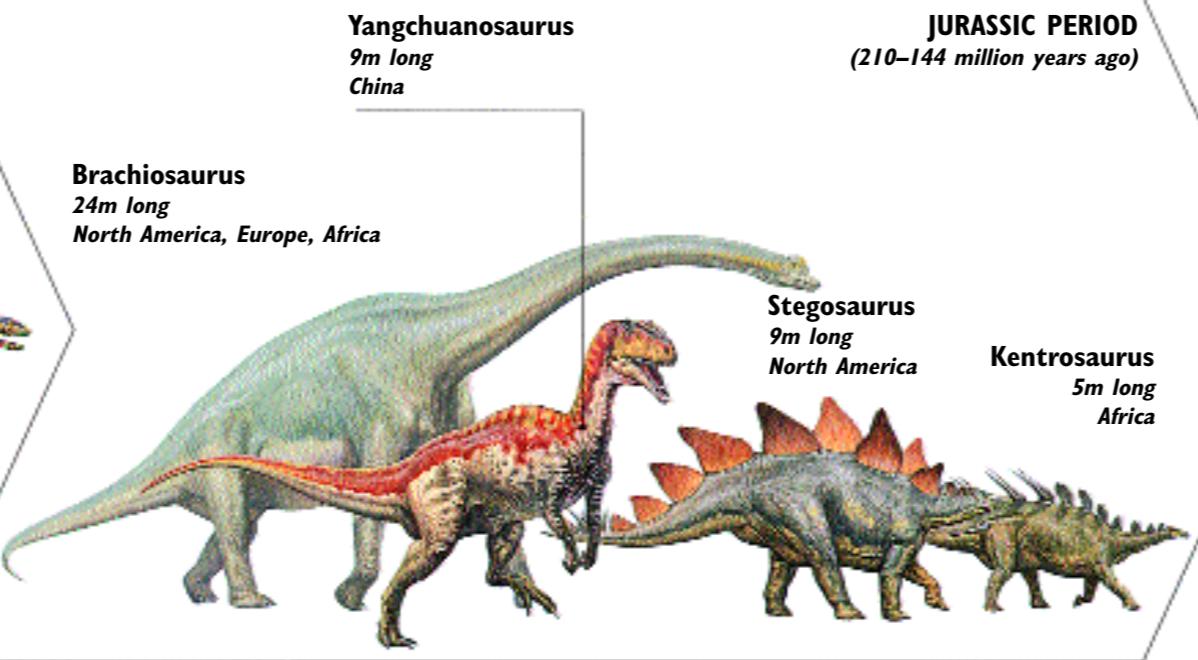
The time: 75 million years ago. The place: somewhere in North America. Gathering at the river's edge are herds of dinosaurs: *Parasaurolophus*, *Corythosaurus* and *Lambeosaurus*. Can you see

Scientists call the time when dinosaurs lived the Mesozoic Era. It is divided into three periods: the Triassic, Jurassic and Cretaceous. Different kinds of dinosaurs lived in different parts of the world at different times.

TRIASSIC PERIOD
(245–210 million years ago)

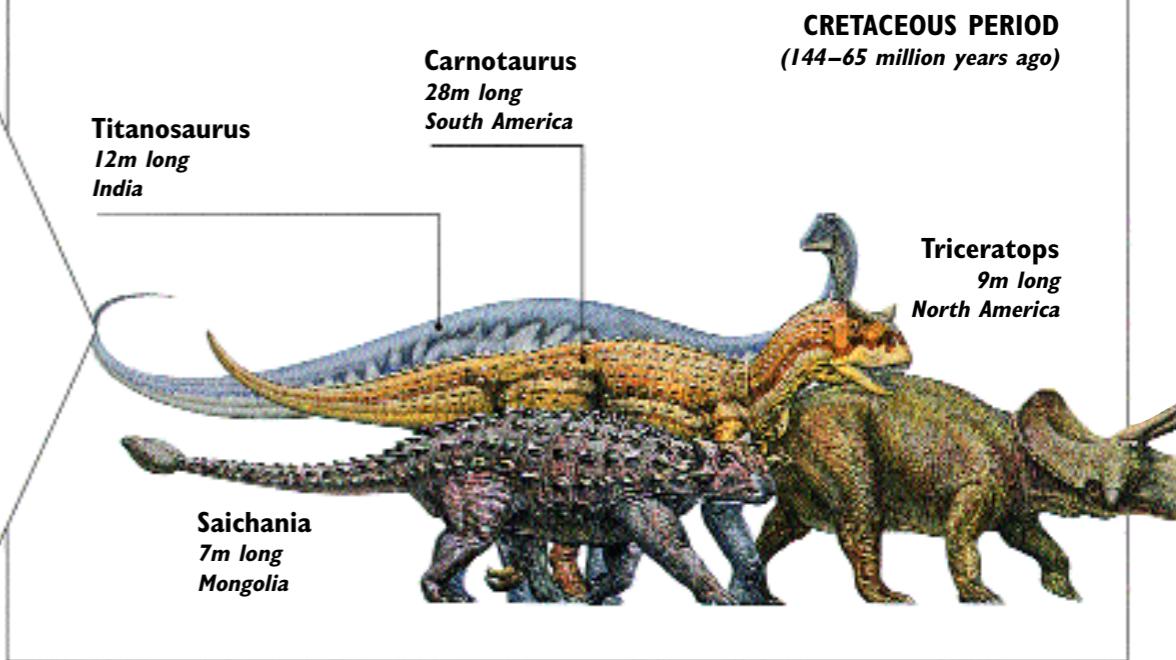


Yangchuanosaurus
9m long
China



JURASSIC PERIOD
(210–144 million years ago)

Titanosaurus
12m long
India

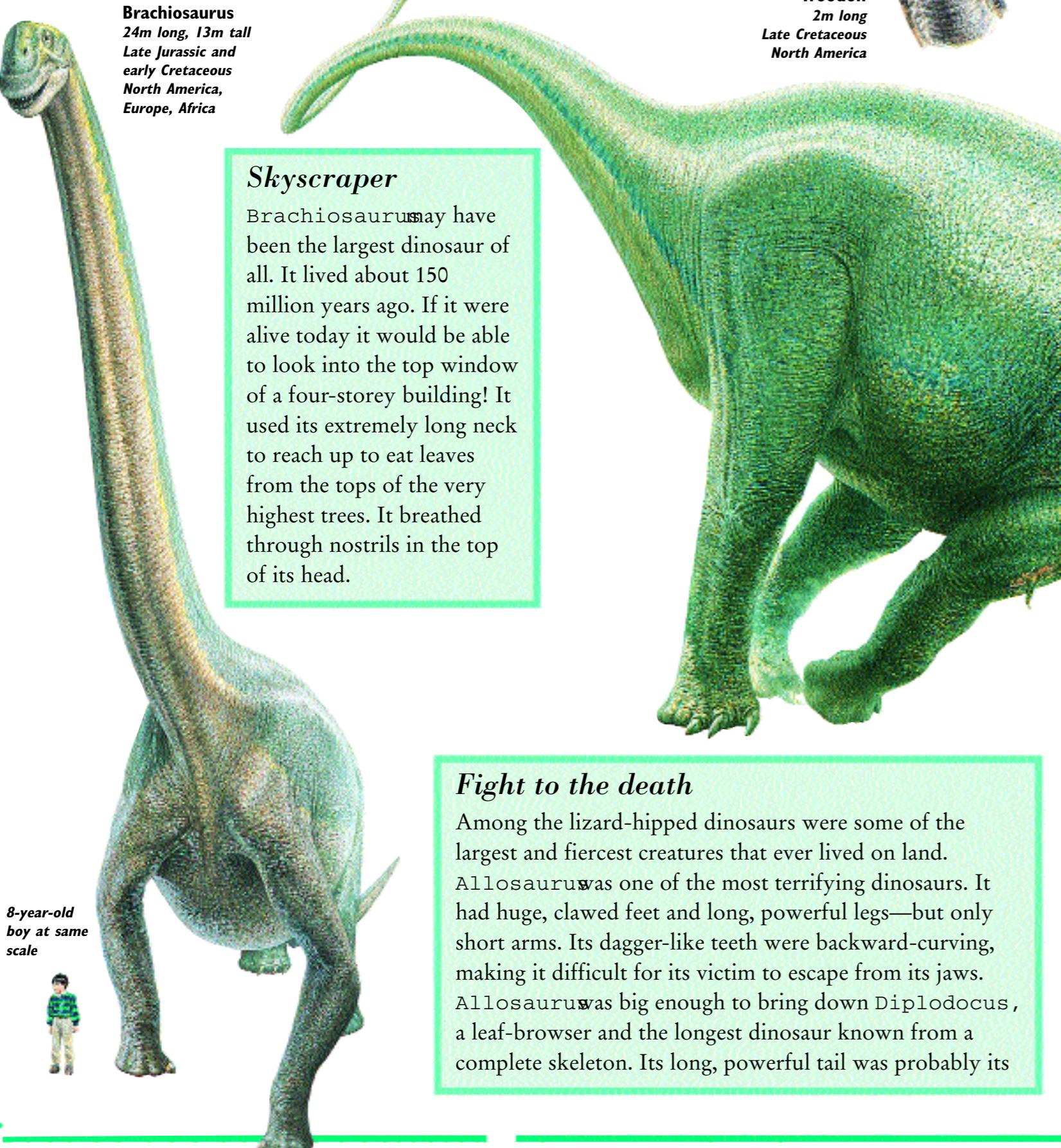


CRETACEOUS PERIOD
(144–65 million years ago)

