



Adventures From the Land of Dinosaurs

The Baby- Eaters



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It wasn't just raining, it was pouring. It was 220 million years ago, during the Triassic period, in what is now New Mexico, USA. Running through the storm were a herd of Coelophysis, some of the earliest known dinosaurs. In their panic they tripped over each other as floodwater lapped around their feet.



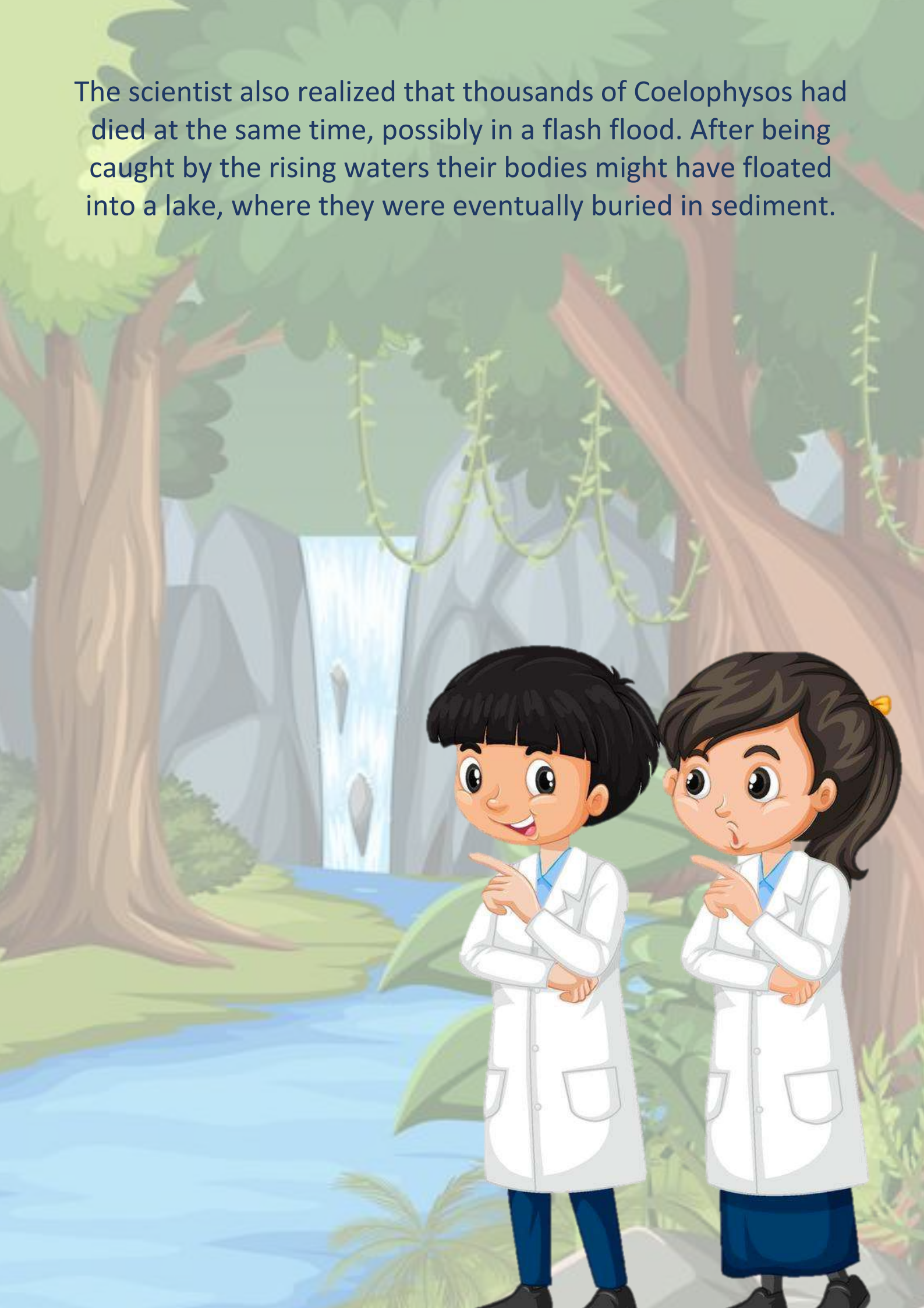
Fast-forward to the 20th century and 30 large blocks of fossils were removed from a quarry. Inside the blocks were an estimated 2850 Coelophysis skeletons. And they had a story to tell ...



