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DINOSAURS!

DISCOVER THE GIANTS OF THE PREHISTORIC WORLD

81



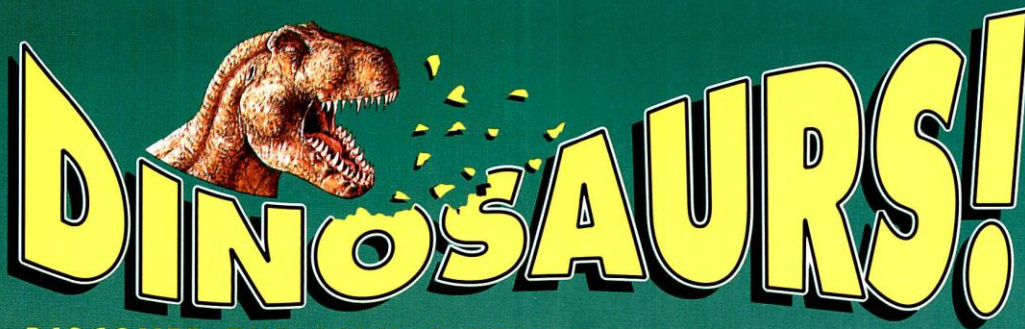
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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •



IDENTIKIT

Meet a plant-eating dinosaur and two other prehistoric creatures

ANCHISAURUS	1921
PYROTHERIUM	1924
KANNEMEYRIA	1925

PREHISTORIC WORLD



Walk in Jurassic North America in DINOSAUR SAFARI 1926



SPOTTER'S GUIDE

Find out how pterosaurs feed in PTEROSAUR HEADS 1934

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What happened to the remains when a dinosaur died? Discover the grisly truth in PREHISTORIC SCAVENGERS 1936



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ASK THE EXPERT

Dr David Norman of Cambridge University answers more of your dinosaur queries BACK COVER

PLUS

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Anchisaurus keep together to try and scare off predators 1930

3-D Gallery

Leaellynasaura hunt for food in Late Cretaceous Australia 1932

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ANCHISAURUS

This small plant-eater was one of the first dinosaurs to be discovered in North America.



about 210 million years ago, in the Early Jurassic Period, herds of *Anchisaurus* plodded across the lake shores in search of food. They were some of the earliest plant-eating dinosaurs on Earth. These peaceful grazers probably feasted on the early horsetails and ferns that flourished by the edge of the water.

UP AND DOWN

Anchisaurus had a front-heavy body – so it probably walked on all-fours as well as on two legs. The dinosaur may have reared up on its hind legs to reach the plant tops. It probably used its short front legs to steady its long, heavy body when it was on the move. *Anchisaurus* would have held its large thumb claws off the ground to stop them getting damaged.

ANCIENT SAUROPOD

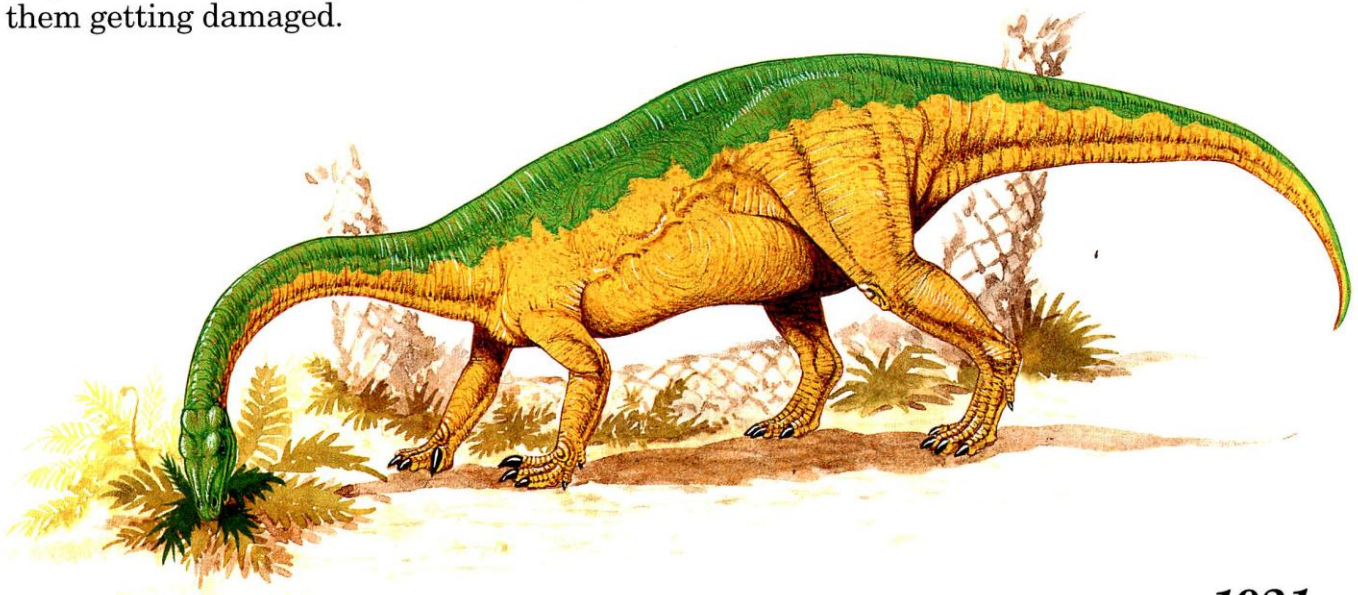
The long-necked *Anchisaurus* was a prosauropod – a primitive version of the giant sauropods such as *Brachiosaurus*, which lived millions of years later.

TIP TOP

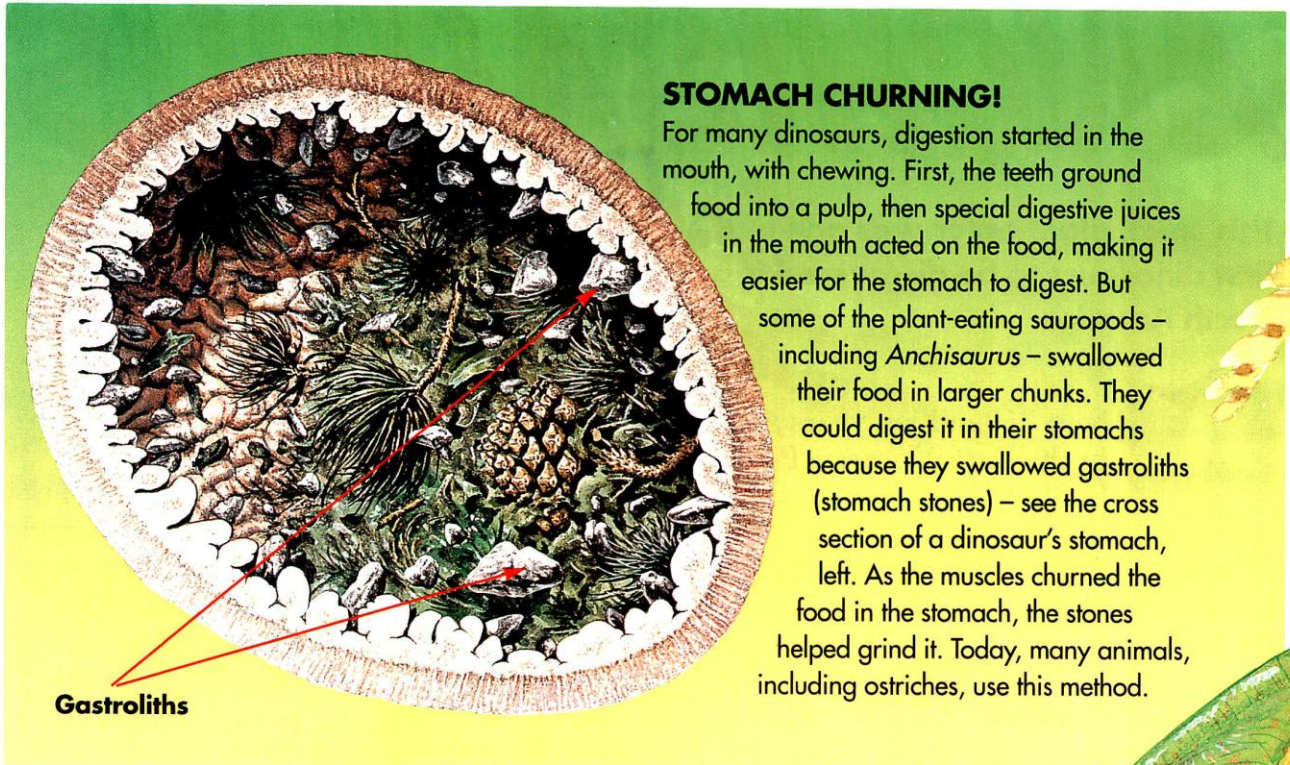
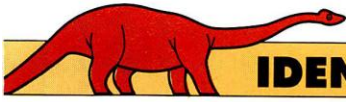
Anchisaurus was one of the first dinosaurs to be able to crane its neck upwards to find more food. Other plant-eaters living at the same time were short, stocky creatures with short necks. They were unable to reach the tender green shoots that grew higher up. But *Anchisaurus* could always find plenty of juicy leaves to eat.

SHARP TEETH

Anchisaurus had saw-edged, pencil-shaped teeth. It used them to shred the leafy twigs and ferns it fed on. The dinosaur probably stuffed the plant pieces into its mouth with its hands, so that nothing fell out while it was eating.



1921



Gastroliths

STOMACH CHURNING!