Longest, largest, cleverest, fiercest

DINOSAURS belong to one of two groups: the lizard-hipped or the bird-hipped. The lizard-hipped dinosaurs are pictured here. They had forward-jutting pubic bones (the lower part of the hipbone). Some were flesh-eaters, known as theropods, while others were long-necked plant-eaters, or sauropods.

Brachiosaurus
24m long, 13m tall
Late Jurassic and early Cretaceous
North America, Europe, Africa



Skyscraper

Brachiosaurus may have been the largest dinosaur of all. It lived about 150 million years ago. If it were alive today it would be able to look into the top window of a four-storey building! It used its extremely long neck to reach up to eat leaves from the tops of the very highest trees. It breathed through nostrils in the top of its head.

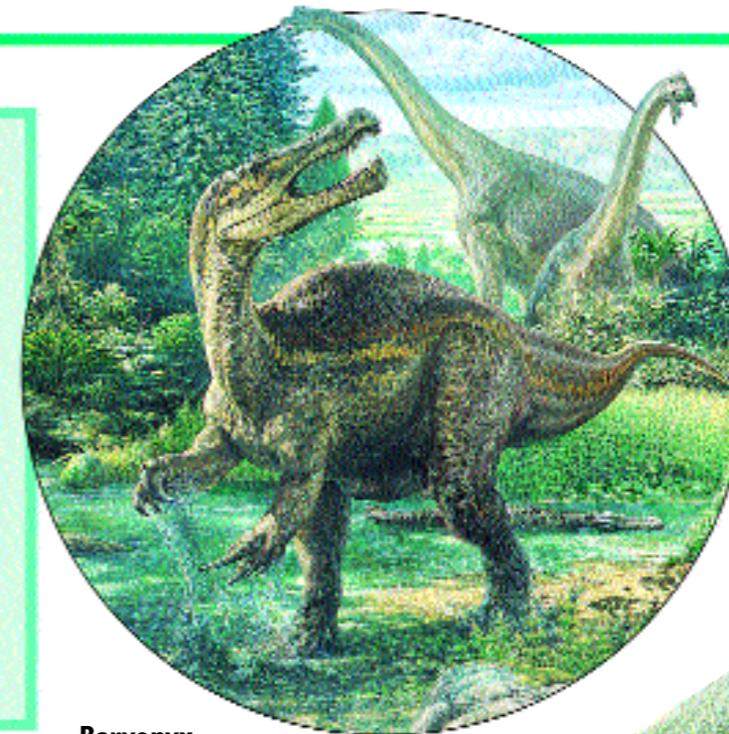
Troodon
2m long
Late Cretaceous
North America



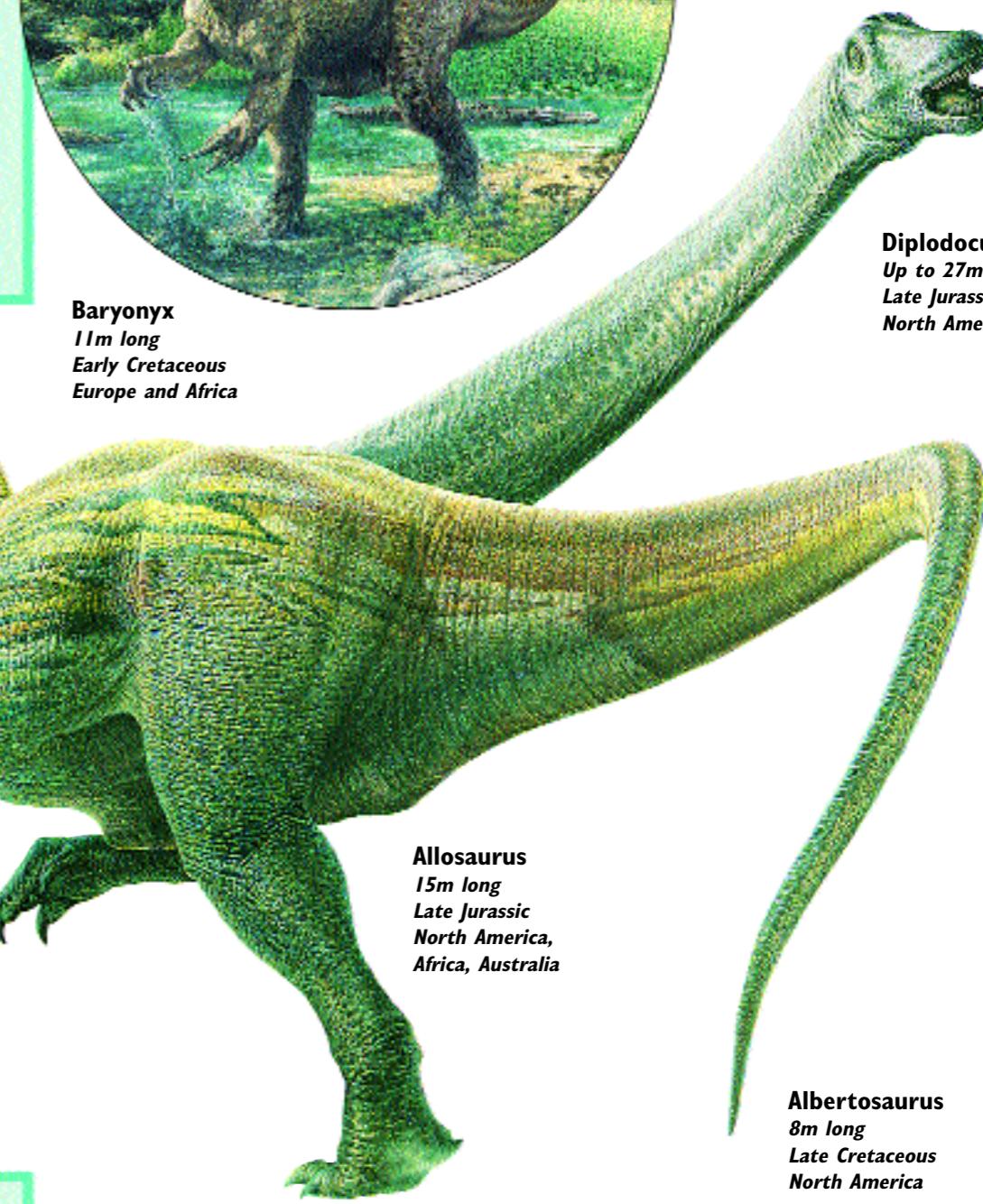
Tooth and claw

Troodon ('wounding tooth') was probably the cleverest dinosaur. It had a large brain and huge eyes, and may have been a night-time hunter. Baryonyx ('heavy claw') had a long head shaped a little like a crocodile's and strong front limbs. It used its hooked claws for fishing.