The skeletons ranged from hatchlings to fully grown adults, and they were usually found tangled together. A researcher was looking at two adult specimens when he noticed something unusual – there appeared to be baby Coelophysis bones where the stomach of one of the adults was. Could the adults have been eaten babies?



The scientist also realized that thousands of Coelophysos had died at the same time, possibly in a flash flood. After being caught by the rising waters their bodies might have floated into a lake, where they were eventually buried in sediment.



A few years later, researchers took another look at the two adults in an attempt to solve the mystery of the baby bones. The ribs of one of the adults were pulled back – possibly from the body exploding after death – making it nearly impossible to tell if any of the bones were originally in the stomach. The other skeleton did have some bones in its stomach, but they were from an extinct crocodile relative, not a baby *Coelophysis*. It seemed like the mystery had been solved.



Then, in 2009, palaeontologists investigated a different, fairly complete *Coelophysis* specimen. They noticed a cololite, a block of digested food that had not yet become a coprolite (fossilized poo – yes, that’s a thing). Inside the cololite were the hands and feet of, you guessed it, baby *Coelophysis*! And there was also a skull with preserved vomit nearby that had baby *Coelophysis* jaws in it. So, it looks like *Coelophysis* were cannibals after all!



The First Giants



Sauropods, including famous dinosaurs like Diplodocus and Brachiosaurus, were the largest land animals ever. Some were as long as a jumbo jet and a few shattered the scales at 60 tonnes (75 tons)!



The earliest sauropods, called, sauropomorphs, appeared with the first dinosaurs around 230 million years ago. At first, they were small, only about as long as a motorbike, and they walked on two legs. So, when did sauropods get so big?

Sauropomorph



At first palaeontologists believed huge sauropods appeared in the Jurassic period, around 180 million years ago. But that changed in 2018, with a startling discovery in north-west Argentina.

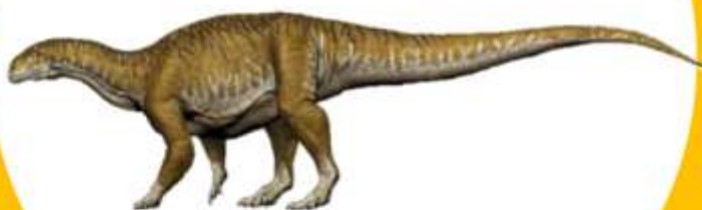


Working through 210-million-year-old bright red rock, Dr Cecilia Apaldetti and her team were excavating two partial skeletons. When they removed the bones, Cecilia scratched her head. This can't be right, she thought.