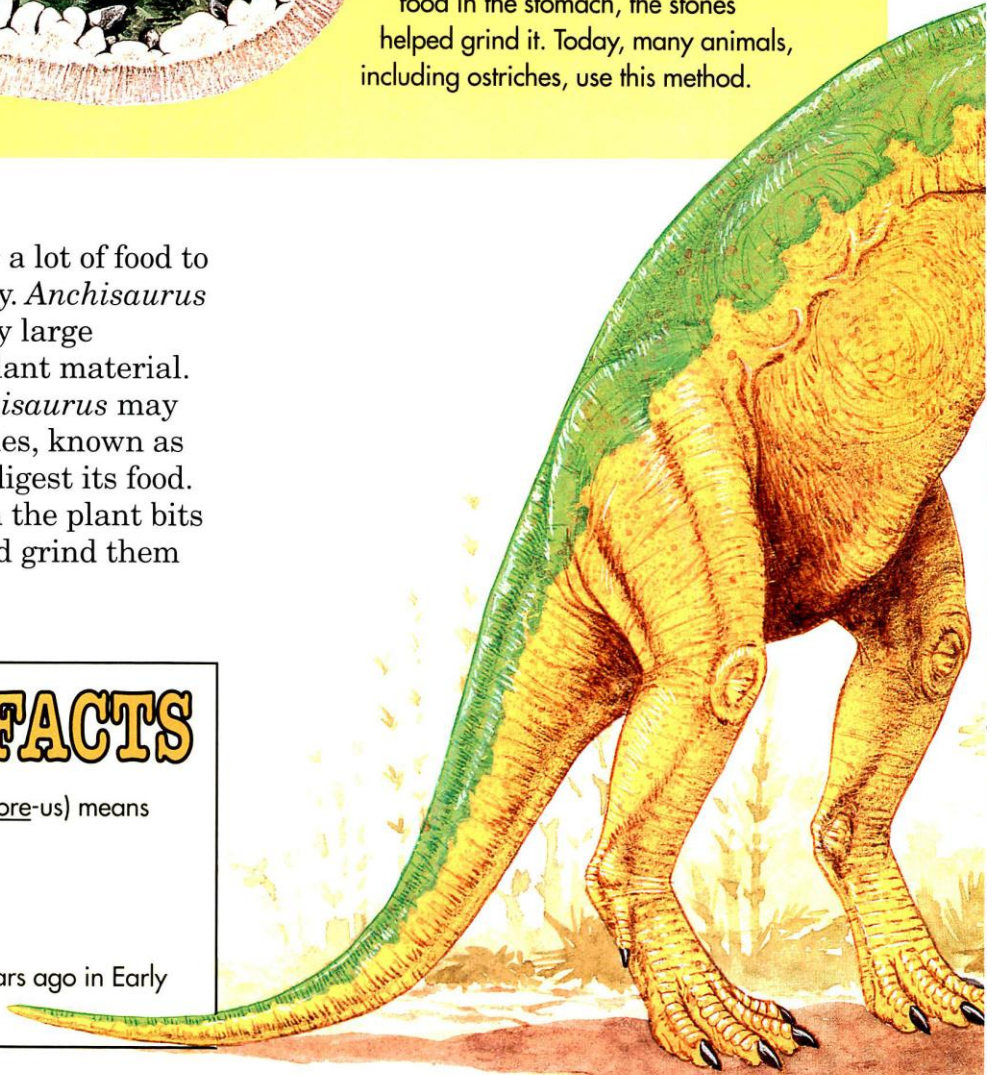
For many dinosaurs, digestion started in the mouth, with chewing. First, the teeth ground food into a pulp, then special digestive juices in the mouth acted on the food, making it easier for the stomach to digest. But some of the plant-eating sauropods – including *Anchisaurus* – swallowed their food in larger chunks. They could digest it in their stomachs because they swallowed gastroliths (stomach stones) – see the cross section of a dinosaur’s stomach, left. As the muscles churned the food in the stomach, the stones helped grind it. Today, many animals, including ostriches, use this method.

IT’S A GRIND

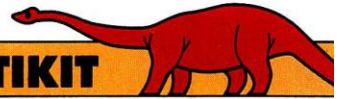
Plant-eaters have to devour a lot of food to fuel their bodies with energy. *Anchisaurus* must have had an extremely large stomach to digest all that plant material. Like other herbivores, *Anchisaurus* may have swallowed small pebbles, known as ‘stomach stones’, to help it digest its food. The stones pressed down on the plant bits during digestion, and helped grind them into pulp more quickly.

MONSTER FACTS

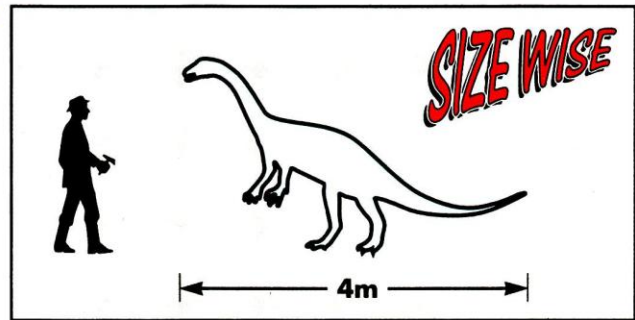
- **NAME:** *Anchisaurus* (an-ki-sore-us) means ‘near lizard’
- **GROUP:** dinosaur
- **SIZE:** 2 – 4m long
- **FOOD:** plants
- **LIVED:** about 210 million years ago in Early Jurassic North America



1922



With its long neck and strong back legs, *Anchisaurus* was able to stretch up to the highest branches to reach the most succulent leaves.



BAND AID

Fossil footprints show that *Anchisaurus* moved about in herds. They probably banded together for protection. Big meat-eaters, such as *Dilophosaurus*, were less likely to attack a large group of animals, and twenty pairs of eyes were better than one for spotting potential predators.

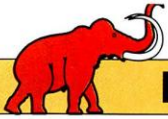
ON THE RUN

Anchisaurus was as long as a man is tall, but lighter. It was probably fairly fast on its feet and might have outrun a hungry carnivore. If the plant-eater was cornered, it could have struck out with its great curved thumb claws to defend itself.

IT'S A FACT

MIX UP

Anchisaurus was probably America's first known dinosaur. But it was not correctly identified for about 100 years. The first fossil was found in 1818, but it was thought to be part of a human skeleton. It wasn't until 1855 that experts realised it was part of an animal. It was then reclassified as a dinosaur. It was finally identified as *Anchisaurus* in 1912.



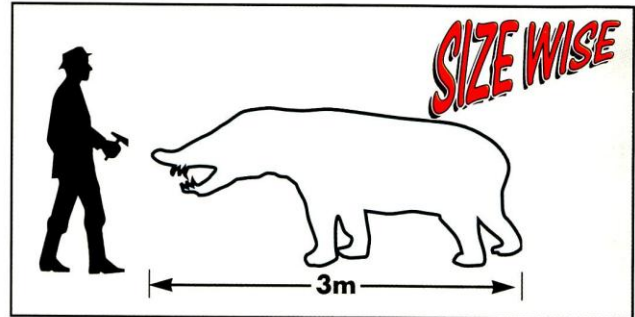
IDENTIKIT

PYROTHERIUM

Pyrotherium looked like a large elephant, with tusks and a long nose.



The fossils of *Pyrotherium* were discovered in beds of ancient volcano ash. So it was named the 'fire beast'.



MIGHTY ROOTER

Pyrotherium was a plant-eater like today's elephant. But instead of having just one pair of tusks, it had a range of chisel-shaped tusks to help it feed. *Pyrotherium* probably used its odd-looking tusks to root up tasty bulbs and shoots.

SPLENDID ISOLATION

The big plant-eater was one of many prehistoric animals that evolved in South America. Because the continent was cut off from the rest of the world by sea, these animals developed successfully away from many other animals. But things changed when North and South America became joined two million years ago.

INVASION

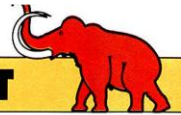
When animals from North America moved in, they drove *Pyrotherium* out. *Pyrotherium* died out because it was not as successful at hunting for the same food.

MONSTER FACTS

- **NAME:** *Pyrotherium* (py-ro-thee-ree-um) means 'fire beast'
- **GROUP:** mammal
- **SIZE:** 3m long
- **FOOD:** plants
- **LIVED:** about 35 million years ago in the Oligocene in South America

1924



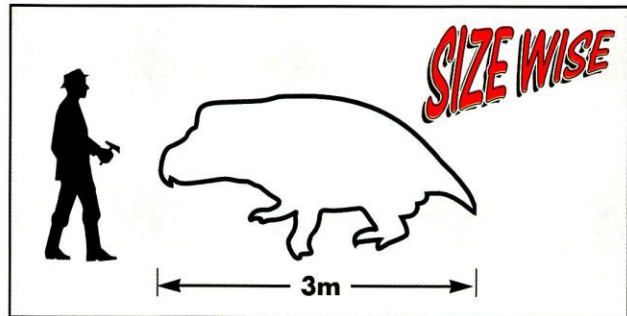


KANNEMEYRIA

This huge mammal-like reptile was as big as a hippopotamus.



kannemeyria belonged to one of the most successful groups of mammal-like reptiles – the dicynodonts.



BIGGER AND BETTER

The bulky plant-eater was fatter than today's hippopotamus. It had a gigantic, barrel-like rib cage, which gave lots of room for a long gut. Its head was huge, too, but it was lightly built so that it could move around. There were large openings in its skull for its massive jaw muscles.