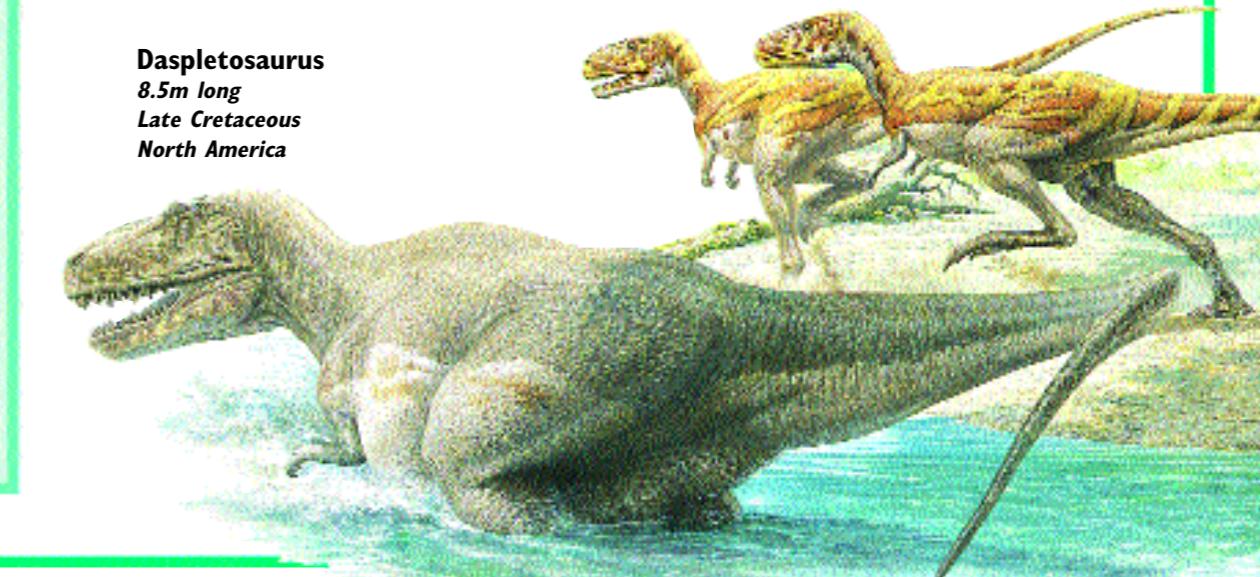
Baryonyx
11m long
Early Cretaceous
Europe and Africa



Diplodocus
Up to 27m long
Late Jurassic
North America



Allosaurus
15m long
Late Jurassic
North America, Africa, Australia



Fight to the death

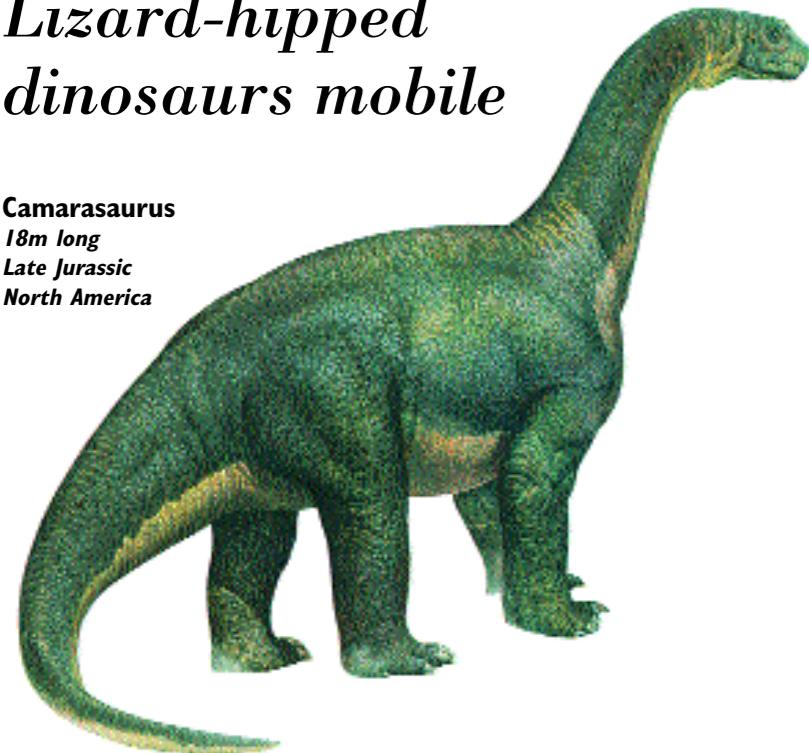
Among the lizard-hipped dinosaurs were some of the largest and fiercest creatures that ever lived on land. Allosaurus was one of the most terrifying dinosaurs. It had huge, clawed feet and long, powerful legs—but only short arms. Its dagger-like teeth were backward-curving, making it difficult for its victim to escape from its jaws. Allosaurus was big enough to bring down Diplodocus, a leaf-browser and the longest dinosaur known from a complete skeleton. Its long, powerful tail was probably its

Tyrant lizards'

Giant flesh-eating tyrannosaurs ('tyrant lizards') stalked the forests at the end of the Age of Dinosaurs. They all had massive heads and huge, saw-edged teeth—even the 'babies' of the family, Albertosaurus and Daspletosaurus.

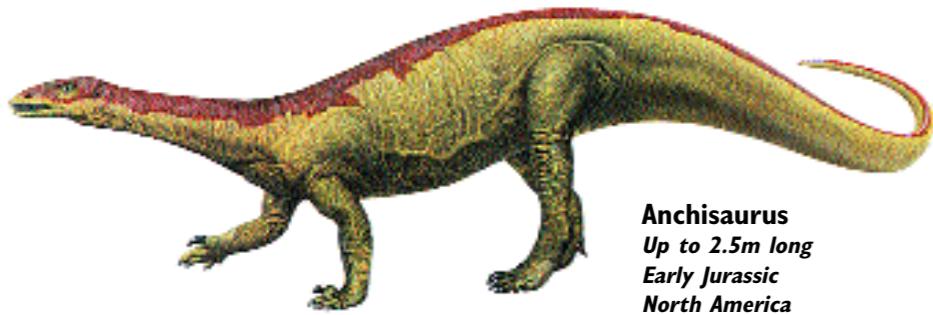
Lizard-hipped dinosaurs mobile

Camarasaurus
18m long
Late Jurassic
North America



Blunt head

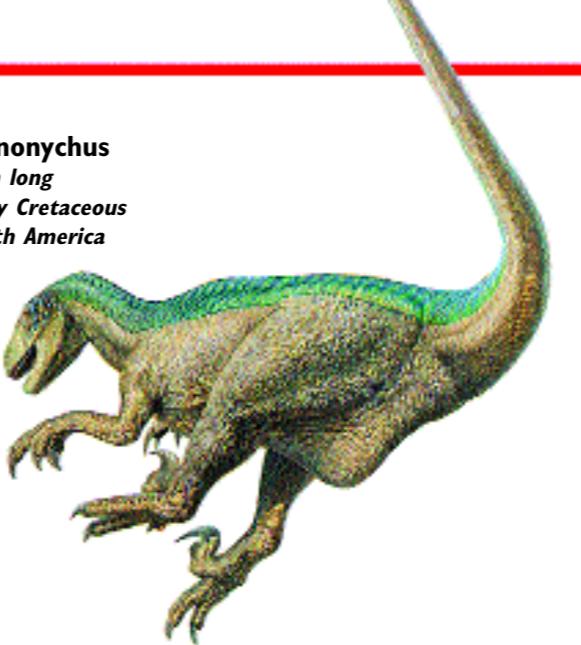
Camarasaurus was, like Diplodocus, a long-necked plant-eating dinosaur. Its head was shorter and blunter, and it had a shorter neck and tail. Despite the curved claws on its front feet, it would have been no match for a hungry flesh-eater like Allosaurus.



Little cousin

Anchisaurus was a smaller relative of the mighty, long-necked plant-eaters like Diplodocus and Brachiosaurus. Although its arms were shorter than its legs, it probably spent most of its time on all fours. It may have reared up on its back legs when it needed to crop leaves, to run at speed, or to defend itself with its sharp, sickle-shaped thumb-claws.

Deinonychus
13m long
Early Cretaceous
North America



'Terrible claws'

For its size, Deinonychus was probably the deadliest killer of all known dinosaurs. It had a large head with powerful jaws full of razor-sharp teeth, curved like daggers. But its most lethal weapons, the 'terrible claws' after which it is named, were on its feet. Deinonychus may have overcome its prey by leaping into the attack, tearing gashes in its victim's flesh with its toe-claws (see page 13).

