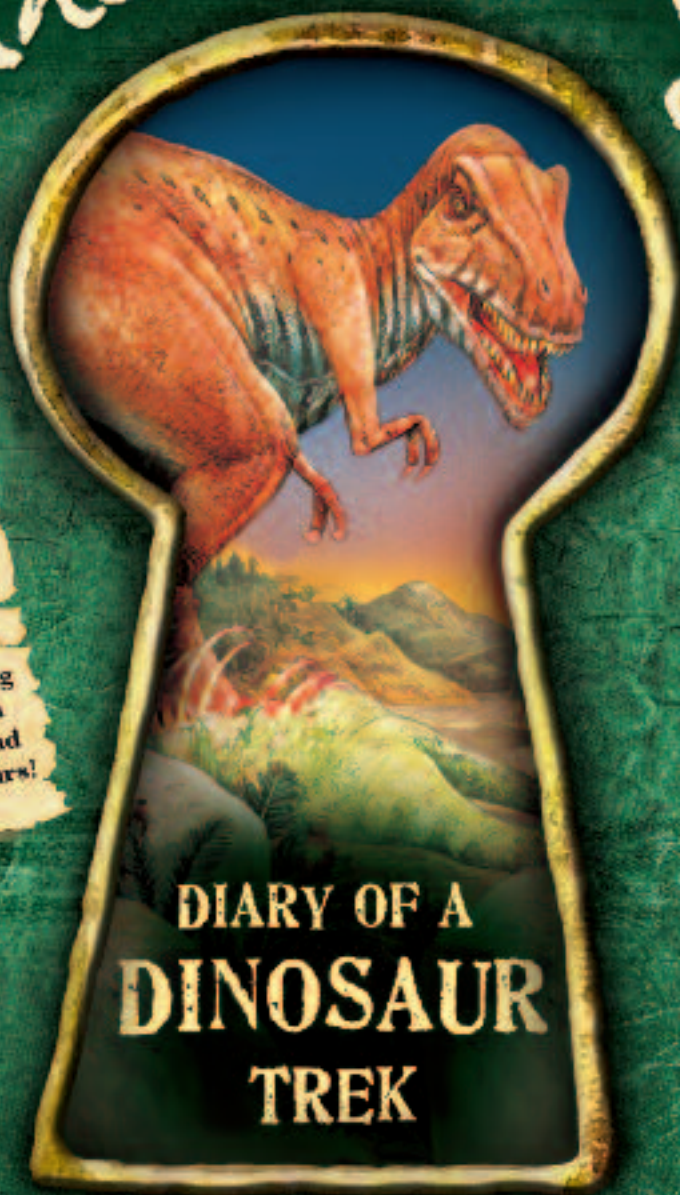


The Time Key



Take an exciting
journey back in
time to the land
of the dinosaurs!

DIARY OF A
DINOSAUR
TREK

The Time Key

DIARY OF A DINOSAUR TREK



First published in 2010 by Orpheus Books Ltd.,
6 Church Green, Witney, Oxfordshire, OX28 4AW, England

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ISBN XXXXXXXXXX

A CIP record for this book is available from the British Library.

Printed and bound in China



Dear Reader,

We could hardly believe it ourselves. DINOSAURS!!! Have you ever imagined what it would be like to see them in the flesh, hear them, smell them ... even feel their breath on the back of your neck? All those things ACTUALLY HAPPENED to us but, of course, nobody believed a single word we said. And why should they? Dinosaurs died out millions of years ago—everyone knows that. To see living dinosaurs was just impossible. But we DID.

So that's why we wrote it all down the very next day. It was the most INCREDIBLE adventure of ALL TIME. After you've read this diary and looked at our photos, we're sure you will believe us. And maybe you'll discover what it was REALLY like to find yourself in the land of the DINOSAURS!


Josh and Maisie



The Time Key

DIARY OF A DINOSAUR TREK



 Orpheus

It all began one wet day ... Granddad suggested that my brother Josh and I look for some interesting books to read in his study. He had hundreds. Some of them were really ancient.



While we were looking, a very strange thing happened. A book fell out of the bookcase all by itself. It was an old book about searching for dinosaur fossils.

A page had come loose in the fall.

On it was a photo of something that really sparked our

interest: an

enormous, curved claw, a metre long. Scary!

A MYSTERIOUS CLAW

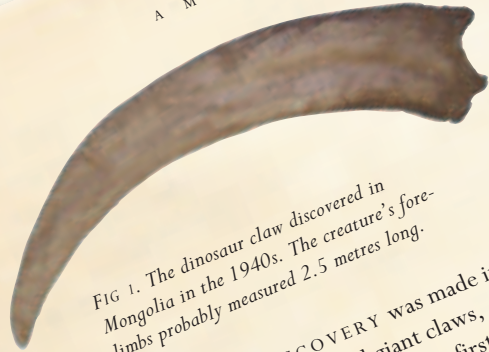


FIG 1. The dinosaur claw discovered in Mongolia in the 1940s. The creature's forelimbs probably measured 2.5 metres long.

FASCINATING DISCOVERY was made in the late 1940s in Mongolia. Several giant claws, each about a metre long, were unearthed. At first, scientists thought they belonged to a giant prehistoric turtle. During further expeditions in the 1950s, however, other fossils, including a tooth and various parts of limbs, were discovered. From these discoveries, palaeontologists concluded that the fossils were in fact the remains of a previously unidentified dinosaur. No skull has yet been found, but scientists think that the creature most likely belonged to the theropod sub-order, that it walked on two legs and that it might even have had feathers. The claws, three on each hand, might have been used to attack other dinosaurs, but it is more likely that the creature was an herbivore and lived like a gorilla, using its claws to pull down leaves off trees.

No one had ever seen such a huge claw before. The dinosaur it belonged to must have been absolutely MASSIVE—perhaps twice as big as T. rex! As we were reading, we could feel a slight draft coming from the space on the shelf left by the book. At the back of the bookcase there was what looked like a small



door. We took some more books off the shelf. There it was, complete with a key in the lock. Josh and I looked at each other. Of course, I couldn't resist the temptation ... I turned the key and pushed open the door—

very slowly. It was too dark to see anything at first. The air was cool and damp. Before I could stop myself, I had climbed through. I was standing in a cave. I could

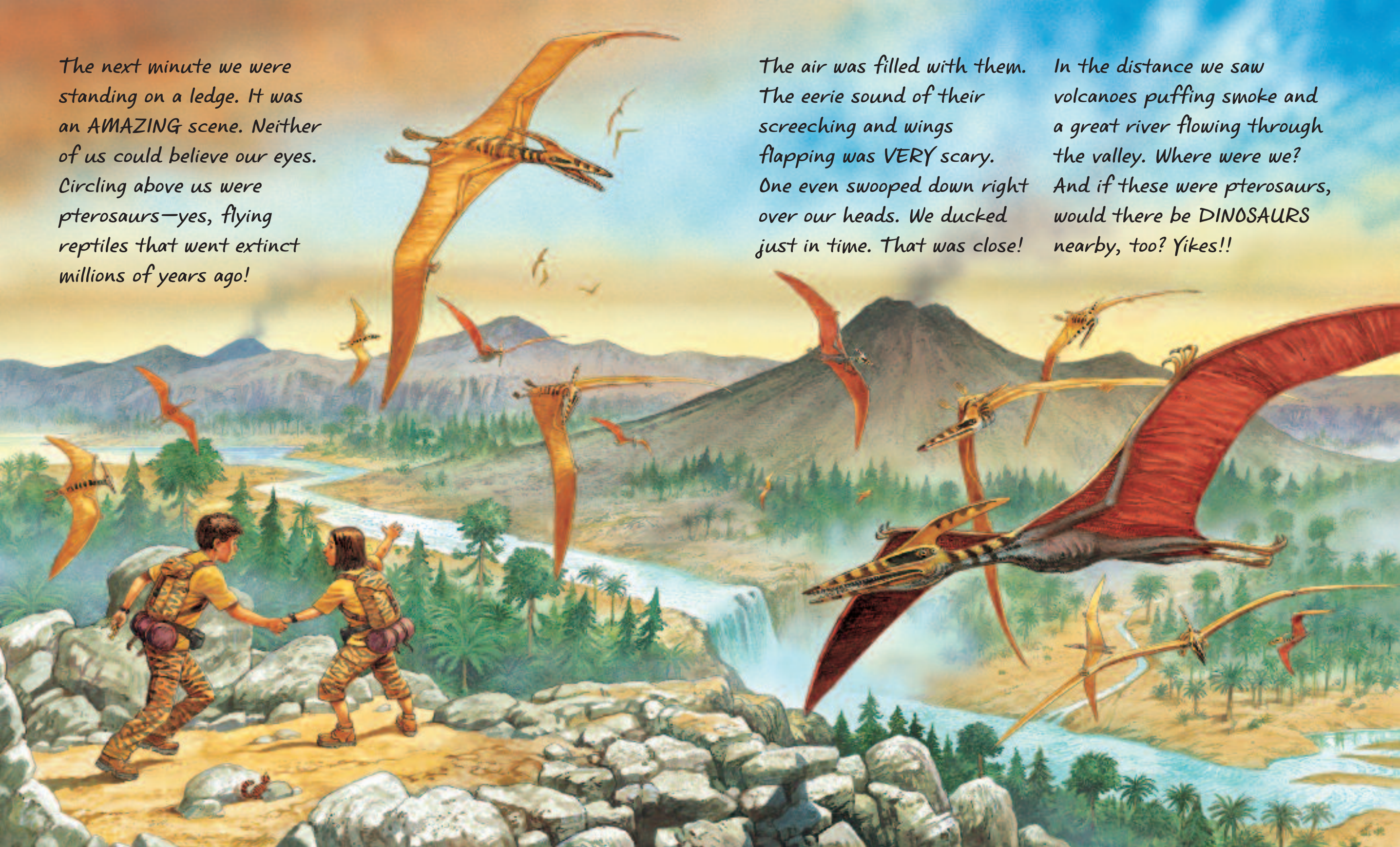
hear Josh shouting "Maisie!" Then he climbed through after me. The door clicked shut behind us, but Josh had the key in his hand. We crept towards the cave entrance ...



The next minute we were standing on a ledge. It was an AMAZING scene. Neither of us could believe our eyes. Circling above us were pterosaurs—yes, flying reptiles that went extinct millions of years ago!

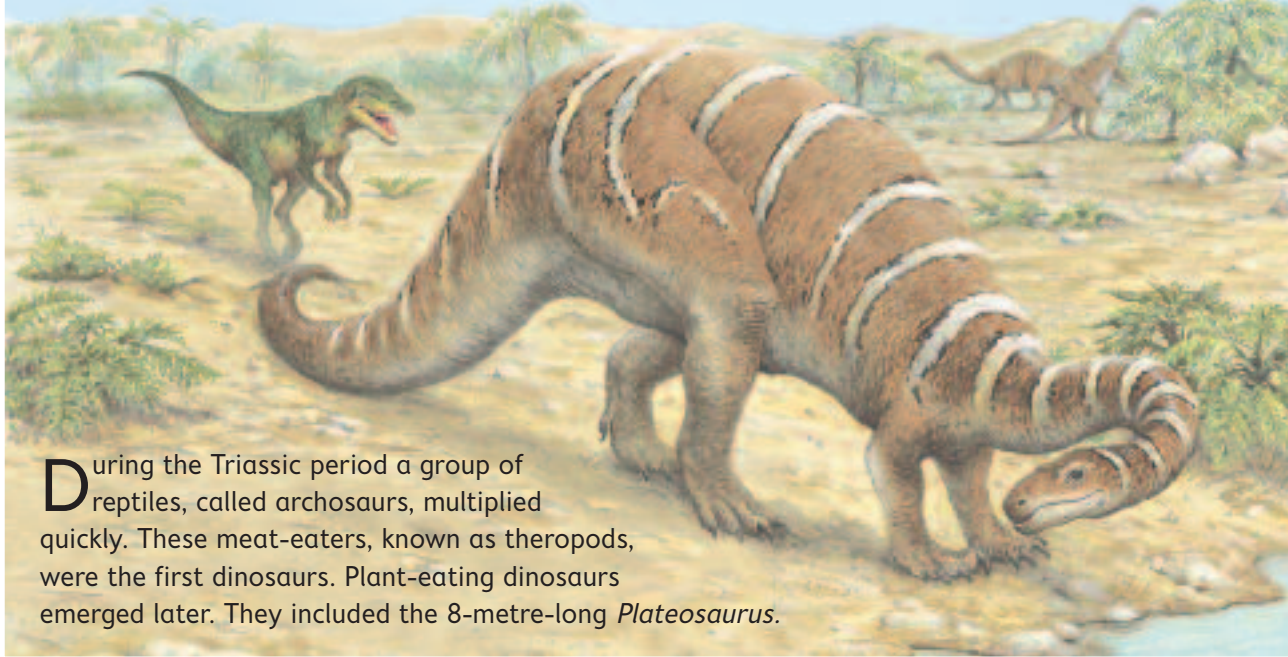
The air was filled with them. The eerie sound of their screeching and wings flapping was VERY scary. One even swooped down right over our heads. We ducked just in time. That was close!

