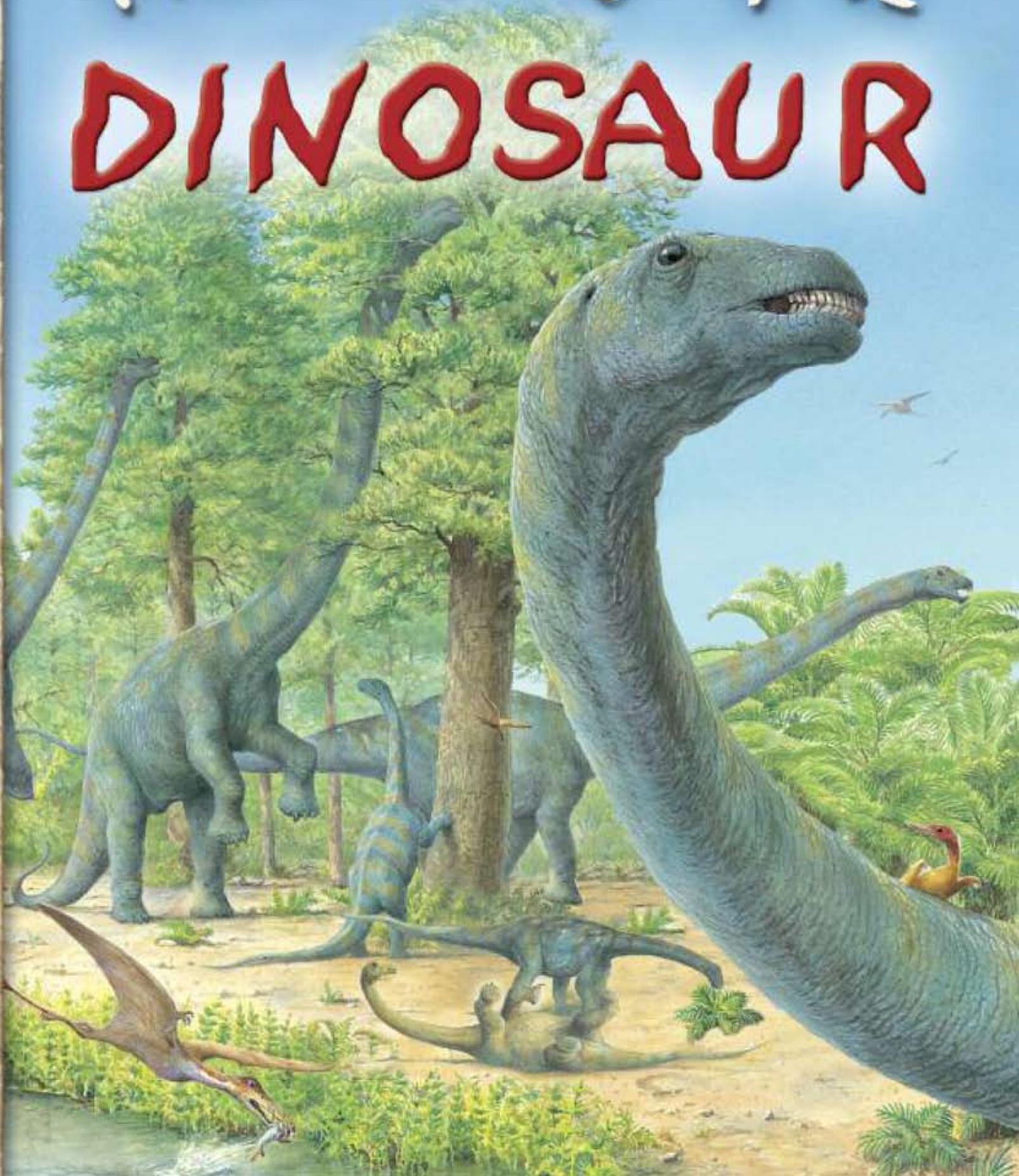


The story of a
DINOSAUR



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DINOSAUR



illustrated by
Peter Scott

 Orpheus

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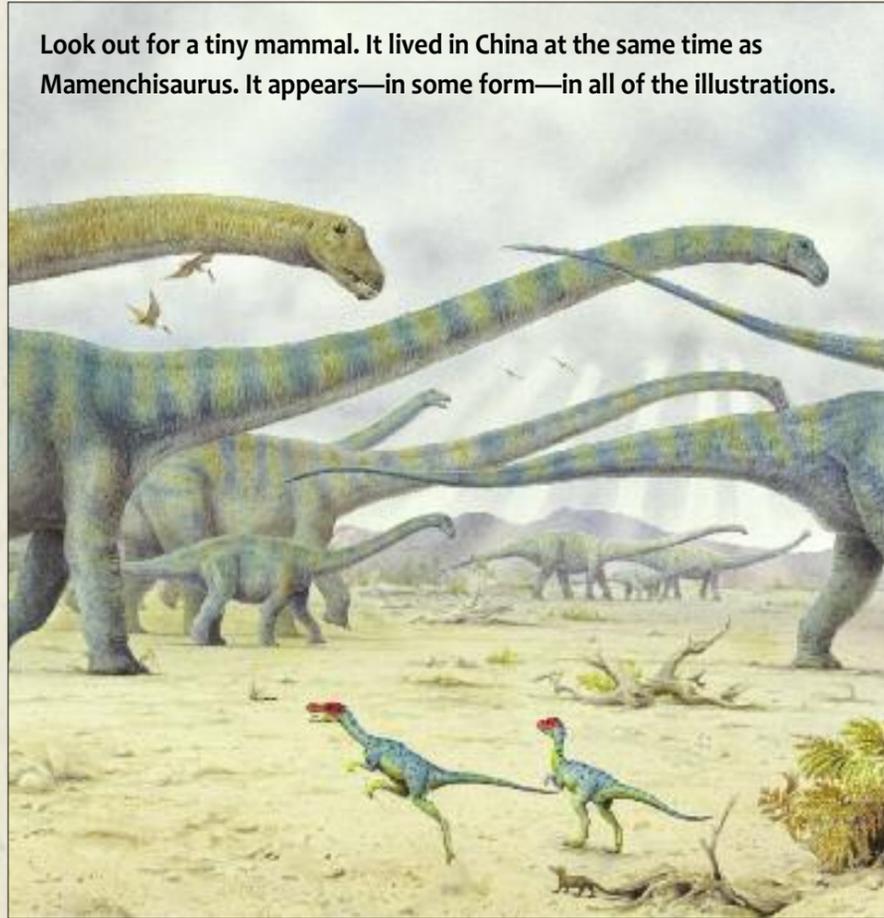
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Look out for a tiny mammal. It lived in China at the same time as Mamenchisaurus. It appears—in some form—in all of the illustrations.