Ornithomimus
3.5m long
Late Cretaceous
North America

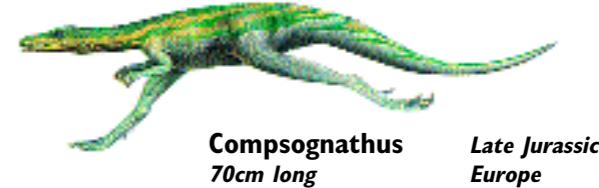


'Bird mimic'

Ornithomimus was a bird-like dinosaur. It looked like an ostrich with a long tail and no feathers. Like that flightless bird, it would roam across the plains, sprinting away from any danger using its long legs. Ornithomimus was probably not a fussy eater: small mammals, lizards, insects, eggs, fruits and leaves could all be snapped up in its sharp-edged, but toothless, beak and



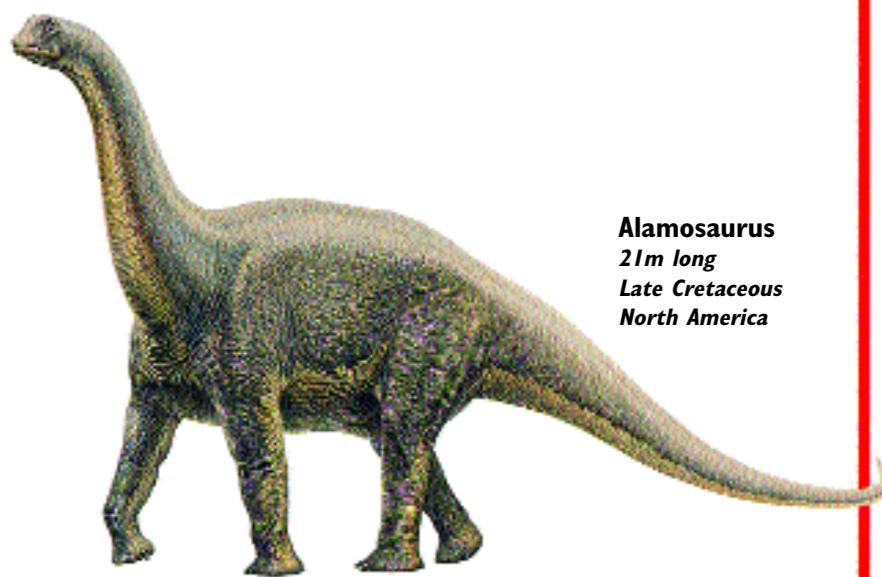
Tyrannosaurus
12m long
Late Cretaceous
North America



Compsognathus
70cm long
Late Jurassic
Europe

'Pretty jaw'

About the size of a cat, Compsognathus was one of the tiniest dinosaurs. Like a cat, it would have carefully stalked lizards, insects or small mammals through the undergrowth before pouncing on its victim. It had thin legs and bird-like feet, and looked quite like Archaeopteryx—the first-known bird. In fact, the two animals lived in the same place at the same time, and may have been closely related. Compsognathus' name means 'pretty jaw', perhaps after the tiny, delicate bones in its skull. Its jaw wouldn't have looked too pretty to a lizard about to be



Alamosaurus
21m long
Late Cretaceous
North America

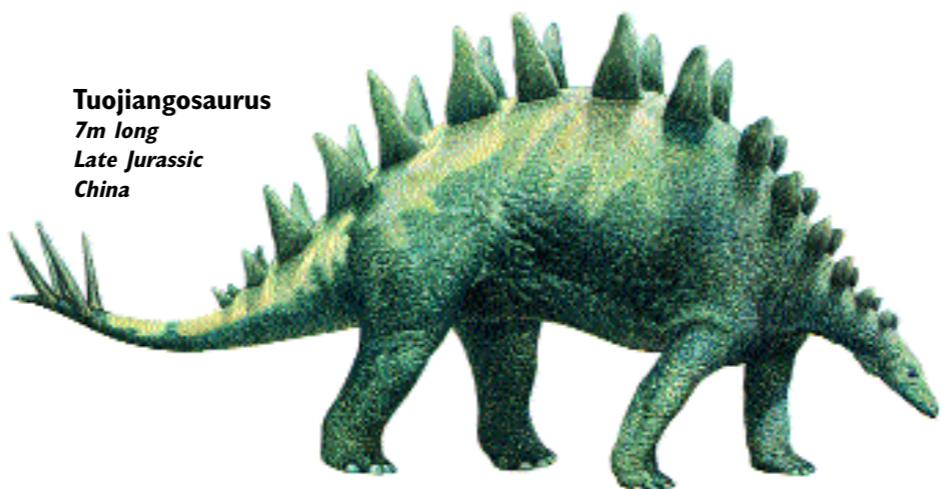
Survivor

In late Cretaceous times, much of lowland North America was a swampy jungle, the domain of duck-billed dinosaurs—and the terrifying flesh-eaters that preyed on them. The long-necked plant-eaters had mostly died out, but one, Alamosaurus, lived on. It survived by feeding on the leaves from trees growing on higher, drier ground.

Crests, spikes, horns, clubs

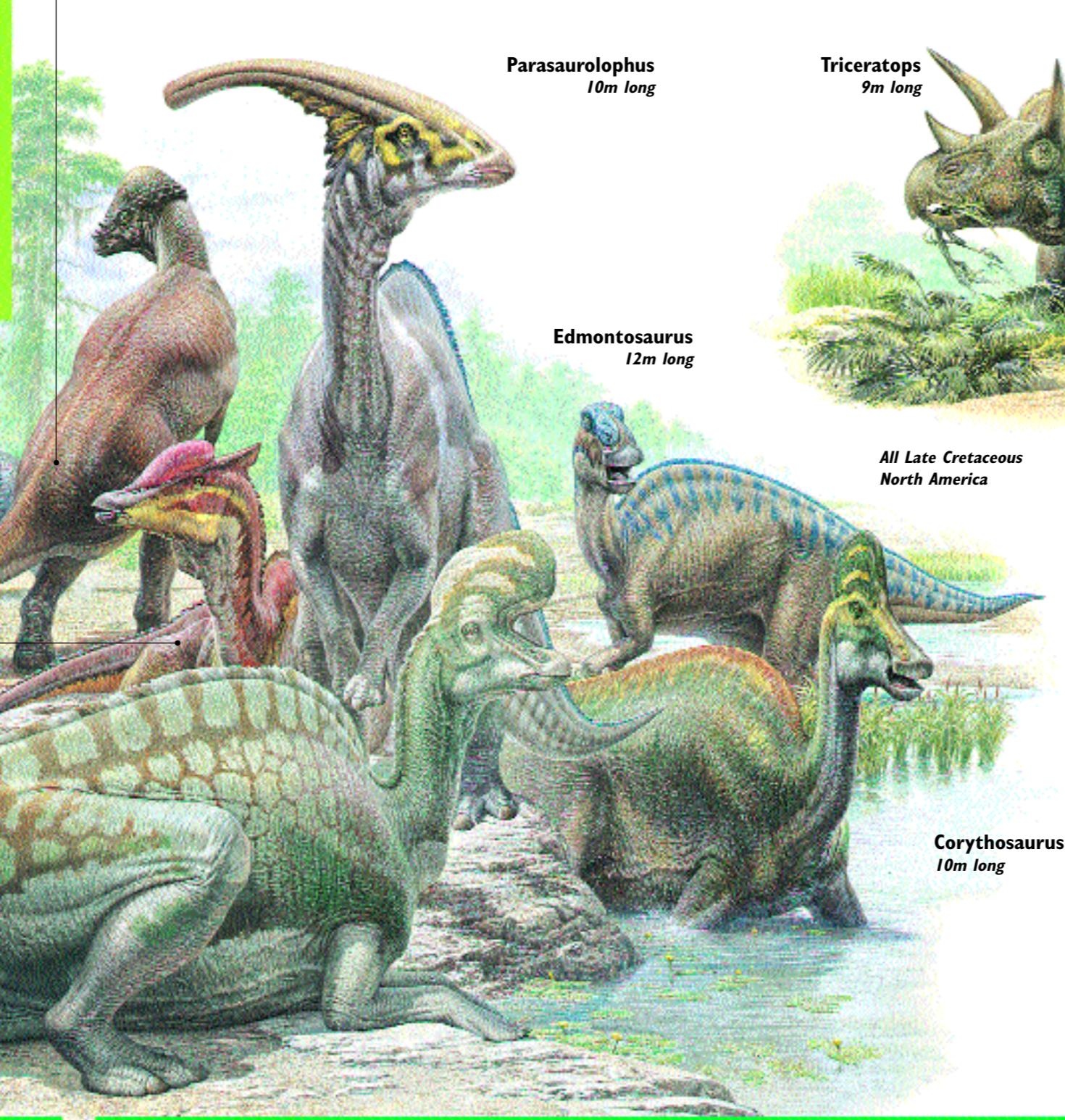
THE SECOND group of dinosaurs was the bird-hipped dinosaurs (see page 4). They had backward-slanting pubic bones. All bird-hipped dinosaurs were plant-eaters. Many had some form of protection from attack by flesh-eating dinosaurs: studs, spikes, horns or clubs on the end of their tails.