In the distance we saw volcanoes puffing smoke and a great river flowing through the valley. Where were we? And if these were pterosaurs, would there be DINOSAURS nearby, too? Yikes!!



TRIASSIC PERIOD

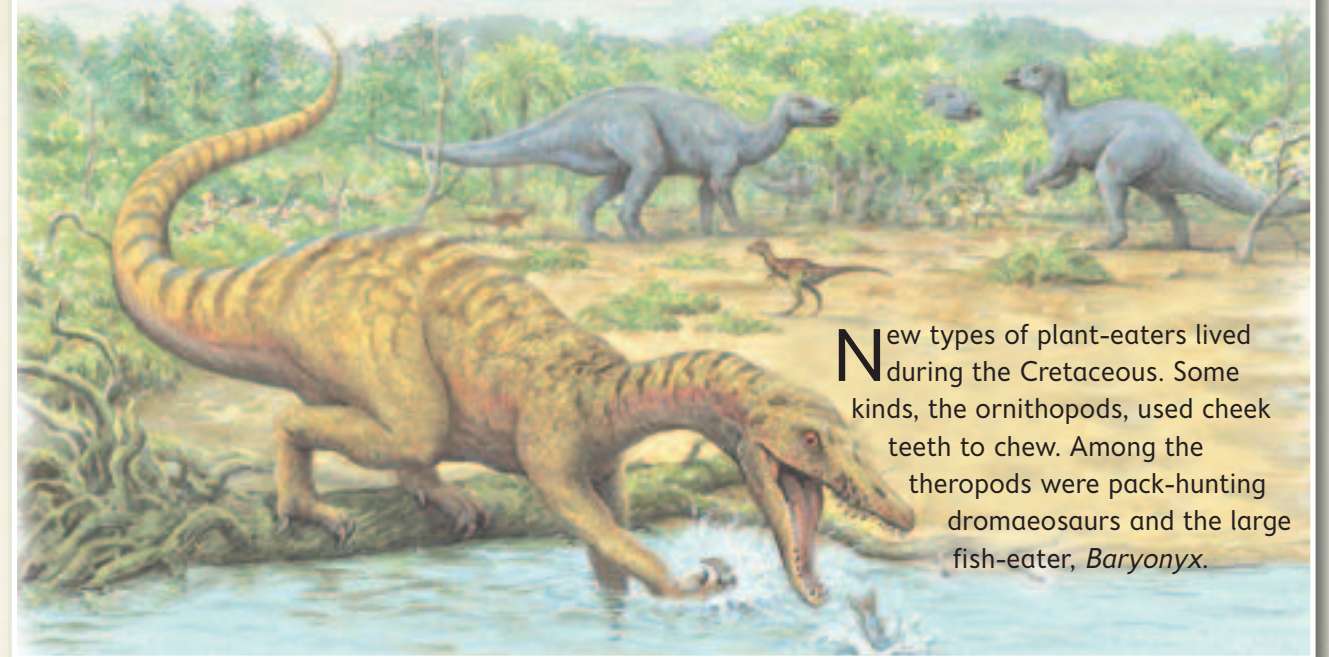
225 - 208 MILLION YEARS AGO



During the Triassic period a group of reptiles, called archosaurs, multiplied quickly. These meat-eaters, known as theropods, were the first dinosaurs. Plant-eating dinosaurs emerged later. They included the 8-metre-long *Plateosaurus*.

CRETACEOUS PERIOD

144-65 MILLION YEARS AGO



New types of plant-eaters lived during the Cretaceous. Some kinds, the ornithopods, used cheek teeth to chew. Among the theropods were pack-hunting dromaeosaurs and the large fish-eater, *Baryonyx*.

JURASSIC PERIOD

208 - 144 MILLION YEARS AGO



During the Jurassic, massive, long-necked plant-eaters called sauropods evolved. Theropods also became larger and more powerful. To defend themselves, some plant-eaters developed armour. *Stegosaurus* had a double row of bony plates on its back, as well as vicious tail spines.

THE END OF DINOSAURS

65 MILLION YEARS AGO

After dominating the land for 160 million years, all the dinosaurs mysteriously died out at the end of the Cretaceous. No one knows exactly why, but scientists think that their extinction was caused by climate change,

possibly after an asteroid struck Earth. Falling temperatures and drastically reduced vegetation made it impossible for dinosaurs to live. Mammals and birds, descendants of small, feathered theropods, escaped extinction.



There was only one thing to do: GO EXPLORING! What an opportunity to see LIVING dinosaurs. We just HAD to find the owner of that incredible claw!



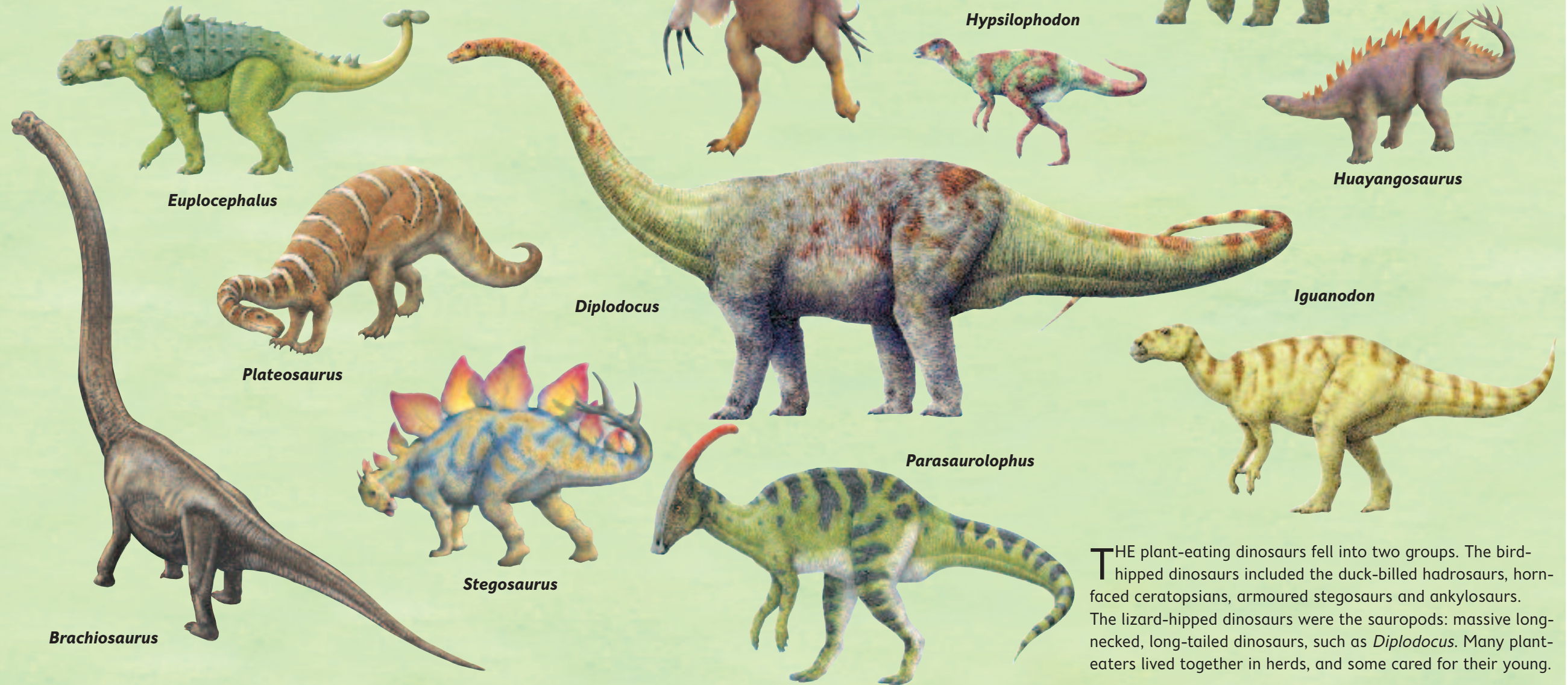
Surely it had to be a dinosaur? We gulped. Our dinosaur tracks guide told us that these prints were made by a titanosaur. This was a sauropod from the late Cretaceous period. It was one of the largest dinosaurs that ever lived.

We didn't have to go far before coming across another amazing thing. What creature could have made such GIANT tracks as these? They made our own feet look puny.

"Yes, and one of the smelliest", said Josh, standing by a huge pile of dung, still wet and warm. Obviously it hadn't been very long since the gigantic beast had passed this way. We knew it was only a plant-eater, but that didn't mean it was harmless. We had to be VERY careful ...

PLANT-EATING DINOSAURS

Plant-eating dinosaurs first appeared in the late Triassic period, about 210 million years ago, and existed until the dinosaurs became extinct 65 million years ago. Early plant-eaters could not chew the leaves they ate, so they had to swallow stones to make the leaves easier to digest. Later plant-eaters, such as the hadrosaurs, developed cheek teeth to chew their food.



THE plant-eating dinosaurs fell into two groups. The bird-hipped dinosaurs included the duck-billed hadrosaurs, horn-faced ceratopsians, armoured stegosaurs and ankylosaurs. The lizard-hipped dinosaurs were the sauropods: massive long-necked, long-tailed dinosaurs, such as *Diplodocus*. Many plant-eaters lived together in herds, and some cared for their young.

We walked on silently, looking all around us for signs of danger. The tracks disappeared into a forest. We pushed our way through the dense vegetation. Still no sign of any giant reptiles. We arrived at a clearing. "Eggs!" shouted Josh.