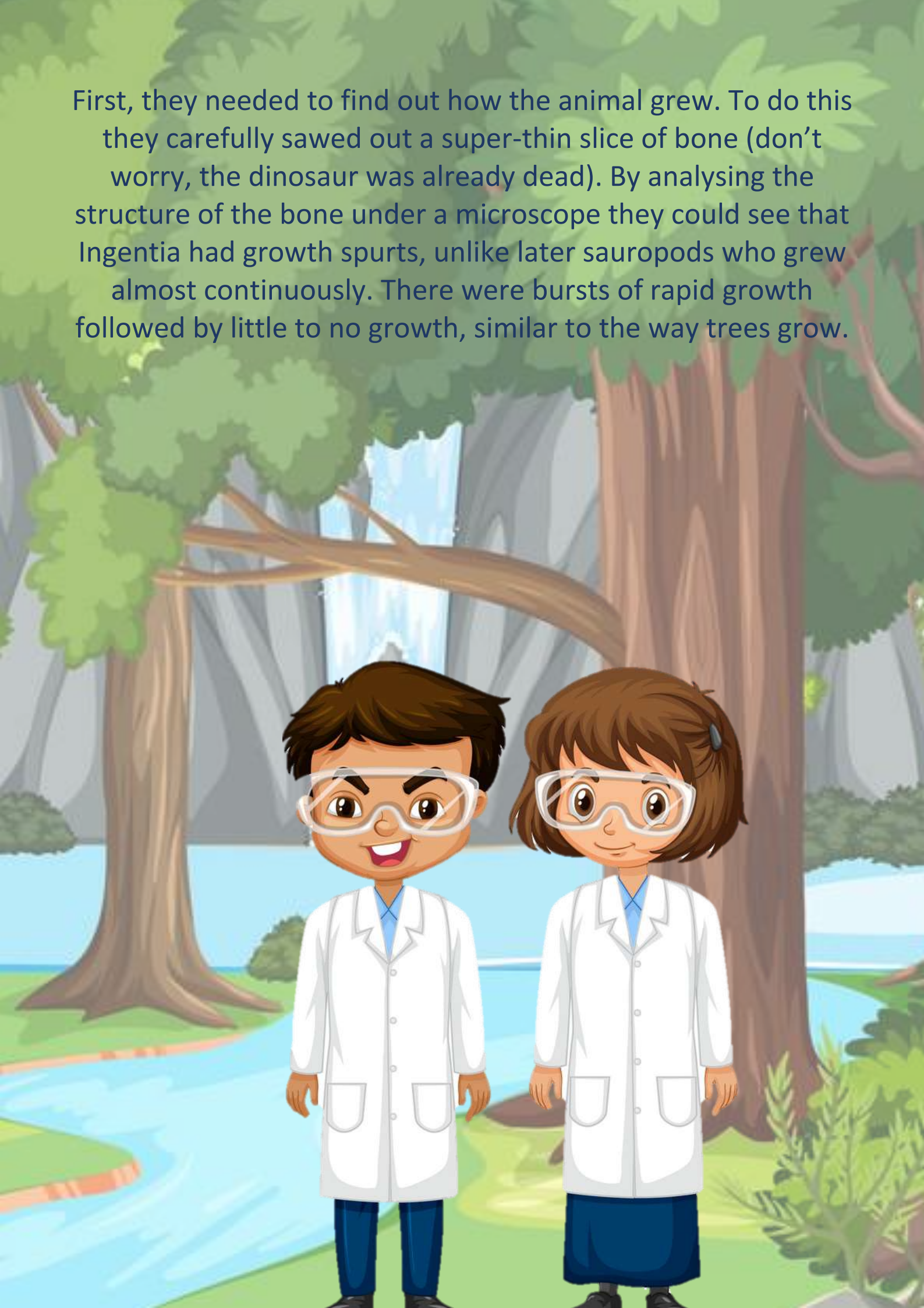


The dinosaur they had discovered, *Ingentia*, was roughly three times the size of the other Triassic dinosaurs! But Cecilia noted it definitely wasn't one of the later sauropods – it had a shorter neck, and its legs were more bendy. Excited, the team got to work finding out all they could about this gargantuan animal.

Ingentia



First, they needed to find out how the animal grew. To do this they carefully sawed out a super-thin slice of bone (don't worry, the dinosaur was already dead). By analysing the structure of the bone under a microscope they could see that Ingentia had growth spurts, unlike later sauropods who grew almost continuously. There were bursts of rapid growth followed by little to no growth, similar to the way trees grow.



But while *Ingentia* grew differently, it might have breathed the same way as its larger relatives. The team discovered holes in its backbone that would have housed air sacs. These were part of a clever breathing system, like that used by birds, which meant *Ingentia* was able to get twice the amount of oxygen from a single deep breath.

Ingentia



***Ingentia* had air sacs attached to its spine that helped it breathe efficiently**



The air sacs also helped keep the dinosaur cool and made its skeleton weigh less. All incredible adaptations that helped this early giant grow!