The Age of DINOSAURS

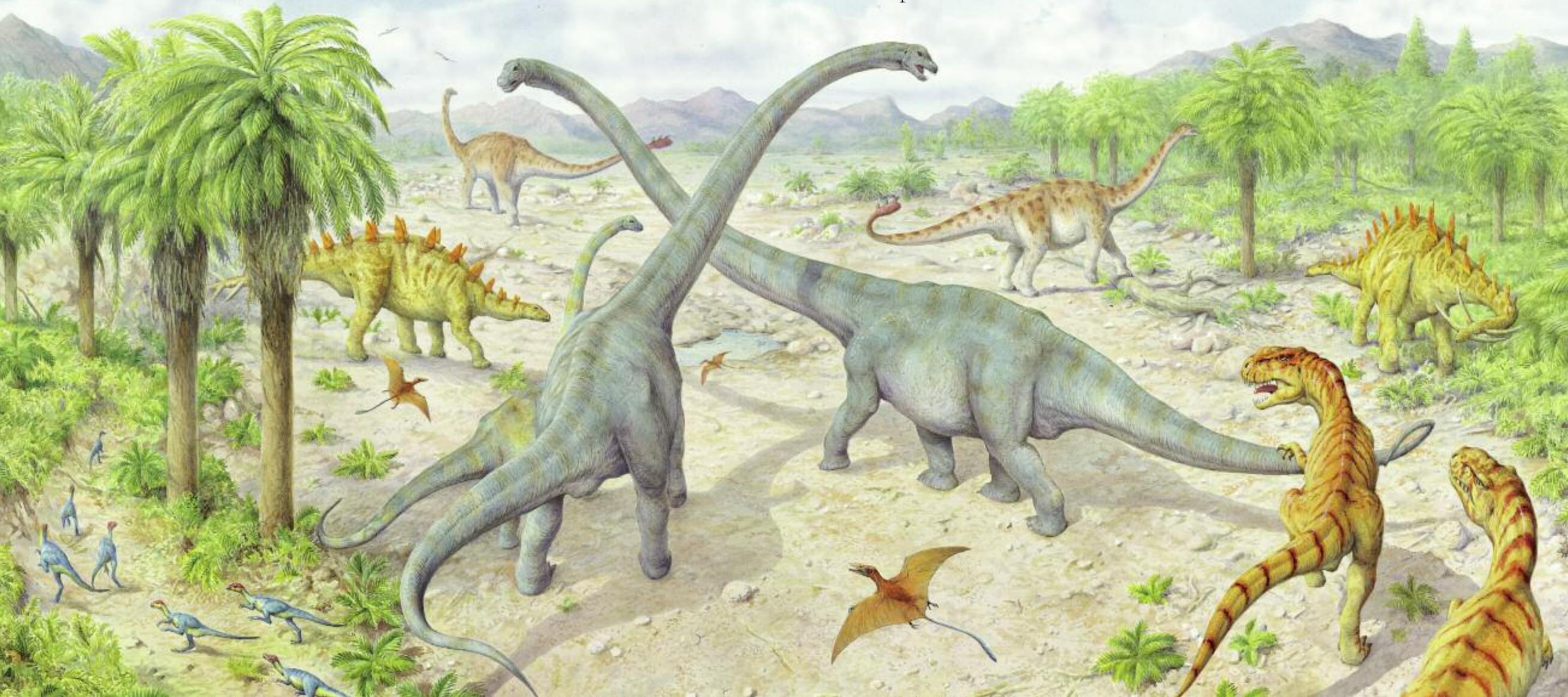
The time from about 230 to 65 million years ago, including the Triassic, Jurassic and Cretaceous periods, is called the Age of Dinosaurs. During that time, many different kinds of land-living, upright-walking reptiles spread to all parts of the world. Some were fast-moving, two-legged hunters, while others were massive, lumbering plant-eaters, called sauropods. One of these sauropods, called Mamenchisaurus, lived in China during the Jurassic period...



We are in China. The date is 160 million years before the present day. It is mid-morning, and the weather already hot and humid.

Dinosaurs of many different kinds are about. Their snorts and roars fill the air as they search for food.

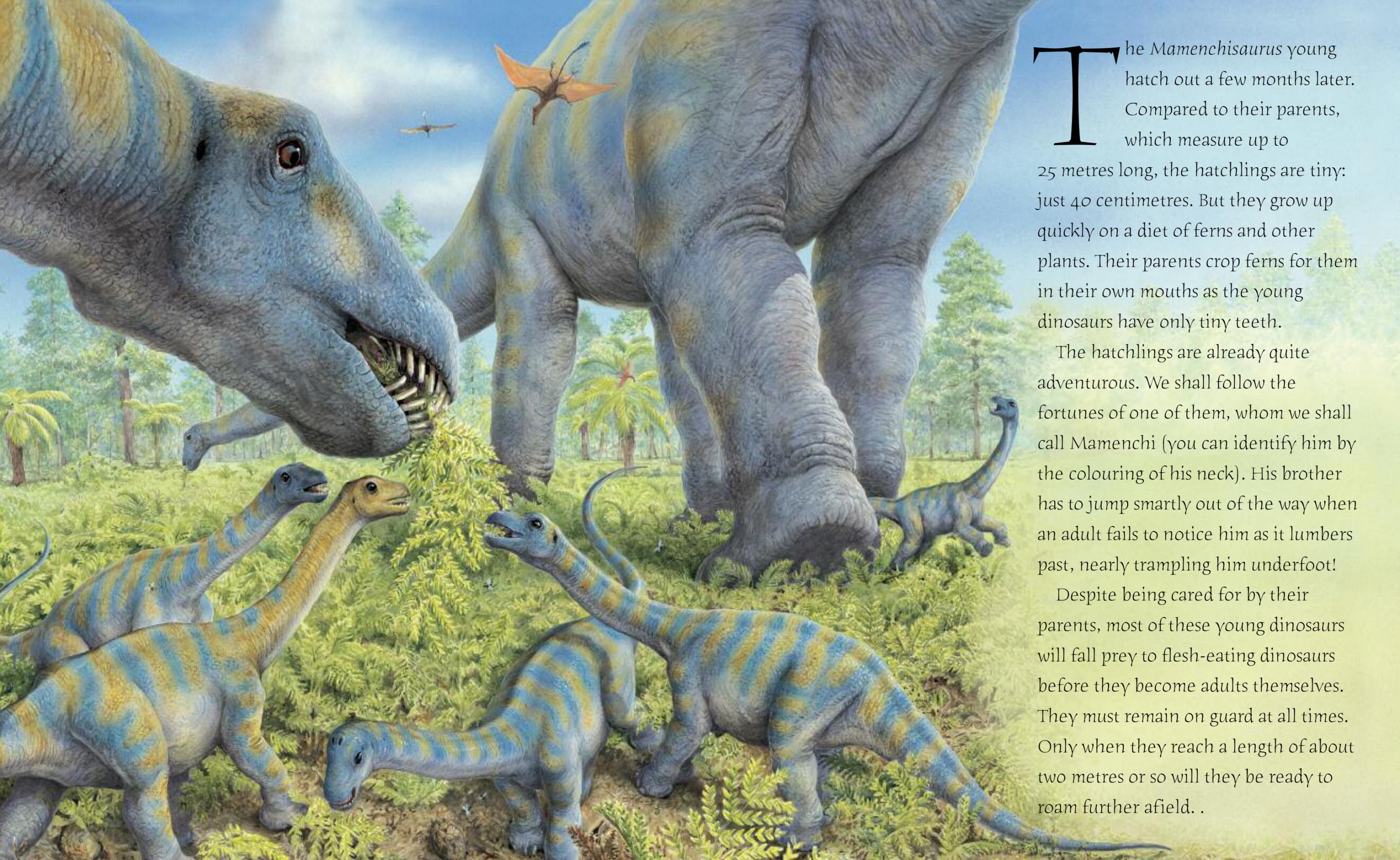
Two *Tuojiangosaurus*, dinosaurs with pointed plates running the length of their backs, plod around cropping ferns, while a *Shunosaurus* eats leaves from a tree, its spiked tail-club waving to and fro. A group of tiny *Xiaosaurus* sprint away from the approaching flesh-eaters, *Yangchuanosaurus*, but two giant, long-necked *Mamenchisaurus* stand their ground. For now, the predators decide not to attack.