Hadrosaurs (the 'duck-billed' dinosaurs) had no such defences. They relied on their large size and the protection of the herd. Some hadrosaurs, like *Corythosaurus*, *Lambeosaurus* and *Parasaurolophus* had hollow crests on their heads. These may have helped them to boom out loud warning hoots whenever danger was spotted (see



Tuojiangosaurus
7m long
Late Jurassic
China

Pachycephalosaurus
8m long



Stygimoloch
2m long

Sauropellosaurus
9m long

Lambeosaurus
15m long

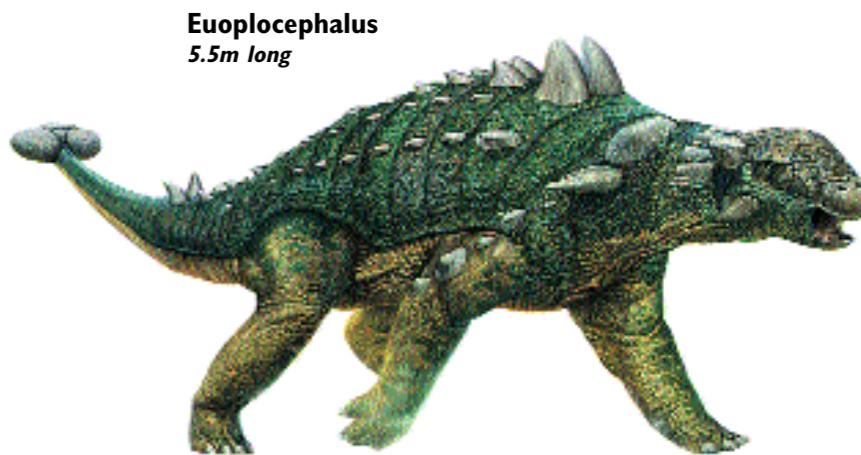
Parasaurolophus
10m long

Edmontosaurus
12m long

Dangerous tails

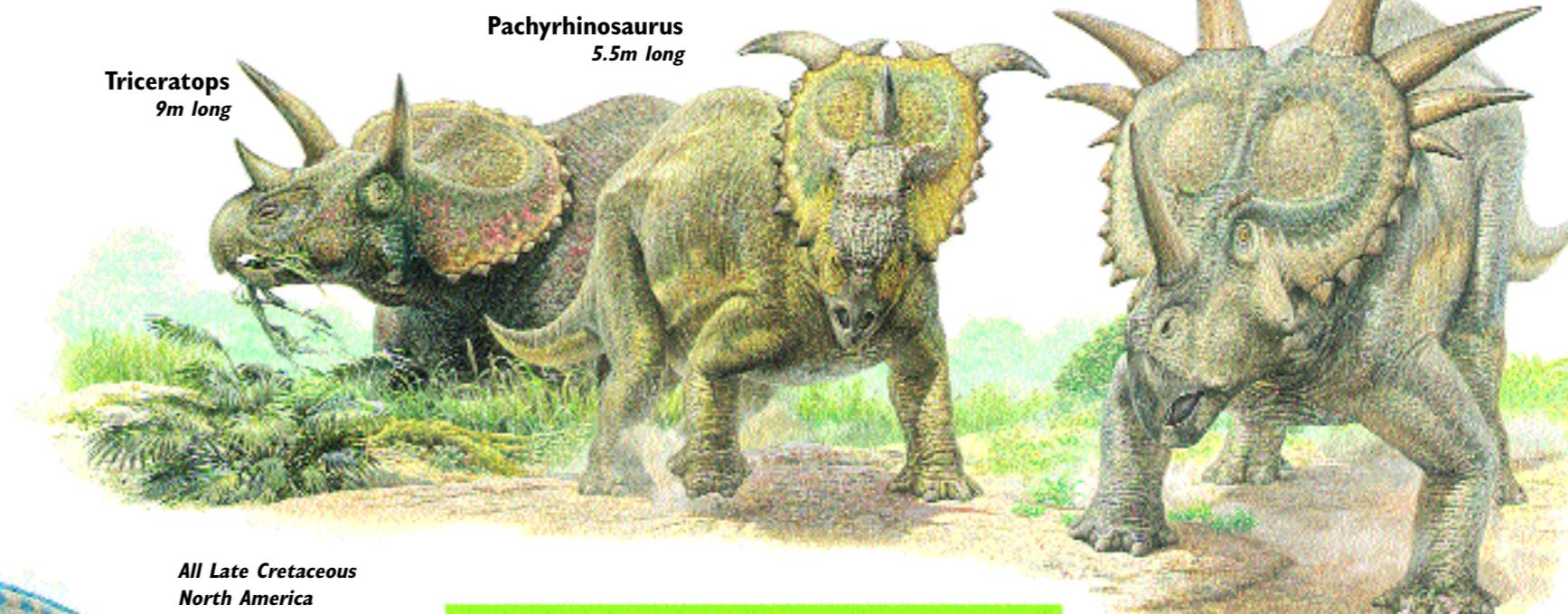
Tuojiangosaurus lived in China during the Jurassic Period. The pointed plates running the length of its back might have given it some protection, but one swish of that spiked tail could have finished off any attacker.

Euoplocephalus ('well-armoured head') had an appropriate name. Slabs of bony armour covered almost all of its body, including even its eyelids. A heavy, bony club at the end of its tail gave this tank-like dinosaur a lethal weapon with which to



Euoplocephalus
5.5m long

Styracosaurus
5.5m long



All Late Cretaceous
North America

Pachyrhinosaurus
5.5m long

Triceratops
9m long

Horned faces

The ceratopsians ('horned faces') had massive neck frills, horns and parrot-like beaks. Even *Tyrannosaurus* might have had difficulty overcoming *Styracosaurus*, a large dinosaur with a number of enormous spikes on its neck frill. Male ceratopsians of the same kind may have fought one another for dominance of their herds, using their horns in ferocious head-to-head combat.

With its sharp beak and teeth, *Psittacosaurus* ('parrot-lizard') could have eaten plants too tough for other animals. It could stand, walk and run on its back legs.

Psittacosaurus
2m long
Early Cretaceous
Asia (Mongolia,
China, Thailand,
Russia)

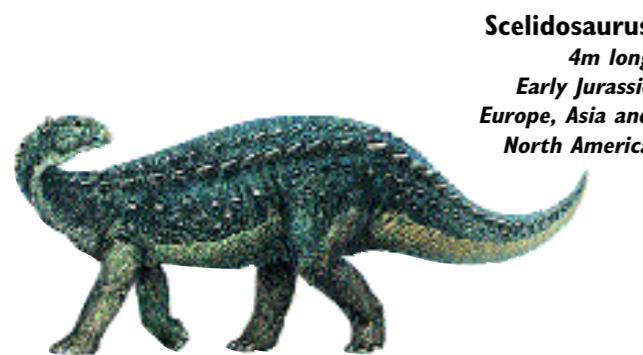


Bird-hipped dinosaurs mobile

Iguanodon
9m long
Early Cretaceous
Europe, Africa and North America

Thumb spike

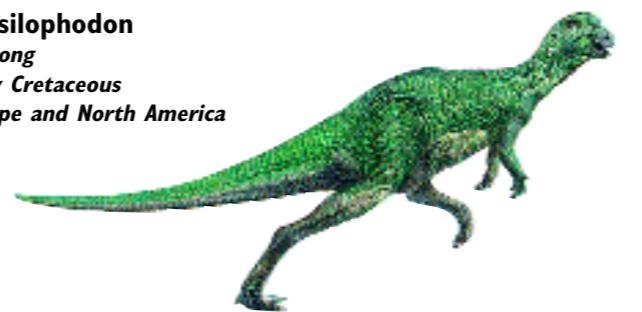
Iguanodon seemed equally at ease walking on its two hind feet as well as on all fours. Its five-fingered hands were able to grasp things, as well as, with the use of the thumb spike, cause injury to an attacker (see page 12). Herds of these great dinosaurs roamed the swampy Cretaceous landscape, stripping off leaves and chewing ferns as they went.



Plates and studs

Scelidosaurus was a small, slow-moving, plant-eating dinosaur. How could it defend itself? Its body was covered with a tough, scaly skin, a layer of bony plates and rows of sharp studs running the length of its back and tail. A flesh-eater might easily damage its teeth when trying to sink them into its flesh. Scelidosaurus probably lived close to rivers and browsed on leafy twigs.