TEARING AND SHREDDING

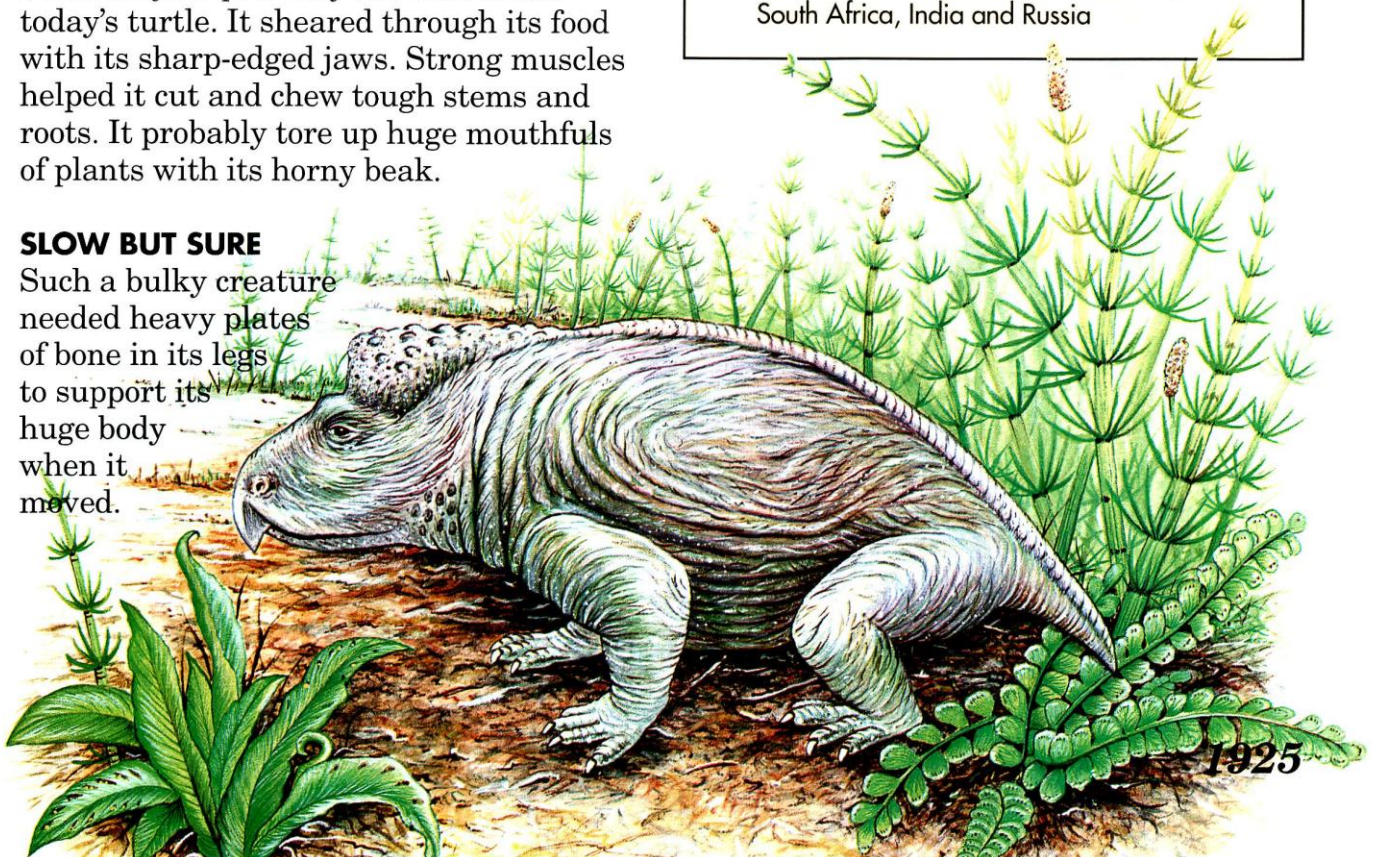
Kannemeyria probably ate rather like today's turtle. It sheared through its food with its sharp-edged jaws. Strong muscles helped it cut and chew tough stems and roots. It probably tore up huge mouthfuls of plants with its horny beak.

SLOW BUT SURE

Such a bulky creature needed heavy plates of bone in its legs to support its huge body when it moved.

MONSTER FACTS

- **NAME:** *Kannemeyria* (kan-ah-may-er-ee-a) means 'from Kannemerer'
- **GROUP:** mammal-like reptile
- **SIZE:** up to 3m long
- **FOOD:** plants
- **LIVED:** about 220 million years ago in the Early Triassic Period in South America, South Africa, India and Russia



1925



Dinosaur safari

Jurassic North America

Imagine you are in North America, somewhere in Wyoming. But what you can see aren't wheat prairies and the foothills of the Rocky Mountains. You are there in Late Jurassic times!

Our safari begins 150 million years ago on a dusty plain. Away to the north, near where the United States/Canadian border now lies, there is a shallow inland sea. It used to be much bigger. The plain is its dried-up bed. There are still lakes here and there, and streams trickle down from the Rockies.

WHERE DINOSAURS DRINK

You are standing beside one of the lakes. The shore has been churned up and you can see huge footprints. This is the dry season and the lake has almost dried up. When the rains start, the streams will flow faster and the lake will fill up again.

BIG SAUROPOD COUNTRY

Despite the lack of rain, the banks of the stream are thick with vegetation. As you walk upstream towards the highlands, you catch glimpses of the animals that made the gigantic footprints along the edge of the lake. This is the country of the sauropod. Huge dust clouds signal where herds of *Apatosaurus* are travelling from one feeding ground to another. They keep together in tight groups in case they are attacked by big meat-eaters, such as *Allosaurus* or *Ceratosaurus*.

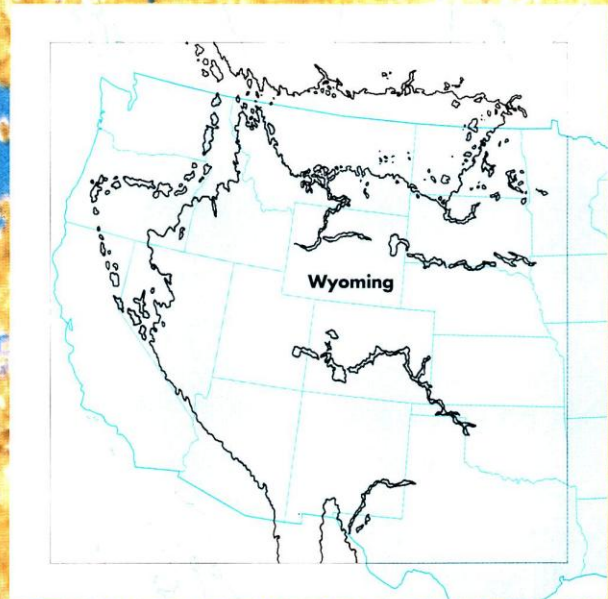
1926



The volcanic islands off the coast probably looked like this island.



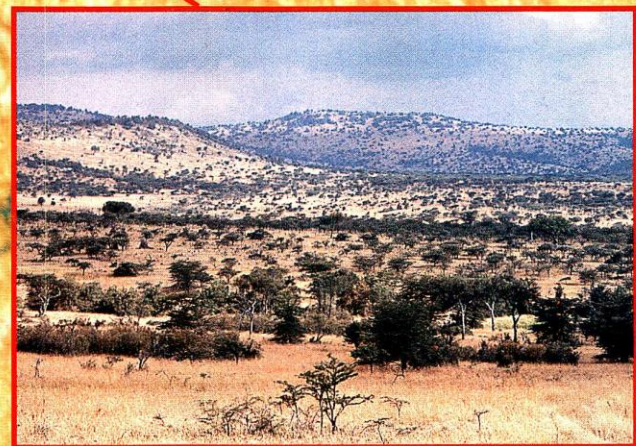
Start here! Your safari begins beside this lake. Follow the path, shown in red, through the mountains to the shore.



The main part of our Jurassic map is now part of the USA. The blue map, above, shows the area today, divided into the states of America. The black part shows where the land was in Jurassic times, when our safari takes place.



Perhaps the wooded slopes looked like this forest in New Zealand.



The dry Jurassic plain may have been something like this African grassland.



TALL FEEDERS

Here and there, on the wooded river banks, you can see herds of *Diplodocus*. They rise up on their hind legs, reaching their long necks high up into the trees to eat. The trees are bare of branches up to the highest point the sauropods can reach. Occasionally, you catch glimpses of other sauropods, such as *Brachiosaurus*. *Camarasaurus* lives here too.

HERE COMES THE RAIN

As you continue your journey, the wet season begins and the rains fall. Ferns spring up in the open areas between the streams. The cycads put out new bunches of palm-like fronds on top of their barrel-shaped trunks. The sauropods are still on the move, enjoying the fresh vegetation. And you can see many other animals out looking for food.

The scene below shows the sort of countryside that you will be journeying through after the rains fall. Remember to keep an eye out for the meat-eaters!

A BEAST OF OPEN COUNTRY

In the distant open spaces, you see the jagged silhouette of a *Stegosaurus*. This plated plant-eater prefers the drier open spaces. Out in the open, its plates will not become entangled in branches, and the wind can keep its massive body cool.

SMALLER CREATURES

Pterosaurs sweep down, screeching over your head. They probably think you are a small, but dangerous, meat-eating dinosaur. There are some dinosaurs living here that are just your size. Swift and ferocious *Ornitholestes* and *Coelurus*, for instance. Watch out for them! These two-legged predators can run very fast, and can catch their victims in long, clawed fingers and sharp teeth.

TO THE HILLS

After many days' travel you see the mountains ahead, and you start to climb into the foothills. The scenery changes completely. Now you are walking up wooded hillsides. Great tree ferns, covered with creepers, tower above you.





HIDDEN ANIMALS

Animal life is different here, too, but you cannot really see it. It is hidden in the thick undergrowth. Some plants have thorns more than 2cm long. They probably protect the plants against big browsing animals! More than once, however, you come across a great armoured ankylosaur feeding in a clearing. It is difficult to say what kind it is, but it is quite primitive.

OVER THE MOUNTAIN...

At last you come to the mountains. Pterosaurs soar around the peaks, but, apart from them, there is very little animal life. Slowly, you make your way through the mountain passes. Then you begin to descend towards the ocean.

...AND DOWN TO THE SEA

Again, you pass through wooded foothills. But now, through the leaves, you catch a glimpse of water ahead of you. You can even see a string of islands, with smoking volcanoes. This is where the edge of the continent is being crushed and pushed up to form mountains.