A group of *Mamenchisaurus* mothers have laid their eggs in clutches, each quite close to the others. To make their nests, they grub up the soil around the eggs using their teeth. The dinosaurs keep a watchful eye over their eggs.

When a gang of small, fast-running, egg-eating dinosaurs launch a raid on the nests, a *Mamenchisaurus* swings her head low down to the ground and angrily chases them off, although not before a few eggs are grabbed.





The Mamenchisaurus young hatch out a few months later. Compared to their parents, which measure up to 25 metres long, the hatchlings are tiny: just 40 centimetres. But they grow up quickly on a diet of ferns and other plants. Their parents crop ferns for them in their own mouths as the young dinosaurs have only tiny teeth.

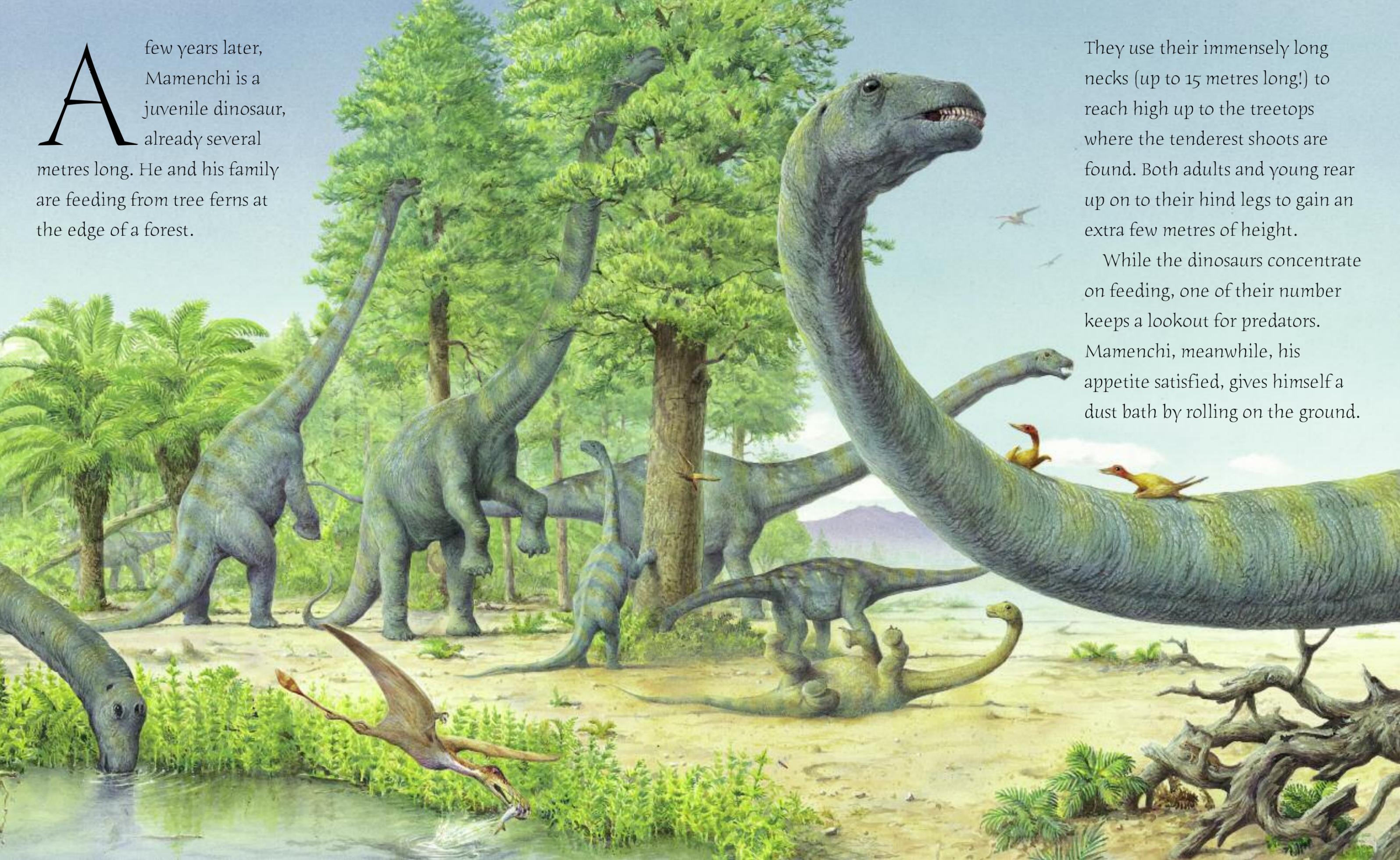
The hatchlings are already quite adventurous. We shall follow the fortunes of one of them, whom we shall call Mamenchi (you can identify him by the colouring of his neck). His brother has to jump smartly out of the way when an adult fails to notice him as it lumbers past, nearly trampling him underfoot!

Despite being cared for by their parents, most of these young dinosaurs will fall prey to flesh-eating dinosaurs before they become adults themselves. They must remain on guard at all times. Only when they reach a length of about two metres or so will they be ready to roam further afield. .

A few years later, Mamenchisaurus is a juvenile dinosaur, already several metres long. He and his family are feeding from tree ferns at the edge of a forest.