And there they were, neatly arranged in a basin hollowed out from a large pile of earth. They looked just like pale melons. We knew that mother dinosaurs made their nests by grubbing up the soil with their teeth, but we never imagined we'd actually see a real nest. Mum was probably not far away, and she would definitely be VERY



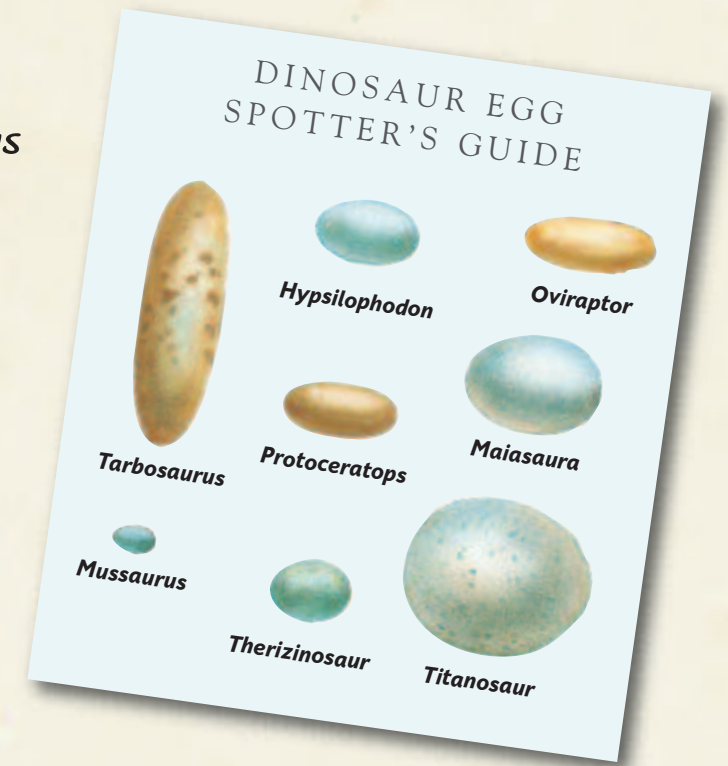
This is a sketch of what I thought the baby dinosaur inside its egg looked like

protective of her eggs. We decided to wait for her anyway, hidden in the bushes, of course. After a while, I couldn't resist

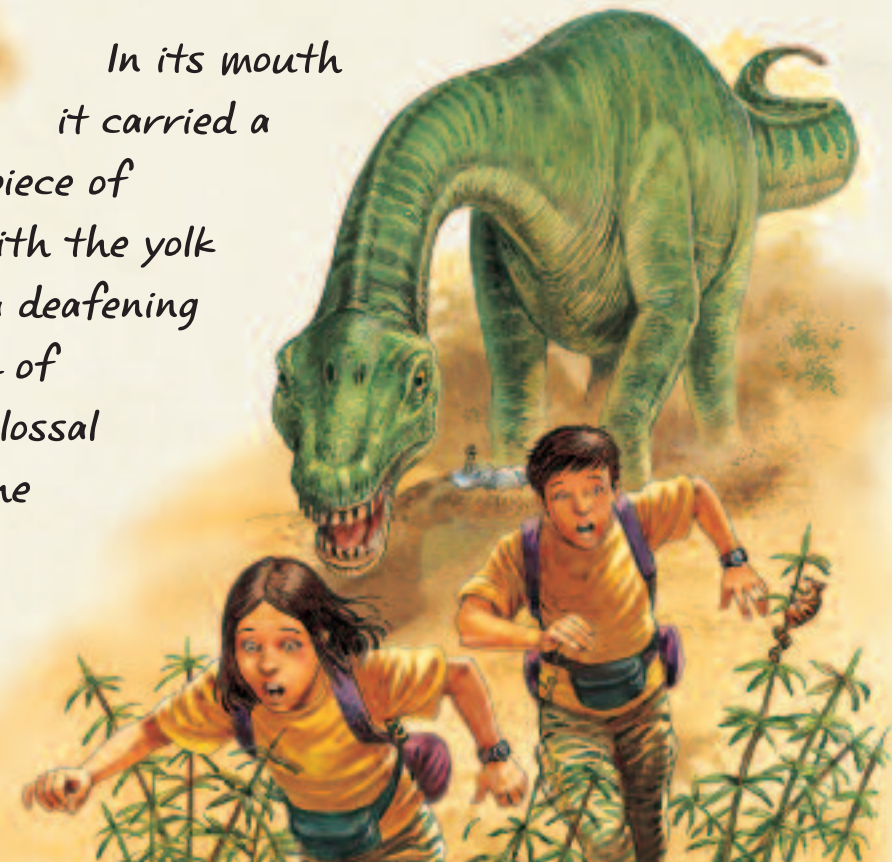
taking a closer look. I was just about to reach out and touch an egg before I got the shock of my life!



We checked in our guide. As we suspected: these eggs probably belonged to the titanosaur whose tracks we'd been following. Suddenly, as if from nowhere, a tiny dinosaur, no bigger than a cat, darted by.



In its mouth it carried a piece of eggshell, still with the yolk inside it. Then, with a deafening bellow and the CRACK of splintering trees, a colossal dinosaur burst into the clearing. She took one look at us and snorted VERY angrily. We didn't stick around to



DINOSAUR BABIES

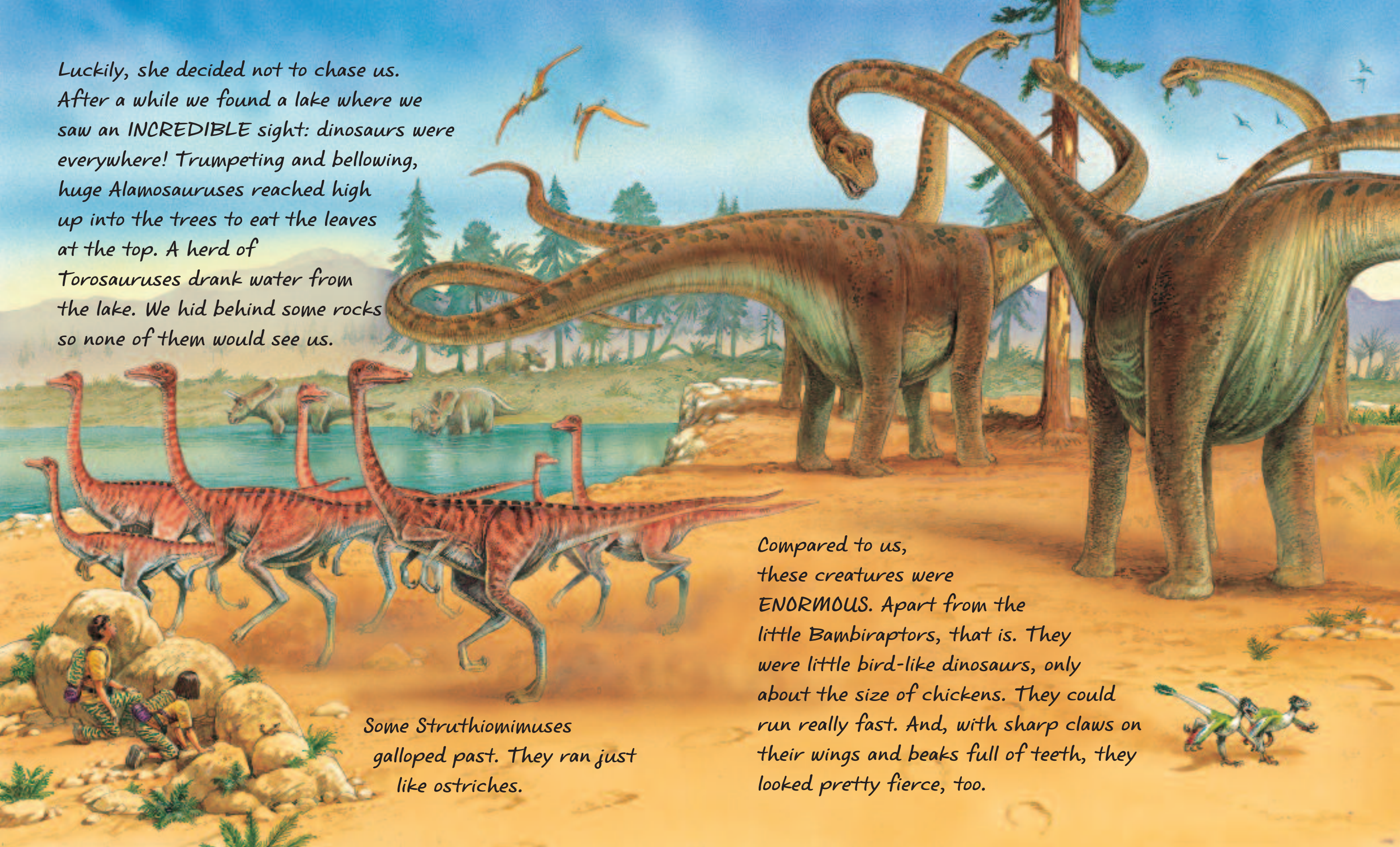
From the discovery of a fossilized group of nests with eggshells in North America in 1979, scientists have been able to build up a picture of how a dinosaur cared for its young. They named the dinosaur whose fossilized eggs they had found *Maiasaura*, "Good Mother Lizard". She would first build a mound, possibly using her teeth to rake the soil (*below*), before hollowing out a basin at the top. Then she laid about 30 large, spherical eggs in a circular pattern. Instead of sitting on the nest, *Maiasaura* would have covered them with rotting vegetation to keep the eggs warm. After hatching out, the babies needed constant care and food, just as newly-hatched birds and turtles do today. Even when the young were big enough to leave the nest, the mother had to be watchful for predators.



Luckily, she decided not to chase us. After a while we found a lake where we saw an **INCREDIBLE** sight: dinosaurs were everywhere! Trumpeting and bellowing, huge Alamosauruses reached high up into the trees to eat the leaves at the top. A herd of Torosauruses drank water from the lake. We hid behind some rocks so none of them would see us.

Some Struthiomimuses galloped past. They ran just like ostriches.

Compared to us, these creatures were **ENORMOUS**. Apart from the little Bambiraptors, that is. They were little bird-like dinosaurs, only about the size of chickens. They could run really fast. And, with sharp claws on their wings and beaks full of teeth, they looked pretty fierce, too.



There was still no sign of our mystery dinosaur with the great claw. Josh thought we should go back, but I was all for pressing on. It wasn't EVERY day you got to travel back 70 million years, was it? I took lots of photos to prove we had been here.

This is one of those tiny dinosaurs that raced about on two legs. They fed on insects, lizards and eggs. With their feathery bodies, they looked just like birds.

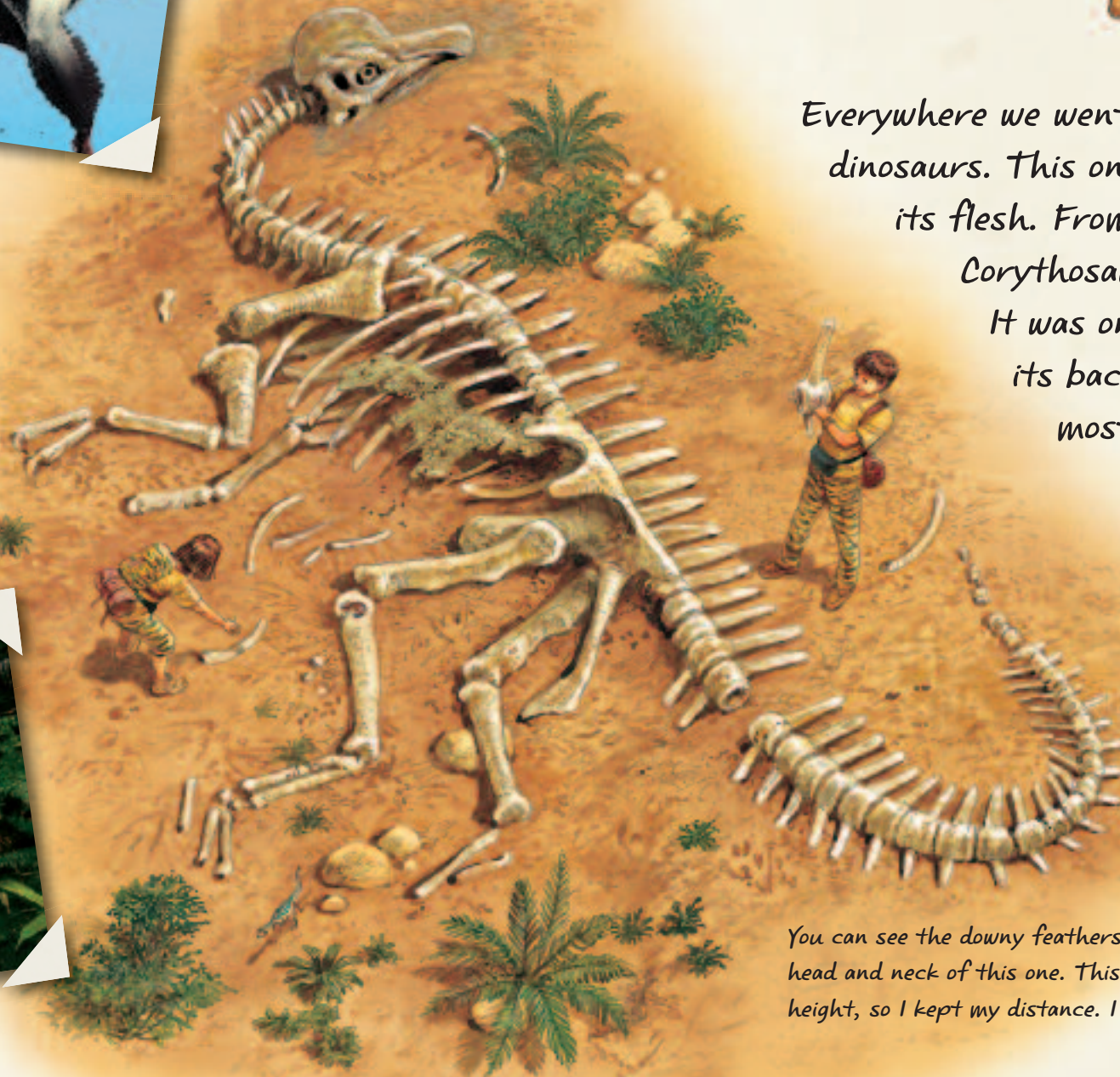


I even saw some feathery dinosaurs flying. No, not pterosaurs again, but little ones that looked very like birds.