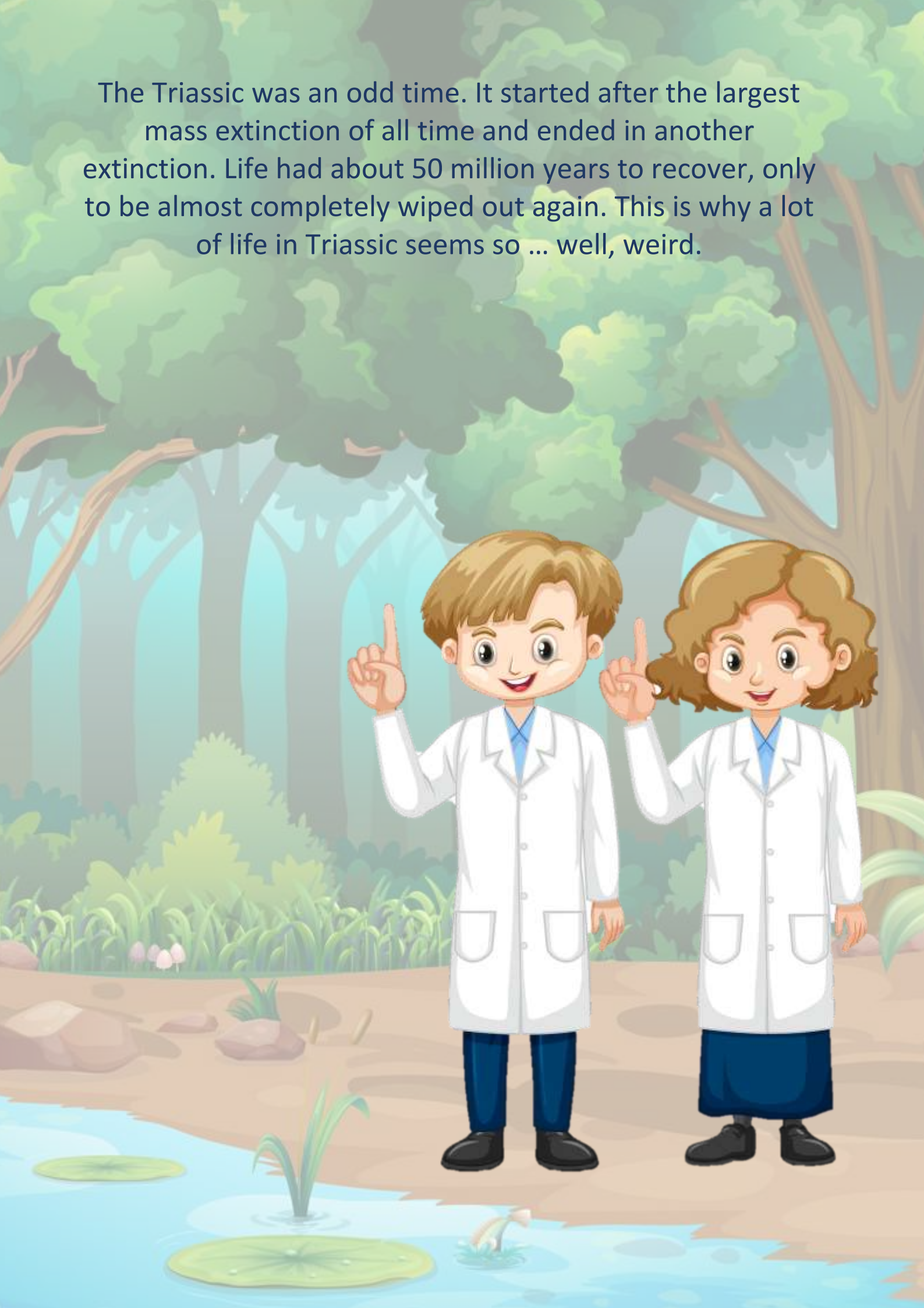




Weird Life of the Triassic



The Triassic was an odd time. It started after the largest mass extinction of all time and ended in another extinction. Life had about 50 million years to recover, only to be almost completely wiped out again. This is why a lot of life in Triassic seems so ... well, weird.



Sharovipteryx was a small lizard with thin membranes attached to its legs. It's thought these animals glided from tree to tree using these "wings".