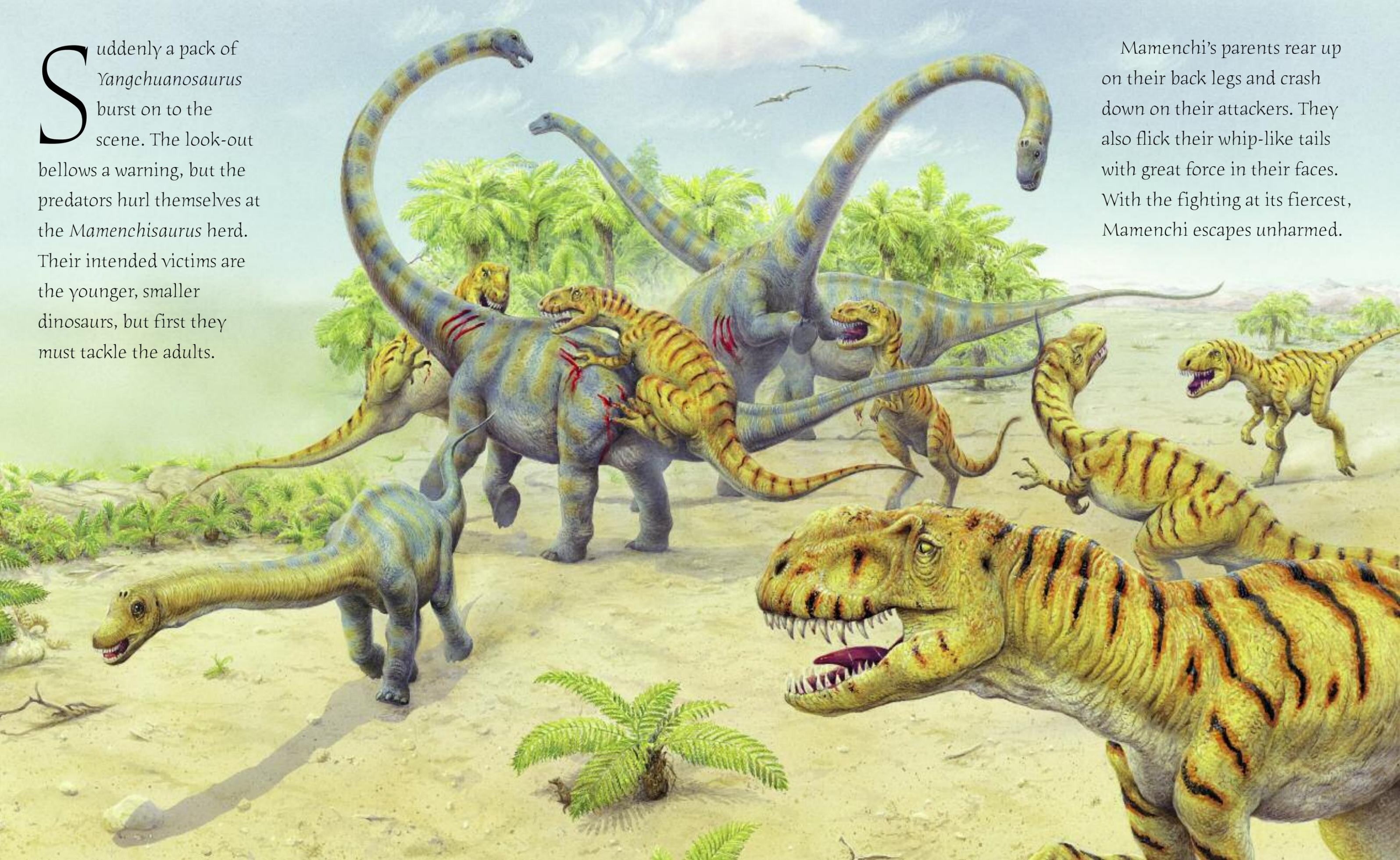
They use their immensely long necks (up to 15 metres long!) to reach high up to the treetops where the tenderest shoots are found. Both adults and young rear up on to their hind legs to gain an extra few metres of height.

While the dinosaurs concentrate on feeding, one of their number keeps a lookout for predators. Mamenchisaurus, meanwhile, his appetite satisfied, gives himself a dust bath by rolling on the ground.



Suddenly a pack of *Yangchuanosaurus* burst on to the scene. The look-out bellows a warning, but the predators hurl themselves at the *Mamenchisaurus* herd. Their intended victims are the younger, smaller dinosaurs, but first they must tackle the adults.

Mamenchisaurus's parents rear up on their back legs and crash down on their attackers. They also flick their whip-like tails with great force in their faces. With the fighting at its fiercest, *Mamenchisaurus* escapes unharmed.



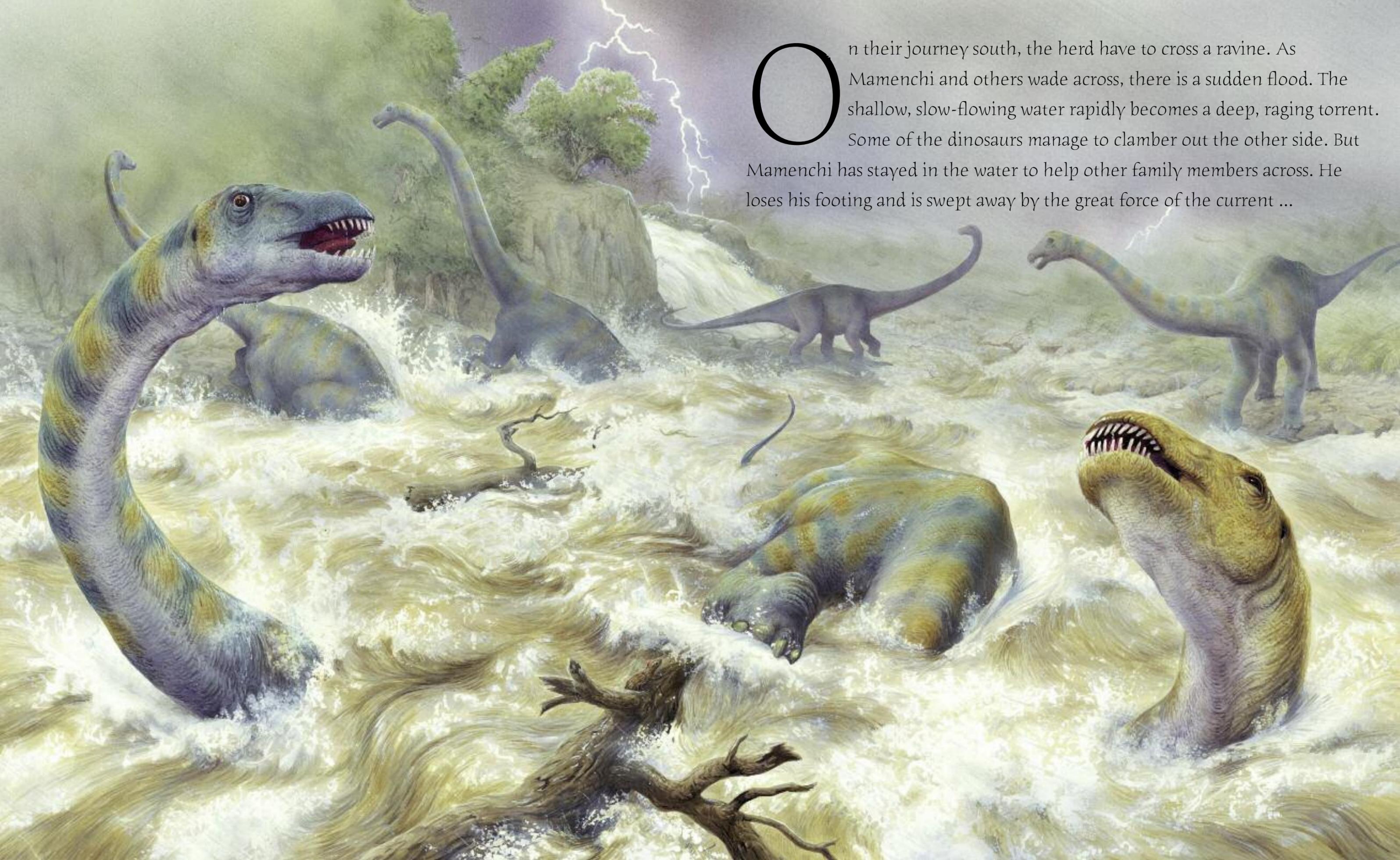
Years later and Mamenchi has grown into an adult. Now has a family of his own. His family belong to a much larger herd of dinosaurs. They all stay together for protection against predators.