Here's what the insides of a Corythosaurus must once have looked like.

Everywhere we went, we found bones of long-dead dinosaurs. This one had been picked clean of nearly all its flesh. From its crest, I could tell it was a Corythosaurus, one of the duckbill family. It was only while Josh was inspecting part of its backbone that I remembered one of the most dangerous scavengers of all ...



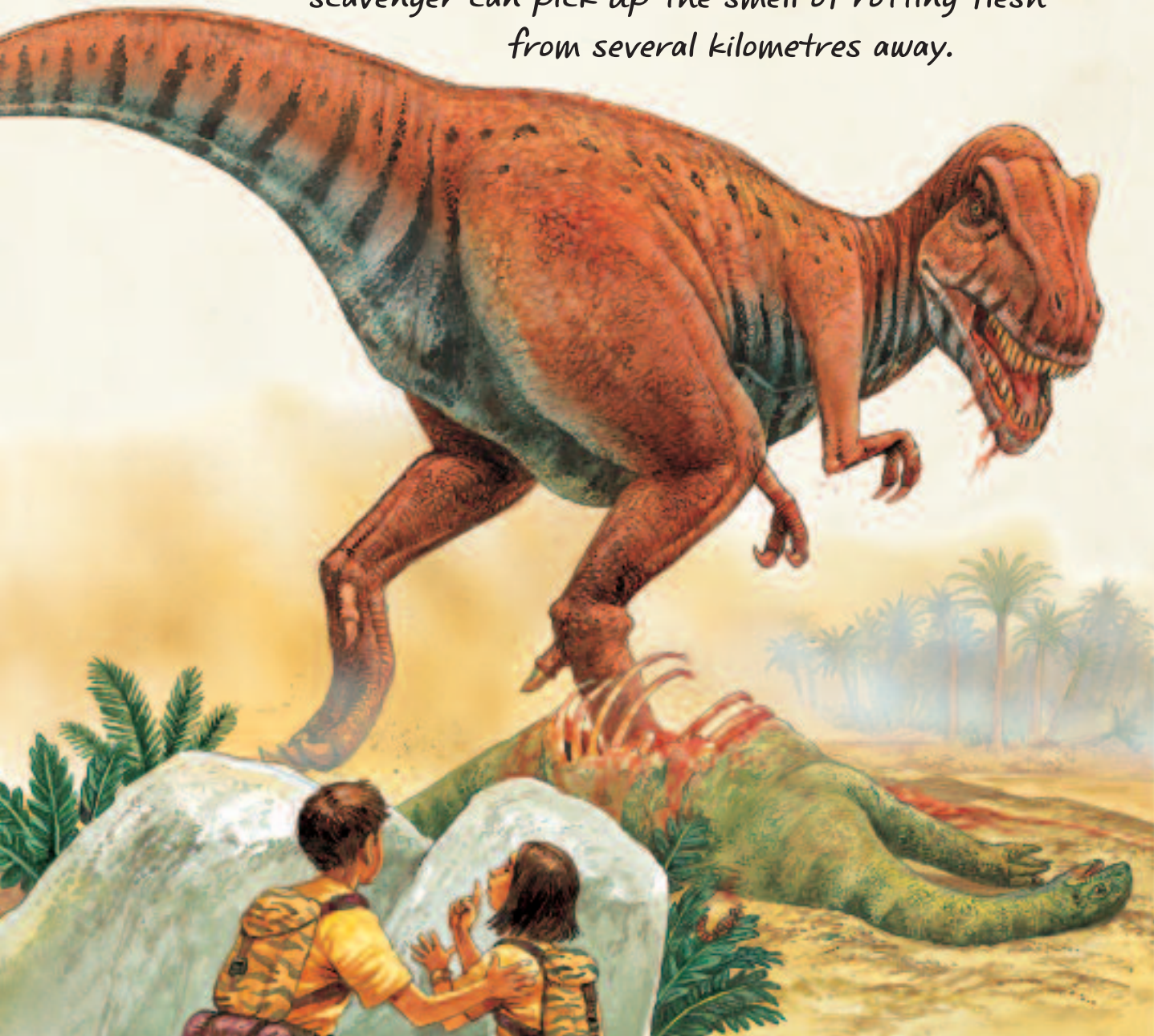
You can see the downy feathers on the head and neck of this one. This raptor was about my height, so I kept my distance. I didn't like the look of its teeth ...



“Maisie, you must be mad!”

“We can’t leave here without seeing one”, I said. “If we’re very quiet and don’t move, it won’t go after us.”

We soon found the carcass of a dinosaur. Yuk! Josh squeezed his nostrils tightly, but I thought this was perfect. A good scavenger can pick up the smell of rotting flesh from several kilometres away.



We hid behind some rocks, and, within minutes, the KING OF DINOSAURS, stood before us. Wow! Tyrannosaurus rex! We didn’t move a muscle. Here was the largest, fiercest, SCARIEST monster you could ever imagine—just metres away. Eek! I think we could both have easily fitted into his mouth.

He tore a few huge chunks out of the side of the carcass before wandering off. Both of us let out a breath—which he must have heard. He stopped, and slowly turned round. We froze...



He let out a spine-chilling roar, waggled his tiny arms and lolloped off. Whew!

That was close!

This is one of its teeth, at actual size. The curved shape and razor-sharp edge makes it perfect for tearing meat from the bones of its prey.

FLESH-EATING DINOSAURS

Flesh-eating dinosaurs are known as theropods. Theropods were among the first dinosaurs. When they first appeared, they were very small reptiles perfectly suited to the hot, dry climate during the early Triassic period. But even as the world grew wetter in the Jurassic, theropods also adapted. As their main food source, larger plant-eating sauropods, grew bigger because of the abundance of food—trees and green vegetation—so, too, did the theropods, who became large, powerful hunters.