Sharovipteryx



Erythrosuchus was the largest predator in the early Triassic. It had a big head attached to a crocodile-like body.

Erythrosuchus



Shonisaurus was a type of reptile called an ichthyosaur. It was the largest marine reptile ever – the size of a modern fin whale. It's thought that the juveniles had teeth, but the adults were toothless. They lived in groups called pods, like dolphins.

Shonisaurus



Atopodentatus was an early marine reptile. It had a hammer-shaped mouth and a bunch of comb-like teeth, which is used to gather plants from the seafloor.

Atopodentatus



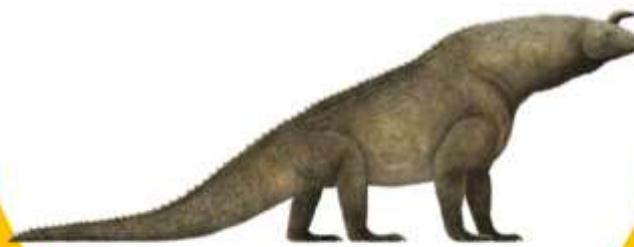
Known as the “monkey reptile”, **Drepanosaurus** climbed trees and had claws on the end of its tail.

Drepanosaurus



Shringasaurus was a reptile that used its long neck to browse higher than other plant-eaters.

Shringasaurus



The most notable feature of the reptile **Longisquama** was the plume of long scales on its back. Scientists think they may have been used to impress potential mates.

Longisquama



Tanystropheus was the giraffe of the seas. It had an extremely long neck – it was half the length of the animal. It used this to catch fish and squid.



The 3D Pterosaur



Pterosaurs, like the famous Pterodactyl, terrorized the skies of the Mesozoic. And although they lived at the same time as dinosaurs, they weren't dinosaurs but flying reptiles. Finding pterosaur bones is difficult – they're very delicate and are almost always destroyed during fossilization.



Dr Brooks Britt and Dr Fabio Vecchia were hunting for bones in the US state of Utah, well known for its dinosaur discoveries. When the team spotted a pterosaur bone poking out of a rock, they knew they had come across something special.



Now was the tricky part. Since the bones were too fragile to remove completely from the rock, the palaeontologists had to cut out a block of rock to take back to the lab. Then they had a great idea: they decided to X-ray it.



What they found took their breath away – instead of being crushed like most pterosaur fossils, this pterosaur had been preserved in 3D! They called it *Caelestiventus*, and promptly printed out a model of it using a 3D printer.

Caelestiventus



From the model they discovered that this 210-million-year-old was much larger than other Triassic pterosaurs. It also had a horn-like crest and a pelican-like throat pouch. Unlike pelicans, however, *Caelestiventus* lived around a lake surrounded by sand dunes in a giant desert, and there's no evidence there were fish nearby. So, this pterosaur probably spent its time hunting small reptiles.



The Frozen Reptile



Searching for dinosaurs in Antarctica is not easy, and that's putting it mildly. First, in case you hadn't noticed, Antarctica is covered in snow and ice. That means palaeontologists can only hunt for fossils on the tops of mountains that poke through the thick ice. This didn't deter geologist David Elliot.



In 1991, at an altitude of 4000m (13000 ft), a mere snowball's throw from the South Pole, he discovered the bones of a dinosaur that would later be called Cryolophosaurus.