As winter sets in and the vegetation dies back, the herd sets out for richer forests and swamplands hundreds of kilometres to the south.

The long winter days and lower temperatures signal to the dinosaurs that the time has come to make their long migration journey. They cannot survive cold conditions.

The young walk in the centre of the migrating herd, while some adult *Mamenchisaurus* keep a lookout for danger. They know that predatory dinosaurs will stealthily accompany the herd, watching for stragglers, as it marches southwards.





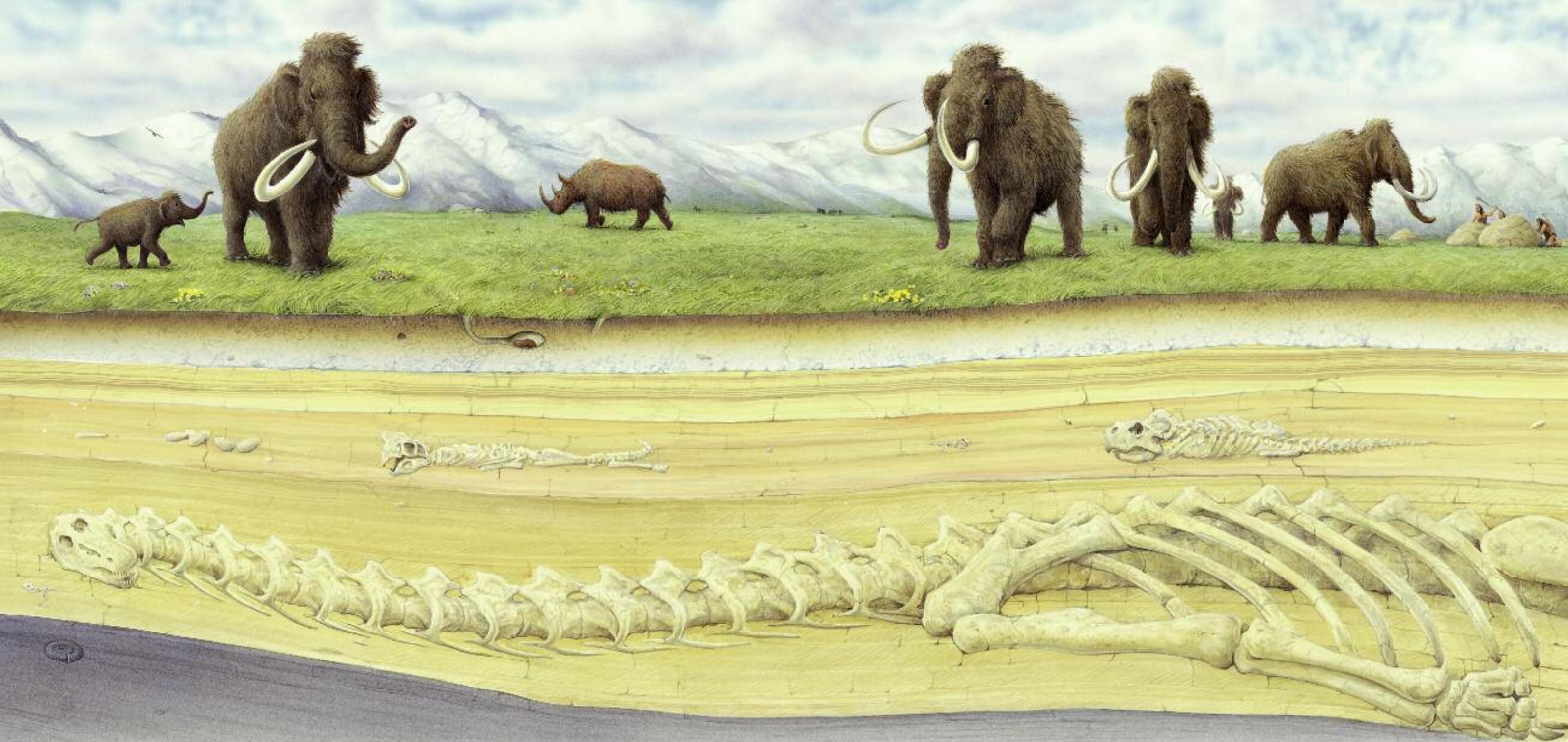
On their journey south, the herd have to cross a ravine. As Mamenchi and others wade across, there is a sudden flood. The shallow, slow-flowing water rapidly becomes a deep, raging torrent. Some of the dinosaurs manage to clamber out the other side. But Mamenchi has stayed in the water to help other family members across. He loses his footing and is swept away by the great force of the current ...

Mamenchi never escaped from the flood. The giant dinosaur soon drowned. His body slumped to the bottom of the river, where it was immediately covered over by mud and silt swept along by the swirling torrent. Soon, the river became calm again. Months later, all the soft parts of the dinosaur's body, the skin, flesh and organs, rotted away.

The hard parts, the teeth and bones, however, remained. The bones are so heavy, even strong currents cannot shift them.

While Mamenchi's remains lie beneath the river bed, life goes on. As dinosaurs come to the river's edge to drink, pterosaurs (flying reptiles) flit back and forth looking for fish to pluck from the water's surface. In the water, fish and turtles seek out their prey.





Millions of years have passed. Mamenchis' remains have turned to stone. More and more sediments had gradually settled on the river bed above his bones. The tiny rock fragments were pressed more and more firmly together, eventually becoming rock.