Eoraptor



Coelophysis



Carnotaurus



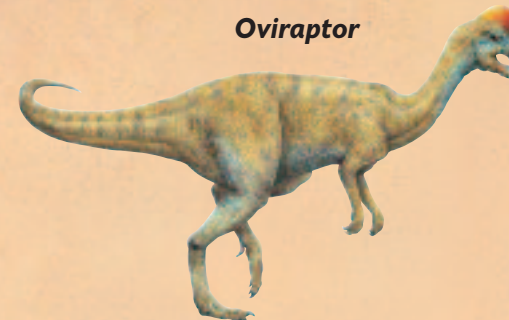
Allosaurus



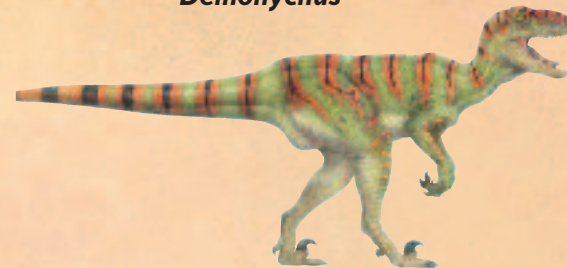
Compsognathus



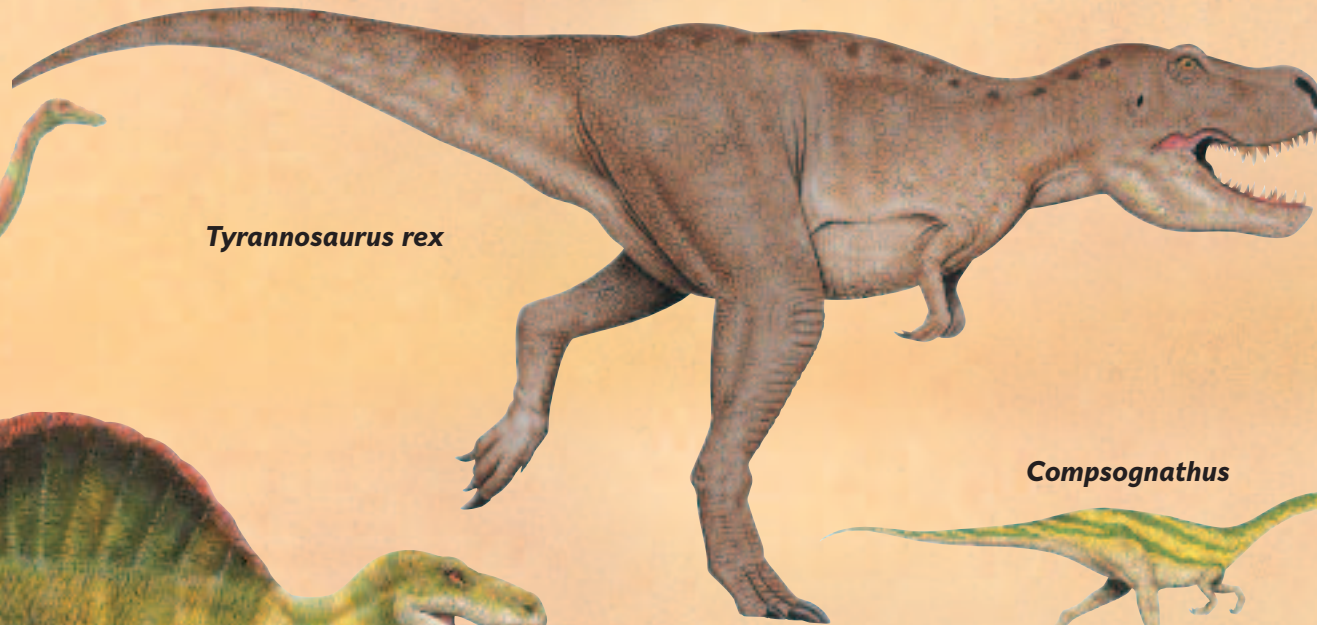
Oviraptor



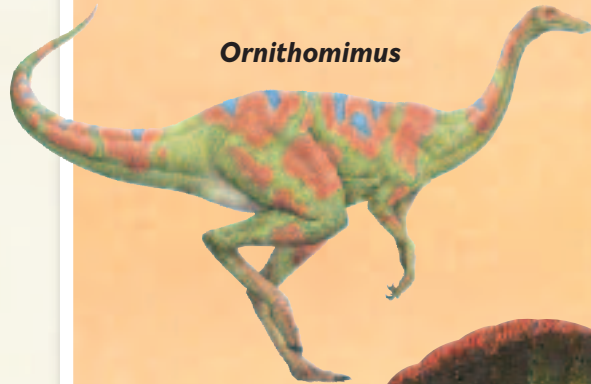
Deinonychus



Tyrannosaurus rex



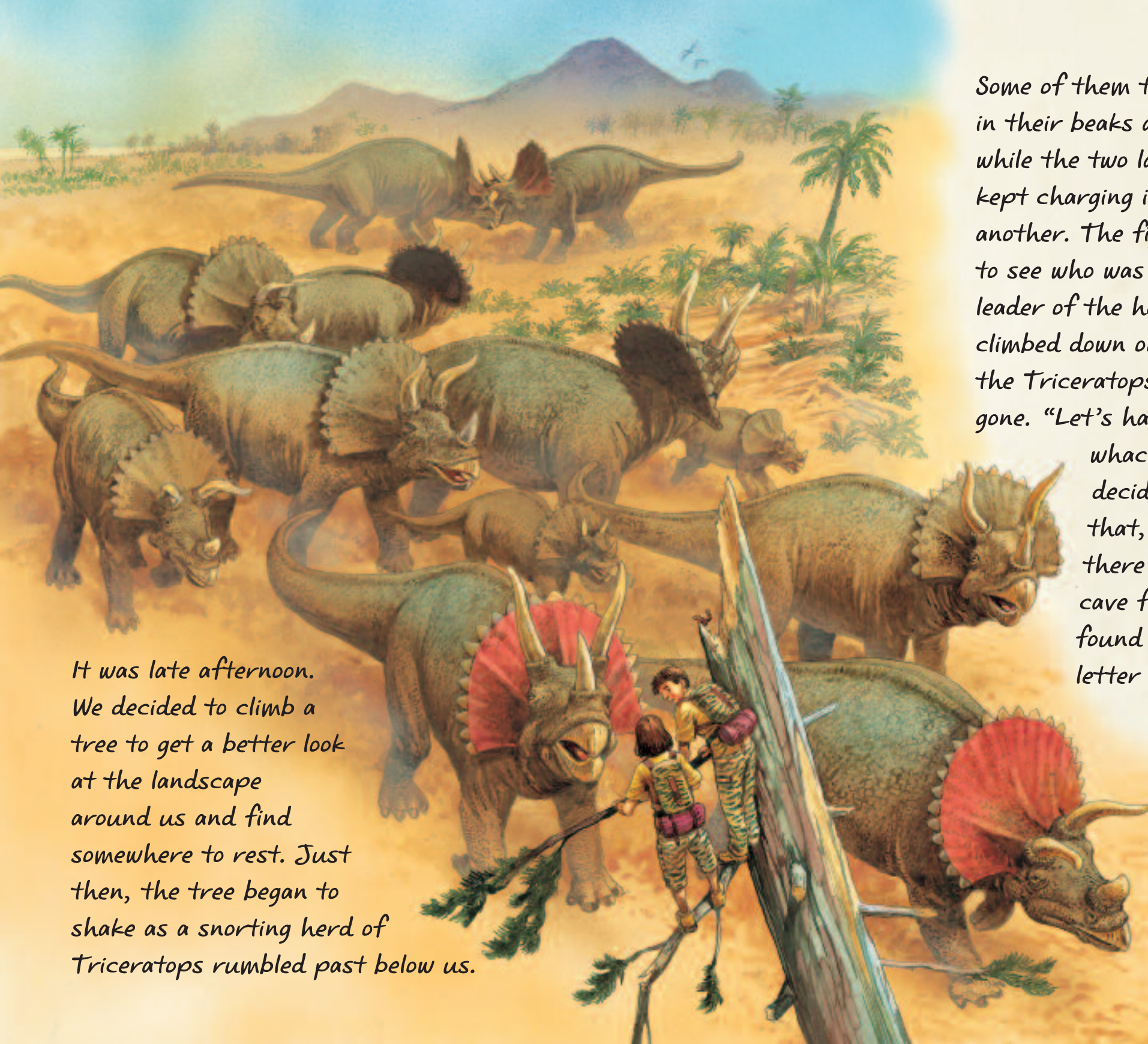
Ornithomimus



Spinosaurus



Theropods ran on two muscular hind legs. A large theropod, such as *Tyrannosaurus rex*, killed or scavenged on its own, rushing at its prey and plunging its dagger-like teeth into its flesh. Smaller theropods might have hunted in packs. This enabled them to bring down victims much larger than themselves. One group of small theropods may have had feathers.



It was late afternoon. We decided to climb a tree to get a better look at the landscape around us and find somewhere to rest. Just then, the tree began to shake as a snorting herd of Triceratops rumbled past below us.

Some of them tore off plants in their beaks as they went, while the two largest males kept charging into one another. The fight was on to see who was going to be leader of the herd. We climbed down only after the Triceratops herd had gone. "Let's have a kip in that cave over there. I'm

whacked", sighed Josh. It was very lucky we decided to do that, because, there on the cave floor, we found this letter ...



You are not far from the place where you will find the dinosaur with the giant claw. Follow the river to its mouth, but beware of swamps. When you reach the coast, make a raft, for your destination is the island ahead of you. How do I know this? Because, like you, I am a time traveller and I came in search of the same mysterious creature.

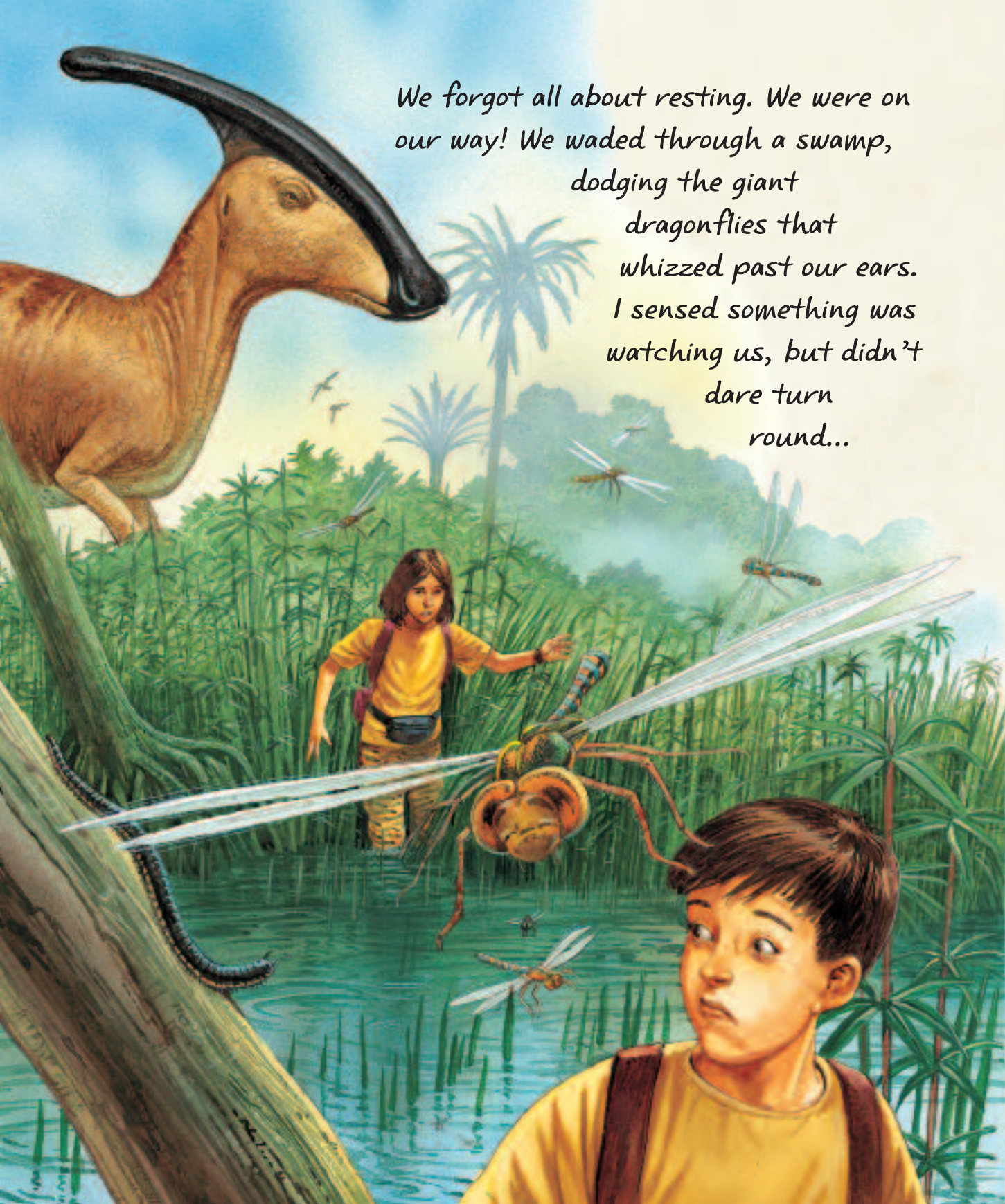
Good luck!

Where you are now



There is a volcano on the island

We forgot all about resting. We were on our way! We waded through a swamp, dodging the giant dragonflies that whizzed past our ears. I sensed something was watching us, but didn't dare turn round...



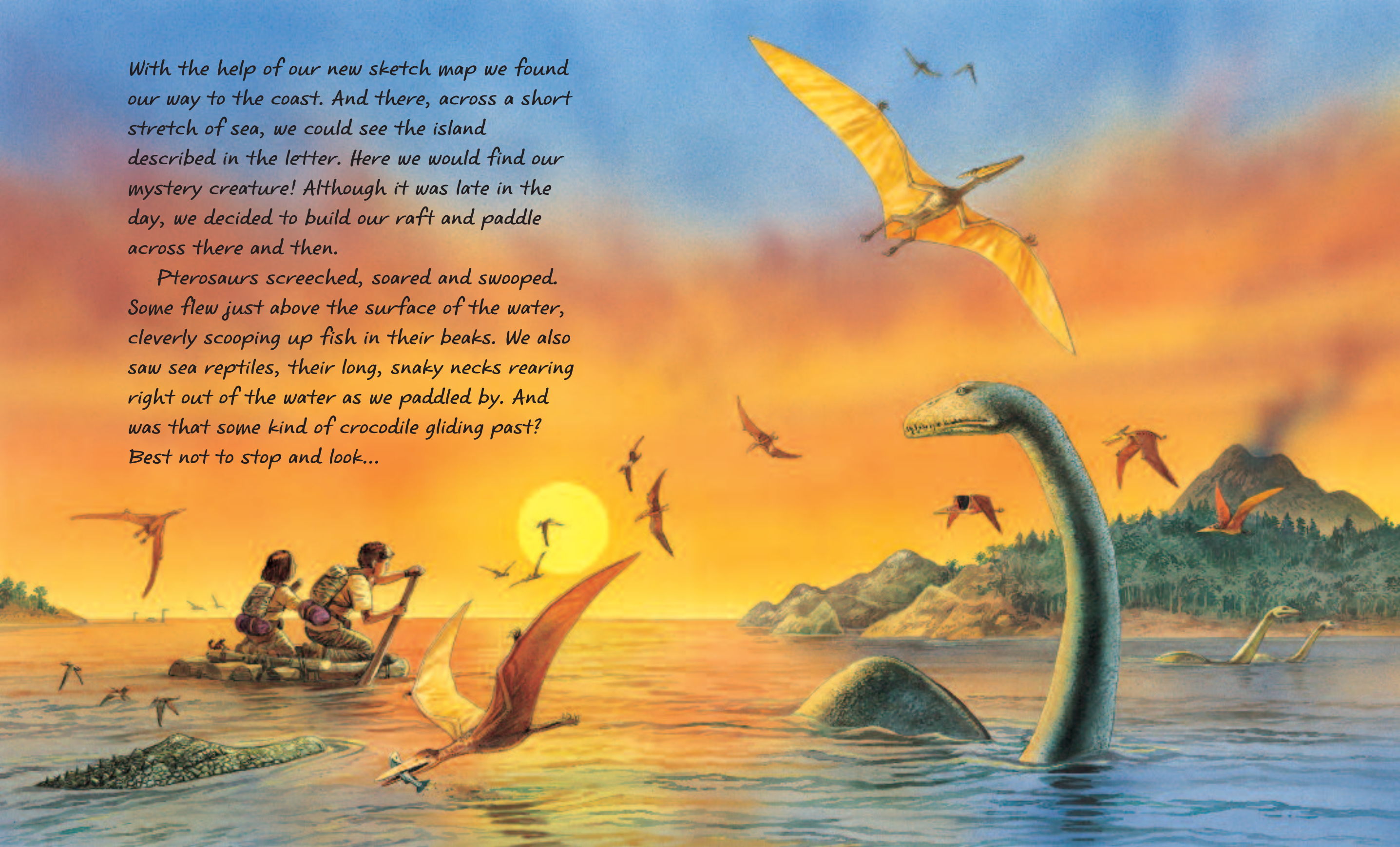
Just then there was a deep, deafening HOOOOT, like a ship's foghorn. I nearly jumped out of my skin! We whirled round to see a Parasaurolophus, bellowing into the air. I'm sure it could be heard for miles around. In fact, that was probably the idea,

to attract a mate or to find other dinosaurs of the same kind. I wondered whether the crest on its head made its call so loud. "Hey, look what I've got, Maisie", cried Josh. I looked over and saw he had found a small, furry animal, peeping out of his rucksack. "I do believe this is one of the very first mammals. Probably an ancestor to our dog back home, eh Josh?"