Cryolophosaurus



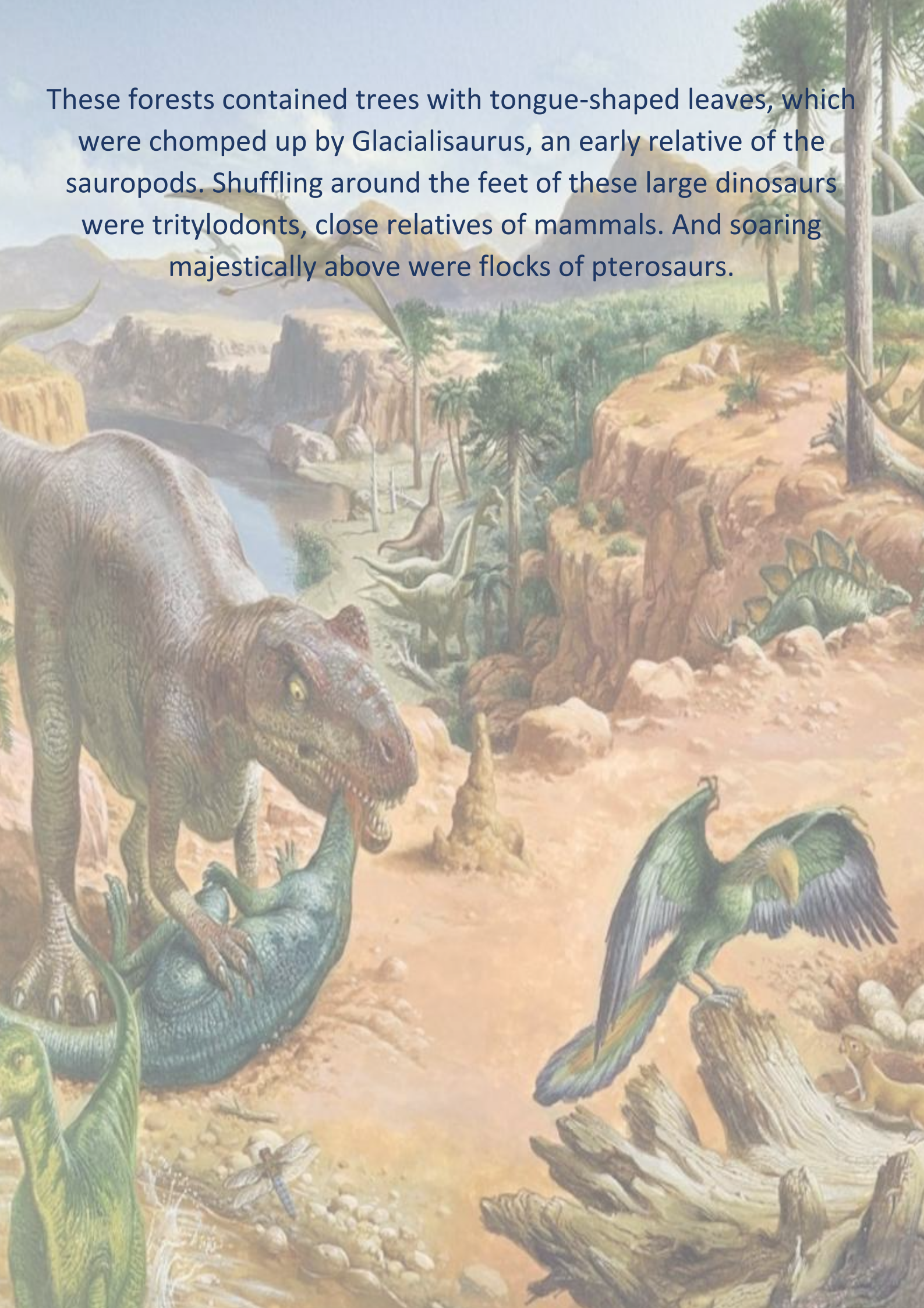
If finding the fossil was difficult, excavating it was even harder. It took three weeks and the team had to use power tools like jackhammers and rock saws to remove large blocks of rock. Oh, and then the blocks had to be flown off the mountain by helicopters.