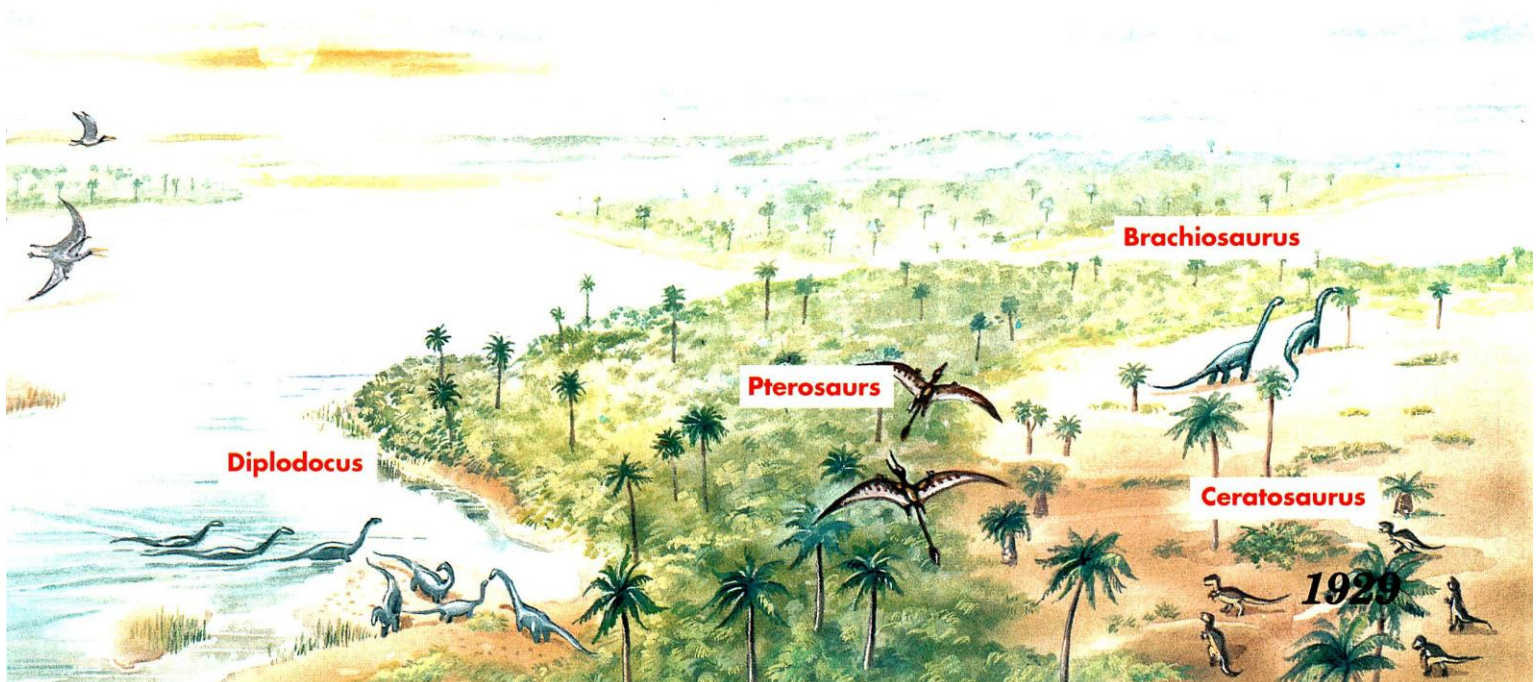
*Is it
true*

that ankylosaurs lived during the Jurassic?

In recent years, ankylosaur fossils have been found in the Morrison Formation, which is made up of layers of rock stretching along the foothills of the Rockies, from Montana to New Mexico. The muds, sands and gravels which formed these rocks were laid down by streams running across a plain in Late Jurassic times. Some of the best dinosaur skeletons have been found here. The ankylosaur fossils were not very well preserved and scientists think they were washed down from the uplands, where these beasts lived.

THE OCEAN

The coastline is cluttered with islands. The offshore islands are gradually being welded to the edge of the continent, making it bigger. At the bottom of the cliffs, plesiosaurs and ichthyosaurs swim in the surf. Pterosaurs dive down onto the fish that have been disturbed by the big reptiles. And beyond that? A vast ocean, far larger than the Pacific today, reaches towards distant lands that will eventually become the modern continent of Asia.

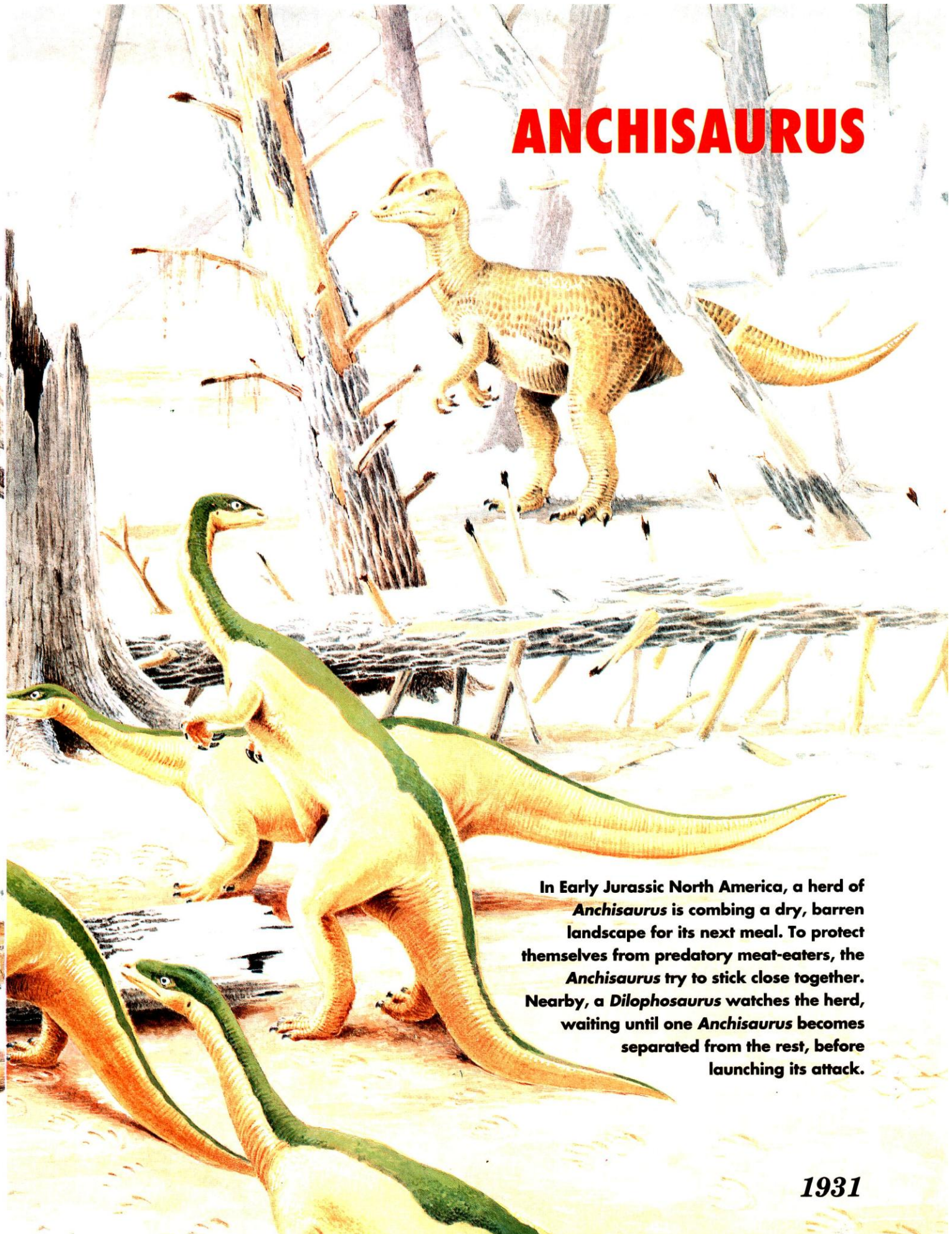


GIANTS OF THE PAST



1930

ANCHISAURUS



In Early Jurassic North America, a herd of *Anchisaurus* is combing a dry, barren landscape for its next meal. To protect themselves from predatory meat-eaters, the *Anchisaurus* try to stick close together. Nearby, a *Dilophosaurus* watches the herd, waiting until one *Anchisaurus* becomes separated from the rest, before launching its attack.

1931

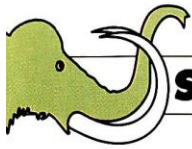
3-D Gallery 90

LEAELLYNASAURA



A red and green illustration of a dinosaur, likely a Leaellynasaura, in a landscape. The dinosaur is shown in profile, facing right, with its head lowered as if grazing. The background features stylized trees and a rocky terrain. The entire image is rendered in a high-contrast, two-color style using red and green ink on a white background.

In Late Cretaceous Australia, a herd of *Leaellynasaura* is scouring the dusty land for a meal. Known as 'dinosaur gazelles', these chicken-sized plant-eaters are always on their guard, and can move swiftly if they sense danger.



Pterosaur heads

Ornithocheirus

Long and spear-like or deep and brush-like, pterosaur heads came in all shapes and sizes.



Many pterosaurs lived near water. They swooped down from the Mesozoic cliffs and rocks to catch food. Some hunted for fish, some snapped at insects, and others sieved up tiny water creatures. Many pterosaurs caught their food while in the air. But some just stood still and dabbled for it in the shallows. Pterosaurs evolved their different head shapes to help them feed in different ways.



LONG AND SHORT

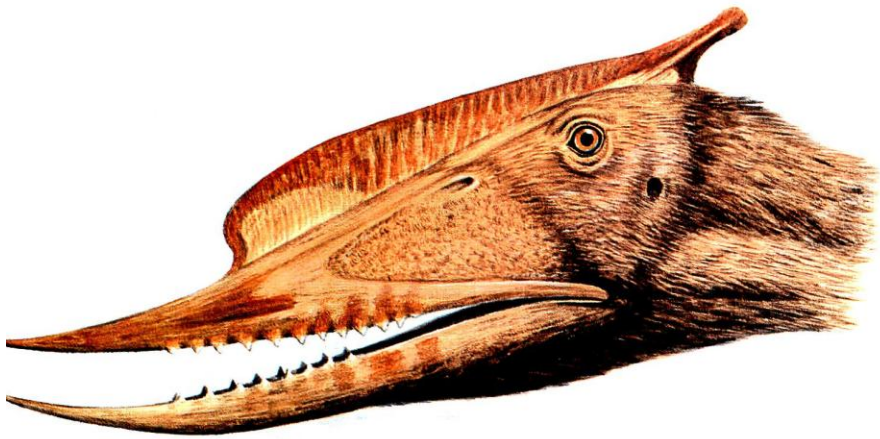
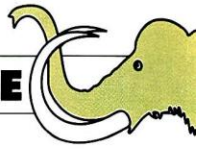
Ornithocheirus speared slippery fish for its food. This pterosaur had long jaws lined with short, sharp teeth. A parent pterosaur may have stored fish in a special throat pouch to take back to the nest. A young *Ornithocheirus* could use its long beak to pick the fish out of the pouch. Today's pelicans have throat pouches like this.

PLUCKY EATER

Dsungaripterus had amazing jaws that curved upwards at the end. It probably used them like a pair of giant tweezers, to pluck small crabs and shellfish off the rocks. *Dsungaripterus* cracked the shells open on specially flattened teeth at the back of its mouth. Its bony crest may have helped *Dsungaripterus* to steady itself as it soared through the sky.