With the help of our new sketch map we found our way to the coast. And there, across a short stretch of sea, we could see the island described in the letter. Here we would find our mystery creature! Although it was late in the day, we decided to build our raft and paddle across there and then.

Pterosaurs screeched, soared and swooped. Some flew just above the surface of the water, cleverly scooping up fish in their beaks. We also saw sea reptiles, their long, snaky necks rearing right out of the water as we paddled by. And was that some kind of crocodile gliding past? Best not to stop and look...



PTEROSAURS AND MARINE REPTILES

Flying reptiles, known as pterosaurs, lived at about the same time as the dinosaurs. Many flew near the sea, swooping down to snatch fish from the surface of the water. Their wings were made of skin stretched between their arm bones and leg bones. Early kinds, like *Dimorphodon*, had long tails to help them steer. Later kinds, the pterodactyls, had much shorter tails. Some were the largest flying animals that ever lived.

Reptiles also dominated the seas in the Age of Dinosaurs. Ichthyosaurs were dolphin-like creatures with streamlined bodies, high back fins and fishy tails. Plesiosaurs had long necks and flippers, which they used to “fly” through the water. Pliosaurus, with their large heads and powerful jaws, were the tigers of the seas, preying on fish, squid, ammonites and other reptiles.



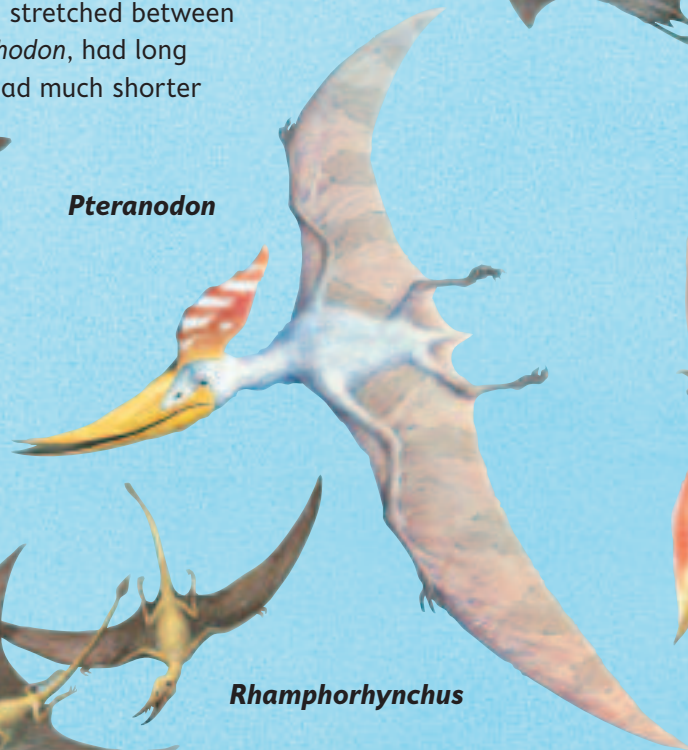
Dimorphodon



Tapejara



Rhamphorhynchus



Pteranodon

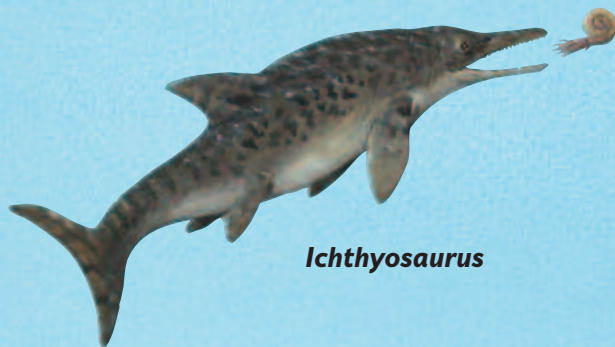
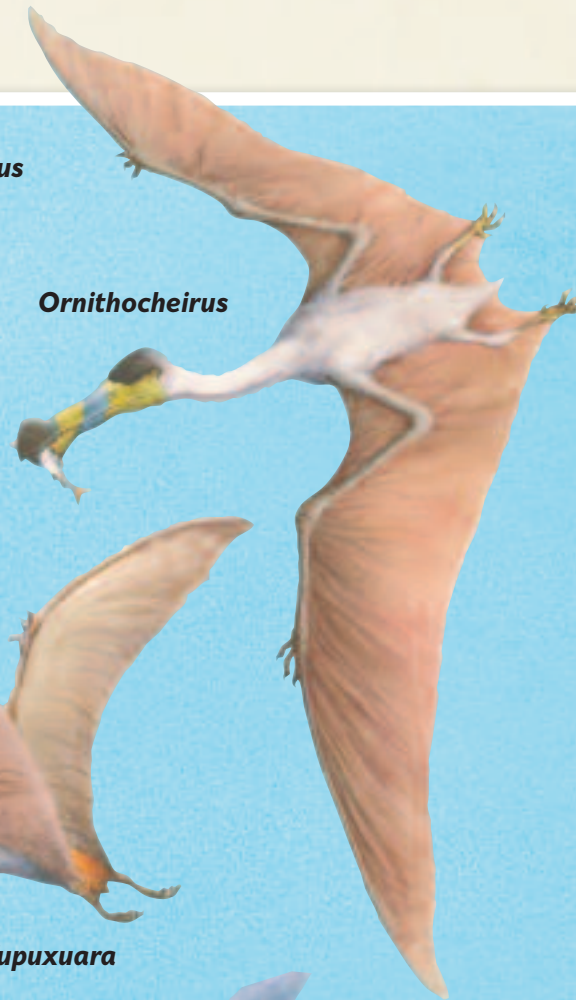


Dsungaripterus

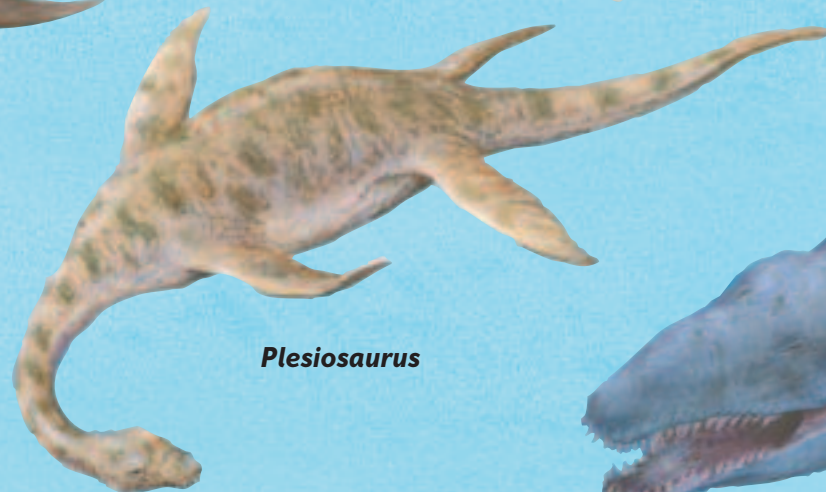


Tupuxuara

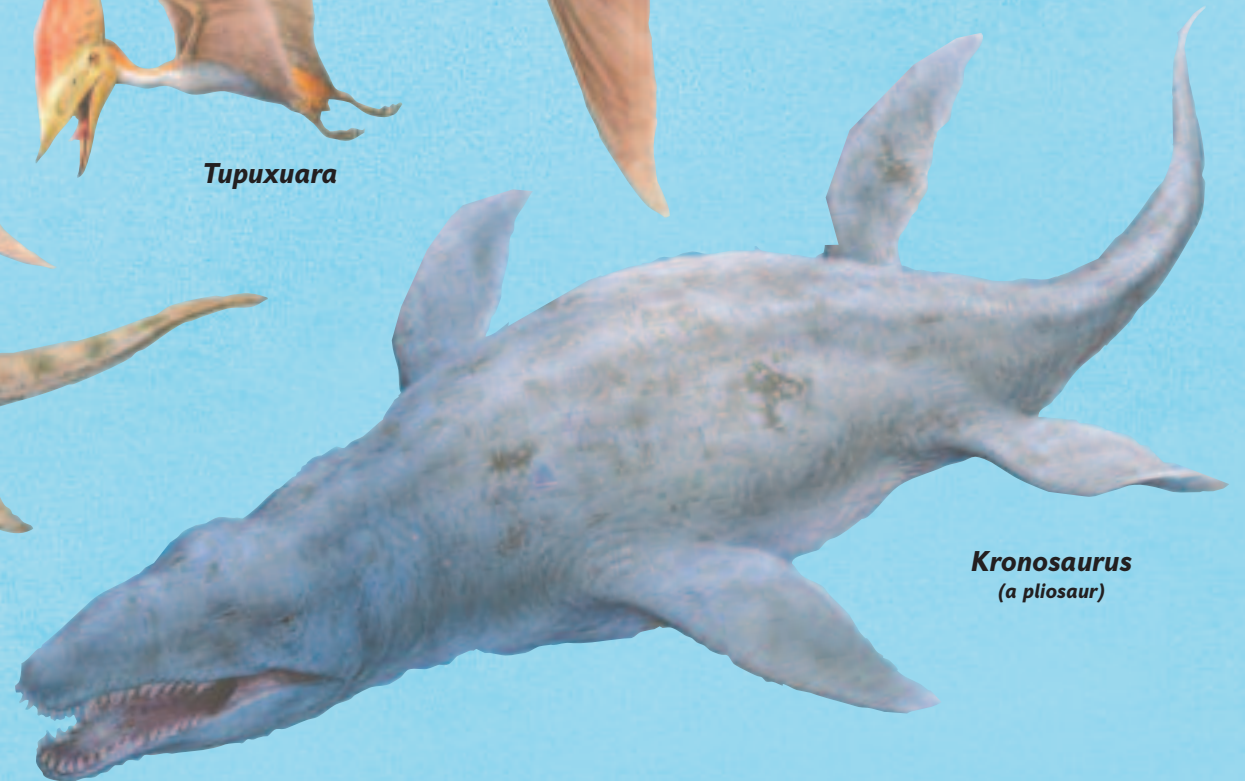
Ornithocheirus



Ichthyosaurus



Plesiosaurus

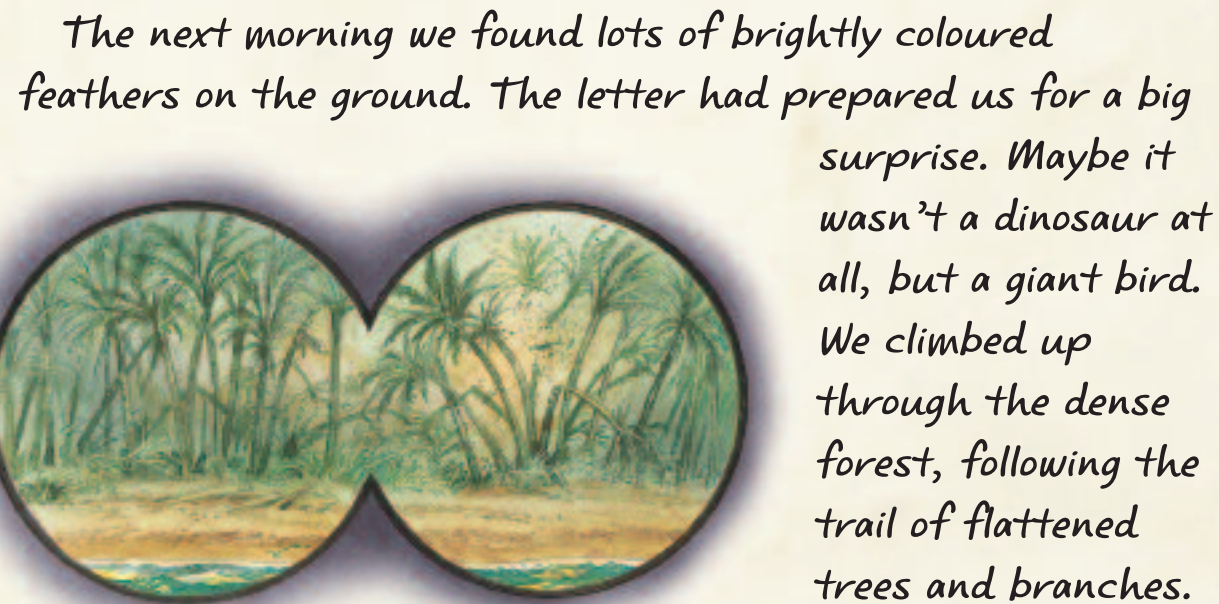


Kronosaurus
(a pliosaur)