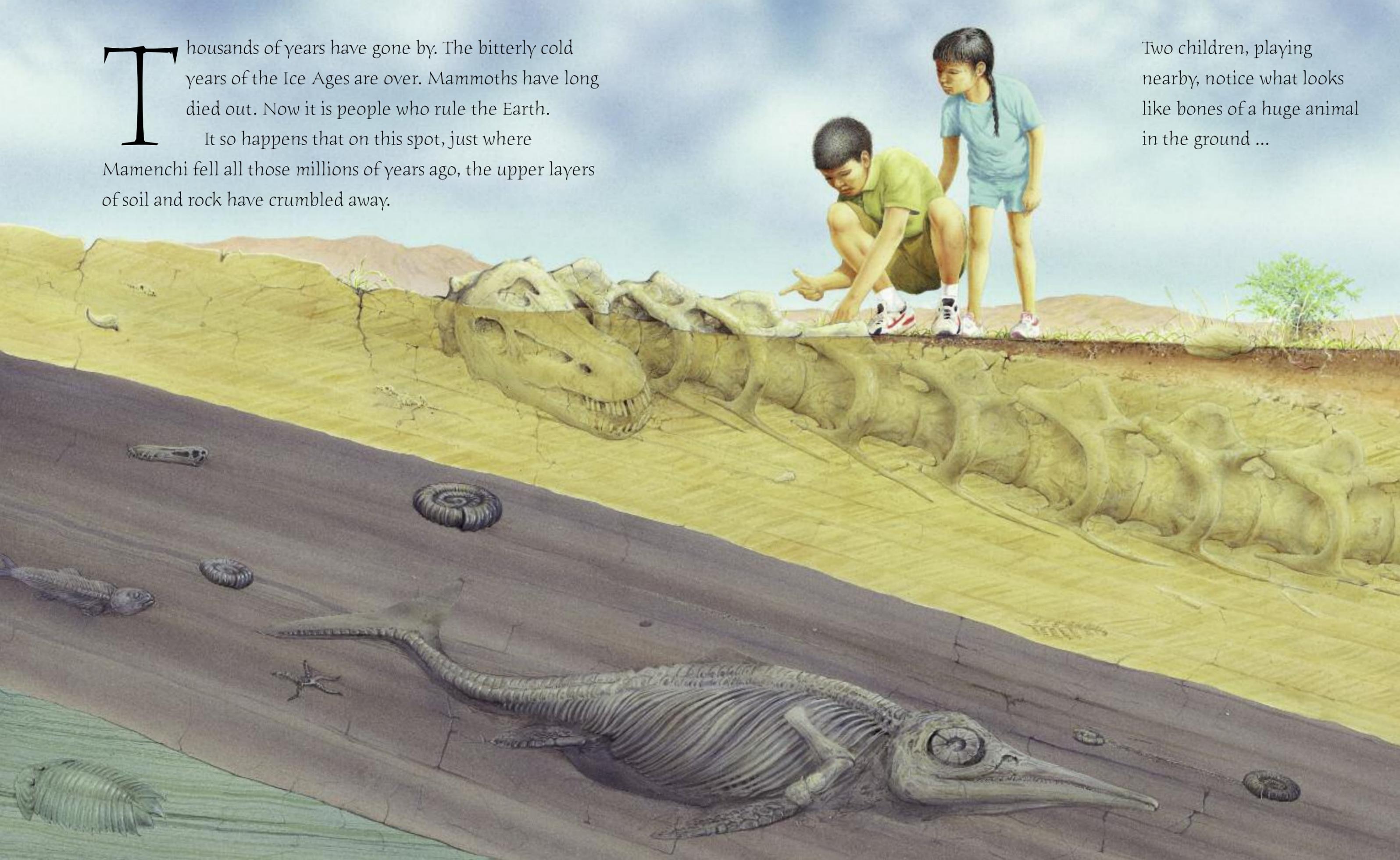
As millions of years passed, more layers of sediments, more layers of rock, and more animals' remains all built up.

Now it is the Ice Ages, a time in the story of the Earth when the climate was cooler and winters were long. Woolly mammoths and rhinoceroses (and people who hunt them) roam the grassy plains.

Thousands of years have gone by. The bitterly cold years of the Ice Ages are over. Mammoths have long died out. Now it is people who rule the Earth.

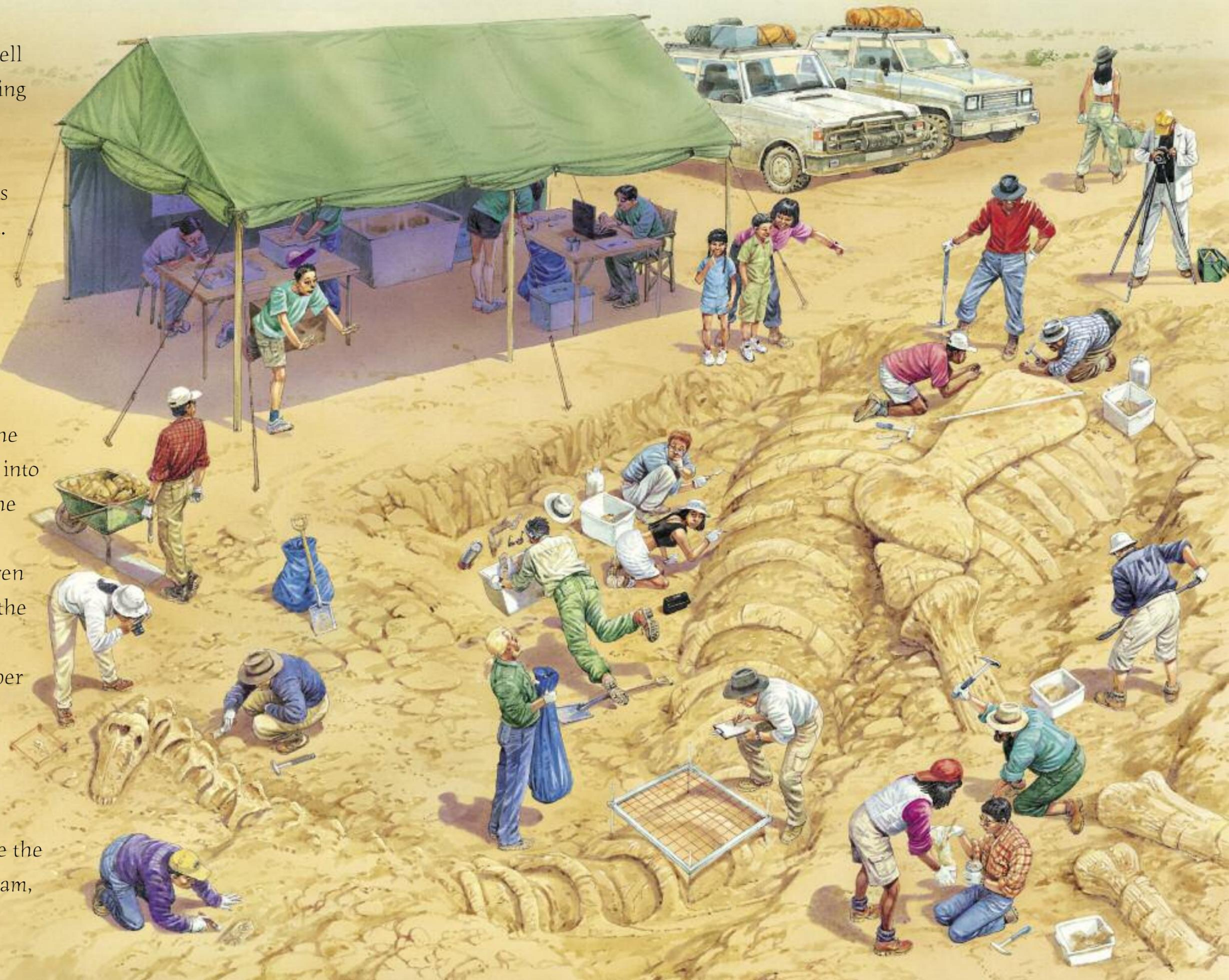
It so happens that on this spot, just where Mamenchis fell all those millions of years ago, the upper layers of soil and rock have crumbled away.