1934

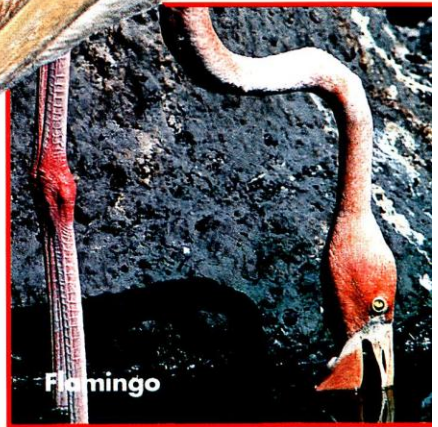




Dsungaripterus (above) picked up shellfish in its long, curved jaws. It then crunched up the shells with its strong back teeth.



Pterodaustro (above) scooped up mouthfuls of water and sieved out the fish, just like this flamingo.



FILTER FEEDER

Pterodaustro is known as the 'flamingo pterosaur' because experts think it fed like today's flamingo. Its lower jaw was lined with a sieve, made up of thousands of long, narrow teeth. *Pterodaustro* fed on the shrimp-like creatures it found in the mud.

GRIP FAST

Preondactylus had long, beak-like jaws and forward-pointing front teeth. It probably ploughed its lower jaw through the surface of the water as it flew along.



Preondactylus (left) probably fished like today's pelican.



Anurognathus (right) had small, blunt teeth and probably lived on insects.

TOOTHLESS WONDER

Quetzalcoatlus had slim, toothless jaws. It fed on creatures that lived in muddy pools and picked off bits of flesh from carcasses.

SNAP HAPPY

Anurognathus had a short, blunt head. Its mouth was studded with tiny, peg-like teeth. It snapped up dragonflies or wood wasps while it was in flight.



1935



Prehistoric scavengers

When a dinosaur died, its body was not just left to rot. There were plenty of creatures more than happy to take advantage of an easy meal.

Animals in the wild die for many reasons. Some are killed by predators, others die of old age or illness. But their bodies do not stay around for long. A dead animal provides a tasty meal for an entire army of scavengers, from large mammals to tiny bacteria. Scavengers are nature's refuse collectors, clearing away unwanted rubbish. Without them, the world would be littered with rotting carcasses.

FOOD NOT FOSSILS

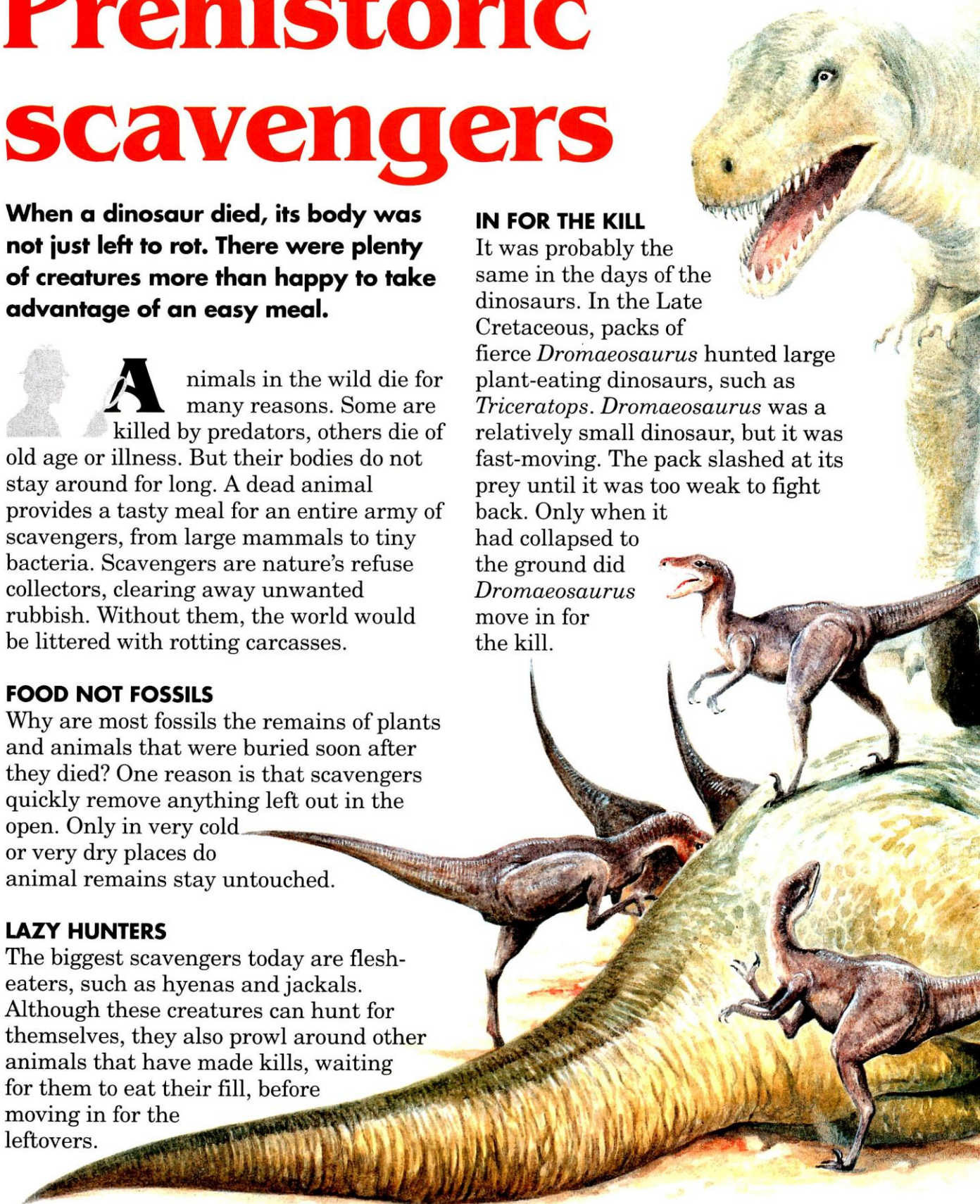
Why are most fossils the remains of plants and animals that were buried soon after they died? One reason is that scavengers quickly remove anything left out in the open. Only in very cold or very dry places do animal remains stay untouched.

LAZY HUNTERS

The biggest scavengers today are flesh-eaters, such as hyenas and jackals. Although these creatures can hunt for themselves, they also prowl around other animals that have made kills, waiting for them to eat their fill, before moving in for the leftovers.

IN FOR THE KILL

It was probably the same in the days of the dinosaurs. In the Late Cretaceous, packs of fierce *Dromaeosaurus* hunted large plant-eating dinosaurs, such as *Triceratops*. *Dromaeosaurus* was a relatively small dinosaur, but it was fast-moving. The pack slashed at its prey until it was too weak to fight back. Only when it had collapsed to the ground did *Dromaeosaurus* move in for the kill.



1936

Although hyenas are good hunters, they will often feed on lions' kills once the lions have eaten their fill.



Tyrannosaurus rex

MOVE OVER!

Often, larger, slower-moving carnivores, such as mighty *Tyrannosaurus rex*, were attracted by the stench of blood in the air.

They followed the scent to the scene of the kill, and lurked nearby, waiting to steal the meal. When the prey was dead, or almost so, *T rex* would move in. The smaller dinosaurs were driven off and the giant was left to eat his fill.

Dromaeosaurus

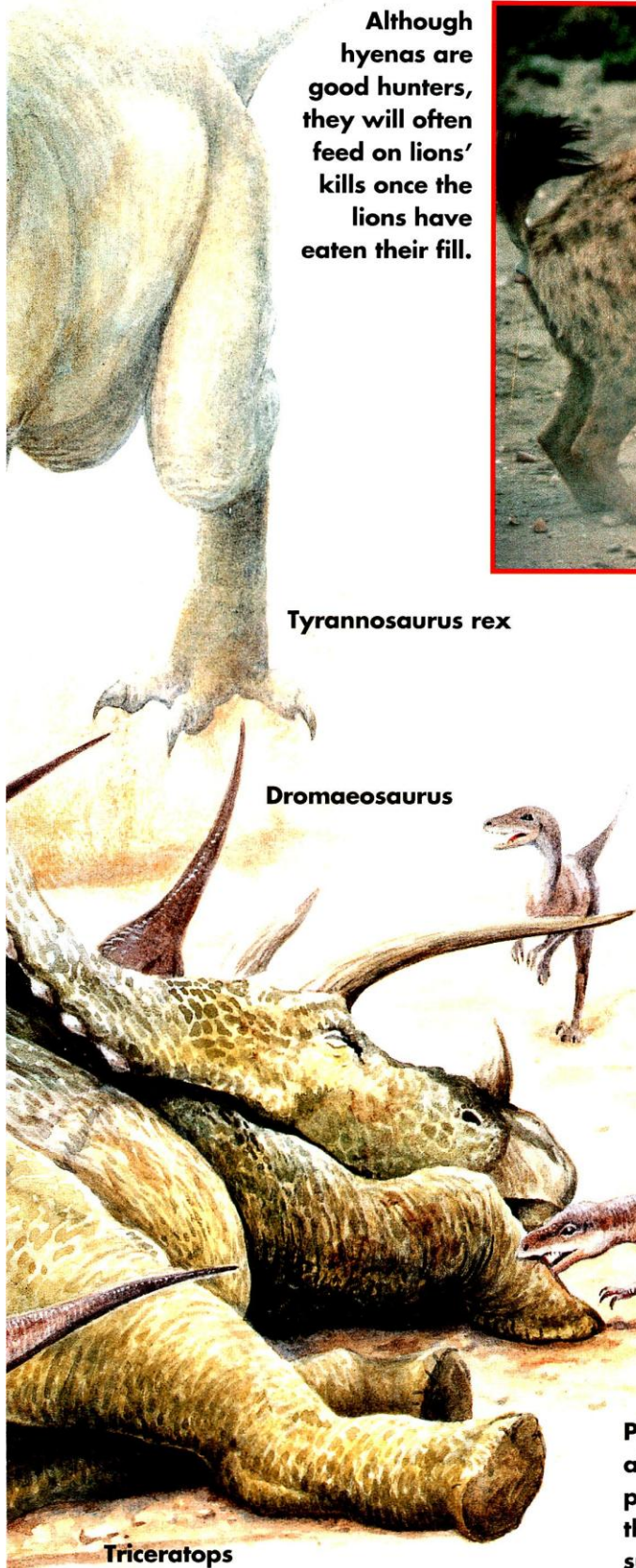
OUR MEAL TOO!