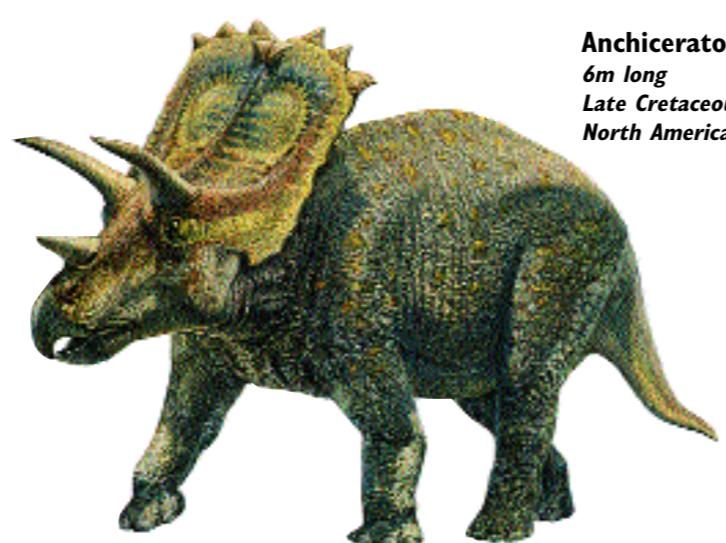
Hypsilophodon
2m long
Early Cretaceous
Europe and North America



Quick on its feet

Little Hypsilophodon was like a gazelle. Large herds gathered on swampy lowlands to nibble at low plants and ferns. Some of these keen-sighted dinosaurs may have stood on lookout duty. At the slightest hint of danger, the herd would scatter. Hypsilophodon was one of the fastest dinosaurs. It could also veer easily from side to side to dodge an attacker.

Scelidosaurus
4m long
Early Jurassic
Europe, Asia and North America



Rhino dino

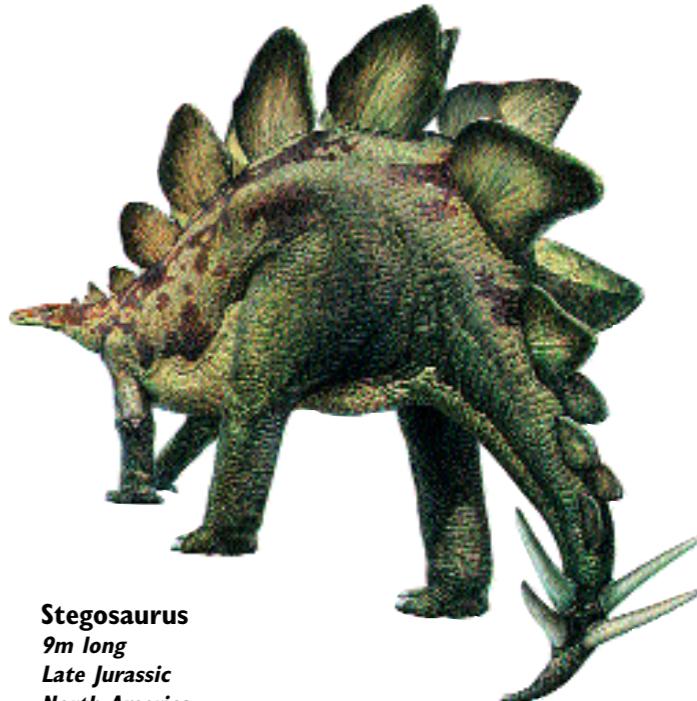
The ceratopsians were the rhinoceroses of the dinosaur world (see page 9). They had strong, stocky bodies with quite short legs, and they carried horns on their heads. Anchiceratops had three horns, all pointing menacingly forward. It also had a neck frill complete with spiky studs set around the top of its rim. The frill was not all solid bone: there were wide openings in the bone covered with skin. Anchiceratops probably used its narrow, horny beak and scissor-like teeth to shear off tough swamp plants.



Stegoceras
2m long
Late Cretaceous
North America

Bone-headed

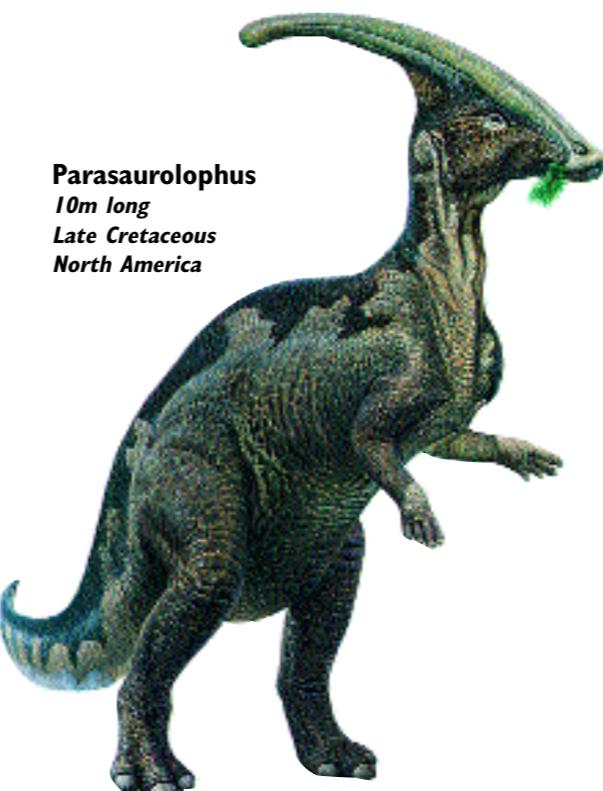
Not to be confused with Stegosaurus, Stegoceras was a much smaller beast which stood on two legs and had a thick-boned, dome-shaped head. It must have used its head for ramming—usually rival males competing with one another to dominate the herd, just as sheep and goats do today.



Stegosaurus
9m long
Late Jurassic
North America

Massive plates

No one knows for sure why Stegosaurus had a double row of wide, diamond-shaped, bony plates sticking up all the way down its back. They may have protected it from attack, or perhaps they helped in some way to control the dinosaur's body temperature. What is certain is that the spikes on the tail would have seriously injured any attacker unlucky enough to catch a blow to the body or head. Stegosaurus was not the cleverest of beasts: its brain was the size of a sausage!



Parasaurolophus
10m long
Late Cretaceous
North America

Loud bellows

Parasaurolophus was a duck-billed dinosaur. We can tell it apart from its many relatives by the great, backward-pointing crest on the top of its head. This crest, measuring up to two metres long, contained hollow tubes linked to the creature's nostrils. When Parasaurolophus belled its call, the tubes worked like organ pipes, making very loud,



Edmontonia
7m long
Late Cretaceous
North America

Tank dinosaur

Edmontonia was the size of an army tank and just as well armoured. Rows of bony plates covered its head and body. Its shoulders and sides were particularly well protected with spikes sticking out at all angles. Faced with danger, it may have used its armour as a shield, or gone on the attack itself, jabbing its spikes into its assailant.