Two children, playing nearby, notice what looks like bones of a huge animal in the ground ...



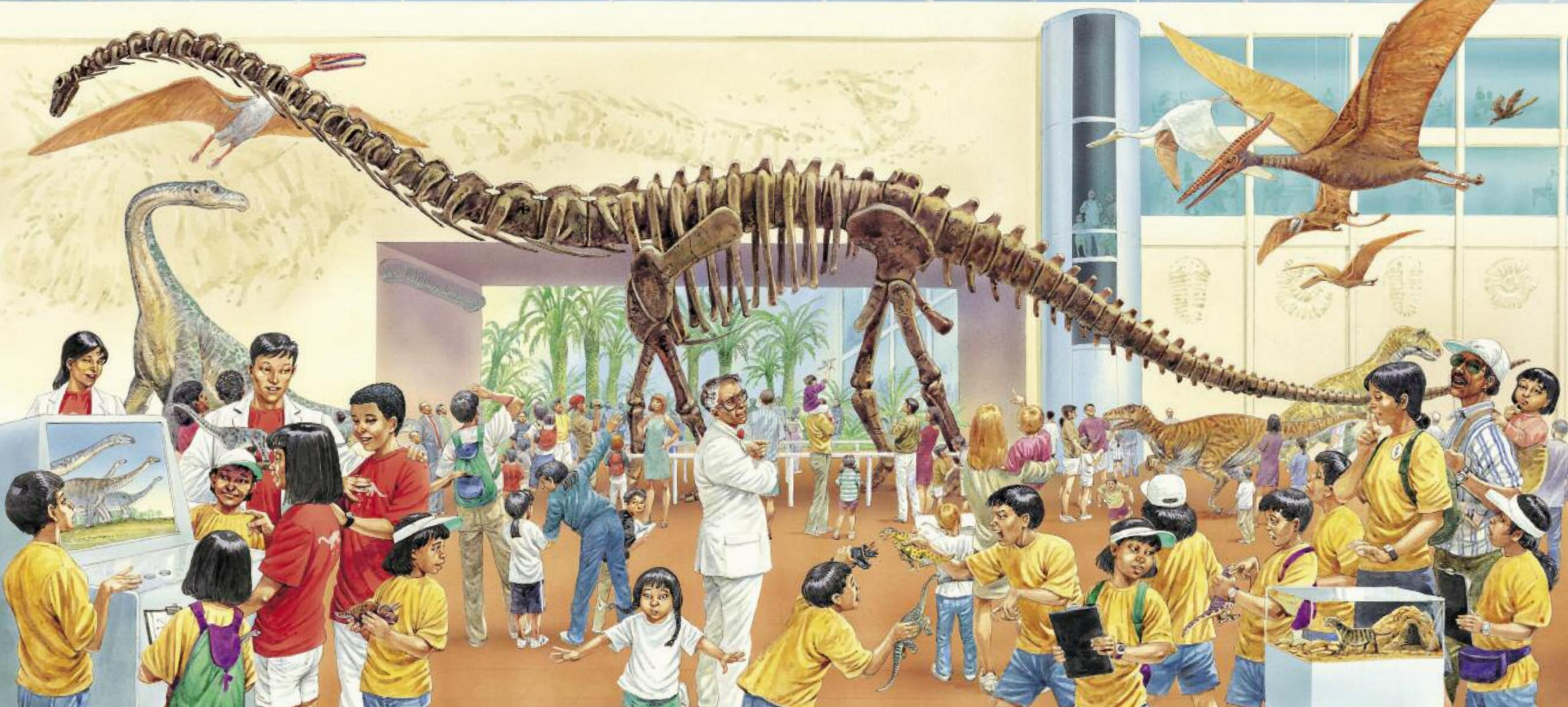
The children rush home to tell their parents of their amazing discovery. They contact scientists from the Natural History Museum. The museum sends a team of experts to inspect the find. They are very excited about what they see—a rare example of a *Mamenchisaurus* skeleton! A major excavation is organized.

Now a team of scientists called palaeontologists, who specialize in the study of fossils, are carefully digging into the rock all around the bones that the children found. Using picks and shovels, as well as thin blades and even toothbrushes, they remove some of the surrounding rock from the fossilized skeleton. The palaeontologists number all the bones, record their exact positions and photograph them. They paint a sticky substance called resin on the bones to stop them crumbling. Then they carefully place the bones in sacks packed with plastic foam, and send them off to the museum.



Having lain undisturbed in his rocky tomb for more than 100 million years, Mamenchi once again stands proudly on his four mighty limbs! In a painstaking task, the museum staff have expertly put Mamenchi's skeleton back together again. Using steel rods and cables, they have mounted it in pride of place in the museum's main exhibition area.

Visitors who have come from far afield flock to see this new wonder, and stare in amazement at its great size. The guides are on hand to tell the visitors more about the dinosaur, along with the other creatures that shared his world. The children who discovered it a few years ago are frequent visitors to the museum. But only you, the reader, know Mamenchi's full story ...



THE DINOSAURS

Many different kinds of dinosaur existed during their 165-million-year time on Earth. The first dinosaurs were small, two-legged hunters, but soon dinosaurs that fed on plants began to appear. Some kinds grew so big they had to walk on all fours. The meat-eaters became larger, too, so they could be powerful enough to tackle these giants. In later times, during the Cretaceous period, most of the massive long-necked dinosaurs became extinct.