But the pack of *Dromaeosaurus* did not give up that easily!

They waited nearby, and snatched mouthfuls of food while *T rex* was busy eating.

And, when the giant had finished feeding, there was still plenty left for *Dromaeosaurus* and other smaller creatures.

Packs of *Dromaeosaurus* were fierce hunters. They were able to kill large prey, such as *Triceratops*. But larger predators, such as *Tyrannosaurus rex*, were able to bully their way through and steal their kills. Smaller scavengers, such as rodents and bugs, also came to feed.



Triceratops

LEFTOVERS

Neither *Tyrannosaurus rex* nor *Dromaeosaurus* would have eaten the entire *Triceratops* carcass. Other hungry meat-eaters, attracted by the smell of the meat, would have hurried along. Large lizards, like the monitor lizards of today, and smaller dinosaurs, such as *Chirostenotes* and *Struthiomimus*, may have come to feed on the softer parts of the dead animal. They would also have made a meal of the lizards! Many insects, such as flies and beetles, would have crawled over the remains, feeding and laying their eggs. When the eggs hatched, the maggots would have had a meal, too.

FLYING SCAVENGERS

Just like the vultures of today, toothed birds, such as *Ichthyornis*, may have fluttered above the heads of the scavengers. As soon as they saw a chance, they would have dived down to snatch a mouthful of meat from the carcass.

NIGHT FEEDERS

As darkness fell, small mammals such as *Purgatoris*, which lived and fed like shrews, would have crept out to feed at the remains. They would have snapped up the maggots that had hatched from eggs laid by the flies that had fed earlier in the day.

THE BARE BONES

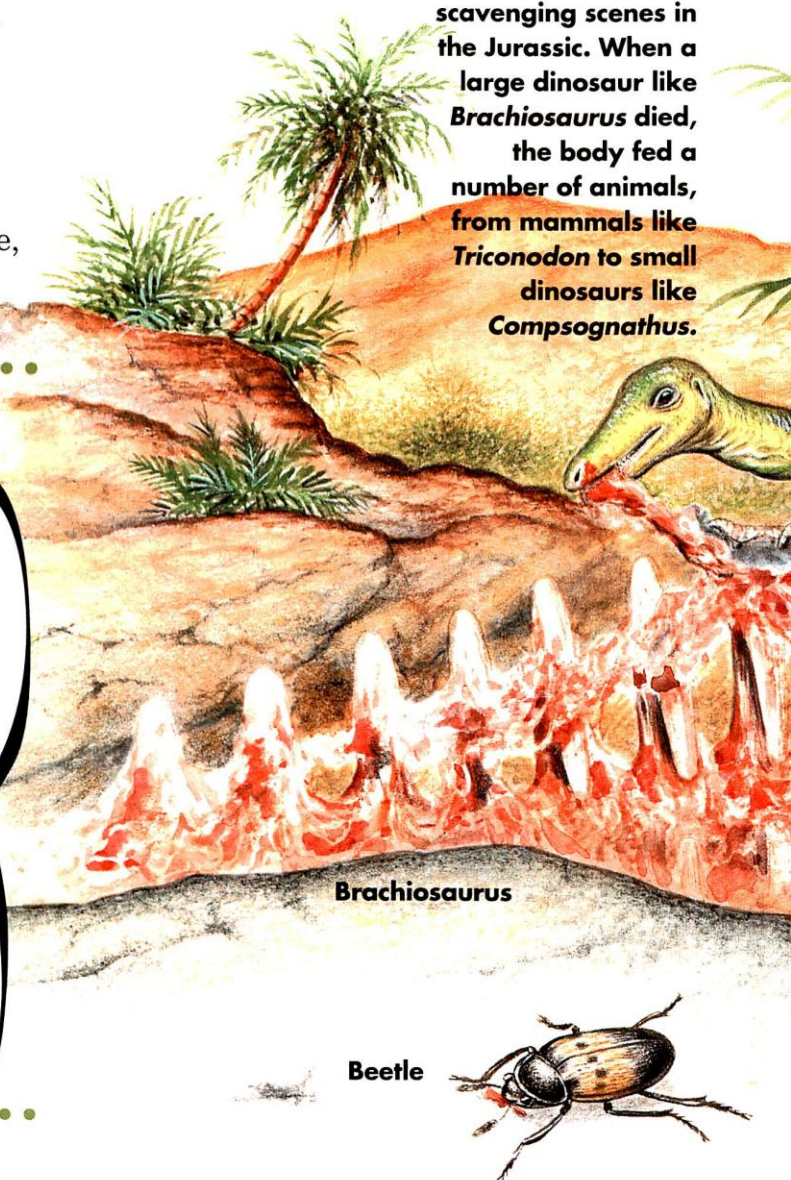
Eventually, all that would have been left of that once great beast, *Triceratops*, would have been its bones, picked completely clean by the scavengers.

There were similar scavenging scenes in the Jurassic. When a large dinosaur like *Brachiosaurus* died, the body fed a number of animals, from mammals like *Triconodon* to small dinosaurs like *Compsognathus*.

IT'S A FACT

THAT MEAT-EATING DINOSAURS COULD NOT CRUSH BONES.

The teeth of carnivorous dinosaurs were designed for slashing and carving. They did not have strong enough teeth or jaws to crush bones. The bones of a *Camarasaurus* from Wyoming, in the USA, have been found with large, grooved toothmarks, cut soon after the creature died. But none of the bones had been crushed.



Brachiosaurus

Beetle

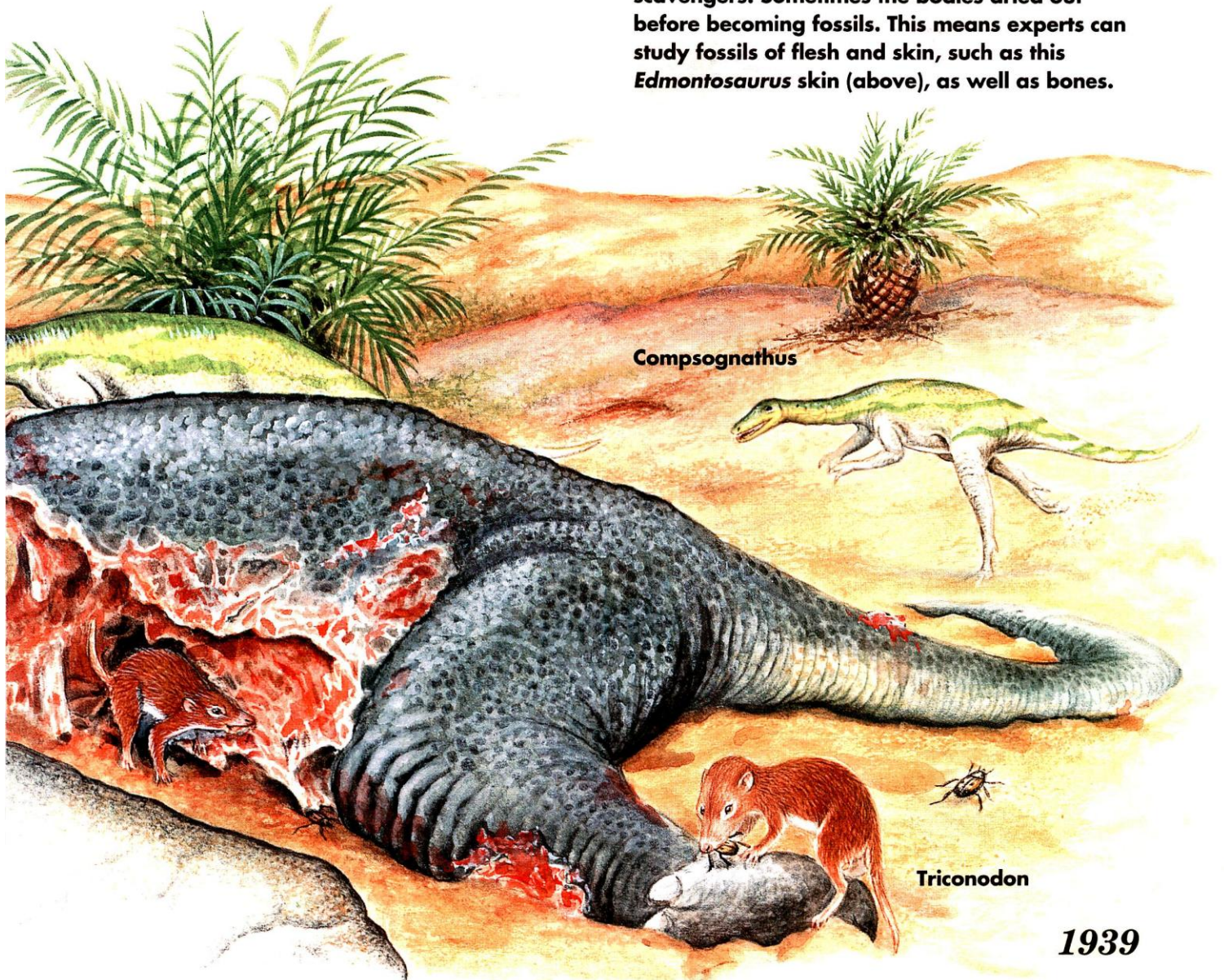
1938

MUMMIFIED

Not all dinosaur carcasses were eaten in this way. Several mummified dinosaurs have been unearthed. This happens when the body, with skin and flesh intact, dried out completely before being fossilized. This means that scavengers had not been able to strip all the meat and bones from the dead dinosaur. Perhaps these preserved dinosaurs died in an area where scavenging dinosaurs and animals could not reach them. Or perhaps, millions of years ago, there were fewer scavengers at work than there are today.



Not all dinosaur carcasses were picked clean by scavengers. Sometimes the bodies dried out before becoming fossils. This means experts can study fossils of flesh and skin, such as this *Edmontosaurus* skin (above), as well as bones.