As we neared the island. I pulled out a pair of binoculars and trained them on the shore. What was this? Some of the trees behind the beach had been torn down. What kind of creature could

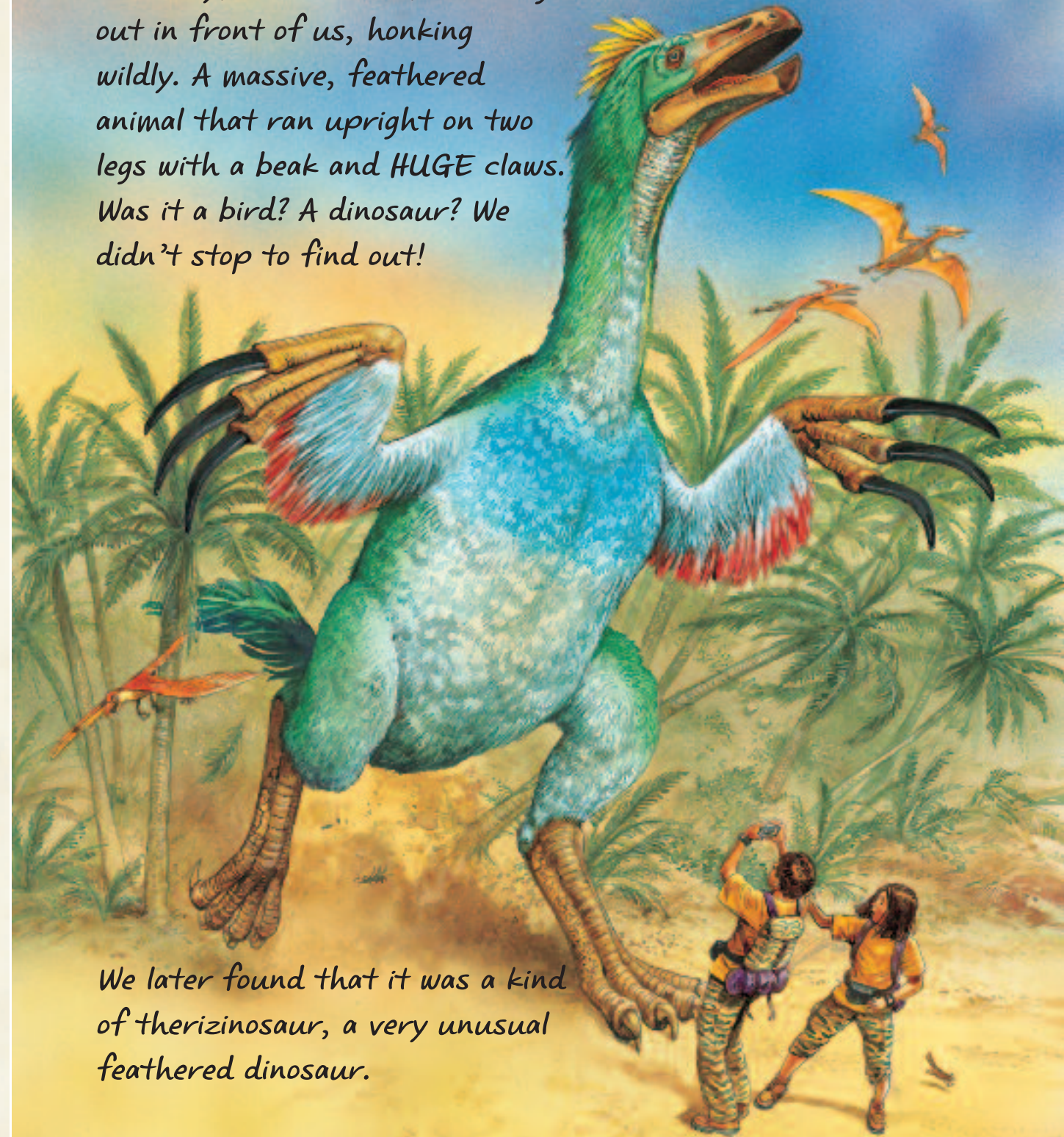


have caused this damage? That night, we made camp on the beach. What a day it had been! We could hardly sleep with the excitement of remembering all the things we'd seen.

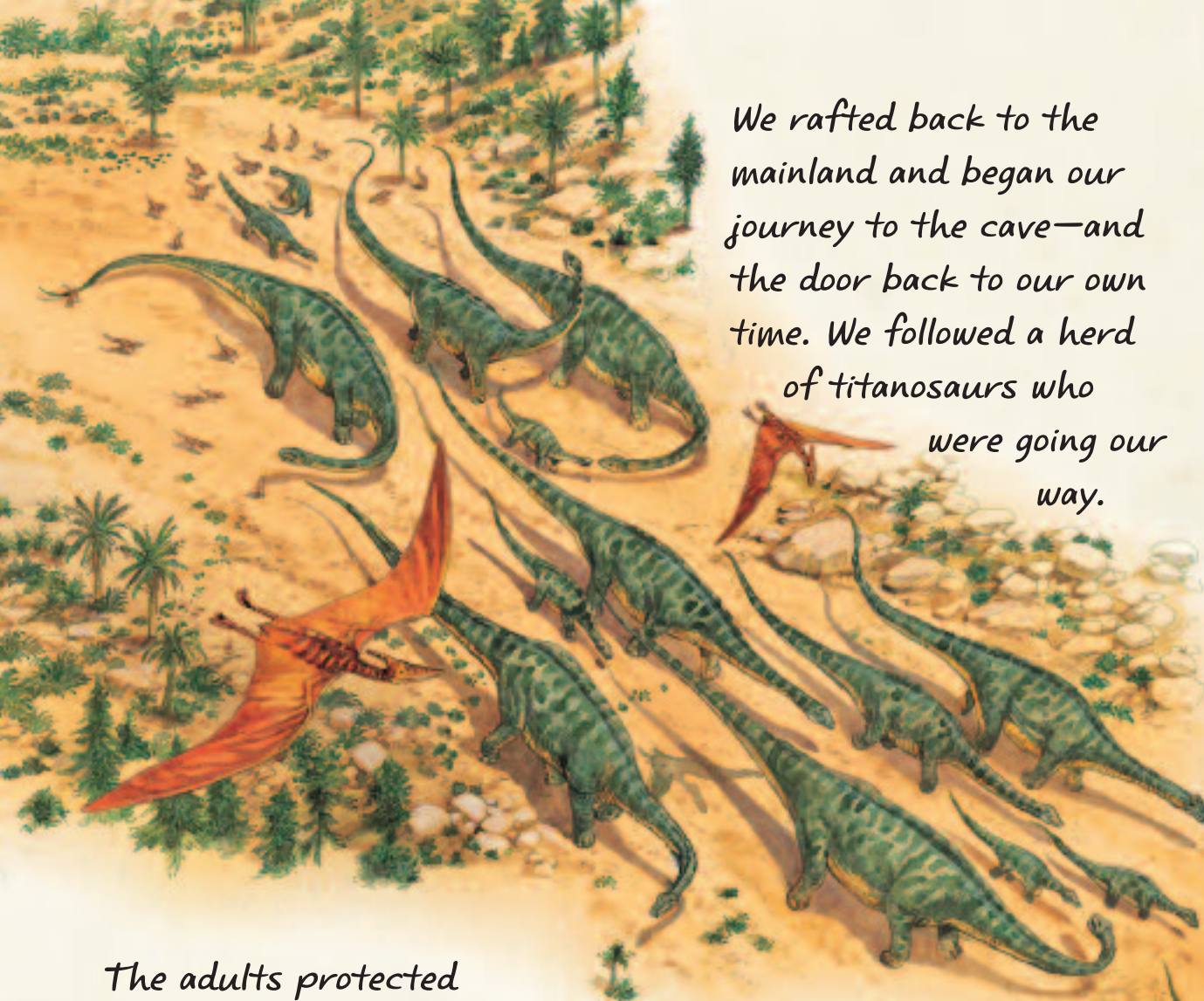


The next morning we found lots of brightly coloured feathers on the ground. The letter had prepared us for a big surprise. Maybe it wasn't a dinosaur at all, but a giant bird. We climbed up through the dense forest, following the trail of flattened trees and branches.

Suddenly, there it was, bursting out in front of us, honking wildly. A massive, feathered animal that ran upright on two legs with a beak and HUGE claws. Was it a bird? A dinosaur? We didn't stop to find out!



We later found that it was a kind of therizinosaur, a very unusual feathered dinosaur.



We rafted back to the mainland and began our journey to the cave—and the door back to our own time. We followed a herd of titanosaur who were going our way.

The adults protected their young by walking on the outside. Good idea, we thought, and walked alongside the young ones, too. They didn't seem to mind us being there. Just then Josh stopped. "Oh no, the key's gone! It must have fallen off my belt." How would we ever get home now? In a panic, we ran back the way we had come. Luckily for us, we soon found our precious key, glinting on the ground.



We had the key, but now we were on our own. Our protectors, the titanosaur herd, had marched on, moving too swiftly for us to catch up. A pack of dromaeosaurs, small but ferocious flesh-eaters, were skulking about. If they spotted us, we would surely be an easy lunch...

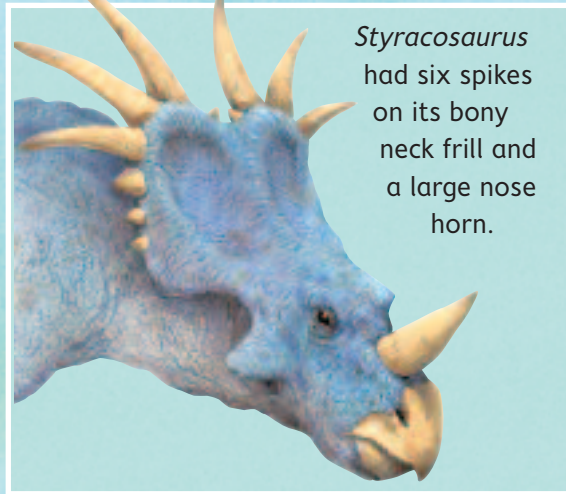
TOO LATE! But once again, luck was on our side. A large Euoplocephalus, swinging its clubbed tail and knocking a few off their feet, held them off while we escaped. But how long would it be before they caught up with us?



DINOSAUR DEFENCE

All plant-eating dinosaurs needed ways to defend themselves against predators. The very size of the largest sauropods offered them some protection. Smaller plant-eaters roamed around in herds, benefitting from safety in numbers. Some dinosaurs protected themselves with horns or bony plates on their bodies.