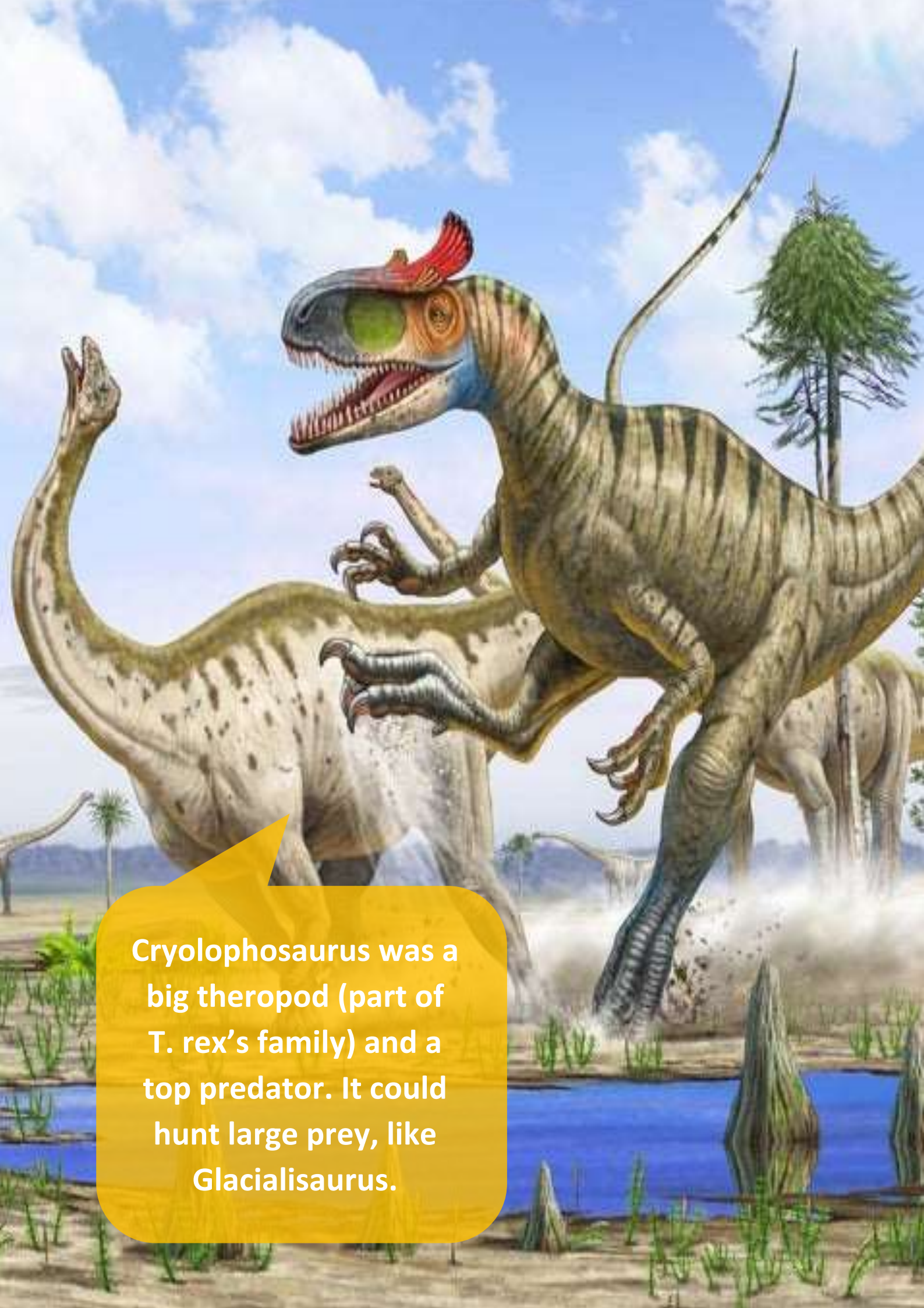


Antarctica was a very different place in the early Jurassic. It was further north and had a cool climate that supported forests.



These forests contained trees with tongue-shaped leaves, which were chomped up by *Glacialisaurus*, an early relative of the sauropods. Shuffling around the feet of these large dinosaurs were tritylodonts, close relatives of mammals. And soaring majestically above were flocks of pterosaurs.





Cryolophosaurus was a big theropod (part of T. rex's family) and a top predator. It could hunt large prey, like Glacialisaurus.

But it was probably an opportunistic predator – which means it wasn't fussy and would eat whatever it could. Cryolophosaurus had a prominent crest above its eyes, which may have been used to help individuals identify each other, or as an impressive display. Who would have thought this rule of the Jurassic would have ended up frozen in ice at the top of a mountain?





THINK

DIGITAL ACADEMY