1939



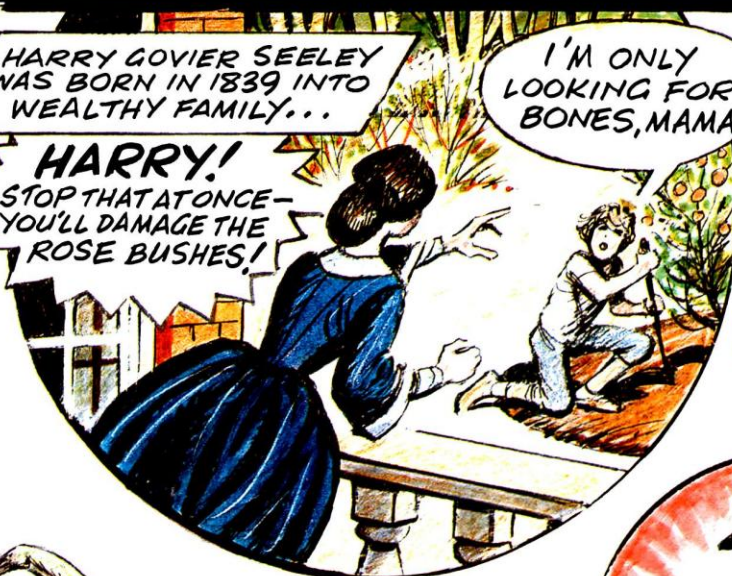
HIP HIP HOORAY!

WHEN HIS EDUCATION WAS OVER, HARRY BECAME THE ASSISTANT TO ADAM SEDGEWICK, AN EMINENT GEOLOGIST IN CAMBRIDGE

HARRY GOVIER SEELEY WAS BORN IN 1839 INTO A WEALTHY FAMILY...

I'M ONLY LOOKING FOR BONES, MAMA

HARRY!
STOP THAT AT ONCE—
YOU'LL DAMAGE THE
ROSE BUSHES!



HOW ARE YOU GETTING ON HARRY?

I'VE JUST ABOUT FINISHED CATALOGUING THE FOSSIL REPTILES IN THIS ROOM, SIR

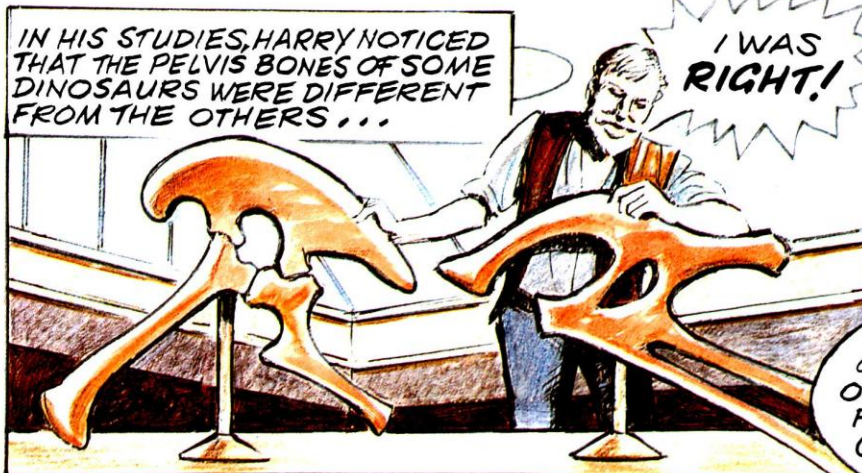


IN ALL, HARRY DUG UP FORTY TAIL VERTEBRAE AND FOOT BONES OF A BEAST HE CALLED MACRUROSAURUS, OR LONG-TAILED LIZARD, WHICH WAS PROBABLY A SAUROPOD

FIVE YEARS LATER, HE DUG UP ANOTHER FOSSILIZED VERTEBRA. HE CALLED THE CREATURE IT HAD BELONGED TO CRATEROSAURUS, OR "BOWL REPTILE". IT WAS PROBABLY A **STEGOSAUR**

IN HIS STUDIES, HARRY NOTICED THAT THE PELVIS BONES OF SOME DINOSAURS WERE DIFFERENT FROM THE OTHERS...

I WAS RIGHT!



HE DID A LOT OF RESEARCH WAS ONE HUNDRED PER CENT



OWEN GOT IT WRONG. THERE ARE NOT ONE, BUT TWO GROUPS OF DINOSAURS. THE PELVIS OF THE OLDER TYPE IS SIMILAR TO PRIMITIVE REPTILES. I SHALL CALL THESE **SAURISCHIA**, OR REPTILE-HIPPED



HARRY WAS SO GOOD AT WHAT HE DID THAT HE WAS OFFERED SEVERAL IMPORTANT JOBS...

THE NATURAL HISTORY ARE NOT STILL PESTERING YOU, ARE THEY, HARRY?



NO—THIS ONE'S FROM THE GEOLOGICAL SURVEY

IN 1869, IN THE CAMBRIDGESHIRE COUNTRYSIDE, HARRY DUG UP SOME BONES

THIS IS PART OF THE FOOT OF SOME SORT OF REPTILE!



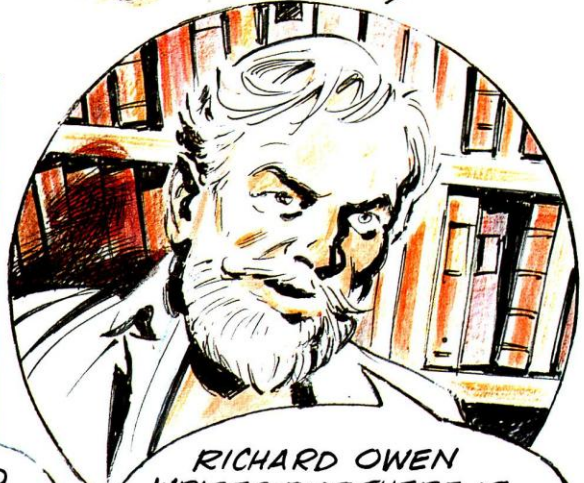
AS MORE AND MORE FINDS WERE MADE, HARRY STUDIED AND READ ABOUT AS MANY OF THEM AS HE COULD...



HARRY! DIDN'T YOU HEAR THE GONG? YOU'RE NOT DRESSED FOR DINNER YET!

I'LL BE THERE IN A MOMENT

WHAT'S SO IMPORTANT, ANYWAY?

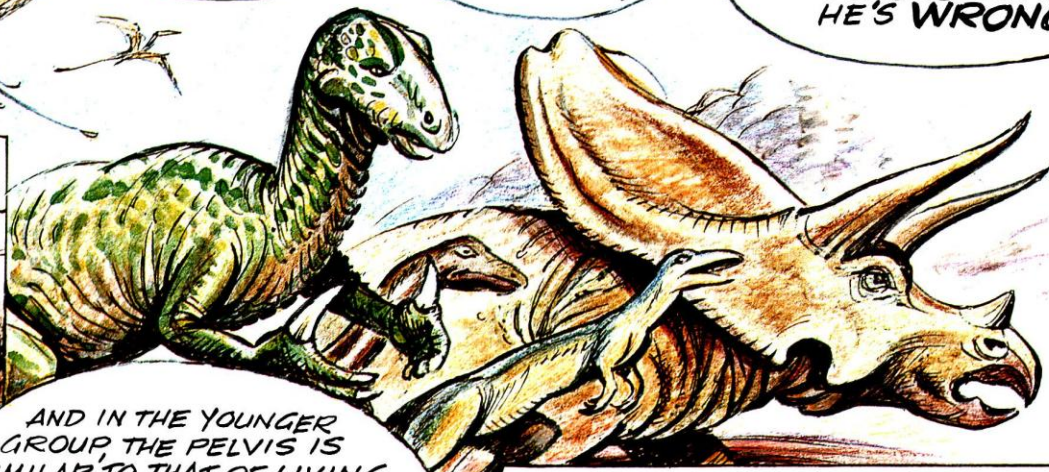


RICHARD OWEN WRITES THAT THERE IS ONLY ONE ORDER OF DINOSAURS—BUT I THINK HE'S WRONG!

AND WHEN HE ISN'T CERTAIN...



AND IN THE YOUNGER GROUP, THE PELVIS IS SIMILAR TO THAT OF LIVING BIRDS. I PROPOSE TO CALL THIS GROUP ORNITHISCHIA, OR BIRD-HIPPED DINOSAURS



SEELEY'S CLASSIFICATION OF DINOSAURS HAS BEEN USED BY SCIENTISTS EVER SINCE, ALTHOUGH RECENTLY SOME NEW THEORIES HAVE BEEN ADVANCED.

Improve and test your knowledge

FACT FILE

Ichthyosaurus holds all the answers.
See how you score in the quiz.

Long nose – no!
Some scientists think that *Brachiosaurus* may have had a trunk like an elephant. The enormous nostrils in the skull seem to suggest this. However, there is no room on the skull for the attachment of the powerful muscles needed to make a trunk work.

1 The dinosaur *Leaellynasaura* was as big as:
a) a hippopotamus
b) a chicken
c) a sheep

2 The teeth of carnivorous dinosaurs could:
a) crush bones
b) shred tough leaves
c) slash and carve flesh

5 *Dsungaripterus* had jaws like:
a) a sieve
b) a lion's
c) giant tweezers

3 Mummified dinosaur remains are the result of:
a) skin and flesh drying out
b) Ancient Egyptians burying them
c) dinosaurs drowning in rivers

6 Hippopotamus-sized *Kannemeyria* was:
a) a mammal-like reptile
b) a dinosaur-like mammal
c) a reptile-like bird

4 The small plant-eater *Anchisaurus* lived in:
a) Carboniferous Europe
b) Early Jurassic North America
c) Precambrian South America

7 Which pterosaur is the 'flamingo pterosaur'?
a) *Quetzalcoatlus*
b) *Anurognathus*
c) *Pterodaustro*

8 *Pyrotherium* was called 'fire beast' because:
a) it liked hot food
b) it had fiery red skin
c) it was found in volcanic ash

Carnosaur curls
A newly discovered flesh-eating dinosaur from Antarctica has a curl-like crest on its head.