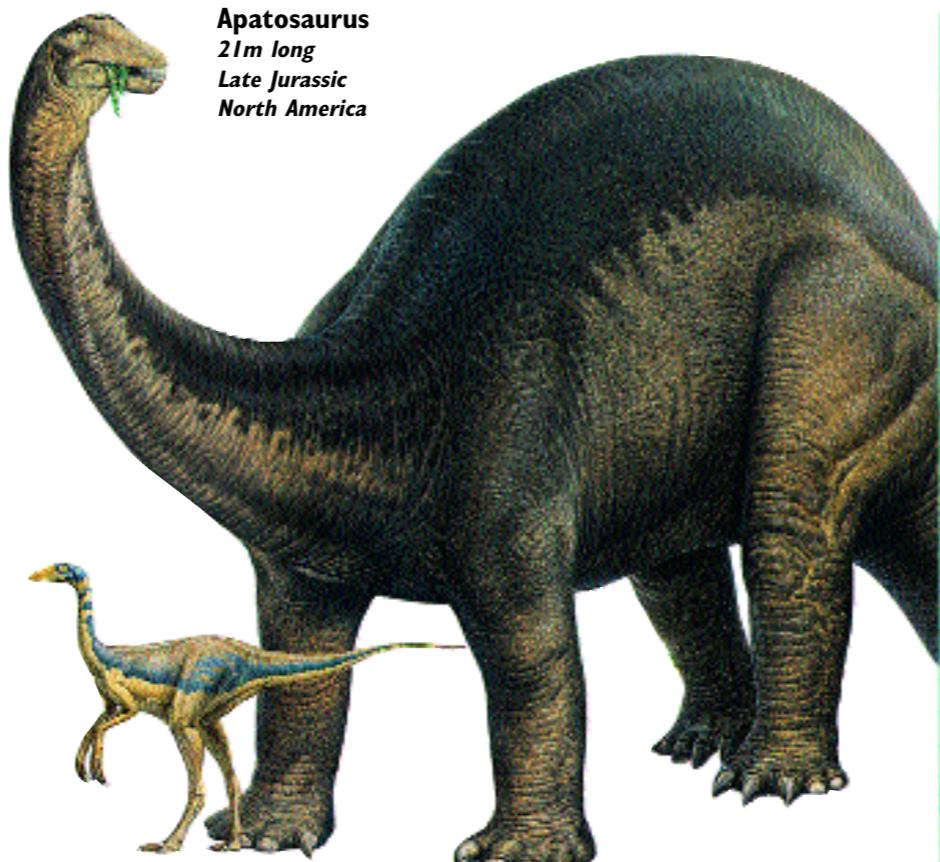
How dinosaurs lived

WHEN we think of a dinosaur, perhaps the first image that comes to mind is an enormous, long-necked creature like Apatosaurus (once known by the name Brontosaurus). With its massive, elephant-like legs, it would have been far too slow to flee from attackers. Instead, it roamed around in herds, relying on strength in numbers as a means of defence.

Apatosaurus probably had to eat all the time to nourish its massive body. It may even have slept standing on its feet, resting between breaks from browsing on leaves and ferns.

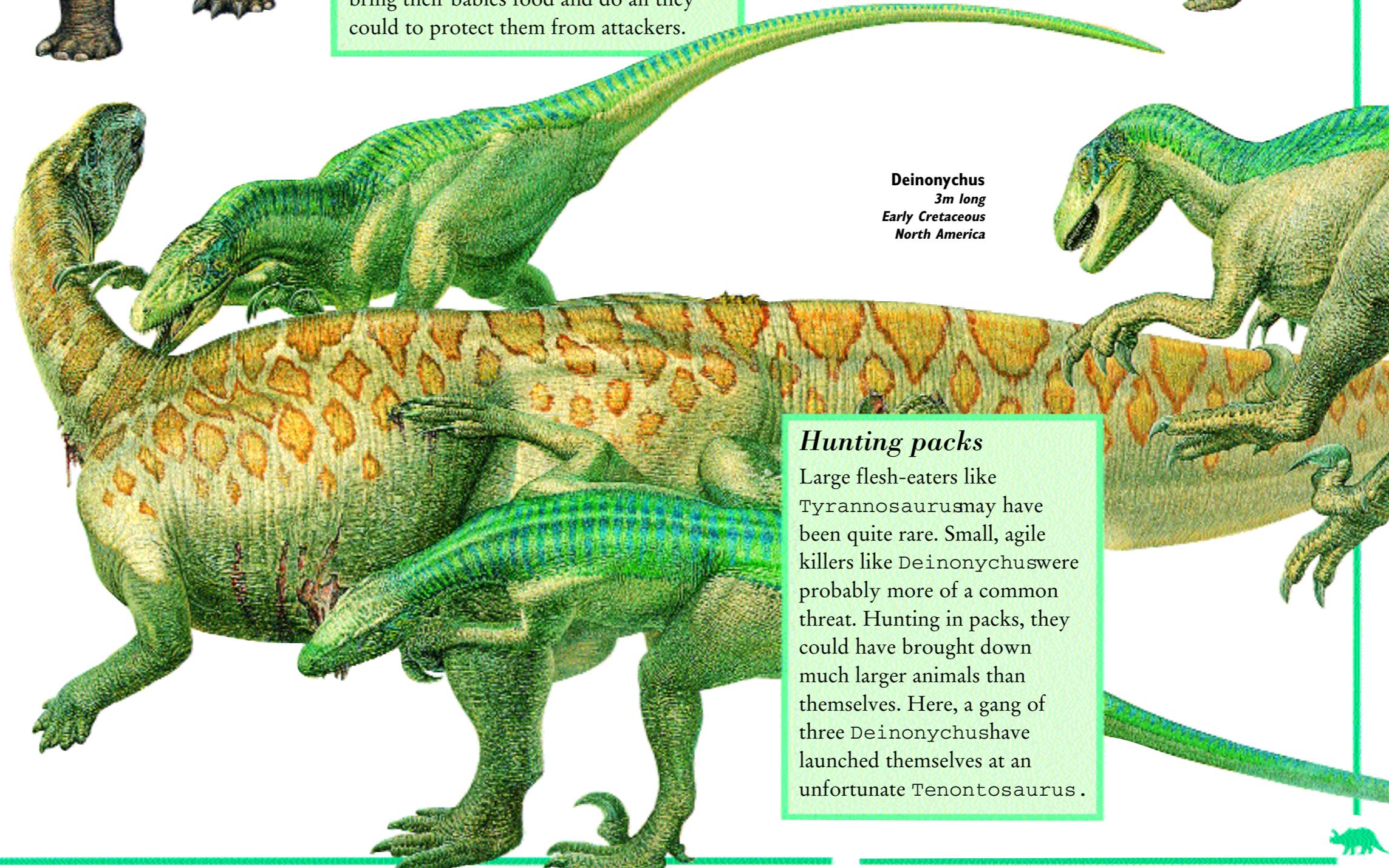
Many other kinds of dinosaurs were no larger than animals living in the world today. Some quite small and light dinosaurs were capable of running very fast on two legs. In contrast to Apatosaurus, Dromiceiomimus was a lightly built dinosaur, about the size of a human, and with the sprinting speed of an ostrich. Agile

Apatosaurus
21m long
Late Jurassic
North America



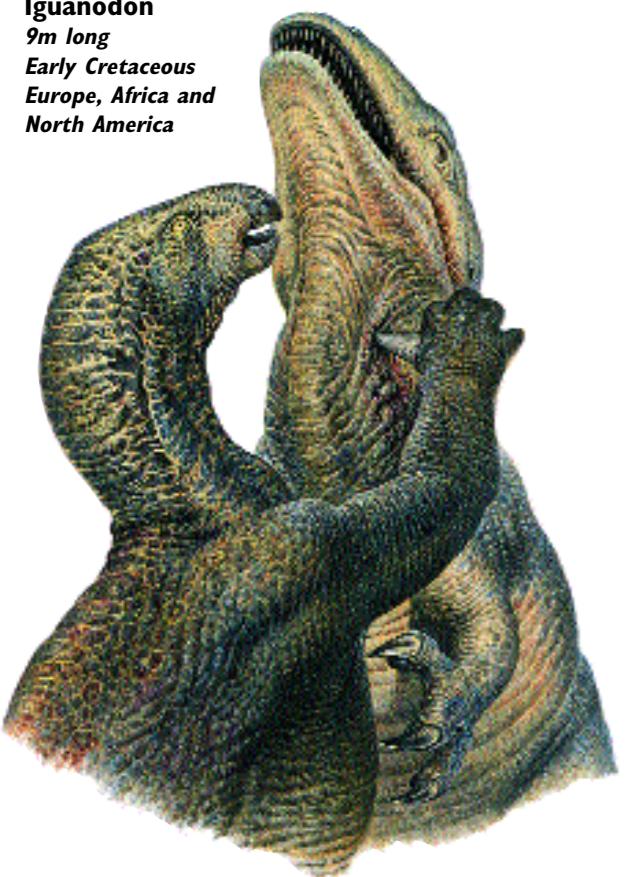
Dromiceiomimus
3.5m long
Late Cretaceous
North America