SAUROPODS

Sauropods, such as Brachiosaurus and Diplodocus, were a large plant-eating dinosaurs with long necks and tails. They used their long necks to browse on leaves that were high up in tall trees, low down on the ground or in the water. They swallowed pebbles, which helped to grind up their food in their stomachs, speeding up digestion.

Brachiosaurus

Pteranodon

Archaeopteryx

BIRDS, PTEROSAURS AND MARINE REPTILES

The birds are living dinosaurs! The first birds, such as Archaeopteryx, were descendants of small raptors: theropods with coverings of feathers rather than scales.

Flying reptiles, known as pterosaurs, lived at the same time as dinosaurs. Their wings were made of skin stretched between their long fourth fingers and legs. Some had wingspans of more than 10 metres and were the largest flying animals that ever lived.

Reptiles also dominated the seas in the Age of Dinosaurs. Ichthyosaurs were dolphin-like creatures with fishy tails. Plesiosaurs had long necks and flippers. Pliosaurs, with their large heads and powerful jaws, were the tigers of the seas.

SPIKES, HORNS AND ARMOUR

Some plant-eating dinosaurs were well-equipped to defend themselves. Stegosaurus had rows of plates on its back and spikes on its tail. Ankylosaurus had a heavy club on its tail, as well as slabs of bony armour all over its body. Triceratops had a massive neck frill and three horns with which to threaten attackers.

Diplodocus

Stegosaurus

Triceratops

Tyrannosaurus rex

Ankylosaurus

Plesiosaurus

Deinonychus

TYRANNOSAURUS REX

Tyrannosaurus rex's massive jaws had rows of saw-edged teeth, some up to 18 cm long. It rushed at its victims, bringing them down with its teeth or feet. Its tiny arms might have pinned down its prey while its foot-claws did the rest.

RAPTORS

Not all the flesh-eaters were giants like T. rex. The raptors, were small, fast theropods that hunted in packs. Deinonychus had a massive, curved claw on each of its toes, which it used to slash its victims' hides.

GLOSSARY

Bacteria Tiny living things made up of only one cell. They are members of neither the plant or animal kingdoms.

Continental drift The movement of continents around the globe. The Earth's outer layer is made up of separate tectonic plates, which are constantly on the move, pushing into, pulling away from, or sliding alongside one another, taking continents or parts of continents with them.



Triassic world



Jurassic world



Cretaceous world

In the Triassic period, all the continents were joined together as one vast mass of land, Pangaea. During the Jurassic period, the continents began to move apart. This drift continued through the Cretaceous period.

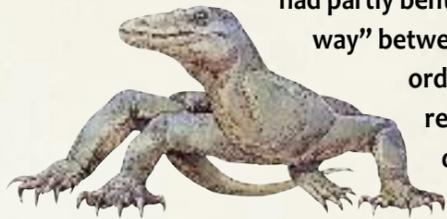


WHAT IS A DINOSAUR?

Dinosaurs, such as *Compsognathus* (left) stood and walked on straight legs, which were directly beneath their bodies. No other reptiles had straight, upright legs like this. Most reptiles, including today's lizards, like the Komodo dragon (below), and tortoises, have legs at the sides of the body. They bend down at the knees.



Prehistoric reptiles, called thecodonts (above), had partly bent legs, "half way" between an ordinary reptile and a dinosaur.



Dinosaurs Reptiles that lived on land during the Mesozoic Era (250-65 million years ago). They first evolved during the Triassic period (250-208 mya), and lived on through the Jurassic (208-144 mya) and Cretaceous periods (144-65 mya).

Fossils The ancient remains or traces of once-living things, usually found preserved in rock. A living thing becomes fossilized when it is buried by sediments and the tiny spaces inside its hard parts are filled with minerals which set hard over time.

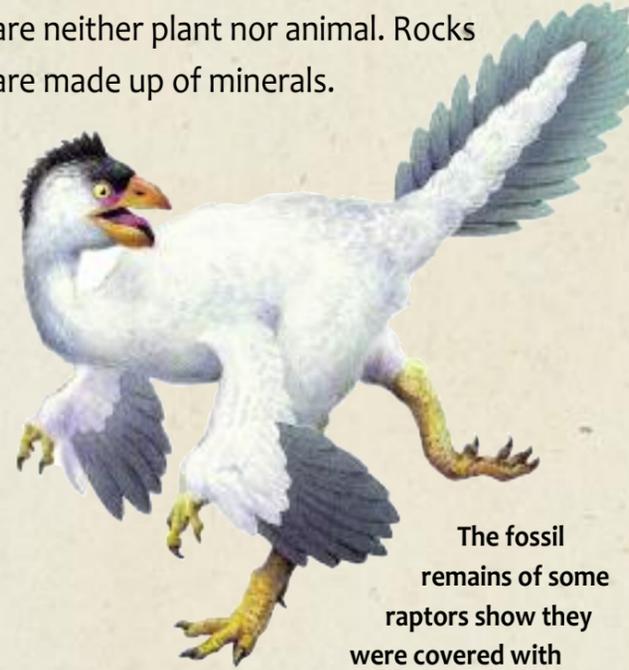
In an ornithischian dinosaur (right) the two lower parts of the hip bone, known as the pubis and ischium, both slope down and back.



In a saurischian, the pubis forms an upside-down V shape with the lower rear part, the ischium.

Ice Ages A cold period in the Earth's history when ice spread out from the poles and mountains to cover large areas of the Earth's surface. The last Ice Age began 2 million years ago and may not have ended yet.

Minerals Natural chemical substances that are neither plant nor animal. Rocks are made up of minerals.



The fossil remains of some raptors show they were covered with feathers and that their forearms resembled wings. *Caudipteryx* looked more like a bird than a dinosaur.

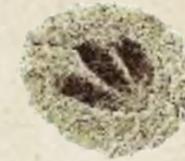
Ornithischians The "bird-hipped" dinosaurs, one of two major types of dinosaur.

Palaeontologists Scientists who study fossils.

Predators Animals that prey on others.

Pterosaurs Flying reptiles that existed from the late Triassic to late Cretaceous Periods. Their wings were formed from skin flaps between the fourth finger and lower body.

Saurischians The "lizard-hipped" dinosaurs, one of two major types of dinosaur.



Besides bones and teeth, footprints are also fossils. They can indicate the size, weight and speed of a dinosaur.

Sauropods Long-necked, four-legged, plant-eating saurischian dinosaurs. They were the largest and heaviest land animals of all time.

Sediments Eroded rock fragments that are transported by wind, water or ice and laid down elsewhere.

Tectonic plates The large slabs into which the Earth's surface is divided. The plates move relative to one another around the globe.

Theropods All the meat-eating saurischian dinosaurs.

EXTINCTION

All the dinosaurs abruptly died out at the end of the Cretaceous period, 65 million years ago. Scientists think that a massive asteroid, a large rocky object in space, crashed to Earth (above). The explosion would have filled the atmosphere with dust, blotting out the Sun for many years.