1942

Not new news

You probably think the idea that birds evolved from dinosaurs is an exciting new theory. But the Victorian naturalist, Thomas Henry Huxley, proposed it soon after the first Archaeopteryx was discovered in 1861. The idea fell out of favour in 1926 when the Danish palaeontologist, Gerhard Heilmann, denounced it, and it did not resurface until the 1970s.

Not so dim!



This little creature is called Dimylus, and it lived in Europe over 20 million years ago. Dimylus was a bit like a mole, and may have lived on molluscs.

9

Animal remains that turn into fossils usually:

- a) get buried very quickly
- b) get eaten by scavengers
- c) get frozen in ice

10

Which of these dinosaurs moved around in large herds?

- a) *Ceratosaurus*
- b) *Allosaurus*
- c) *Apatosaurus*

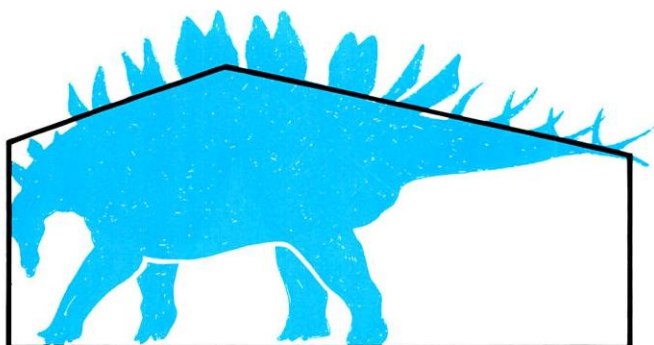
Throwback or kickback?

Every now and then, a whale is spotted with a pair of hind legs. This freak of nature is a throwback to the whale's distant ancestors that lived on land.

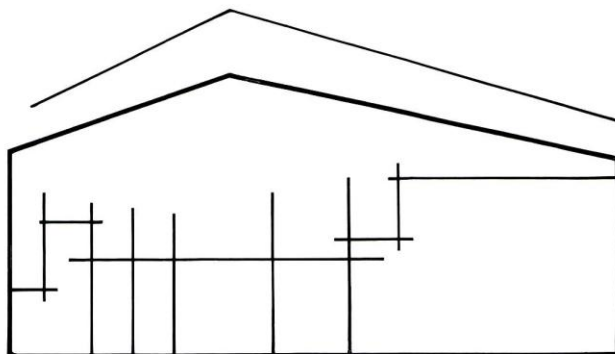


DACENTRURUS

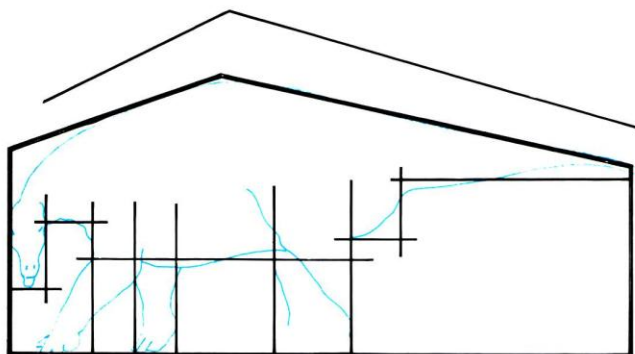
1 First decide on the basic shape of your dinosaur. Draw this with a pencil in the middle of a piece of paper. From this angle *Dacentrurus* looks a bit like a shed.



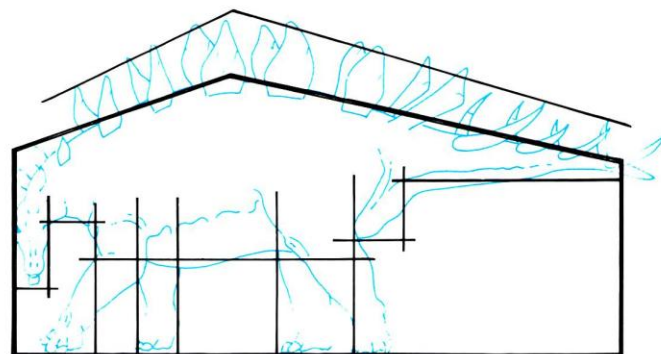
2 Draw lines in the shape to show where the main parts of the body go – mark where the legs join the body, for example. Draw a line to show where the plates and spines go.



3 Draw in the outline of *Dacentrurus*, following the lines you made in Step 2. Don't press too hard with your pencil, so you can rub out the lines if you make a mistake.



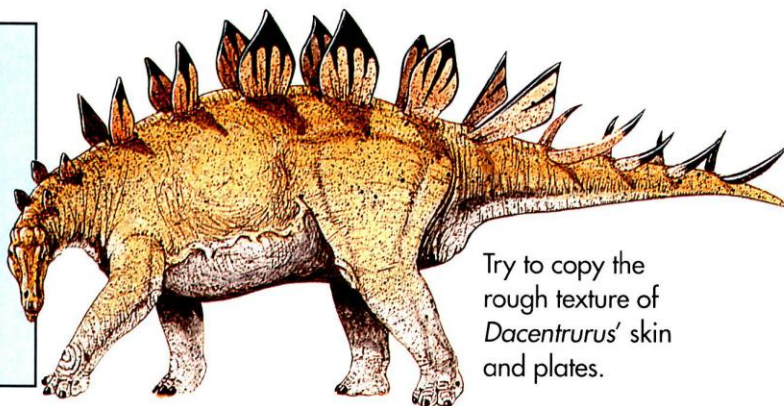
4 Look at the plates and tail spines. You can only see part of the row behind. This row looks smaller because it is further away. It is also darker because it is in shadow.



Fact box

Dacentrurus was the first stegosaur ever discovered.

- **NAME:** *Dacentrurus* (da-sen-troo-rus) means 'pointed tail'
- **GROUP:** dinosaur
- **SIZE:** about 7m long
- **FOOD:** plants
- **LIVED:** in Late Jurassic Europe



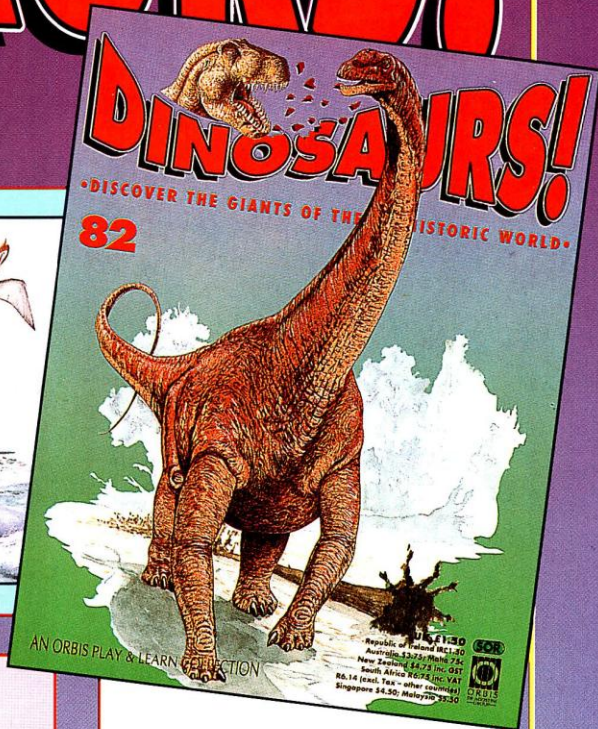
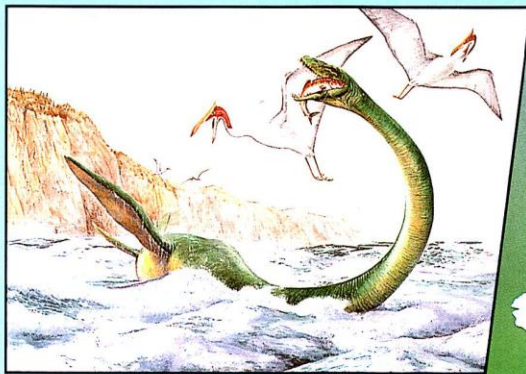
Try to copy the rough texture of *Dacentrurus*' skin and plates.

1944

COMING IN PART 82 OF

DINOSAURS!

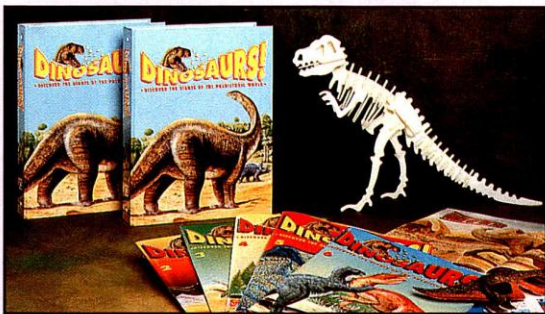
Find out the fascinating story behind dinosaur names in **SPOTTER'S GUIDE**. See the changing faces of sauropods in **TIME DETECTIVE**



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PLUS

Three fascinating creatures in **IDENTIKIT** and **HISTORY IN PICTURES 3-D GALLERY GIANTS OF THE PAST**

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ANSWERS TO FACT FILE QUESTIONS: 1.b 2.c 3.a 4.b 5.c 6.a 7.c 8.c 9.a 10.c



Dr David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

What is the most exciting dinosaur find in the last five years?

There have been so many dinosaur finds in recent years that it's very hard to pick the most exciting! One really interesting find concerns some work that has been done in England. It involved carefully removing parts of the shell from dinosaur eggs found in China. Inside some of the eggs, the tiny embryonic bones of baby dinosaurs, preserved in great detail, were found.



Did prehistoric mammals have stronger teeth than meat-eating dinosaurs?

The answer really depends upon which sort of teeth you are talking about. The long, thin, stabbing teeth which lined the jaws of the large theropods were incredibly strong. But carnivorous mammals have much more complicated teeth than dinosaurs. Behind the stabbing (canine) teeth, their cheek teeth (molars) have spikes and sharp ridges for puncturing flesh, shearing meat and, in some cases, crunching bones. These sorts of teeth are much stronger, on average, than dinosaur teeth.

Were there jellyfish in prehistoric seas?

The remains of jellyfish-like creatures have been found preserved in rocks which appear to date back some 600 million years to the end of the Precambrian. The first of these fossils were

discovered in the Flinders Mountains of South Australia. The bodies of jellyfish are very soft, and so such discoveries are rare as these creatures would not usually leave an imprint on the surface of a rock.