Tenontosaurus
7m long
Early Cretaceous
North America



Deinonychus
3m long
Early Cretaceous
North America

Iguanodon
9m long
Early Cretaceous
Europe, Africa and
North America



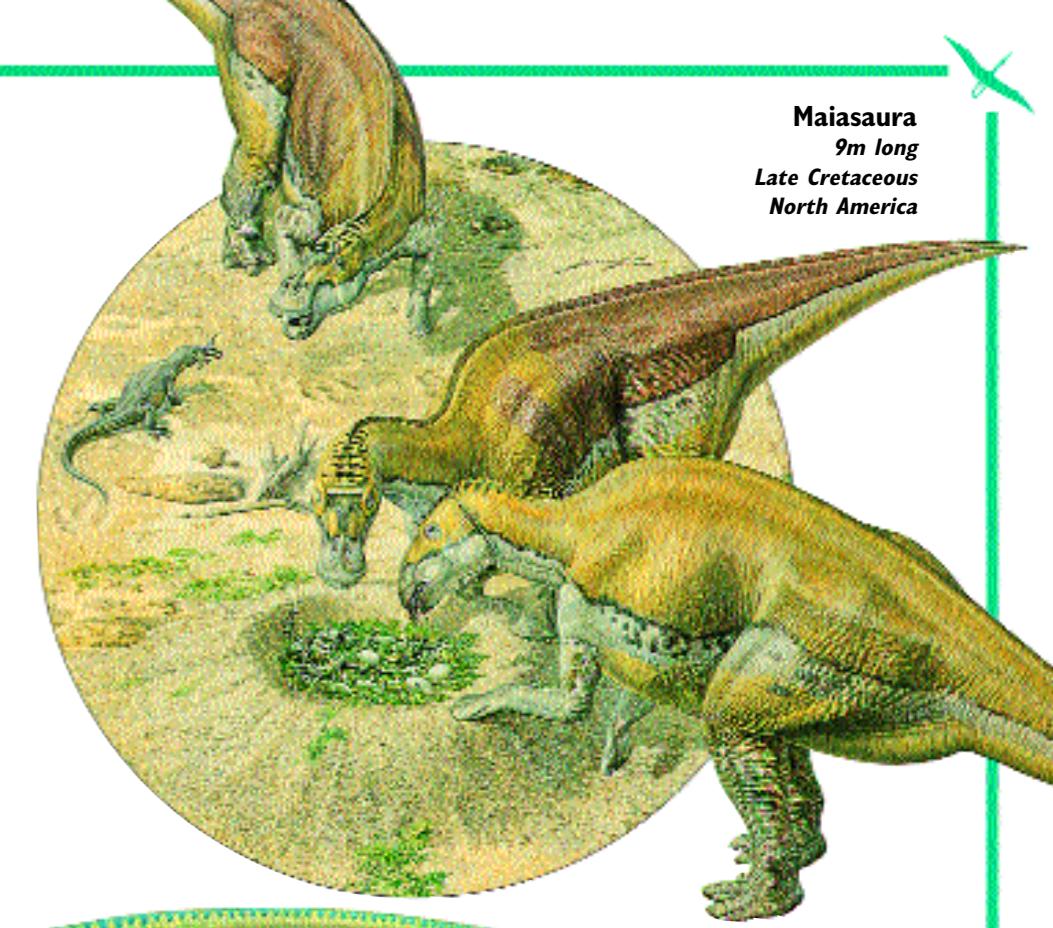
Offence and defence

Many dinosaurs spent their days peacefully cropping leaves and shoots. But no plant-eater could afford to be off its guard. A flesh-eating dinosaur might launch an attack at any time. Great size, a whip-like tail, a covering of bony armour or spikes, or the ability to sprint away were all different methods of defence. Iguanodon had a spike for a thumb, and could have jabbed it in the neck of any dinosaur that dared to attack it.

Good parents

Like other reptiles, dinosaurs laid eggs. Their young hatched out in nests, and, in some cases, the parents stayed with their young for several weeks. Maiasaura (whose name means 'good mother lizard') females would gather together to make nests close to one another as protection from roaming, flesh-eating dinosaurs. They scooped out two-metre-wide basins in mounds of mud, laid up to 25 long, oval eggs in them, and covered them over with rotting vegetation to keep them warm. When the eggs hatched, the parents would bring their babies food and do all they could to protect them from attackers.

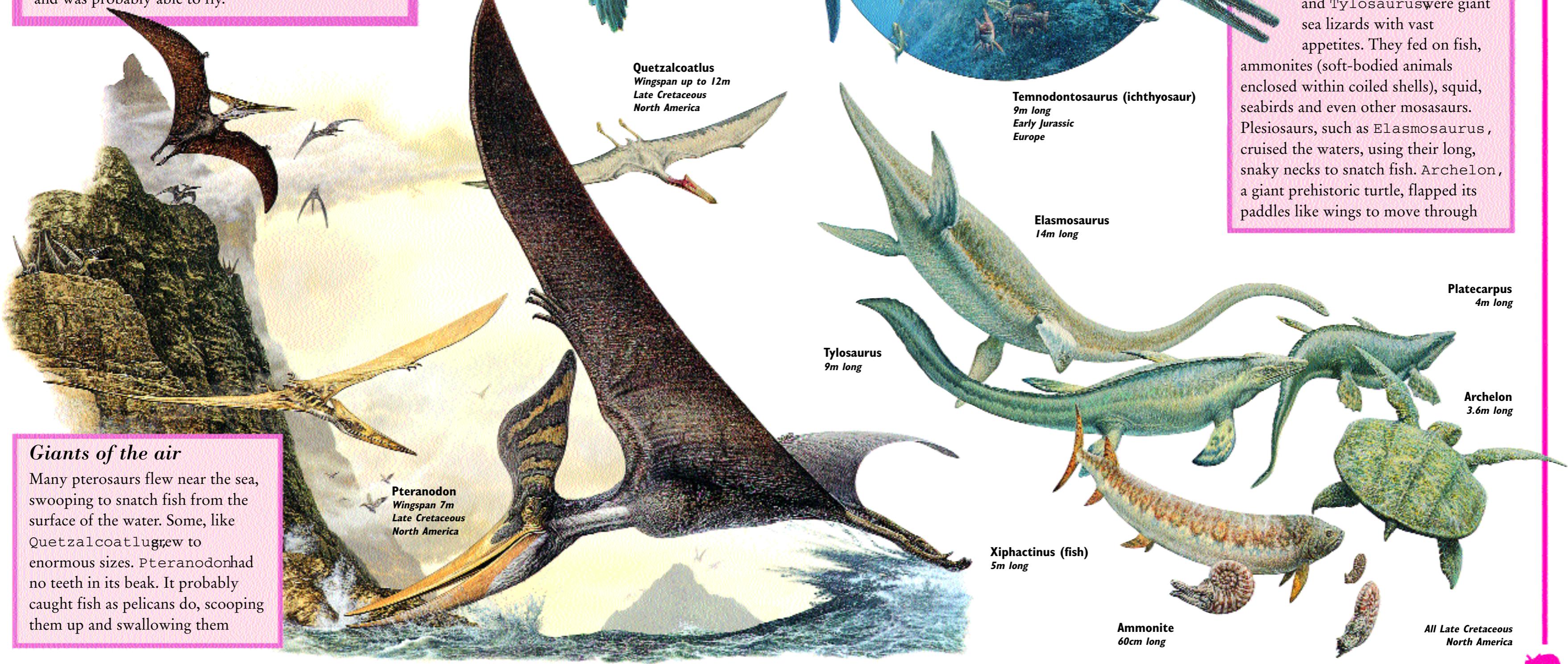
Maiasaura
9m long
Late Cretaceous
North America



Flyers and swimmers

WHILE DINOSAURS ruled the land, other reptiles dominated the seas and skies. Flying reptiles, or pterosaurs, first appeared at about the same time as the dinosaurs. Sheets of skin between the fourth finger and the body made up their wings. Many had powerful, toothed beaks, perfect for seizing fish.

But reptiles were not the only flying animals of their day. Besides insects, birds also made their appearance during the Age of Dinosaurs. The first bird known to us, *Archaeopteryx*, was closely related to the dinosaurs. This pigeon-sized creature had feathers and was probably able to fly.



Giants of the air

Many pterosaurs flew near the sea, swooping to snatch fish from the surface of the water. Some, like Quetzalcoatlus, grew to enormous sizes. Pteranodon had no teeth in its beak. It probably caught fish as pelicans do, scooping them up and swallowing them.

'Fish lizards'

Just as on land, an enormous range of reptiles lived in the seas during the Age of Dinosaurs. The ichthyosaurs, whose name means 'fish lizards', looked more like dolphins. They had streamlined bodies with high back (dorsal) fins, long snouts and paddle-like flippers. They used their fish-like tails for powering themselves through the water and their large eyes for seeking out their prey.

Mosasurs, like *Platecarpus* and *Tylosaurus*, were giant sea lizards with vast appetites. They fed on fish, ammonites (soft-bodied animals enclosed within coiled shells), squid, seabirds and even other mosasurs. Plesiosaurs, such as *Elasmosaurus*, cruised the waters, using their long, snaky necks to snatch fish. *Archelon*, a giant prehistoric turtle, flapped its paddles like wings to move through

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