Others fought with their sharp claws and teeth, or were simply quick enough to run away.



Styracosaurus had six spikes on its bony neck frill and a large nose horn.

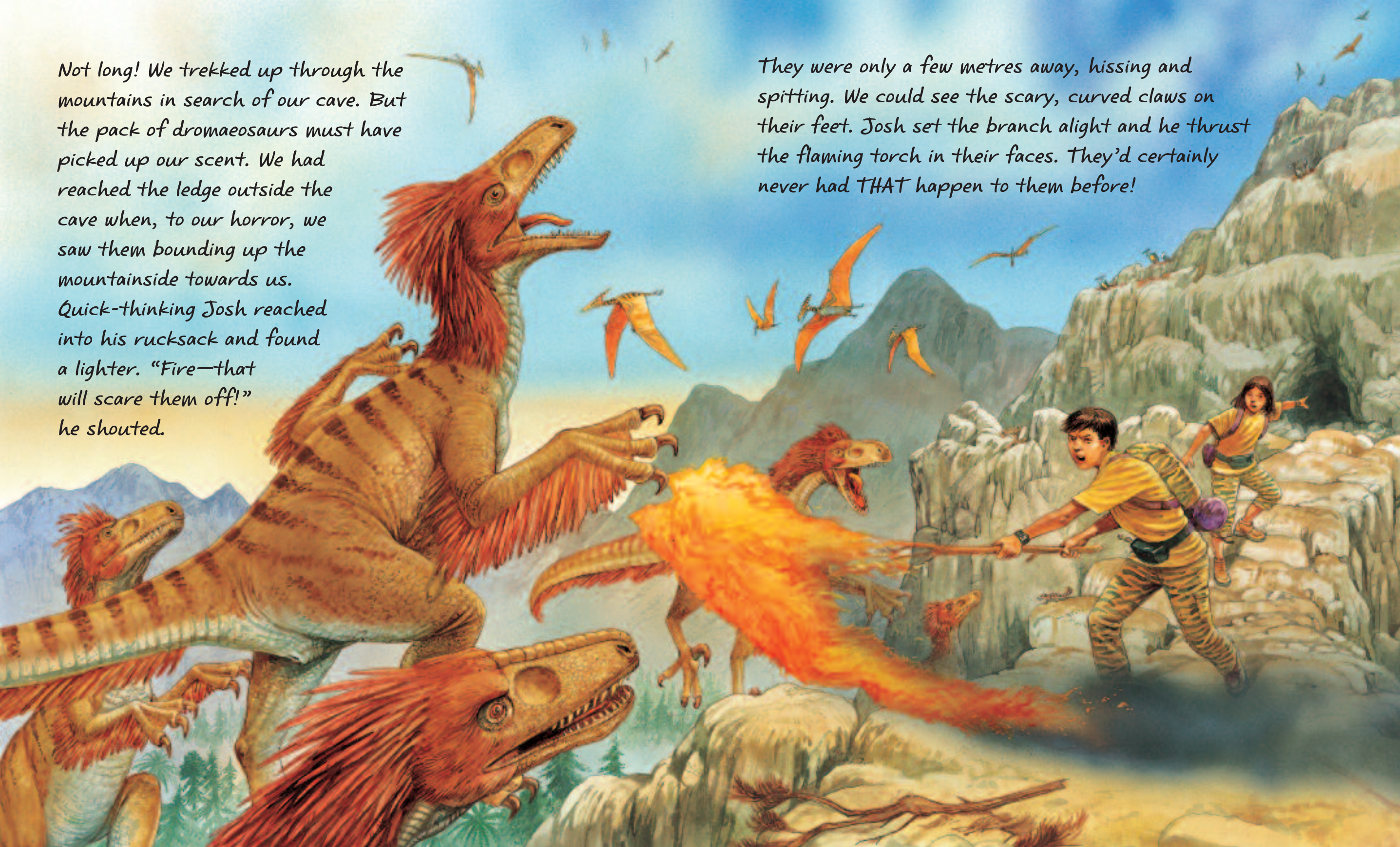
Iguanodon was a plant-eating ornithomimid. It normally relied on its size (nine metres long) and by being part of a herd for protection against predators. But cornered by a hungry *Acrocanthosaurus*, *Iguanodon* would go on the counter-attack. Rearing up on its hind legs it would jab its vicious thumb-spike into its attacker's neck (right).



Stegosaurus was a slow plant-eater. The plates on its back may not have helped to protect it, but swinging its spiky tail in the face of an onrushing *Allosaurus* certainly did (above).

Not long! We trekked up through the mountains in search of our cave. But the pack of dromaeosaurs must have picked up our scent. We had reached the ledge outside the cave when, to our horror, we saw them bounding up the mountainside towards us. Quick-thinking Josh reached into his rucksack and found a lighter. "Fire—that will scare them off!" he shouted.

They were only a few metres away, hissing and spitting. We could see the scary, curved claws on their feet. Josh set the branch alight and he thrust the flaming torch in their faces. They'd certainly never had THAT happen to them before!





While the dromaeosaurs reeled back, howling in fright, we dashed into the cave. There was the door. The dinosaur pack started to snarl and edge towards the cave once more. As I turned the key, I prayed the door would open. YAY—success! We dived through and it slammed shut behind us. We

were safe, back in Granddad's study. Hey, this was weird. Nothing had changed: Josh's mug of hot chocolate was still steaming on the desk. We were back in our tee shirts and jeans. As we climbed to our feet we realised that only a few



seconds had passed since we had climbed through that door! But what door? We looked round and could see only the back of a bookcase. Hearing our cries of surprise, Granddad came in. He smiled when we told him all that had happened. But **OF COURSE** he didn't really believe us for one minute!



A Map of our EXPEDITION

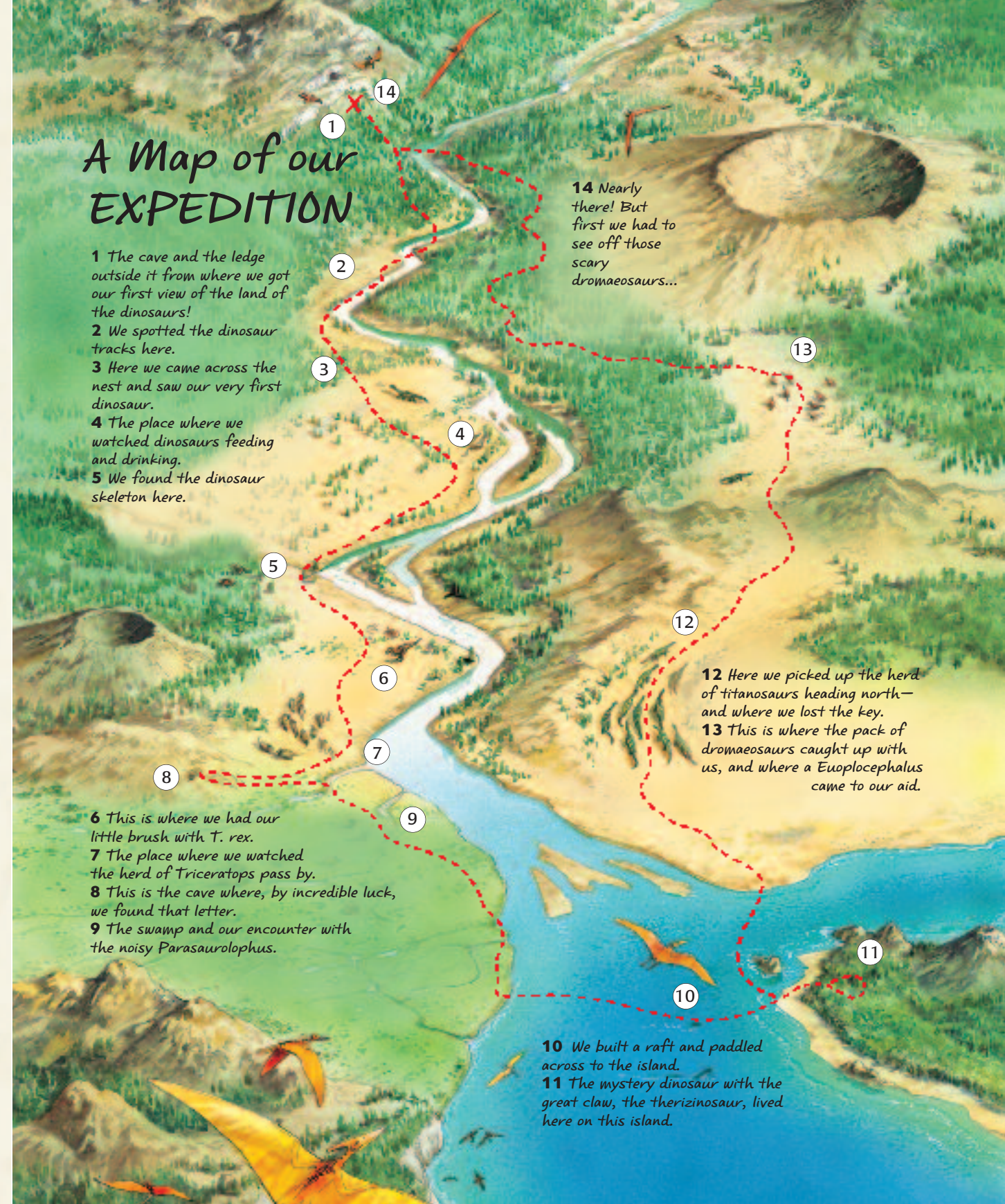
- 1 The cave and the ledge outside it from where we got our first view of the land of the dinosaurs!
- 2 We spotted the dinosaur tracks here.
- 3 Here we came across the nest and saw our very first dinosaur.
- 4 The place where we watched dinosaurs feeding and drinking.
- 5 We found the dinosaur skeleton here.

14 Nearly there! But first we had to see off those scary dromaeosaurs...

12 Here we picked up the herd of titanosaurs heading north—and where we lost the key.
13 This is where the pack of dromaeosaurs caught up with us, and where a Euoplocephalus came to our aid.

- 6 This is where we had our little brush with T. rex.
- 7 The place where we watched the herd of Triceratops pass by.
- 8 This is the cave where, by incredible luck, we found that letter.
- 9 The swamp and our encounter with the noisy Parasaurolophus.

10 We built a raft and paddled across to the island.
11 The mystery dinosaur with the great claw, the therizinosaur, lived here on this island.



GLOSSARY

Archosaurs A group of reptiles that flourished during the Triassic period and gave rise to the crocodiles, pterosaurs, dinosaurs and birds.

Cretaceous period The period of Earth's history about 135-65 million years ago, when the largest dinosaurs lived.

Dinosaurs Reptiles that lived on land during the Mesozoic Era (250-65 million years ago). Dinosaurs walked upright on legs, as birds and mammals do today. Flying reptiles and marine reptiles are not dinosaurs.

Extinction The disappearance of a species. The dinosaurs disappeared forever at the end of the Cretaceous period.

Fossil 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.

Hadrosaurs "Duckbilled" dinosaurs from the late Cretaceous period. Grazing in herds, they were plant-eaters with special, grinding cheek teeth.

Parasaurolophus
(hadrosaur)



Jurassic period The period of Earth's history 203-135 million years ago, when dinosaurs ruled and the first birds lived.

Ornithischians Also called the "bird-hipped" dinosaurs, they are one of two major types of dinosaur (the other is saurischian, or "lizard-hipped"). Ornithischians had backward-sloping pubic bones (the lower part of the hip bone).

Predators Animals that prey on others.

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

Saurischians The "lizard-hipped" dinosaurs. They are one of two major types of dinosaur (the other is ornithischian, or "bird-hipped"). Saurischians had forward-jutting pubic bones (the lower part of the hip bone).

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

Scavenger An animal that feeds on the remains of another larger animal's kill.

Theropods All the meat-eating saurischian ("lizard-hipped") dinosaurs.

Triassic period The period of Earth's history 251-199 million years ago, when marine life flourished and small reptiles roamed the Earth. The first dinosaurs emerged during the Triassic.

